ESPRIT
PROJECTION SYSTEMS

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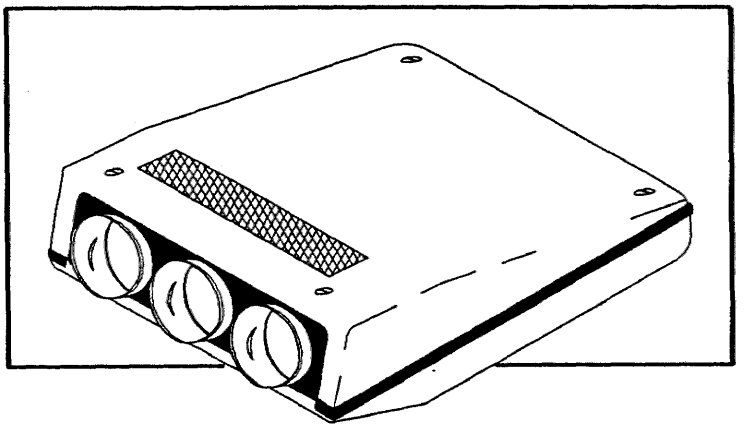

ESPRIT 1500Digital / 2000D / 2000G MODELS 69396 / 69202 / 69203 OPERATION MANUAL

SEPTEMBER 1992 REVISION D
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

NOTE:	Data presented in this manual has been carefully reviewed for accuracy and reliability; however, no responsibility is assumed for inaccuracies. The information contained in this manual is subject to change without prior notice.

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.

President's Message

ESPRIT
AmPro Corporation

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,

David K Mutchler

David K. Mutchler
President

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NOTE: THE INFORMATION CONTAINED IN THE SUPPLEMENT SECTIONS OF THIS MANUAL ARE INTENDED TO BE USED ONLY BY QUALIFIED INSTALLATION/SERVICE TECHNICIANS. DO NOT ATTEMPT TO PROCEED WITH ANY OF THE INSTRUCTIONS OUTLINED IN THE SUPPLEMENT SECTIONS UNLESS YOU ARE FAMILIAR WITH THIS SYSTEM AND THE STANDARD SAFETY PRECAUTIONS PERTAINING TO ELECTRICAL/ELECTRONIC EQUIPMENT.

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Chapter 1

INTRODUCTION / FEATURES / SPECIFICATIONS

1

The ESPRIT 2000 Series of Computer Data/Graphics display systems has as standard equipment many functions not found in even the most expensive systems. As a result of a modular design concept the ESPRIT 1500D*igital* may be upgraded to the ESPRIT 2000D*ata*, which may be upgraded to the model 2000G*raphics* , so that your display system can grow with your requirements. Some of the innovations offered by the ESPRIT 2000 Series

1.1 . . . . . FEATURES:

1.1.1 . . . . . 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.

1.1.2 . . . . . .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.

1.1.3 . . . . . .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.

1.1.4 . . . . . 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.

1.1.5 . . . . . .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 terminal or through a third party control system 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.

1.1.6 . . . . . LENSES:

The ESPRIT 2000 Series (1500Digital, 2000D and 2000G), have f/1.0 high resolution, reflective coated, six element , hybrid lenses utilizing both glass and acrylic elements.

1

1.1.7 . . . . 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.

1.1.8 . . . . . 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 registration 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.

1.1.8.1 . . . . .CONVERGENCE ON GREEN (OPTIONAL):

Convergence on green option provides for the green image all the dynamic registration adjustments normally only available on red and blue. This feature is necessary for applications where extremely precise image alignment is desired, i.e., superimposing multiple projected images to provide extra brightness or jointing multiple projected images side-to-side to form one continuous image.

1.1.8.2 . . . . .INTENSITY MODULATION (OPTIONAL):

Intensity modulation allows the contrast and color balance of the top, bottom, left, right and all four quadrants (corners) of the projected image to be adjusted individually.

1.1.9 . . . . . .OPTIONAL INPUTS:

1.1.9.1 . . . . . 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.

1.1.9.2 . . . . . CGA/EGA/VGA (OPTIONAL):

The ESPRIT systems have the capability to include an optional CGA/EGA/VGA (TTL module) which includes one nine pin "D" and one 15 pin "HD" 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.

1.1.9.3 . . . . .SECOND ANALOG RGB (OPTIONAL):

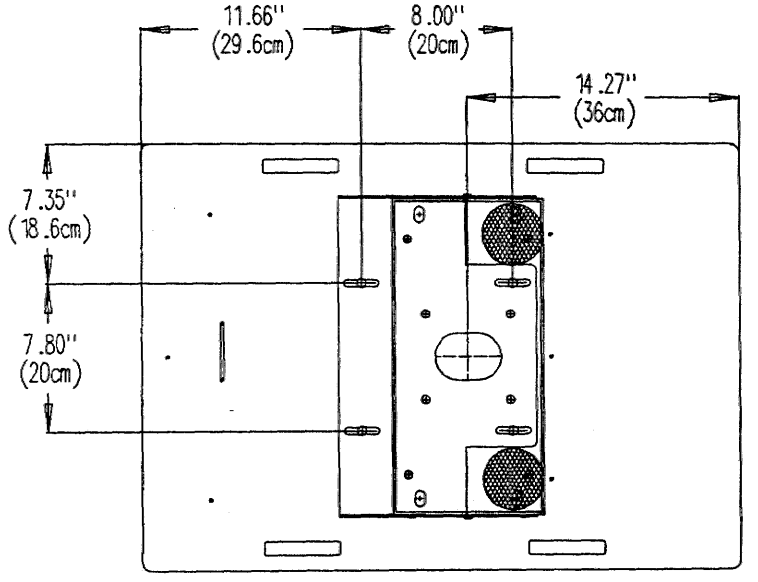
The ESPRIT systems have the capability to include an additional Analog RGB and Composite Sync module in place of the above mentioned TTL/VGA module. The second Analog RGB2 module enables you to switch between two separate Analog RGB sources via the remote control.

1.2 . . . . . SPECIFICATIONS:

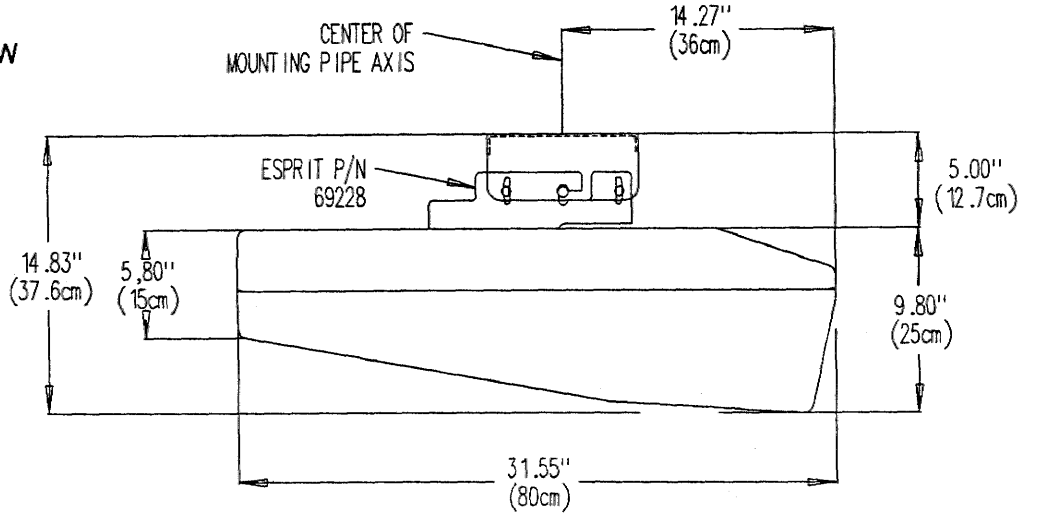
1.2.1 . . . . . GENERAL:

The Display systems in the ESPRIT 2000 Series 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.

BOTTOM VIEW



SIDE VIEW



FRONT VIEW

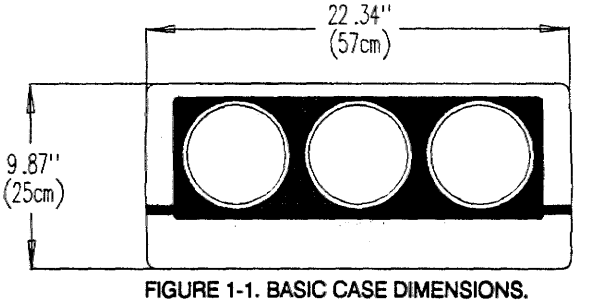


FIGURE 1-1. BASIC CASE DIMENSIONS.

1.2.2 . . . SPECIFICATION CHART:

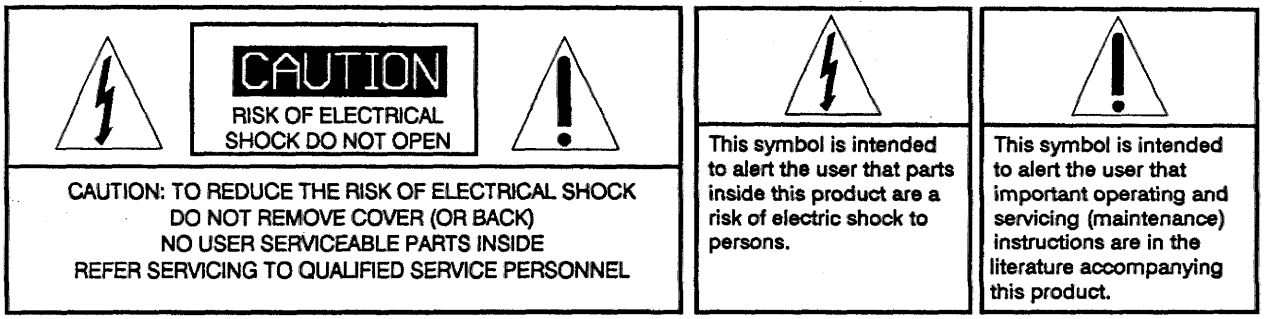
1

SPECIFICATIONS	1500Digital	2000D	2000G
CRTs:	7" liquid-cooled with refractive hybrid f1.10 lenses and Scheimpflug adjustments.		
Resolution: RGB	1024 lines	1280 lines	
Resolution: Video	650 lines		
Light Output:	650 lumens @ 10% peak white		
Screen Size:	4ft. (1.2m) to 20ft. (6.1m) picture width		
Scan Frequencies: Horiz:	15kHz - 38kHz	15kHz - 56kHz	15kHz - 85kHz
Scan Frequencies: Vert:	40 - 150Hz		
RGB Bandwidth:	50MHz	70MHz	
Minimum Retrace: Horiz:	$<5\mu$S	$<3\mu$S	
Minimum Retrace: Vert:	400μS		
Inputs: (module) Std.	Analog RGB1		
Inputs: (module) Opt.	1.) Quad Video Decoder w/S-VHS, 2.) Analog RGB2, 3.) TTL/VGA, 4.) HDTV*		
Remote Control: Std.	Hardwired with 25ft. (7.6m) cable and backlighted LCD read-out		
Remote Control: Opt.	Infrared Executive or Technician Remote Control Kits.		
Remote Control Operates:	Image Quality adjustments, raster alignment, on/off, stand-by, blanking, test patterns, and all static and dynamic registration. Store and recall of all settings, up to 50 channels of any one of the mode of operations. Optional 8 channel RS-232 switcher.		
Upgradability:	2000D or 2000G	2000G	
Special Features:	RS-232 Communications and networking, digital registration, liquid-cooled CRTs, Guided Help System.		
Power Source:	110/220 Vac 50/60Hz		
Maximum Power:	400 watts		
Weight/Ship Wt.:	100/150lb. (45/68kg)		
Operating Ambient Temperature:	+32°F to 97°f (0°C to 36°C)		
Operating Ambient Humidity:	20% to 80% (Non-condensing)		
Part Number:	69396	69203	69202
* Available upon request. Not a module upgrade, special modification required.			

TABLE 1-1

Chapter 2

WARNINGS AND PRECAUTIONS



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:

2

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 5.7, page 5-4 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 AGC SLO-BLO 220-240V 3 AMP 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.

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, but limited to a maximum of 15 months from date of shipment from factory, 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:

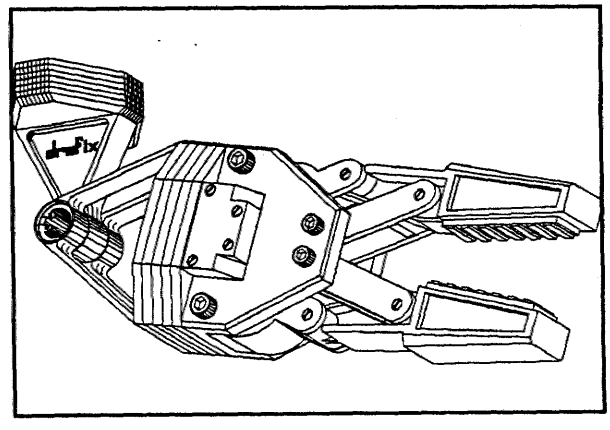
This system is the most versatile large screen data/graphic display system in that it enables a large number of people to view.

USED FOR:

- ☐ CLASSROOMS
- ☐ CONFERENCE ROOMS
- ☐ PRIVATE USE

4

SCREEN



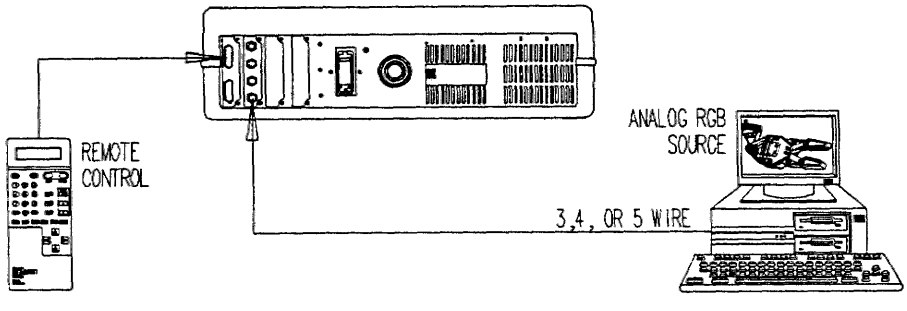


FIGURE 4-1. STANDARD SYSTEM CONFIGURATION.

4.2 . . . . . SYSTEM 2/OPTIONAL CONFIGURATION 1:

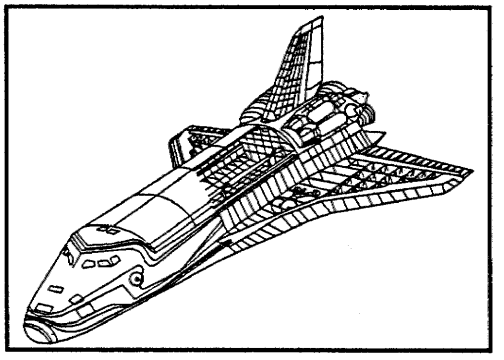
This system is configured to bring together video and computer graphics and technical presentations for business. Its high resolution and versatility to accept various types of personal computers and workstations make it ideal for conferences, training and diversified graphics/data/video services.

USED IN:

- ☐ CONFERENCE ROOMS
- ☐ TRAINING AREAS
- ☐ INFORMATION DISPLAYS

4

SCREEN



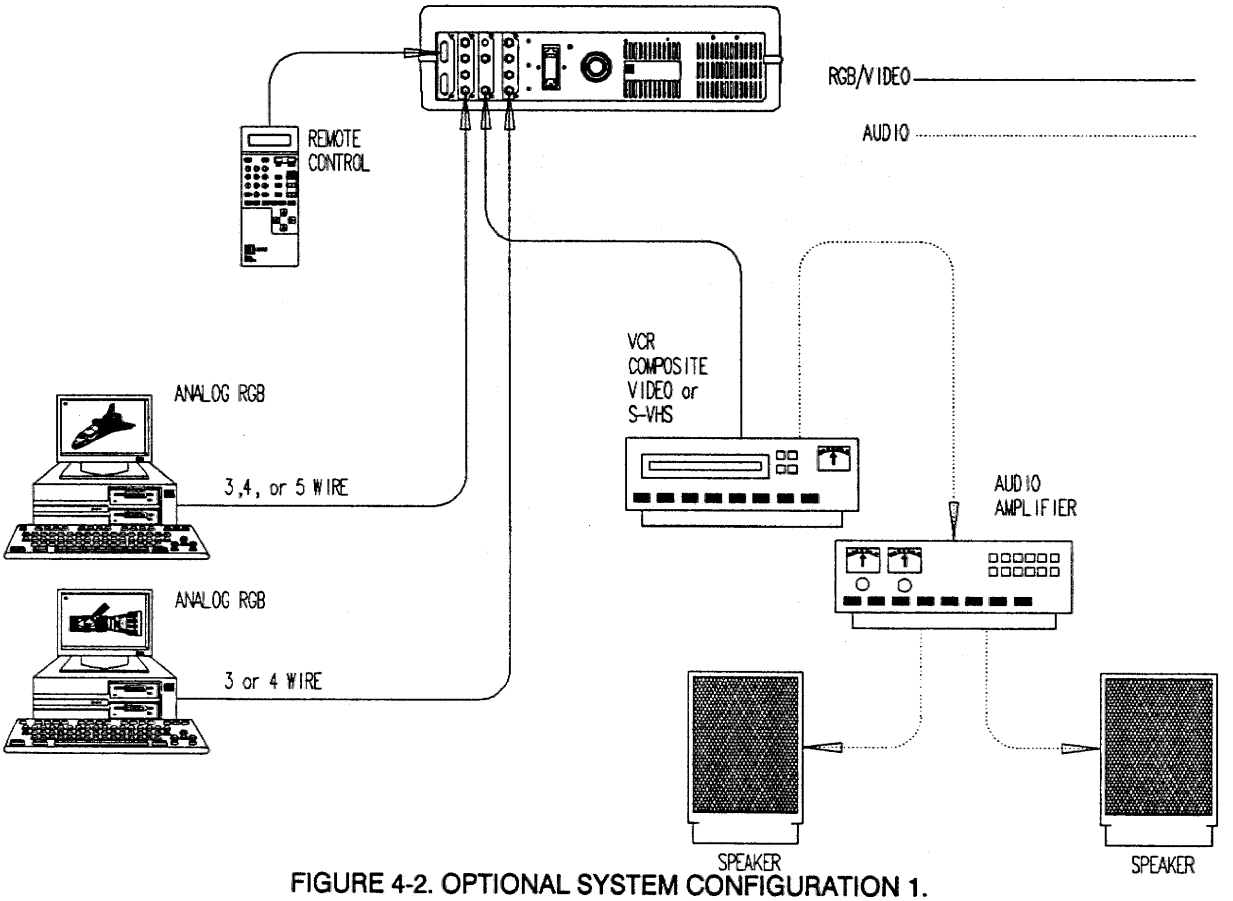


FIGURE 4-2. OPTIONAL SYSTEM CONFIGURATION 1.

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

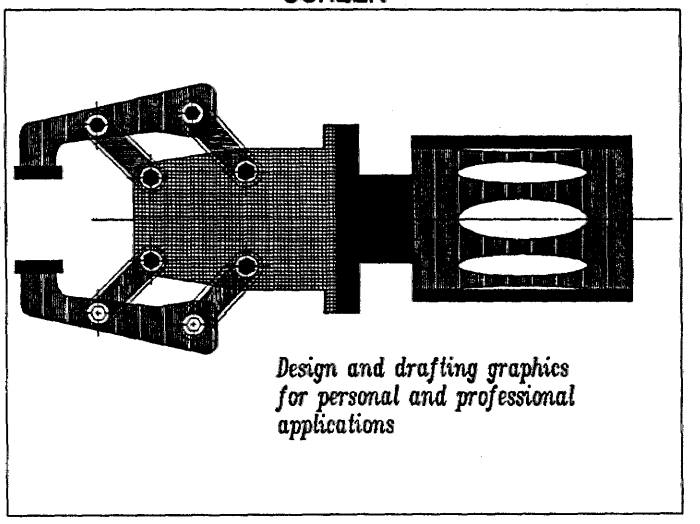
4.3 . . . . . SYSTEM 3/OPTIONAL CONFIGURATION 2:

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

USED IN;

- ☐ CLASSROOMS
- ☐ AUDITORIUMS
- ☐ LECTURE HALLS

SCREEN



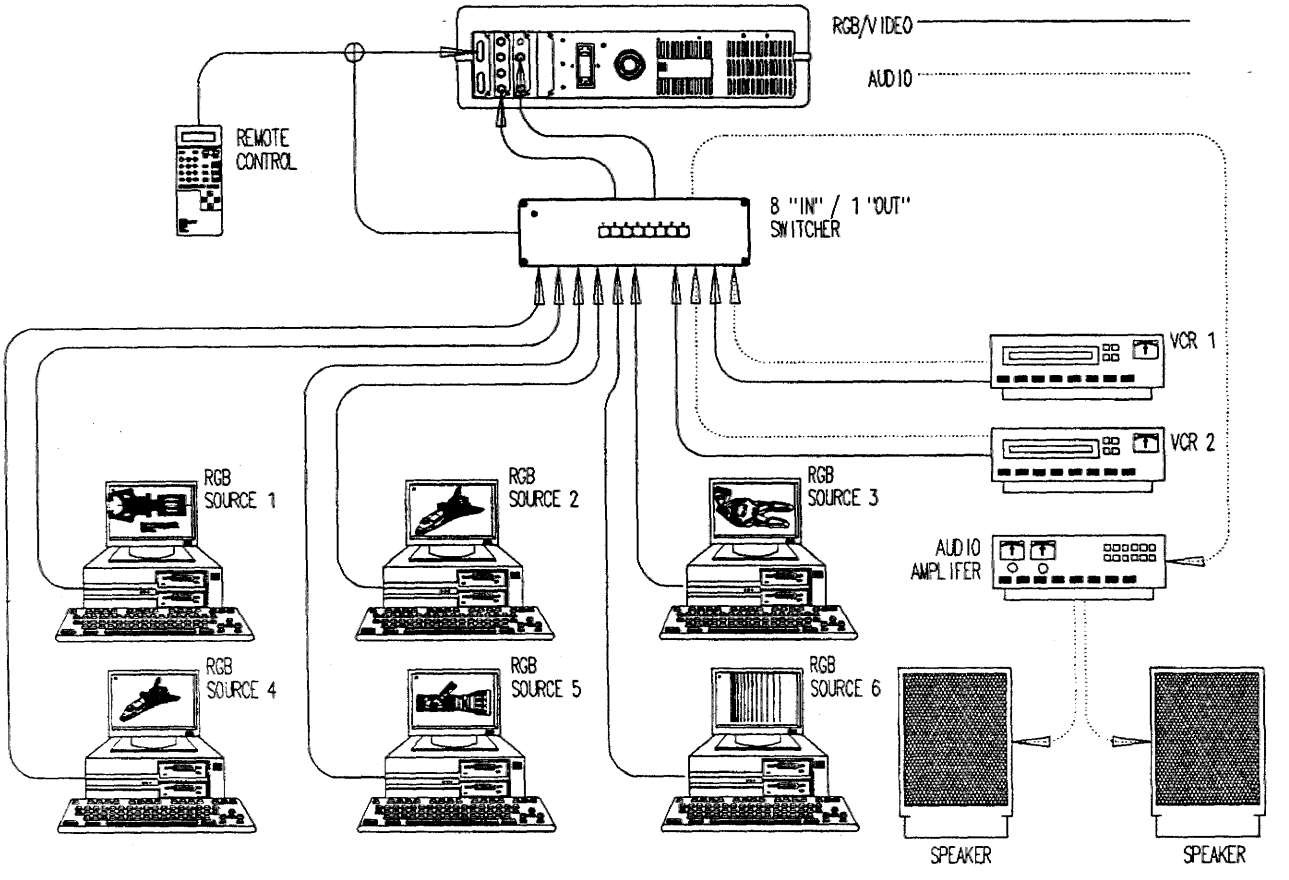


Figure 4-3. Optional system cofiguration 2.

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.

4.4 . . . . SCREEN MATERIAL:

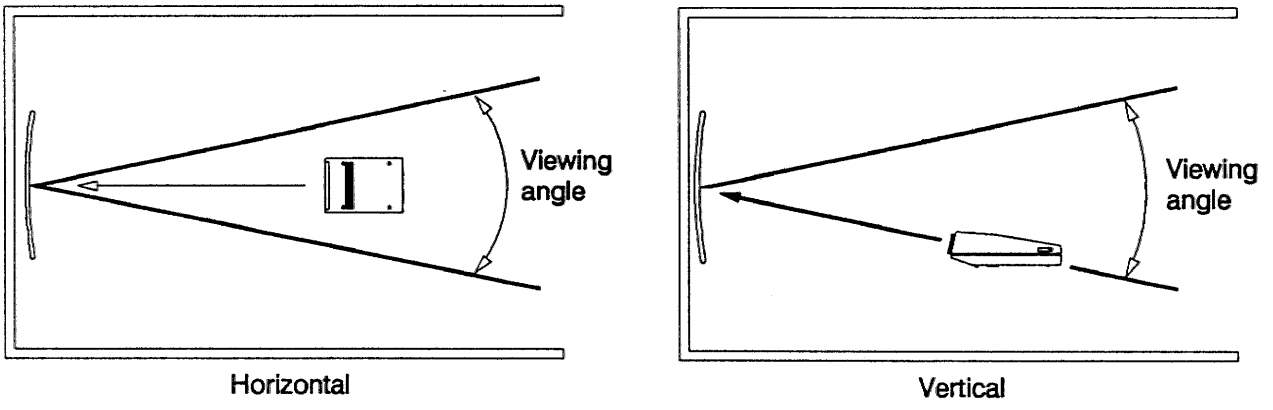
There are variations in screen material which can provide different results. Low gain screens have a wide viewing angle and are best suited for computer graphics applications. High gain screens concentrate the image into a narrow viewing angle as they increase the gain (brilliance) of the projected image and are best limited to video and low resolution graphics applications.

High gain screens provide a viewing angle ≈ ± 50 ° from the center line of the screen. Low gain screens can provide viewing up to ± 90 ° off the center line of the screen. Refer to figure 4.4 for examples.

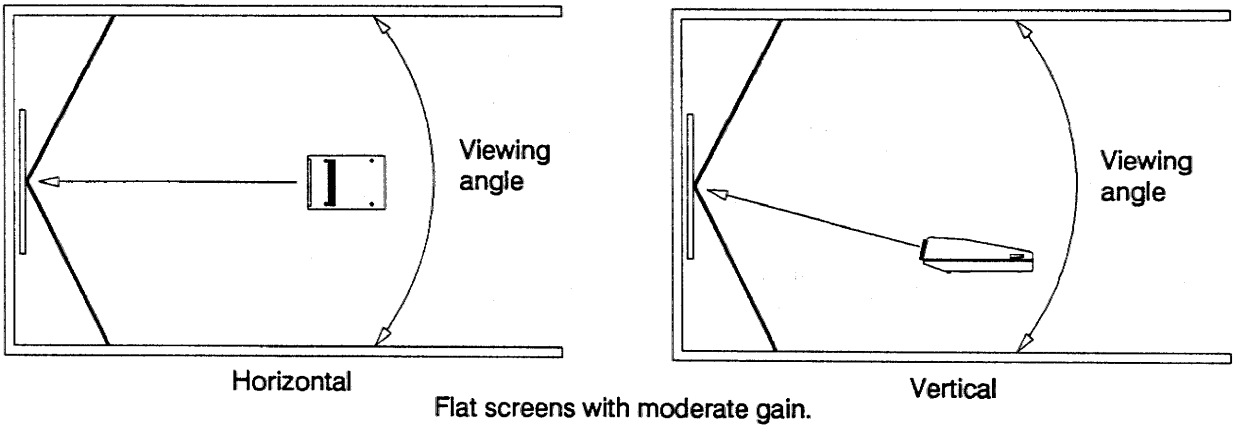
Rear screens provide a nominal gain with a viewing angle typically less than ± 90 ° from the center line. Some rear screen material my cause a "hot spot" if the viewing angle is the same as the projection angle.

4

It is recommended that you consult with your dealer as to the best screen for your particular application.



Curved screens with high gain.



Flat screens with moderate gain.

FIGURE 4-4. VIEWING ANGLES FOR VARIOUS SCREENS.

4.5 . . . . . SCREEN PLACEMENT:

The optimal viewing would be in a darken 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.

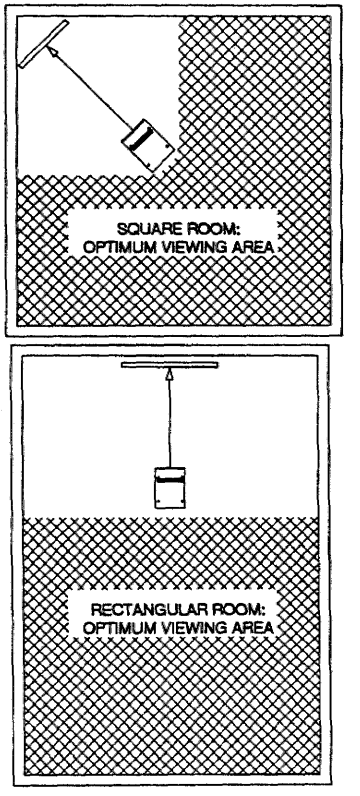


Figure 4-5. Screen placment examples.

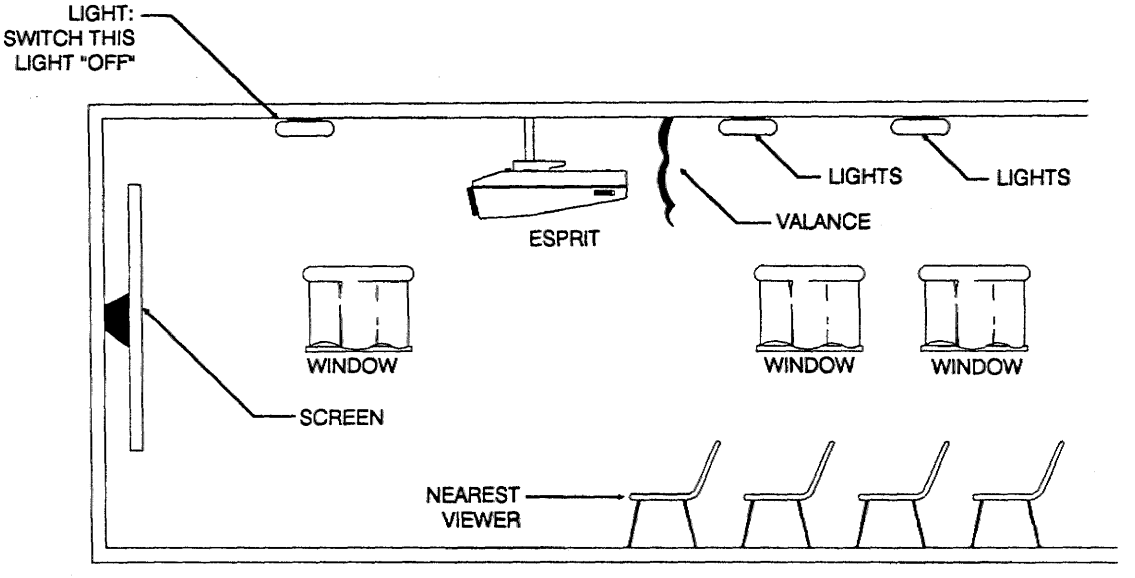


Figure 4-6. Room configuration example.

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.

5

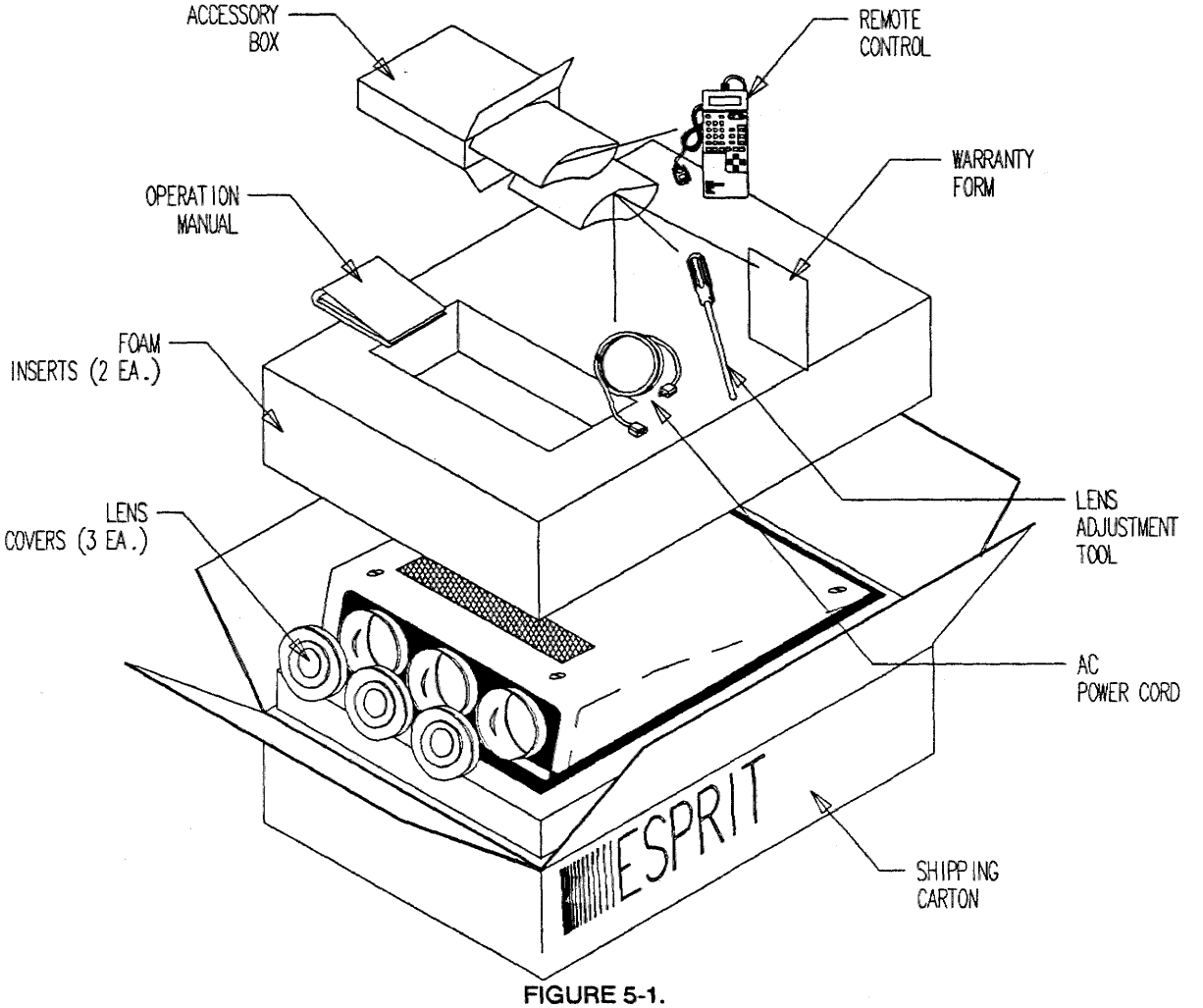


FIGURE 5-1.

SHIPPING CARTON CONTENTS.

5.2 . . . . GENERAL:

The ESPRIT system is factory preset to project a 60 in. x 80 in. 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. Supplement 1 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 5.6 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 Section 5.7 for changing A.C. line voltage.

5

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. 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 1500Digital", or "ESPRIT 2000D", or " ESPRIT 2000G," depending upon your particular system.

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. This will take approximately 1 minute.
- 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. Refer to Supplement 1 to perform any Sweep Configuration changes and this Chapter to perform the necessary mounting requirements for your application.

If for some reason the events do not occur as listed above, proceed to Chapter 10 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 5.8. To refocus the projected image and to register the three images, refer to Supplement 2 (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 Supplement 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 Chapter 4, 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 5-2.

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 5-2. 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.

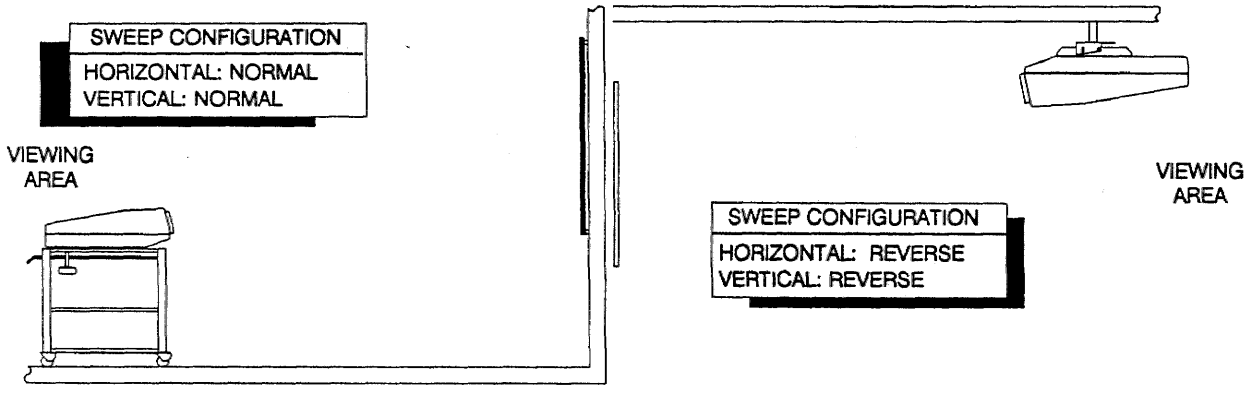


FIGURE 5-2.

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 5-3.
- Rear ceiling mounting requires only the vertical sweep being reversed from the factory preset. Please refer to Figure 5-3.

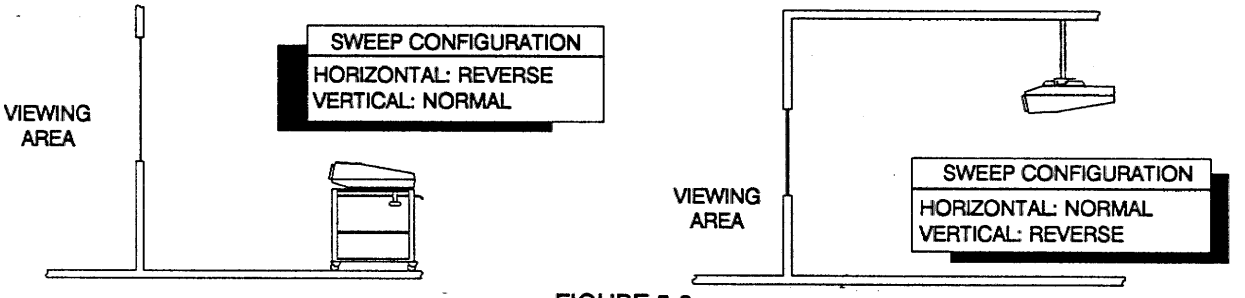


FIGURE 5-3.

REAR/TABLE AND REAR/CEILING MOUNT SWEEP CONFIGURATION.

5.7 . . . . . 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 5-4.

- 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.

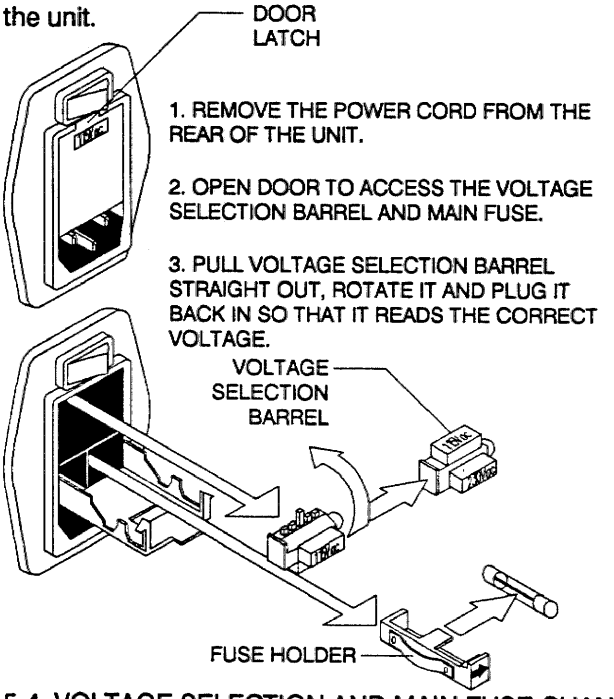


FIGURE 5-4. VOLTAGE SELECTION AND MAIN FUSE CHANGE.

5.8 . . . . . INSTALLATION GUIDELINES:

This information is for the ESPRIT models 1500Digital, 2000D and 2000G series projector installation using the 6 element lenses with an **aspect ratio of 4:3, an optimum 12 ° off-axis projection and using 90% of the CRTs area to optimize the picture size .** Please refer to Figure 5-5, Section 5.8.1 for definitions, Section 5.8.1.1 for the calculations required and examples provided. Refer to Table 5-1 for some common size screens and mounting distance.

5.8.1 . . . . . .DEFINITIONS:

- **A**, refers to the mounting distance, ("throw distance") required.

¤ NOTE 1: For table mount configuration, The "throw distance" is measured from the screen surface to the front of the system.

¤ NOTE 2: For ceiling mount configuration, The "throw distance" is measured from the screen surface to the ceiling mount pipe placement (system's center line of gravity).

- **B**, refers to the distance measured from the floor to the screen center, or for ceiling mount, B refers to the distance from the screen center to the ceiling.

- **C**, refers to the required table height for floor mounting or for ceiling mount configuration the required pipe length.

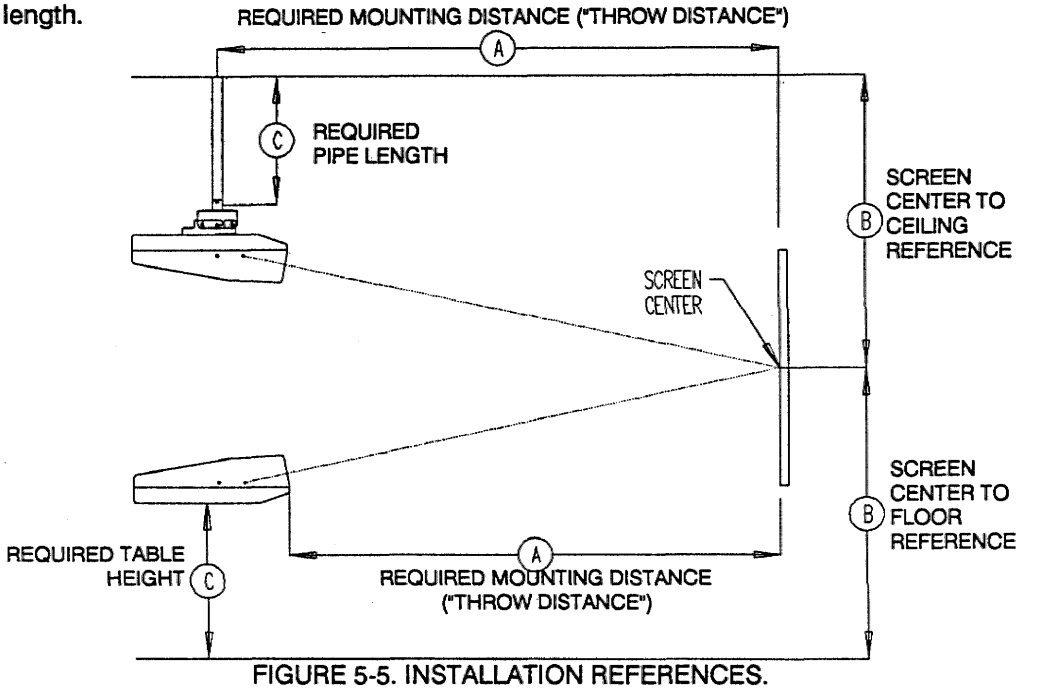


FIGURE 5-5. INSTALLATION REFERENCES.

5.8.1.1 . . . . .CALCULATIONS:

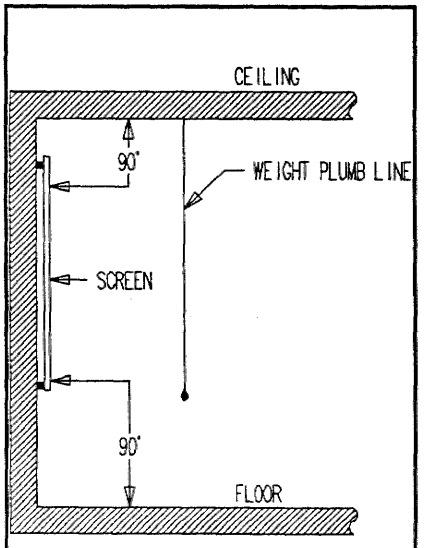
TABLE MOUNT	
MILLIMETERS	INCHES
Amm = 1.43(SWmm) + 225mm Bmm = Distance from screen center to floor in millimeters Cmm = Bmm - [0.30(SWmm)] - 213mm	Ain. = 1.43(SWin.) + 8.8in. Bin. = Distance from screen center to floor in inches. Cin. = Bin - [0.30(SWin)] - 8.4in
CEILING MOUNT	
MILLIMETERS	INCHES
Amm = 1.43(SWmm) + 588mm Bmm = Distance from screen center to ceiling in millimeters Cmm = Bmm - [0.30(SWmm)] - 374mm	Ain. = 1.43(SWin.) + 23.0in. Bin. = Distance from screen center to ceiling in inches. Cin. = Bin - [0.30(SWin)] - 14.75in

5.8.1.2 . . . MOUNTING DISTANCE TABLE 5-1:

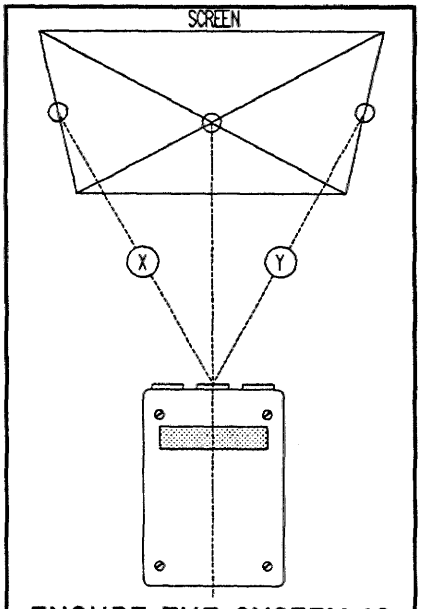
SCREEN WIDTH	*MOUNTING DISTANCE		SCREEN WIDTH	*MOUNTING DISTANCE	
mm (in.)	TABLE	CEILING	mm (in.)	TABLE	CEILING
1219 (48.00)	1968 (77.50)	2329 (91.75)	3962 (156.0)	5890 (232.00)	6253 (246.25)
1524 (60.00)	2403 (94.50)	2766 (109.00)	4507 (168.0)	6326 (249.00)	6689 (263.25)
1829 (72.00)	2839 (111.75)	3202 (126.00)	4572 (180.0)	6538 (257.50)	6901 (271.75)
2134 (84.00)	3275 (129.00)	3637 (143.25)	4877 (192.0)	7197 (283.25)	7560 (297.75)
2438 (96.00)	3710 (146.00)	4073 (160.25)	5182 (204.0)	7633 (300.50)	7996 (315.00)
2743 (108.0)	4146 (163.25)	4509 (177.50)	5486 (216.0)	8069 (317.75)	8432 (332.00)
3048 (120.0)	4582 (180.50)	4945 (194.75)	5791 (228.0)	8505 (334.75)	8868 (349.00)
3353 (132.0)	5018 (197.50)	5381 (211.75)	6096 (240.0)	8941 (352.00)	9304 (366.25)
3658 (144.0)	5230 (206.00)	5593 (220.25)			

* The mounting distance is based on an aspect ratio of 4:3, an optimum 12° off-axis projection and using 90% of the CRT area to optimize the picture size.

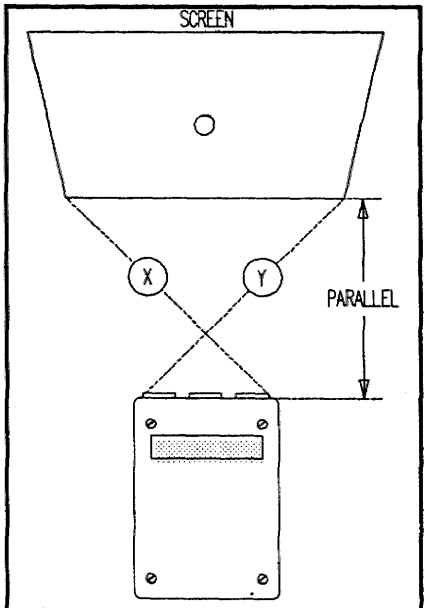
5.8.1.3 . . . . .SYSTEM POSITIONING:



ENSURE THE SCREEN IS INSTALLED AT A 90° ANGLE RELATIVE TO THE CEILING AND FLOOR.

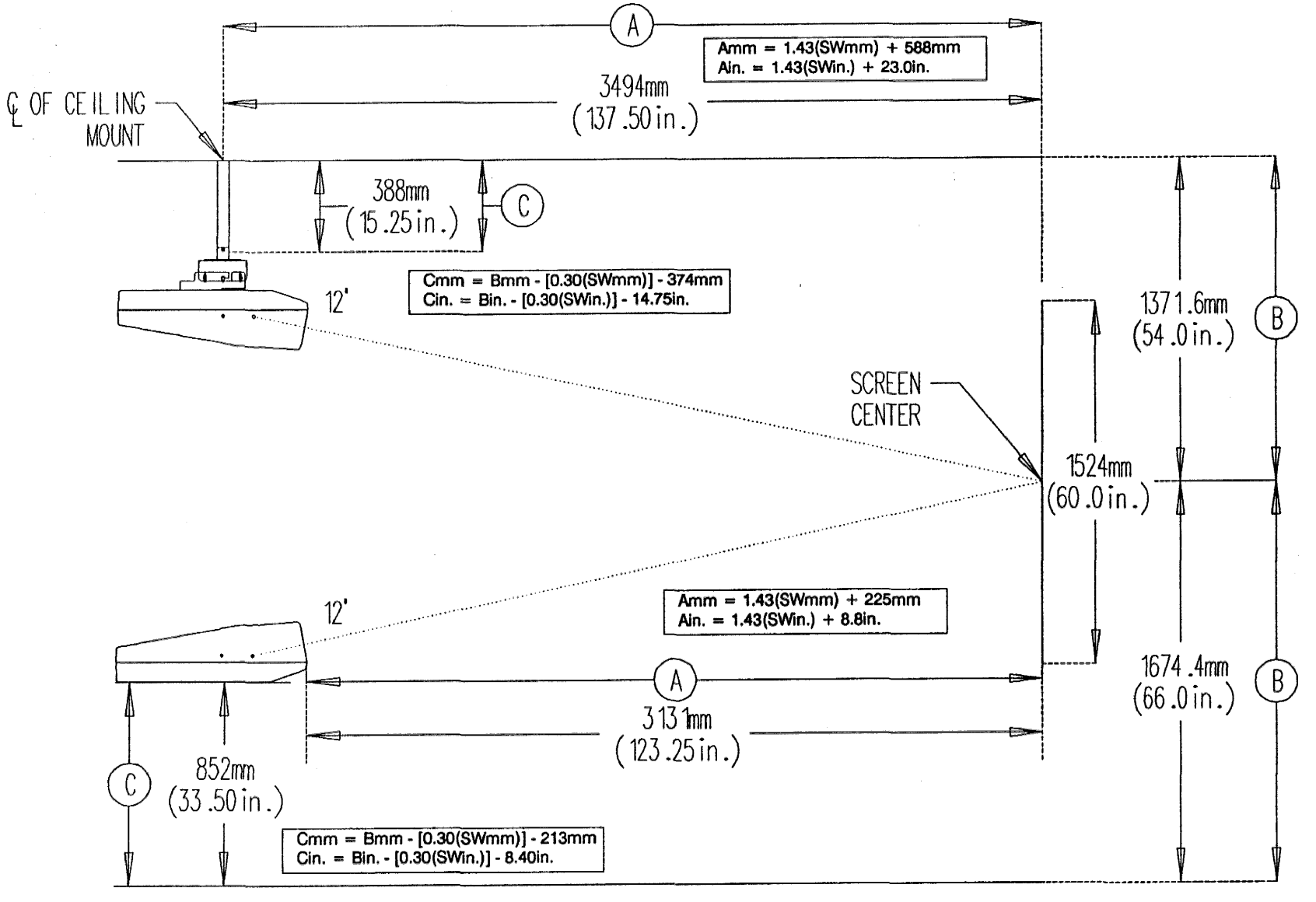


ENSURE THE SYSTEM IS CENTERED ON THE SCREEN. DIMENSIONS X AND Y SHOULD BE EQUAL IN LENGTH.

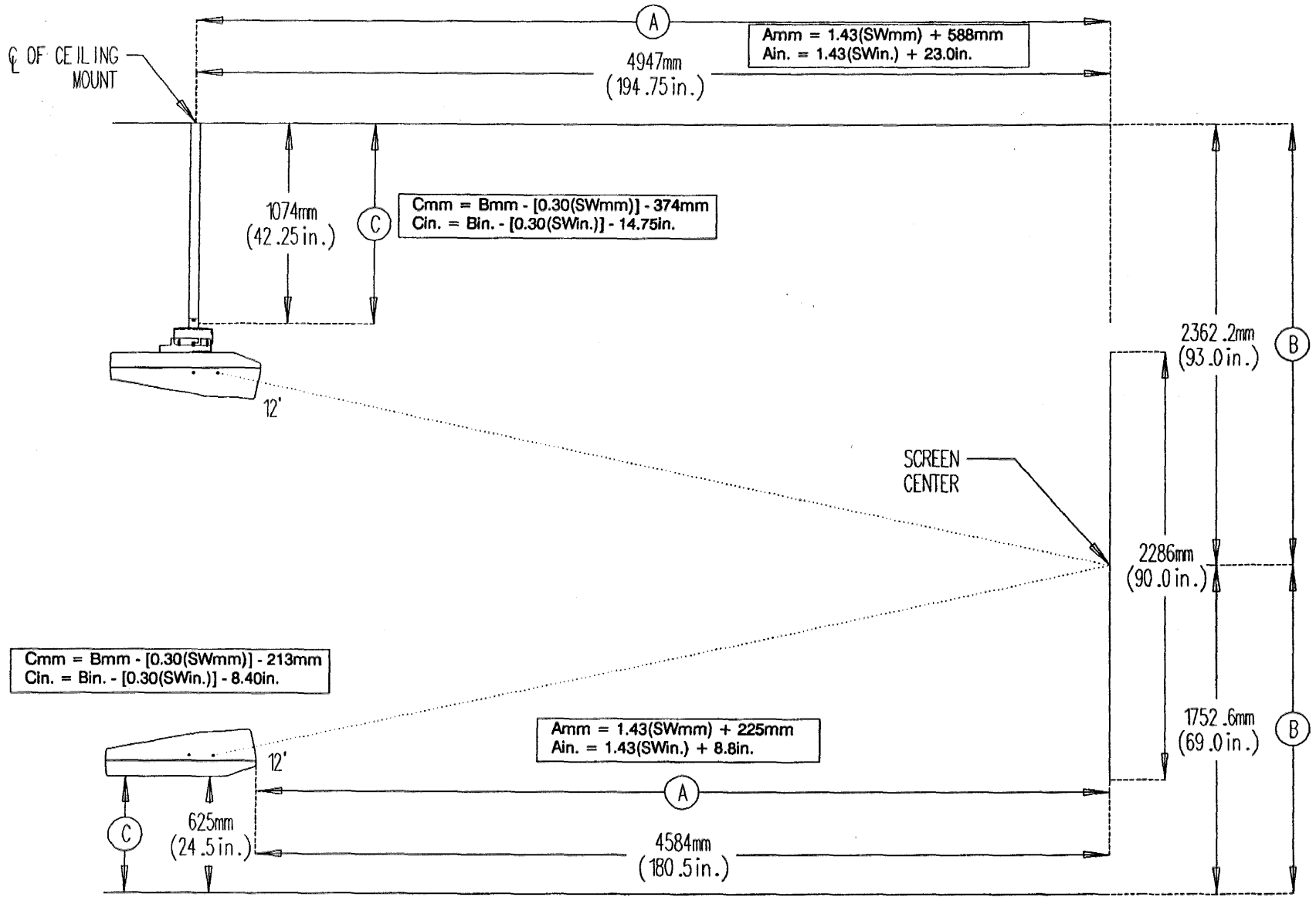


ENSURE THE SYSTEM IS PARALLEL TO THE SCREEN. DIMENSIONS X AND Y SHOULD BE EQUAL IN LENGTH.

5.8.2 . . . . . .INSTALLATION EXAMPLE 1: SW: 2032mm (80.0in.) / 4:3 ASPECT:



5.8.3 .....INSTALLATION EXAMPLE 2: SW: 3048mm (120in.) / 4:3 ASPECT:



Chapter 6

REAR PANEL CONNECTIONS

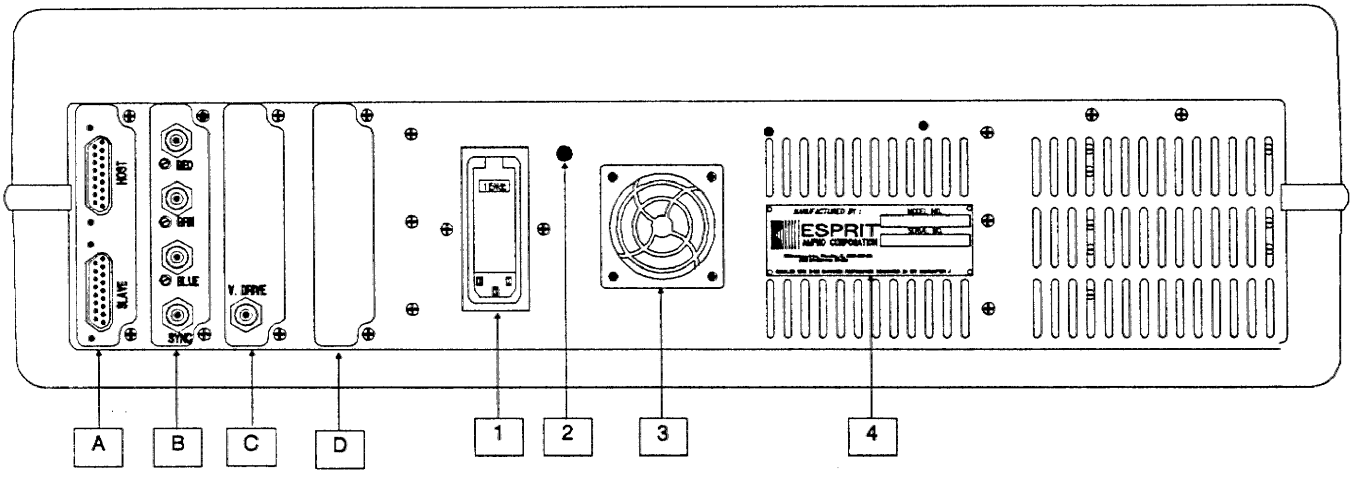
6.1 . . . . . GENERAL:

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	MODULE		ITEM	DESCRIPTION
	STANDARD	OPTIONAL		
A	CPU	NONE	1	AC LINE/MAIN FUSE
B	ANALOG RGB1	NONE	2	RUNNING INDICATOR (LED)
C	VERTICAL DRIVE PANEL	QUAD VIDEO DECODER	3	REAR FAN
D	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 "HOST" 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 9 for RS232 interface data.

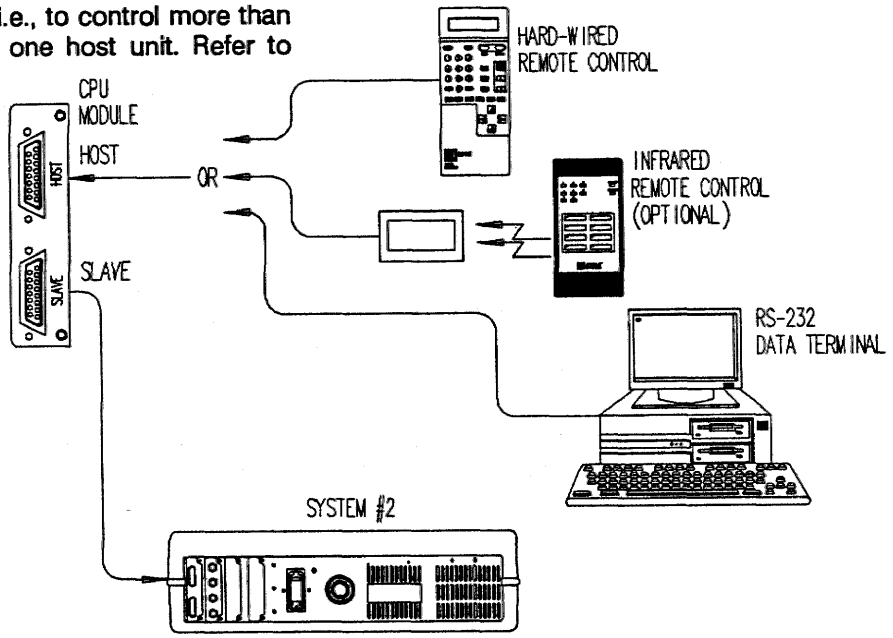


FIGURE 6-2.

6

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

The Analog RGB sources are connected to the RGB1 module via BNC connectors. There are connectors for Red, Green, Blue video input signals, plus separate connectors for Composite / Horizontal Sync. A connector is provided for separate Vertical Sync and is located on the Vertical Drive panel, which is right next to the Analog RGB1 module.

The Analog RGB1 input falls into three major categories, three- wire, (sync on green), four-wire (composite sync), and five-wire (separate horizontal and vertical sync). The ESPRIT Display System will automatically configure itself properly for any one of the above conditions, including sync input and polarity.

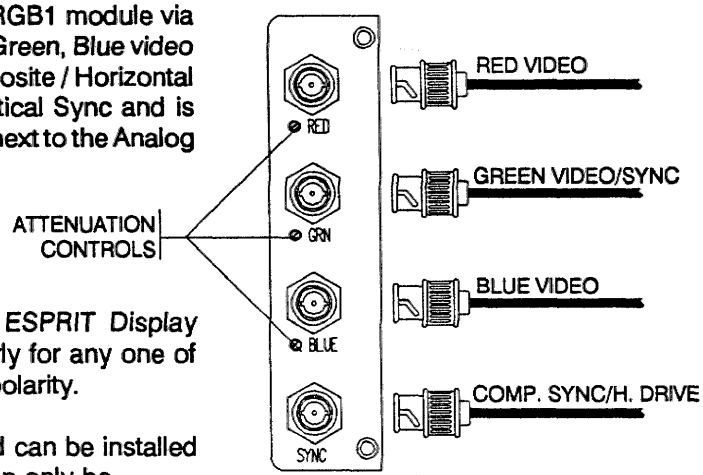


FIGURE 6-3.

A 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 RGB1 and optional RGB2 sources.

RGB VIDEO SPECIFICATIONS	
VIDEO:	RS-170 COMPATIBLE, 0.7vp-p ~ 5vp-p, 75Ω TERMINATED
SYNC:	COMPOSITE H/V, SEPARATE H/V, OR SYNC ON GREEN; AUTO DETECT, 0.3vp-p ~ TTL LEVELS, 75Ω TERMINATED; AUTO DETECT, SELECTABLE SYNC TIP OR BACK-PORCH CLAMPING

6.3.2.1 . . . . . RGB BRIGHTNESS CLAMPING:

The Analog RGB1 and RGB2 have the ability to toggle the black level clamp point from "back-porch" to "sync- tip" by entering 48 **[CODE]**, and may be preset into a channel location. Typically "back-porch" clamping is used and is the default for all channel location. Refer to Chapter 7 for additional information on this and other codes.

6.3.2.2 . . . . . RGB LEVEL ADJUSTMENTS:

The operator controls that affect the Analog RGB1 and RGB2 levels are brightness and contrast controls via the remote control and the Red, Green and Blue level controls located below their respective BNC connectors on either the RGB1 and RGB2 modules.

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 6-3 for the control locations.

6

6.3.3 . . . . . .VIDEO MODULE (OPTIONAL) (SLOT C):

6.3.3.1 . . . . . INPUT 1: 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 6-4.

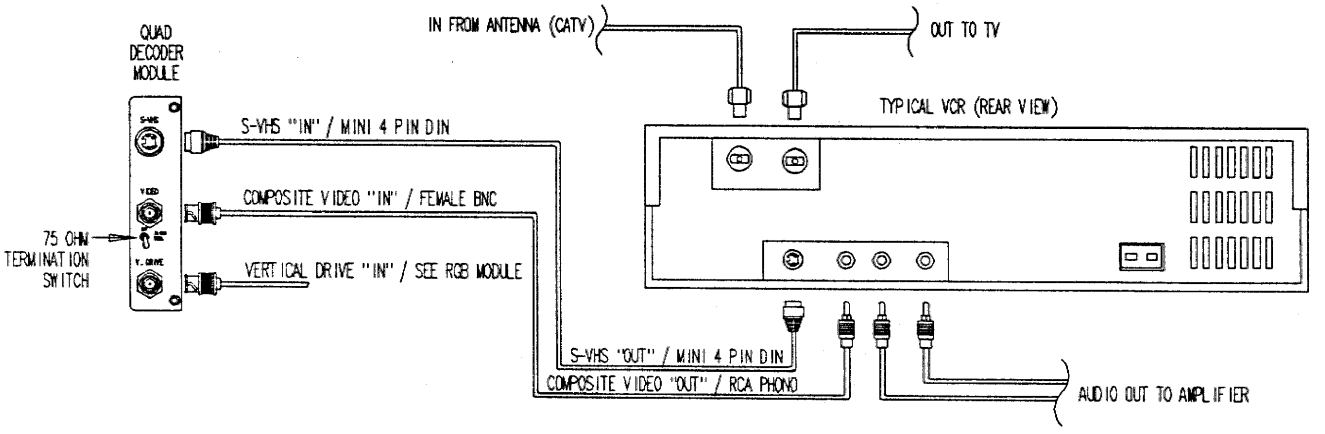


FIGURE 6-4.

6.3.3.2 . . . . INPUT 2: 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 6-5 for the pin-out /description for the female (rear panel) S-Video connector and Figure 6-4 for location.

PIN	DESCRIPTION
1	GROUND
2	GROUND
3	"Y" (1vp-p)
4	"C" (0.285vp-p)

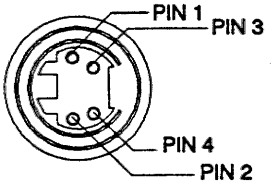


FIGURE 6-5.

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 6-4 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

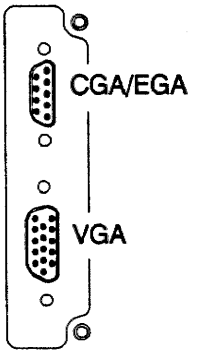
6.3.4 . . . . . .SLOT D:

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.

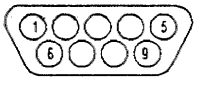
6.3.4.2 . . . . .TTL/VGA MODULE (OPTIONAL):

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. Please refer to Chapter 7, page 7-9 to access the TTL/VGA mode of operation.



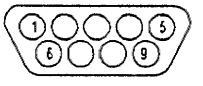
6.3.4.2.1 . . . .CGA/EGA/VGA PIN CONFIGURATIONS:

CGA
COLOR GRAPHICS



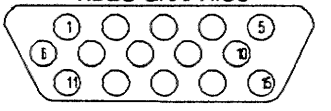
PIN	DESCRIPTION
1	Ground
2	Ground
3	Red
4	Green
5	Blue
6	Intensity
7	N/C
8	Horizontal Sync
9	Vertical Sync

EGA
ENHANCED GRAPHICS



PIN	DESCRIPTION
1	Ground
2	Secondary Red
3	Primary Red
4	Primary Green
5	Primary Blue
6	Secondary Green
7	Secondary Blue
8	Horizontal Sync
9	Vertical Sync

VGA
VIDEO GRAPHICS



PIN	DESCRIPTION	PIN	DESCRIPTION
1	Red Video	9	N/C
2	Green Video	10	Ground
3	Blue Video	11	Ground
4	Ground	12	N/C
5	Ground	13	Horizontal Sync
6	Red Ground	14	Vertical Sync
7	Green Ground	15	N/C
8	Blue Ground		

Chapter 7

REMOTE CONTROL FUNCTIONS

7.1 .....THE REMOTE CONTROL:

This Chapter will familiarize you with the remote control operation for both the standard and any optional operations that may be incorporated in your system, and the many features that are available. Please read completely to avoid any confusion on how the digital remote control operates.

The Hard-Wired Remote Control unit incorporates a 16 X 2 LCD read-out 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).

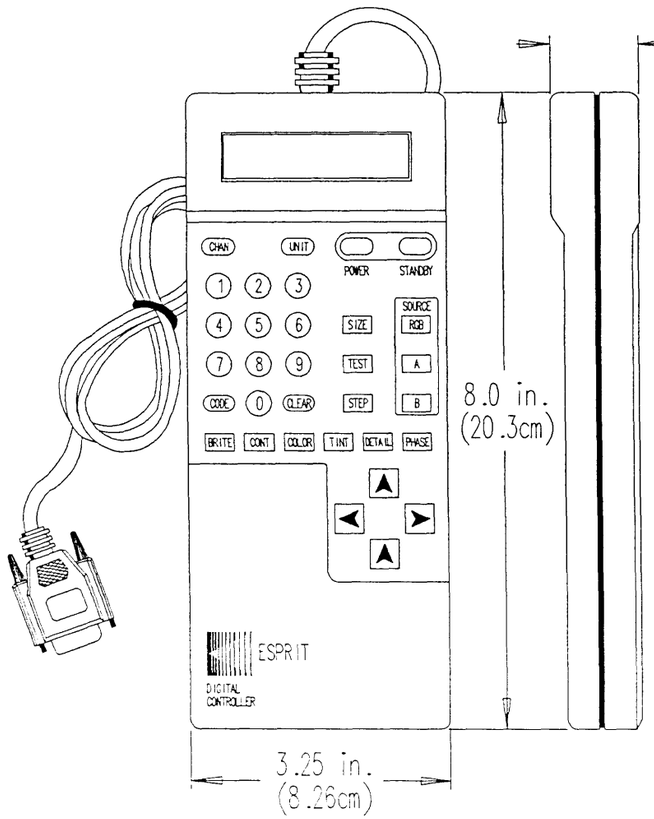


FIGURE 7-1.

HARD-WIRED REMOTE CONTROL DIMENSIONS

7

7

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

7.1.1 . . . . . .REMOTE CONTROL KEYPAD:

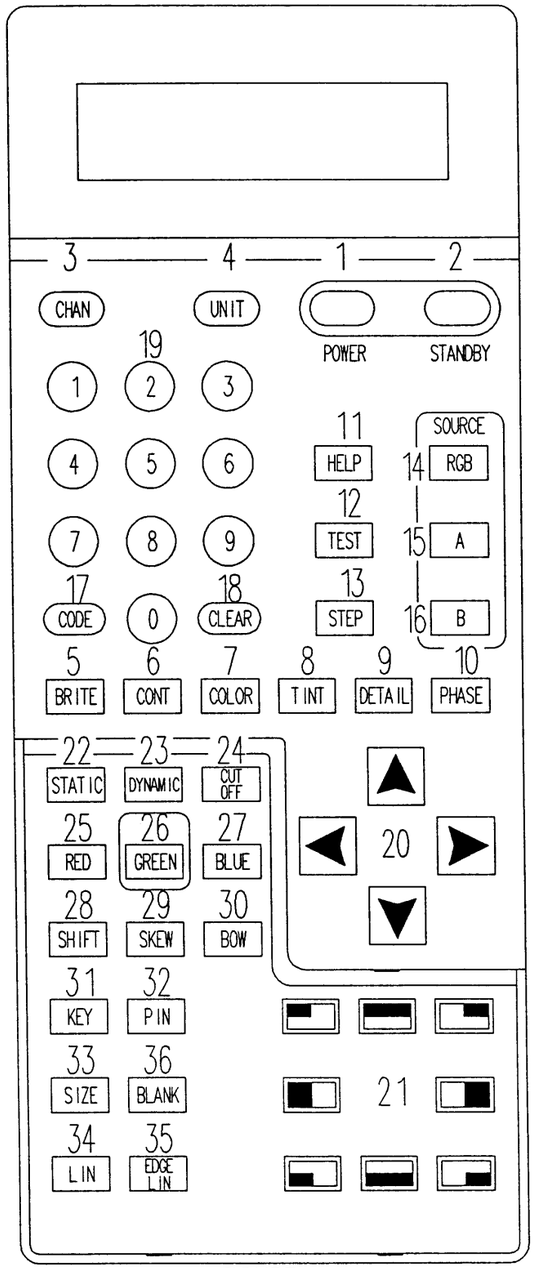


FIGURE 7-2

ACTUAL SIZE SHOWN

7.1.2 . . . . . .KEYPAD SUMMARY/INDEX:

NO.	BUTTON	DESCRIPTION	PAGE
1	POWER	Toggles power On/Off.	7-5
2	STANDBY	Toggles the projected image On/Off.	7-5
3	CHANNEL	Inputs/selects channel designations.	7-5
4	UNIT	Inputs/selects unit numbers.	7-6
5	BRITE	Selects brightness function.	7-6
6	CONT	Selects contrast function.	7-6
7	COLOR	Selects color function.	7-6
8	TINT	Selects tint function.	7-6
9	DETAIL	Selects detail (peaking) function.	7-6
10	PHASE	Selects phase function.	7-7
11	HELP	Selects internal help mode of operation.	7-7
12	TEST	Toggles into/out of internal test mode of operation.	7-8
13	STEP	Cycles through test pattern selection.	7-8
14	RGB	Selects RGB1 mode and/or 62.5kHz internal test pattern.	7-8
15	A	Selects optional mode (RGB2, TTL/VGA, or HDTV). Selects 31kHz test.	7-9
16	B	Selects Video/S-VHS mode (optional). Selects 15kHz internal test mode.	7-9
17	CODE	Inputs code (system commands) assignments.	7-10
18	CLEAR	Removes an incorrect entry. Reset functionality of arrow keys in HELP.	7-12
19	NUMERIC KEYS	Used to set/select channels, and percentage settings of image controls.	7-13
20	ARROWS	Used to adjust image and registration settings.	7-13
21	AREA KEYS	Quadrants/Edges, selects the desired area of registration.	7-14
22	STATIC	Selects the static registration functions.	7-14
23	DYNAMIC	Selects the dynamic registration functions.	7-15
24	CUTOFF	Toggles selected color On/Off.	7-15
25	RED	Enables red only functions, i.e., CUTOFF, Registration.	7-15
26	GREEN	Enables green only functions, i.e., CUTOFF, Registration.	7-15
27	BLUE	Enables blue only functions, i.e., CUTOFF, Registration.	7-15
28	SHIFT	Enables shift functions (Static and Dynamic).	7-16
29	SKEW	Enables skew functions (Dynamic).	7-16
30	BOW	Enables bow functions (Dynamic).	7-17
31	KEY	Enables keystone functions (Static and Dynamic).	7-17
32	PIN	Enables pincushion functions (Static and Dynamic).	7-18
33	SIZE	Enables size functions.	7-18
34	LIN	Enables linearity functions (Static and Dynamic).	7-19
35	EDGELIN	Enables edge linearity functions (Dynamic).	7-19
36	BLANK	Enables blanking, use edge keys to select, Top, Bottom, Left or Right.	7-20

7.2 . . . . . REMOTE CONTROL FUNCTIONS

7.2.1. . . . . .POWER BUTTON: (POWER)

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

☐ 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 **[POWER]** 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 **[POWER]** button is pressed the system will turn "ON" and the display will indicated the last mode of operation that the system was in when it was de- energized.

7.2.2. . . . . .STANDBY BUTTON: (STANDBY)

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

☐ 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 **[STANDBY]** button on the remote control to remove the image. The image is restored to the screen by pressing the **[STANDBY]**key a second time.

7.2.3. . . . . .CHANNEL BUTTON: (CHAN)

FUNCTION: Selects channel number. See Codes page 7-10 to write protect a channel.

DEFINITION OF A CHANNEL: A Channel refers to a location within battery backed-up memory in which data such as mode of operation, all image quality and convergence adjustments are established as a group. The data within the channel is defined and set by the operator/end-user for a particular external video source or sources. The objective of establishing and using channels is to provide a smooth and simple transition between multiple external video inputs that have varying operating parameters such as, black level, contrast, size, phase, blank and mode of operation.

STORING DATA: To store data such as brightness, contrast, phasing, blanking, height, width ,mode of operation, static and dynamic focus, all image quality adjustments and *ALL* Registration Settings for a dedicated channel location, select a channel number and set the parameters for the particular source. Once completed all settings will have been automatically stored. Refer to example below.

- STEP 1. Select a channel number e.g., **[1]** then press **[CHAN]** .
- STEP 2. Set the following parameters: brightness, contrast, phasing, blanking, height, width, mode of operation, and *ALL* registration settings.
- STEP 3: Continue with Steps 1 and 2 to preset all other sources into other channels.
- CHANNEL IDENTIFICATION: To determine a particular channel number for an active source, simply press the **[CHAN]** button and the Remote LCD will indicated the channel number.

7.2.4. . . . . UNIT BUTTON: (UNIT)

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 **[UNIT]** button.

¤ NOTE 1: It is not required to perform steps 1 and 2 for a single unit configuration. Refer to Chapter 9 for more information regarding 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 **[UNIT]** on the remote keypad. This global command will remain in effect until one of the projectors is individually selected. The LCD will display "GLOBAL LISTEN".

¤ NOTE 3: Refer to Chapter 9 for multiple system interconnection/operation, ASCII commands. Refer to Supplement 3 for setting baud rate and address switches of multiple systems.

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7.2.5-10. . . . IMAGE QUALITY ADJUSTMENTS: (BRITE) (CONT) (COLOR) (TINT) (DETAIL) (PAHSE)

FUNCTION: Control image quality

☐ 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.

7.2.5. . . . . .BRITE (BRIGHTNESS): (BRITE)

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.

7.2.6. . . . . .CONT (CONTRAST): (CONT)

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.

7.2.7. . . . . .COLOR: (COLOR)

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.

7.2.8. . . . . .TINT: (TINT)

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.

7.2.9. . . . . .DETAIL: (DETAIL)

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.

7.2.10. . . . .PHASE: [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. LCD will indicate current setting.
- 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.
- 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 read-out will indicate minimum through maximum.

7.2.11. . . . .HELP BUTTON: [HELP]

FUNCTION: Enters the HELP program at main menu page.

☐ 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 at the bottom of 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. You may now use the up and down arrows to adjust the brightness level.
- NOTE 3: 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.

7.2.12. . . . . .TEST BUTTON: [TEST]

FUNCTION: Toggles into last selected test mode of operation.

- ¤ 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;

[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 (*genlocked*) of the input that was running when TEST was selected, i.e. Video, RGB or TTL.

[STEP] Cycles through the available test patterns. Available test patterns; **(1)**, Crosshatch 1 (dense crosshatch), **(2)** Crosshatch 2 (normal), **(3)** Crosshair, or **(4)** Dots.

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7.2.13. . . . . .STEP BUTTON: [STEP]

FUNCTION: Advances sequence of events.

☐ Operation 1: In the TEST mode , **[STEP]** will sequence to next available test pattern.

☐ Operation 2: In the Guided Registration programs, **[STEP]** will advance to next step of alignment.

7.2.14. . . . . .RGB BUTTON: [RGB]

FUNCTION: Enter the Analog RGB1 mode of operation.

☐ OPERATION 1: Pressing **[RGB]** enters the Analog RGB1 mode of operatio for either 3, 4 or 5 wire RGB1 operation.

☐ OPERATION 2: In the HELP mode, pressing the **[RGB]** button will exit to the RGB mode.

☐ OPERATION 3: In the TEST mode, pressing the **[RGB]** button will select the 62.5kHz internal test frequency of operation.

☐ OPERATION 4: (OPTIONAL): With the HDTV option installed, the Analog RGB1 module (input) may be used as the input for your HDTV source. The HDTV mode of operation may be setup within any one of the 50 avaiable channel locations.

- ¤ HDTV NOTE 1: To select the HDTV mode of operation perform the following; A) enter the channel you want HDTV to be stored, B) Select **[RGB]** as your source input, and C) enter 91 **[CODE]** to activate the HDTV function.
- ¤ HDTV NOTE 2: Ensure the channel you have designated for HDTV operation has been setup for "sync-tip" black level clamping. To toggle the clamp point use 48 **[CODE]**.
- ¤ HDTV NOTE 3: To disable the HDTV function, enter 90 **[CODE]**.

7.2.15 . . . .A BUTTON: (OPTIONAL INPUT(S)): [A]

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

☐ OPERATION 1: With the 2nd analog RGB option installed: Pressing **[A]** will select this mode of operation.

☐ OPERATION 2: (OPTIONAL): With the HDTV option installed, the Analog RGB2 module (input) may be used as the input for your HDTV source and setup/stored within any one of the 50 available channel locations.

- ¤ HDTV NOTE 1: To select the HDTV mode of operation perform the following; A) enter the channel you want HDTV to be stored, B) Select **[A]** as your source input, and C) enter 91 **[CODE]** to activate the HDTV function.
- ¤ HDTV NOTE 2: Ensure the channel you have designated for HDTV operation has been setup for "sync-tip" black level clamping. To toggle the clamp point use 48 **[CODE]**.
- ¤ HDTV NOTE 3: To disable the HDTV function, enter 90 **[CODE]**.

☐ OPERATION 3: With the TTL option installed follow Steps 1 and 2 for proper source selection.

- STEP 1: Press **[1]** then **[A]** for CGA/EGA mode of operation.
- STEP 2: Press **[2]** then **[A]** for VGA mode of operation.

☐ OPERATION 4: In the TEST mode: Pressing **[A]** selects the 31.25 kHz. internal test frequency of operation.

☐ OPERATION 5: If in the HELP mode: Pressing **[A]** 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.]

7.2.16 . . . . . .B BUTTON: [B]

FUNCTION: Enters video or S-VHS mode of operation.

☐ OPERATION 1: With the optional Video module installed and using the numeric keypad, depress **["n"]**, then **[B]** to manually select the various video formats and operations, which may be a channel parameter, if so desired, i.e., enter 1 [CHAN], then **[B]** to setup channel 1 to operate in the Quad Video mode of operation.

☐ OPERATION 2: While in the TEST mode, pressing **[B]** will select the 15.75kHz internal test mode of operation.

☐ OPERATION 3: When in the HELP mode, pressing **[B]** will exit to the Video mode of operation.

PRESS	OPERATION
1 **[B]**	Quad Video Mode (composite)
2 **[B]**	PAL Mode (composite)
3 **[B]**	SECAM Mode (composite)
4 **[B]**	NTSC 4.43 Mode (composite)
5 **[B]**	NTSC 3.58 Mode (composite)
6 **[B]**	S-VHS Mode (Quad Auto)
7 **[B]**	S-VHS Mode (PAL)
8 **[B]**	S-VHS Mode (SECAM)
9 **[B]**	S-VHS Mode (NTSC 4.43)
10 **[B]**	S-VHS Mode (NTSC 3.58)

7.2.17 .....CODE BUTTON: (CODE)

FUNCTION: Activates the system's special internal commands.

☐ OPERATION 1: Use the numeric keypad to enter the desired command, then press **[CODE]** to activate the command. NOTE: The LCD read-out will prompt you to enter setting, i.e., ACC = "n", where "n" refers to the corresponding entry listed in the following tables.

CODE	FUNCTION	LCD READ-OUT : OPERATION
20	CHANNEL WRITE-PROTECT (TOGGLE)	CHANNEL WRITE PROTECT ON or OFF: Protects a channel from accidental changes of pre-set adjustments.
21	COPY "BEST-FIT" CHANNEL	COPY IN PROGRESS: Automatically searches and copies the closest channel settings into the active channel. Copies all channel data, excluding mode of operation. NOTE 1: This command will only choose the first channel of the closest match, starting from the lowest-to-highest channel number. NOTE 2: This command will only choose channels that have been "validated" by 24 CODE.
22	COPY CHANNEL "TO"	COPY CHANNEL TO (ENTER 1-50): Copies the active channel settings into the desired channel location.
23	COPY CHANNEL "FROM"	COPY CHANNEL FROM (ENTER 1-50): Copies channel settings from the selected channel into the active channel.
24	VALIDATE CHANNEL	FREQ VALIDATED: This command is used to confirm that a channel has been set and adjusted. Once validated, this command writes the channel horizontal frequency into a "look-up" table for the best-fit command (21 CODE) to use. If a channel has not been validated, it can not be used with the best-fit command. NOTE; 24 CODE additionally activates the channel write-protect command 20 CODE.
25	TEST CHANNEL FOR VALIDATION	Displays the frequency validated (stored) within the selected channel location. **NOTE;** if the channel has not been validated a "NOT VALIDATED" message will be displayed on the LCD.
26	DISPLAY "BEST-FIT" CHANNEL	Displays the channel number and the horizontal frequency from the table of validated channels a possible closest match for the presently active channel.
27	CHANNEL AUTO-SEARCH (TOGGLE OPERATION)	AUTO SEARCH ON: This command allows the system to constantly monitor the incoming signal for changes. If a change is detected, such as the horizontal frequency, the system uses the table of validated channels and automatically re-configures the channel parameters for the best possible display. Works in all modes of operation.
28	COPY CHANNEL "ALL"	LCD PROMPT: COPY CHAN ALL ARE YOU SURE?: Press **[CODE]** for *YES* or any other key for *NO*. Copies the active channel into ALL 50 channel locations.
29	CLEAR ACTIVE CHANNEL	LCD PROMPT: CLEAR CHAN ARE YOU SURE?: Press **[CODE]** for *YES* or any other key for *NO*. Clears or nulls all settings of the active channel location.
30	DISPLAY DIAGNOSTICS	ENABLES ERROR DIAGNOSTICS: Display all appropriate error messages or simply "SYSTEM OK".

7.2.17 .....CODE BUTTON: (continued)

CODE	FUNCTION	LCD READ-OUT : OPERATION
31	DISPLAY "TOT"	Displays the "Total Operating Time" in DAYS:HOURS:MINUTES
32	DISPLAY CRT TIME	Displays the CRTs total elapsed time in, DAYS:HOURS:MINUTES
33	DISPLAY ORIENTATION	Displays the projection mode, i.e., FLOOR MOUNT / FRONT PROJECTION
34	DISPLAY BOARD STATUS	Displays the available input modules installed.
35	DISPLAY ROM REVISION	Displays the current revision level of the operating system.
36	DISPLAY FREQUENCY COUNTER	Displays the horizontal scan rate of the incoming signal for the active channel.
37	ENABLE EXECUTIVE MODE	EXEC MODE ON: This command allows the user to limit the operation of the system to; Power, Standby, and 8 channel selections.
38	DISPLAY HV FAILURE COUNT	Displays the number of times high voltage has cycled on and off.
40	ADJUST RVS	Activates the Red Static Vertical Shift operation. RVS must be performed with registration "off". See 55 CODE.
41	ADJUST BVS	Activates the Blue Static Vertical Shift operation. BVS must be performed with registration "off". See 55 CODE.
42	ADJUST LCD BACK LIGHT	LCD PROMPT: ENTER LITE LEVEL: Enter 0 (off) through 4 (max.).
43	TEST REMOTE CONTROL	Test/verify remote control LCD operation.
44	READ SWITCHES	Reads/displays settings of the baud rate and address switches.
45	DISABLES REGISTRATION KEYS	KEYS DISABLED: This command allows the user to lock-out the convergence keys which will prevent adjustments from being made by unauthorized personnel.
46	ENABLE REGISTRATION KEYS	KEYS ENABLED: Activates keys placed inactive by 45 CODE.
47	ENABLE GUIDED REGISTRATION	Enters the complete guided registration mode of operation. Use CODE to exit at any time.
48	TOGGLE BLACK LEVEL CLAMP POINT	Toggle the black level clamp point from "back-porch" to "sync-tip" mode of operation on a channel- by-channel basis. System will default to "back-porch" clamping.
49	TOGGLE MONOCHROME MODE	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: Turns registration off when performing the mechanical (STATIC) alignments and turn registration on when performing the dynamic alignment functions.
60	ENABLE MASTER SIZE	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.

7.2.17 . . . . . .CODE BUTTON: (continued)

CODE	FUNCTION	LCD READ-OUT : OPERATION
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.
70	UPDATE MODULE STATUS	Use this command in conjunction with Supplement 5 when adding or removing an input module.
77	INITIALIZE INTERNAL TEST / HELP SCREENS	Used to establish screen parameters for the internal test and help screens.
79	RESET INTERNAL SCREENS	Used to reset the test and help screens settings to factory preset conditions for brightness, contrast, size, etc..
90	DISABLE HDTV MODE OF OPERATION (Optional)	Used to disable the HDTV mode of operation, if installed.
91	ENABLE HDTV MODE OF OPERATION (Optional)	Used to enable the HDTV mode of operation, if installed.
92	ENABLE INTENSITY MODULATION (Optional)	Used to activate the intensity modulation mode of operation. Acts as an intensity modulation key.
93	CLEAR INTENSITY SETTINGS (Optional)	LCD PROMPT: NULL INTENSITY ARE YOU SURE? Enter **[CODE]** for *YES* or any other key for *NO*. This code will reset intensity modulation settings to 50%.
900	DISABLE QUIET MODE	Disables the quiet mode of operation and returns the system back to its normal communication mode of operation.
901	ENABLE QUIET MODE	Enables the quiet mode of operation and disables the normal "remote messages" and provides absolutes values. Mainly used for uploading/downloading of DAC data and external RS232 control or computer control.
902	DISABLE EDGE BLEND (Special Option)	Disables the edge blend function control and returns the display system back to its normal remote control operation.
903	ENABLE EDGE BLEND (Special Option)	Enables the edge blend mode of operation in which the display system is "excluded" from the explicit edge blend commands given from the remote control.
909	DISABLE EXECUTIVE MODE	EXEC MODE OFF: Exits the executive mode of operation and resumes normal (full) remote control operation.

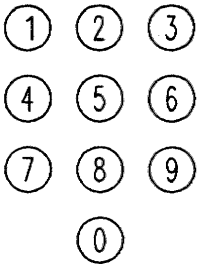
7.2.18 . . . . . .CLEAR BUTTON: (CLEAR)

FUNCTION: Resets accumulator to zero (ACC)

☐ OPERATION 1: Removes an incorrect entry from the display when pressed before any function or operation key is pressed.

☐ OPERATION 2: Reset arrows keys while in the HELP mode of operation.

7.2.19. . . . . .NUMERIC KEYPAD:

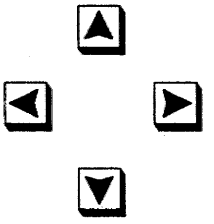


☐ OPERATION 1: Used to set and recall channel and unit numbers.

☐ OPERATION 2: Address internal special features (CODES).

☐ OPERATION 3: Percentage setting of the image quality functions.

7.2.20. . . . . .ARROW KEYS:



☐ OPERATION 1: Increment and decrement selected function level.

☐ OPERATION 2: In the HELP MODE used to advance and regress pages or exit.

7

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.

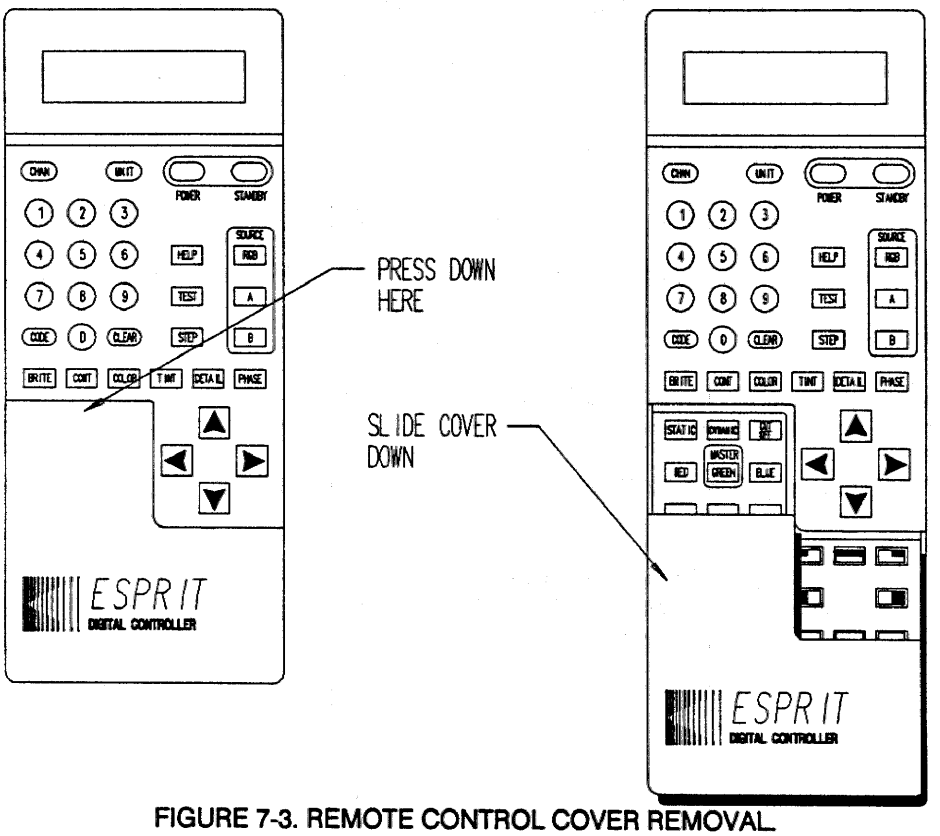
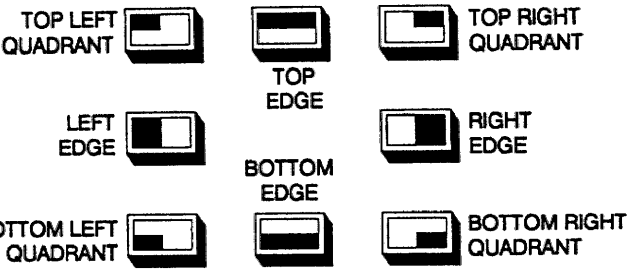


FIGURE 7-3. REMOTE CONTROL COVER REMOVAL

The remainder of this section will highlight the use and functionality of the registration controls. It should be noted that this section includes instructions for both the **STANDARD** registration operation and the **OPTIONAL** convergence on green operation. All functions which apply to the standard registration additionally apply to the the optional registration (convergence on green).

- Optional convergence on green note: All adjustments being made to the green image will additionally effect the red and blue images simultaneously with the exception of green horizontal shift.

7.2.21. . . . . .QUADRANTS AND EDGES:



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

7

7.2.22 . . . . STATIC BUTTON: [STATIC]

FUNCTION: Enables all static operations.

NOTE: Before activating static registration functions disable registration with 55 **[CODE]** and perform the following static functions:

STANDARD and OPTIONAL OPERATION:

- KEYSTONE: Press **[STATIC]**, **[KEY]**, then use the **[⇐]**and **[⇒]** arrows to adjust the E-W Keystone.
- PINCUSHION: Press **[STATIC]**, **[PIN]**, then use the **[⇐]** and **[⇒]** arrows to adjust the E-W Pincushion.

RED AND BLUE STATIC SHIFT OPERATIONS:

- RED STATIC SHIFT: With Registration "OFF", enter 40 **[CODE]** and adjust the **RED VERTICAL SHIFT**.
- BLUE STATIC SHIFT: With Registration "OFF", enter 41 **[CODE]** and adjust the **BLUE VERTICAL SHIFT**.

OPTIONAL OPERATION:

- **SIZE:** Green only. Press **[STATIC]**, **[SIZE]**and use the **[⇑]**and **[⇓]** arrow keys and adjust for the master vertical size. Use the **[⇐]**and **[⇒]**arrow keys and adjust for the master horizontal size.
- **LINEARITY:** Green only. Press **[STATIC]**, **[LIN]**and use the **[⇑]** and **[⇓]**arrow keys and adjust until the squares from top to bottom of a crosshatch pattern are equal in height.
- **SHIFT:** Green only. Press **[STATIC]**, **[SHIFT]**and use the **[⇑]** or **[⇓]** arrow keys and adjust the image until it is centered on the screen. DO NOT OVER SCAN THE FACE OF THE CRT. NOTE: Static shift operates in the vertical direction only.

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

7.2.23 . . . . . .DYNAMIC BUTTON: DYNAMIC

FUNCTION: Enables dynamic registration operation.

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

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

7.2.24 . . . . . .CUTOFF BUTTON : CUT OFF

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

☐ OPERATION 1: Press **[CUTOFF]** then the desired color key to turn (toggle) the image on and off.

7.2.25 . . . . . .RED BUTTON : RED

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

☐ OPERATION 1: Press **[RED]** and select the desired registration function and appropriate area key.

☐ OPERATION 2: Turns " OFF " RED CRT when preceded by the **[CUTOFF]**button.

☐ OPERATION 3: If STATIC function was previously selected then the **[RED]** button additionally exits the STATIC mode and enables DYNAMIC registration mode of operation for Red.

7.2.26 . . . . . .GREEN (MASTER) BUTTON: GREEN

FUNCTION: [DYNAMIC] Selects Master and/or Green Registration or Green cutoff.

☐ OPERATION 1: Press **[GREEN]** and select the desired registration function and appropriate area key.

☐ OPERATION 2: Turns " OFF " GREEN CRT when preceded by the **[CUTOFF]** button.

☐ OPERATION 3: If STATIC function was previously selected then the **[GREEN]** button additionally exits the STATIC mode and enables DYNAMIC registration mode of operation for Green.

7.2.27. . . . . .BLUE BUTTON : BLUE

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

☐ OPERATION 1: Press **[BLUE]** and select the desired registration function and appropriate area key.

☐ OPERATION 2: Turns " OFF " BLUE CRT when preceded by the **[CUTOFF]** button.

☐ OPERATION 3: If STATIC function was previously selected then the **[BLUE]**button additionally exits the STATIC mode and enables DYNAMIC registration mode of operation for Blue.

7.2.28. . . . . .SHIFT BUTTON : SHIFT

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

- NOTE 1: See **STATIC** functions for Master Vertical shift, Red Vertical Shift and Blue Vertical Shift per section 7.2.22 for proper setting prior to proceeding with the remainder of this section.

STANDARD and OPTIONAL OPERATION:

☐ OPERATION 1: [DYNAMIC] Press **[RED]**, **[GREEN]** or **[BLUE]**, then **[SHIFT]** to select the particular color and SHIFT operation.

VERTICAL SHIFTS: Use the **[⇑]** and **[⇓]** arrows to adjust for the Vertical Shifts.

HORIZONTAL SHIFTS: Use the **[⇐]**and **[⇒]**arrows will adjust for the Horizontal Shifts.

- NOTE 1: Green Horizontal shift is only available with the Convergence On Green option and effects only the green image.
- NOTE 2: SHIFT operation is not active in the edge or quadrant controls, only in highlighted center.

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7.2.29. . . . . .SKEW BUTTON : SKEW

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

STANDARD AND OPTIONAL OPERATION:

MASTER HORIZONTAL SKEW OPERATION:

☐ OPERATION 1A: (STANDARD) Press **[SKEW]**, then **[GREEN]** and use the **[⇑]** or **[⇓]** arrows to adjust.

☐ OPERATION 1B: (OPTIONAL) Press **[SKEW]**, then **[GREEN]** and any registration zone (quadrant/edge) key other than the LEFT/RIGHT edge key. Use the **[⇑]** or **[⇓]** arrow keys to adjust.

INDIVIDUAL SKEW OPERATION:

☐ HORIZONTAL SKEW : Select **[SKEW]**, **[RED]**, **[GREEN[1]]** or **[BLUE]**, then **[LEFT]** or **[RIGHT] [EDGE]** and adjust the horizontal skew using **[⇑]**or **[⇓]** arrow key.

☐ VERTICAL SKEW: Select **[SKEW]**, **[RED]**, **[GREEN[1]]** or **[BLUE]** and adjust the vertical skew using **[⇐]** or **[⇒]** arrow key. The selection of the left or right arrow key will automatically select the vertical skew operation which moves and highlights the center axis of the projected image.

[1]NOTE: Convergence on Green option required.

7.2.30. . . . . BOW BUTTON : [BOW]

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

STANDARD AND OPTIONAL OPERATION:

MASTER HORIZONTAL BOW:

☐ OPERATION 1A: (STANDARD): Press **[BOW]**, then **[GREEN]** to select the Master Horizontal Bow operation and use the **[⇑]** and **[⇓]** arrows to adjust.

☐ OPERATION 1B: (OPTIONAL): Press **[BOW]**, then **[GREEN]**, then any registration zone (quadrant/edge) other than the LEFT/RIGHT edge keys. Use the **[⇑]**and **[⇓]** arrows to adjust.

INDIVIDUAL BOW OPERATION:

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

☐ HORIZONTAL BOW : Select **[BOW]**, **[LEFT]** or **[RIGHT]** **[EDGE]**, **[RED]**, **[[1]GREEN]** or **[BLUE]** and adjust the using **[⇑]**or **[⇓]** arrow key.

☐ VERTICAL BOW: Select **[BOW]**, **[RED]**, **[GREEN]** or **[BLUE]** and adjust the vertical bow using **[⇐]** or **[⇒]** arrow key. The selection of the left or right arrow key will automatically select the vertical bow operation which moves and highlights the center axis of the projected image.

¤ [1]NOTE: Convergence on Green option required.

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7.2.31. . . . .KEY BUTTON : [KEY]

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

STANDARD and OPTIONAL OPERATION:

☐ STATIC KEYSTONE: (Registration "OFF") Pressing **[STATIC]**, then **[KEY]** will select the static keystone operation for Master (GREEN) which provides adjustment of the total image. Use the **[⇑]** or **[⇓]** arrow keys to adjust.

☐ DYNAMIC KEYSTONE 1: Pressing **[GREEN]**, an EDGE control, then **[KEY]** will select the master keystone operation for the selected TOP or BOTTOM edge, adjusted by the **[⇑]**and **[⇓]** arrow keys, or LEFT or RIGHT edge control, which is adjusted by the **[⇐]** and **[⇒]** arrow keys. Highlights the selected edge of the image.

☐ DYNAMIC KEYSTONE 2: Pressing **[RED]**, **[[1]GREEN]** or **[BLUE]**, a QUADRANT control then **[KEY]** 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. Utilize the **[⇑]**and **[⇓]** arrow keys to adjust for the vertical keystones and the **[⇐]** and **[⇒]** arrow keys to adjust for the horizontal keystones.

¤ [1]NOTE: Convergence on Green option required.

¤ NOTE 1: Red and Blue operate on QUADRANTS. If an EDGE is selected for RED or BLUE key, the display will prompt, [SELECT QUADRANT].

7.2.32. . . . .PIN BUTTON : PIN

FUNCTION: [STATIC AND DYNAMIC] Selects pincushion operation.

STANDARD and OPTIONAL OPERATION:

☐ STATIC PINCUSHION: (Registration "OFF") Pressing **[STATIC]**, then **[GREEN]** will select static pincushion operation for Master (Green) which provides adjustment of the total image. Use the **[⇐]** and **[⇒]** arrow keys to adjust.

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

☐ DYNAMIC PINCUSHION 1: Pressing **[GREEN]**, an EDGE control, then **[PIN]** 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. Use the **[⇑]** and **[⇓]** arrows for the TOP/BOTTOM pincushions and the **[⇐]** and **[⇒]** arrows for the LEFT/RIGHT pincushions

¤ NOTE 2: STANDARD OPERATION: Green pincushion operates on EDGES. If an QUADRANT is selected for the Green pincushion, the display will prompt [SELECT EDGE].

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☐ DYNAMIC PINCUSHION 2: Pressing **[RED]**, **[[1]GREEN]** or **[BLUE]** a QUADRANT control, then **[PIN]** will select color and pincushion operation for the selected TOP LEFT, TOP RIGHT, BOTTOM LEFT or BOTTOM RIGHT and highlight the selected quadrant. Use the **[⇑]** and **[⇓]** arrows adjust the horizontal pincushions and use the **[⇐]** and **[⇒]** arrows adjust the vertical pincushions.

¤ [1]NOTE: Convergence on Green option required.

7.2.33. . . . .SIZE BUTTON: SIZE

FUNCTION: [STATIC OR DYNAMIC], Selects the height and width operations.

STANDARD AND OPTIONAL OPERATIONS:

MASTER SIZE OPERATION:

☐ STANDARD OPERATION: Press **[GREEN]**, then **[SIZE]** to perform the master size operations.

☐ OPTIONAL OPERATION: Press **[STATIC]**, then **[SIZE]** to perform the master size operations.

☐ Use the **[⇐]**and **[⇒]** to adjust the image width. Use the **[⇑]** and **[⇓]** to adjust the image height.

EDGE SIZE OPERATION:

☐ Press **[RED]**, **[[1]GREEN]** or **[BLUE]**, **[SIZE]**, then an EDGE control to perform individual edge size operations.

☐ WIDTH: After selecting a *color* and **[SIZE]**, select **[LEFT]** or **[RIGHT]**edge and use the **[⇐]** and **[⇒]** arrow keys to perform the edge size operation for the selected color and edge.

☐ HEIGHT: After selecting a *color* and **[SIZE]** select **[TOP]** or **[BOTTOM]**edge and use the **[⇑]**a nd **[⇓]** arrow keys to perform the edge size operation for the selected color and edge.

¤ [1]NOTE: Convergence on Green option required.

7.2.34. . . . .LIN BUTTON : LIN

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

STANDARD and OPTIONAL OPERATION:

MASTER LINEARITY:

☐ OPERATION 1A (STANDARD): Pressing **[GREEN]**, then **[LIN]** will select Master Vertical linearity operation. Use the **[⇑]** or **[⇓]** arrows to adjust.

☐ OPERATION 1B (OPTIONAL): Pressing **[STATIC]**, then **[LIN]** will select Master Vertical linearity operation. Use the **[⇑]** or **[⇓]**arrows to adjust.

- ¤ 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.

EDGE LINEARITY:

☐ Pressing **[RED]**, **[[1]GREEN]** or **[RED]**, then **[LIN]**, then an EDGE control will select individual edge linearity operations.

- ● After selecting a *color* and **[LIN]**, press **[LEFT]** or **[RIGHT]** to select LEFT or RIGHT edge and adjust horizontal linearity by using the **[⇐]** or **[⇒]**arrow.
- ● After selecting a *color* and **[LIN]**, press **[TOP]** or **[BOTTOM]** to select TOP or BOTTOM edge and adjust vertical linearity by using the **[⇑]** or **[⇓]** arrows.
- ¤ [1]NOTE: Convergence on Green option required.

7.2.35. . . . .EDGELIN BUTTON : EDGELIN

FUNCTION: [DYNAMIC] Selects edge linearity operations.

STANDARD and OPTIONAL OPERATION:

☐ Press **[RED]**, **[[1]GREEN]** or **[BLUE]**, **[EDGELIN]** then **[LEFT]** or **[RIGHT]** edge control.

- ¤ NOTE 1: The EDGELIN function affects only the OUTER RIGHT or OUTER LEFT edges of image.
- ● HORIZONTAL EDGE LINEARITY: After selecting a *color* and **[EDGELIN]**, select **[LEFT]** or **[RIGHT]** edge to select Horizontal Linearity operation and use the **[⇐]** or **[⇒]**arrow keys to adjust.
- ¤ [1]NOTE 2: Convergence on Green option required.

7.2.36. . . . . .BLANK BUTTON : BLANK

FUNCTION: [STATIC OR DYNAMIC]Selects blanking operation.

Use the blanking function in case the wanted (active) video is cutoff or to eliminate unwanted (non-active) video information. See PHASE for additional information.

☐ BLANKING: Select an EDGE, then **[BLANK]** to perform the following blanking operations:

- LEFT and/or RIGHT: Press **[LEFT]** or **[RIGHT]** edge control then **[BLANK]** to select horizontal blanking which is adjusted by the **[⇐]** and **[⇒]**arrows.
- TOP and/or BOTTOM: Press **[TOP]** or **[BOTTOM]** edge control then **[BLANK]** to select vertical blanking which is adjusted by the **[⇑]** and **[⇓]** arrows.

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Chapter 8

INTERNAL HELP MENUS

REGISTRATION PROCEDURES

8.1 . . . . . .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.

8.1.1 . . . . . .MAIN INDEX MENU:

The index menu is provided to select a particular chapter/subject. The main menu contains the following subjects. Refer to Figure 8-1.

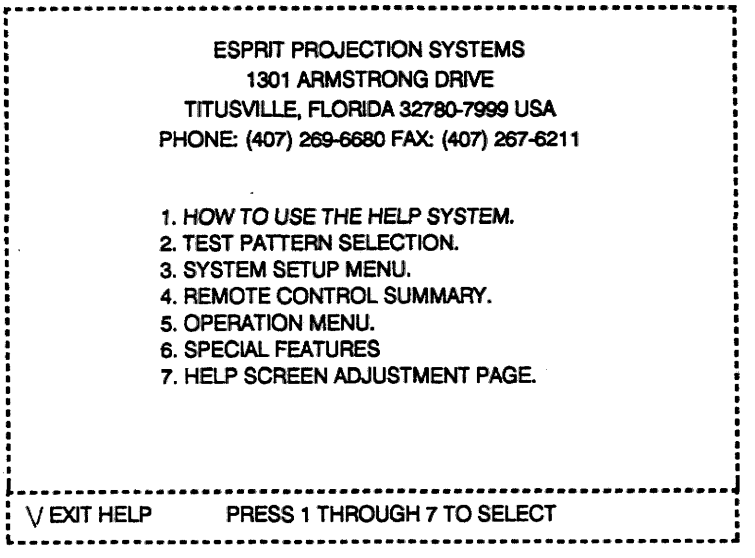

FIGURE 8-1. HELP SYSTEM MAIN MENU.

8.1.2 . . . . . .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:

▲ GO TO INDEX

▼ EXIT HELP

◀ PREVIOUS PAGE

▶ NEXT PAGE

8.1.3 . . . . . .TEST PATTERN SELECTIONS (MAIN MENU SELECTION 2):

This page informs you of the available internal test patterns, frequency and the selection of these patterns. See Chapter7, Section 7.2.12, Page 7-8 for more information.

8.1.4 . . . . . .SYSTEM 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 8-2.

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 8.1.5 and to Figure 8-3.

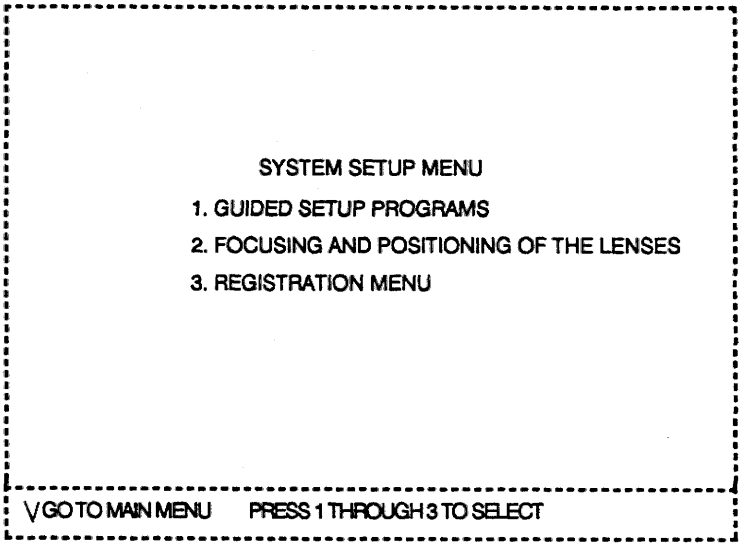

FIGURE 8-2. SYSTEM SETUP MENU SELECTIONS.

8.1.5 . . . . . .REGISTRATION MENU (SYSTEM SETUP SELECTION 3) :

1. DESCRIPTION OF CONTROLS: This selection provides information on the registration controls that are available with an brief explanation of their function.

2. ENABLE REMOTE REGISTRATION KEYS: This selection will be used in conjunction with selection 3 (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.

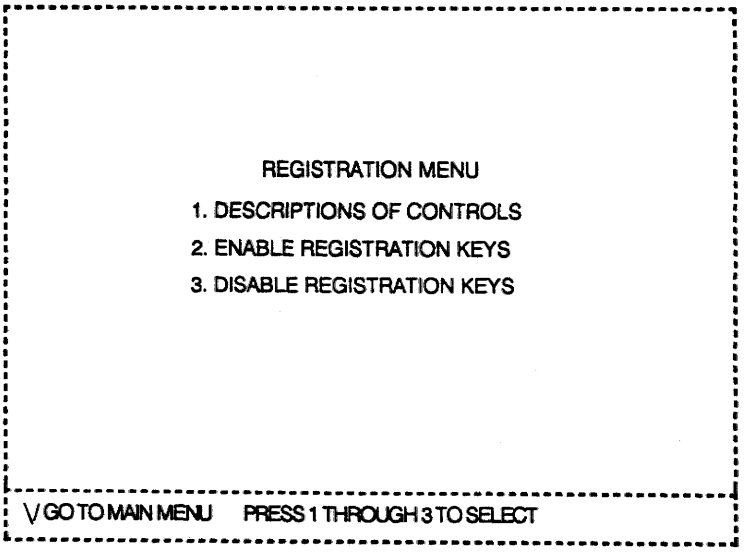

FIGURE 8-3. REGISTRATION MENU SELECTIONS.

8.1.6 .....REMOTE KEYPAD SUMMARY MENU (MAIN MENU SELECTION 4):

This selection provides an additional menu for explanation (of your choice) on the operation of the functions provided on the standard hard-wired remote control. Refer to Figure 8-4.

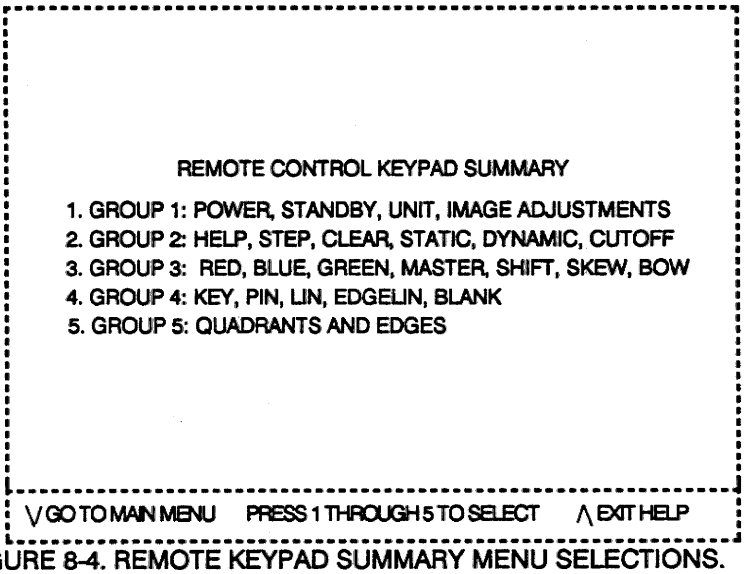

FIGURE 8-4. REMOTE KEYPAD SUMMARY MENU SELECTIONS.

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8.1.7 .....OPERATION MENU (MAIN MENU SELECTION 5):

This selection provides information on the special functions and operation of the ESPRIT system. See Figure 8-5.

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 8-5.

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.

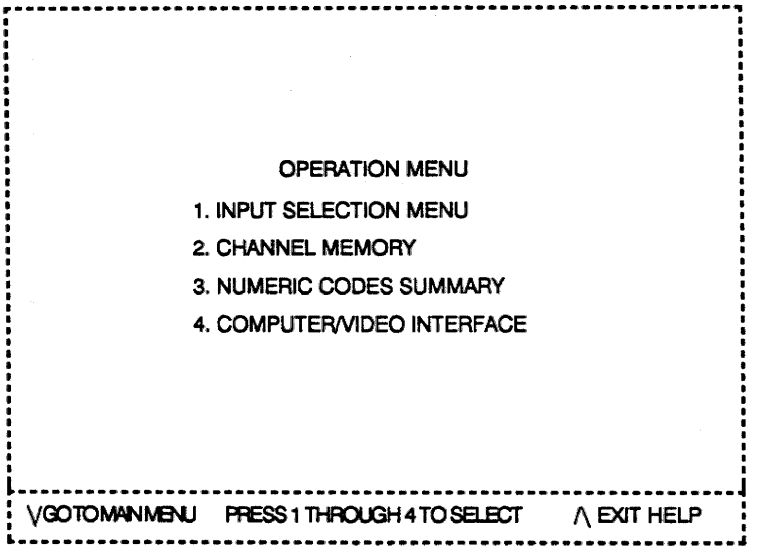

FIGURE 8-5. OPERATION MENU SELECTIONS.

8.1.8 . . . . . .SPECIAL FEATURES (MAIN MENU SELECTION 6):

This section provides basic information on special features such as. Intensity Modulation and Edge Blending.

8.1.9 . . . . . .HELP SCREEN ADJUSTMENT PAGE (MAIN MENU SELECTION 7):

The help screens are contained within their own channel location, (HELP channel)and for this reason it may become necessary to adjust and setup (green geometry) the help screen parameters. Refer to figure 8-6

HELP SCREEN ADJUSTMENT PAGE

1. BRIGHTNESS: PRESS [BRITE] AND ADJUST THE BRIGHTNESS LEVEL OF THIS PAGE.
2. CONTRAST: PRESS [CONT] AND ADJUST THE CONTRAST LEVEL OF THIS PAGE.
3. PHASING: PRESS [PHASE] AND ADJUST UNTIL THE BORDERS AROUND THIS PAGE ARE VISIBLE. SEE BLANKING.
4. BLANKING: PRESS [BLANK] AND ADJUST UNTIL THE BORDERS AROUND THIS PAGE ARE VISIBLE. SEE PHASING.
5. SIZING: PRESS [STATIC]THEN [SIZE] AND ADJUST THE WIDTH AND HEIGHT OF THIS PAGE TO YOUR PARTICULAR SCREEN SIZE.
6. SHIFT: PRESS [STATIC] THEN [SHIFT] AND USE THE [/\] AND [\/] ARROW KEYS UNTIL THIS PAGE IS CENTERED WITHIN YOUR SCREEN. IF AN ADJUSTMENT HAS BEEN MADE, PRESS [CLEAR] PRIOR TO EXITING.

\/GO TO INDEX \/EXIT HELP <PREVIOUS PAGE >GO TO INDEX

FIGURE 8-6. HELP SCREEN ADJUSTMENT PAGE.

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8.2. . . . . .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.

To perform a random setup of a new, or modify an existing channel location, the following conditions must exist prior to building or changing parameters of a channel.

REGISTRATION SETUP OF A CHANNEL:

- 1. Select the channel you wish to adjust, i.e., **[1] [CHAN]**, **[2] [CHAN]**, **[3] [CHAN]** *etc.*
- 2. For building a new channel, select the appropriate mode of operation, i.e., RGB, VIDEO etc.
- 3. If the channel had been previously built and write-protected, enter **[20] [CODE]** to toggle the write-protect "OFF" , this will allow you to make the adjustments you want to make.
- 4. Select the test function method, i.e. Internal Test/Internal Sync or Internal Test/External Sync or an independent test pattern externally generated applied to the appropriate card (slot).

¤ NOTE: Channel settings such as brightness, contrast, detail, tint, color and phasing will have to be made while the active source is being displayed.

8.2.1 .....FACTORY 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 7.2.17, page 7-10 for more information.

CHANNEL	CHANNEL PARAMETER	CHANNEL	CHANNEL PARAMETER	CHANNEL	CHANNEL PARAMETER
1-44 and 48	RGB MODE / 31.5kHz	46	RGB MODE / 64kHz	49	RGB MODE / 21.5kHz
45	RGB MODE / 80kHz	47	RGB MODE / 54kHz	50	VIDEO MODE / NTSC

- 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").

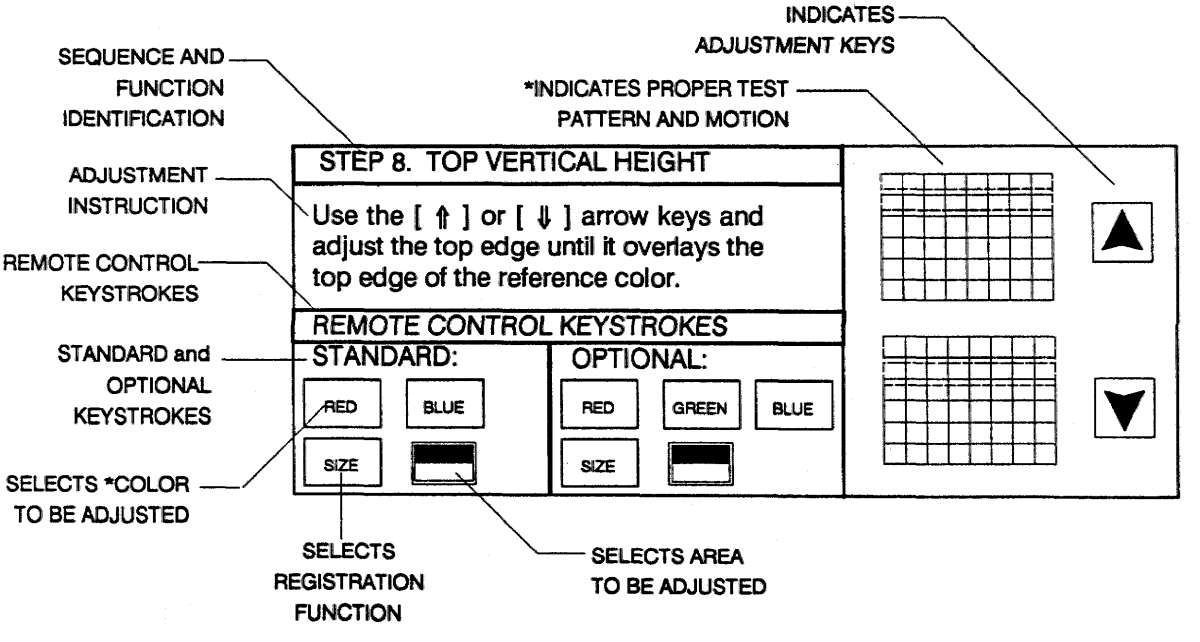
8.3 ..... REGISTRATION PROCEDURES:

The registration of the system is divided into four stages. STAGE 1): Focus and positioning of the lenses. STAGE 2): Sizing and optimizing the geometry of the GREEN image. NOTE: All adjustments being made to the Green image will simultaneous effect the Red and Blue images with the exception of the Green horizontal shift function. STAGE 3): Align the RED image to exactly overlay the GREEN image. STAGE 4): Align the BLUE image to exactly overlay the RED image.

8.4 .....REGISTRATION PREFACE:

This section of the manual is sequenced in such a way as to optimize the registration operation of this system. The information provided in the Registration sequence block will indicate the registration sequence number , function identification, proper function selection (keystrokes) for the standard and optional convergence on green, provides the required test pattern and appropriate adjustment keys. Please refer to example below: NOTE: If your system is equipped with the convergence on green option, then the optional keystrokes indicated in the sequence block will be applicable, unless otherwise indicated.

NOTE: This section of the manual makes the assumption that the system has been installed and positioned properly in accordance with the guidelines set forth by the end-user. Additionally, perform the lens focusing and positioning prior to making any registration settings.

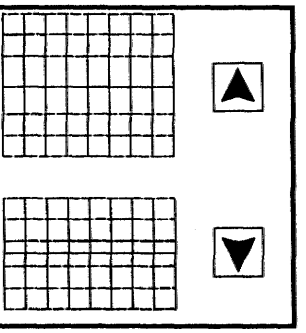


*TEST PATTERN SHOWN MAY VARY DEPENDING UPON THE SPECIFIC REQUIREMENTS AND OPTIONS INSTALLED.

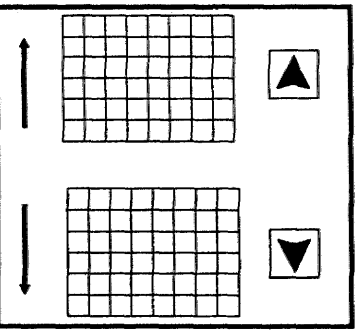
8.4.1 .....REGISTRATION PROCEDURE/SEQUENCE:

8.4.1.2 ....MASTER (GREEN) IMAGE ADJUSTMENTS:

STEP 1. MASTER VERTICAL LINEARITY: (Registration "off")	
Use the [⇑] or [⇓] arrow keys and adjust until the squares from top to bottom of the image are equal in height.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN LIN	OPTIONAL STATIC LIN

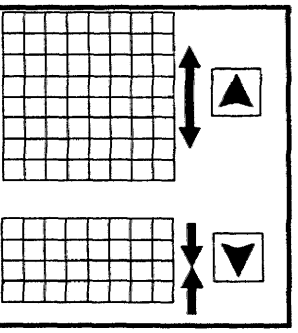


STEP 2. MASTER VERTICAL SHIFT[1]:	
Use the [⇑] or [⇓] arrow keys and adjust the image until it is centered on the screen. Do not over-scan the face of the CRT.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN SHIFT	OPTIONAL STATIC SHIFT

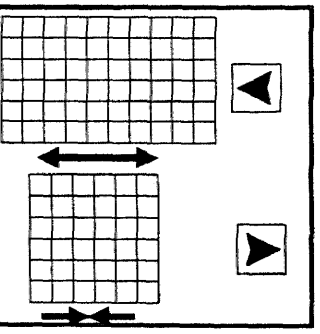


[1]REPEAT STEPS 1 AND 2 TO OPTIMIZE THE PROJECTED IMAGE.

STEP 3. MASTER VERTICAL SIZE:	
Use the [⇑] or [⇓] arrow keys and adjust until the proper height is achieved. Do not over-scan the face of the CRT.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN SIZE	OPTIONAL STATIC SIZE

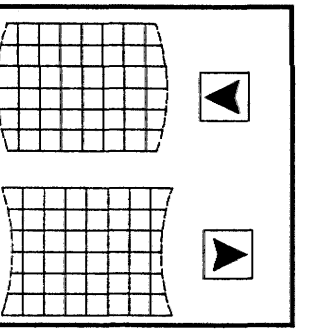


STEP 4. MASTER HORIZONTAL SIZE:	
Use the [⇐] or [⇒] arrow keys and adjust until the proper width is achieved. Do not over-scan the face of the CRT.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN SIZE	OPTIONAL STATIC SIZE

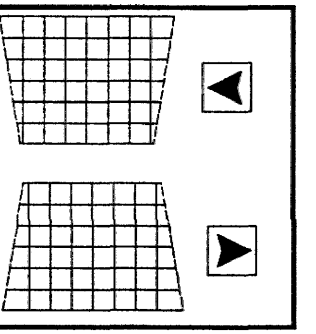


8.4.2. . . . . MASTER (GREEN) IMAGE ADJUSTMENTS: (CONTINUED)

STEP 5. MASTER STATIC E-W PINCUSHION: (Registration "off")	
Use the [⇐] or [⇒] arrow keys and adjust the right edge until it does not bow in or out.	
REMOTE CONTROL KEYSTROKES:	
STANDARD STATIC PIN	OPTIONAL STATIC PIN

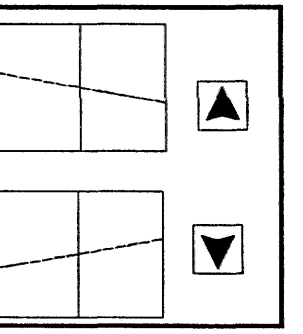


STEP 6. MASTER STATIC KEYSTONE[1]: (Registration "off")	
Use the [⇐] or [⇒] arrow keys and adjust until the right side of the image is parallel to the vertical plane of the screen.	
REMOTE CONTROL KEYSTROKES:	
STANDARD STATIC KEY	OPTIONAL STATIC KEY

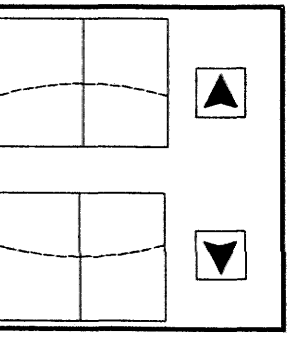


[1]Repeat steps 5 and 6 to optimize the right side of the projected image.

STEP 7. MASTER HORIZONTAL SKEW:	
Use the [⇑] or [⇓] arrow keys and adjust the green horizontal line until it is parallel to the horizontal center line of the screen.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN SKEW	OPTIONAL[2] GREEN SKEW



STEP 8. MASTER HORIZONTAL BOW:	
Use the [⇑] or [⇓] arrow keys and adjust the green center horizontal line until it is straight.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN BOW	OPTIONAL[2] GREEN BOW



[2] It may be necessary to select either top or bottom edge key when performing a random setup of the Master Horizontal Skew.

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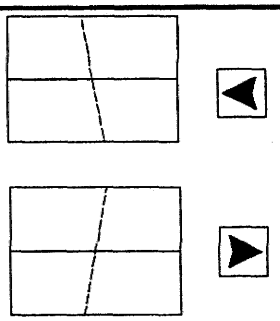
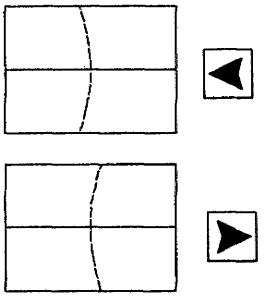
8.4.2. . . . . MASTER (GREEN) IMAGE ADJUSTMENTS: (CONTINUED)

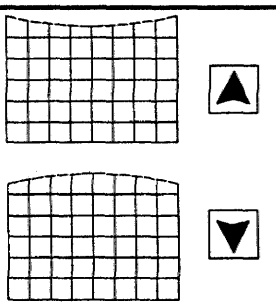
STEP 9. MASTER VERTICAL SKEW:	
Use the [⇐] or [⇒] arrow keys and adjust the green center vertical line until it is parallel to the vertical plane of the screen.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN SKEW	OPTIONAL GREEN SKEW



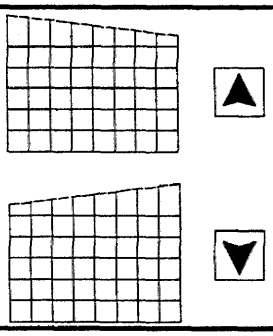
STEP 10. MASTER VERTICAL BOW:	
Use the [⇐] or [⇒] arrow keys and adjust the green center vertical line until it is straight.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN BOW	OPTIONAL GREEN BOW



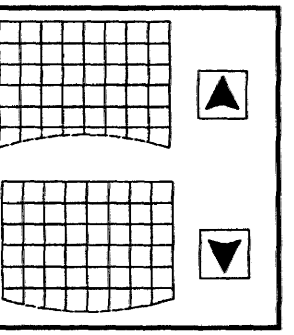
STEP 11. MASTER TOP PINCUSHION:	
Use the [⇑] or [⇓] arrow keys and adjust until the top horizontal line does not bow up or down.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN PIN	OPTIONAL GREEN PIN

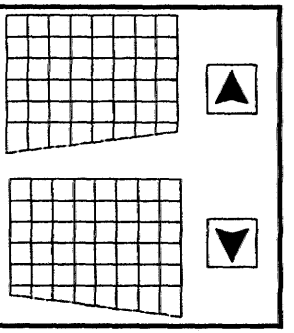


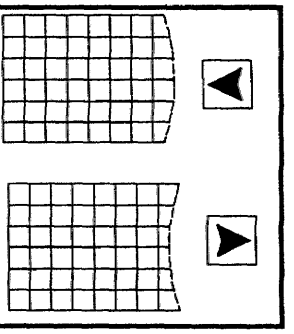
STEP 12. MASTER TOP KEYSTONE:	
Use the [⇑] or [⇓] arrow keys and adjust the top horizontal line until it is parallel with the top horizontal edge of the screen.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN KEY	OPTIONAL GREEN KEY

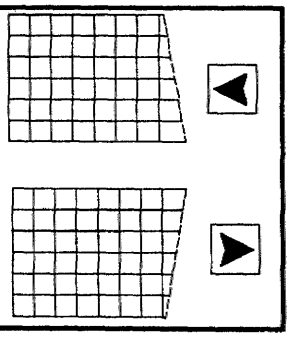


8.4.2. MASTER (GREEN) IMAGE ADJUSTMENTS: (CONTINUED)

STEP 13. MASTER BOTTOM PINCUSHION:	
Use the [⇑] or [⇓] arrow keys and adjust the bottom horizontal line until it does not bow up or down.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: GREEN + PIN + 	OPTIONAL: GREEN + PIN + 

STEP 14. MASTER BOTTOM KEYSTONE:	
Use the [⇑] or [⇓] arrow keys and adjust the bottom horizontal line until it is parallel to the bottom horizontal edge of the screen.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: GREEN + KEY + 	OPTIONAL: GREEN + KEY + 

STEP 15. MASTER RIGHT PINCUSHION:	
Use the [⇐] or [⇒] arrow keys and adjust until the right edge of the image does not bow in or out.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: GREEN + PIN + 	OPTIONAL: GREEN + PIN + 

STEP 16. MASTER RIGHT KEYSTONE:	
Use the [⇐] or [⇒] arrow keys and adjust the right outermost vertical line until it is parallel to the vertical edge of the screen.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: GREEN + KEY + 	OPTIONAL: GREEN + KEY + 

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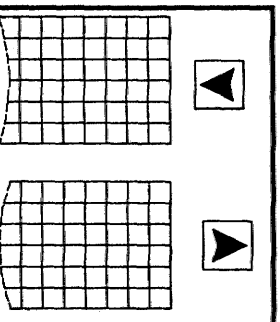
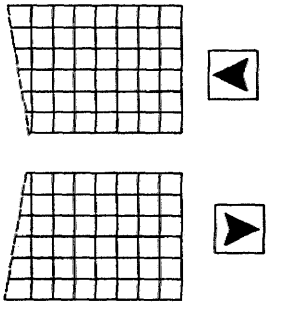
8.4.2. . . . . MASTER (GREEN) IMAGE ADJUSTMENTS: (CONTINUED)

STEP 17. MASTER LEFT PINCUSHION:	
Use the [⇐] or [⇒] arrow keys and adjust the left edge of the image until it does not bow in or out.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN PIN	OPTIONAL GREEN PIN



STEP 18. MASTER LEFT KEYSTONE:	
Use the [⇐] or [⇒] arrow keys and adjust the left outermost vertical line until it is parallel to the vertical edge of the screen.	
REMOTE CONTROL KEYSTROKES:	
STANDARD GREEN KEY	OPTIONAL GREEN KEY



8

END OF MASTER (GREEN) ADJUSTMENTS

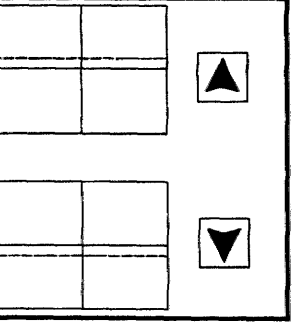
8.4.2.1 . . . . . RED, GREEN[1,2] AND BLUE IMAGE ADJUSTMENTS:

The adjustments outlined in this section are for the RED and BLUE images when using the standard registration board or for the RED, GREEN[1,2] and BLUE images when using the convergence on green option.

[1] NOTE: Convergence on green option required.

[2] NOTE: Convergence on green option. Adjustments being made to the green image will select simultaneous adjustment of the Red, Green and Blue images with the exception of horizontal shift.

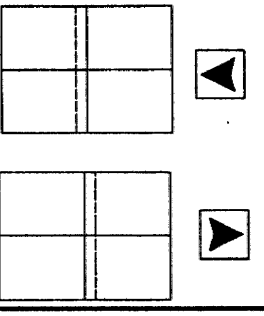
STEP 1. VERTICAL SHIFT[3]:	
Use the [⇑] or [⇓] arrow keys and adjust until the center horizontal line exactly overlays the center horizontal line in the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD RED BLUE SHIFT	OPTIONAL RED GREEN BLUE SHIFT



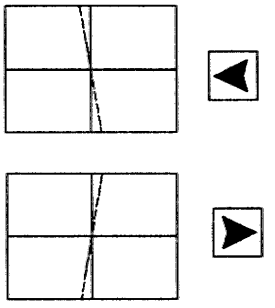
[3] ENSURE THE RED AND BLUE STATIC SHIFT OPERATIONS HAVE BEEN PERFORMED.

8.4.2.1 . . . . .RED, GREEN AND BLUE IMAGE ADJUSTMENTS (CONTINUED):

STEP 2. HORIZONTAL SHIFT:	
Use the [⇐] or [⇒] arrow keys and adjust until the center vertical line exactly overlays the center vertical line in the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD RED BLUE SHIFT	OPTIONAL RED GREEN BLUE SHIFT



STEP 3. VERTICAL SKEW:	
Use the [⇐] or [⇒] arrow keys and adjust until the center vertical line overlays the center vertical line in the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD RED BLUE SKEW	OPTIONAL RED GREEN BLUE SKEW



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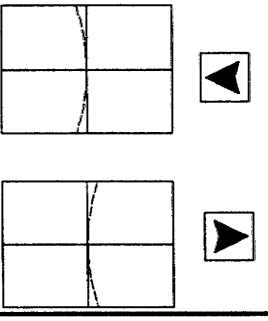
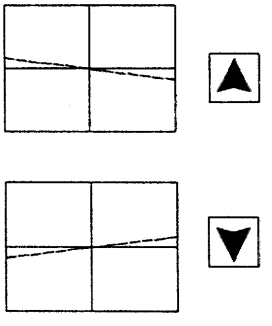
STEP 4. VERTICAL BOW[1]:	
Use the [⇐] or [⇒] arrow keys and adjust until the center vertical line is straight and overlays the center vertical line in the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD RED BLUE BOW	OPTIONAL RED GREEN BLUE BOW



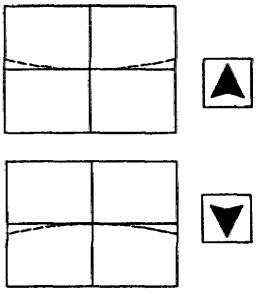
[1] Repeat Steps 3 and 4 to optimize the center vertical line.

STEP 5. HORIZONTAL SKEW[2]: (LEFT AND RIGHT EDGES)	
Use the [⇑] or [⇓] arrow keys and adjust until the center horizontal line overlays the center horizontal line of the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD RED BLUE SKEW OR	OPTIONAL RED GREEN BLUE SKEW OR

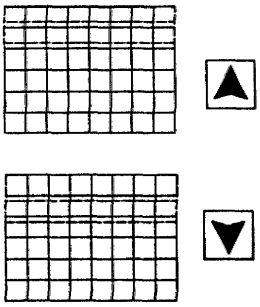


[2]Horizontal Skew operates with the Left and Right Edge controls.

8.4.2.1 . . . . .RED,GREEN AND BLUE IMAGE ADJUSTMENTS (CONTINUED):

STEP 6. HORIZONTAL BOW[1]: (LEFT AND RIGHT EDGE)	
Use the [⇑] or [⇓] arrow keys and adjust until the center horizontal line is straight.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, BOW, OR	OPTIONAL: RED, GREEN, BLUE, BOW, OR

[1]Horizontal bow operates with the Left and Right Edge controls.

STEP 7. TOP VERTICAL HEIGHT:	
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.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, SIZE	OPTIONAL: RED, GREEN, BLUE, SIZE

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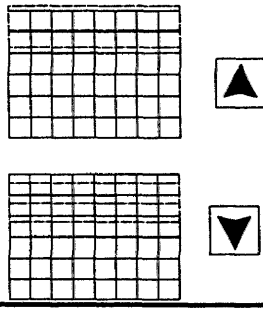
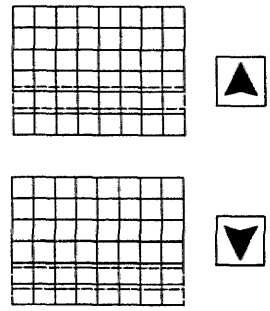
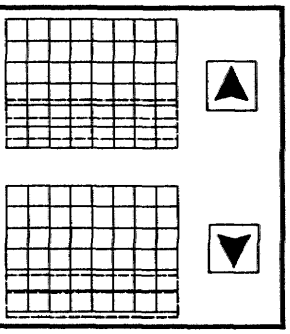
STEP 8. TOP VERTICAL LINEARITY[2]:	
Use the [⇑] or [⇓] arrow keys and adjust the top edge until it overlays the top edge of the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, LIN	OPTIONAL: RED, GREEN, BLUE, LIN

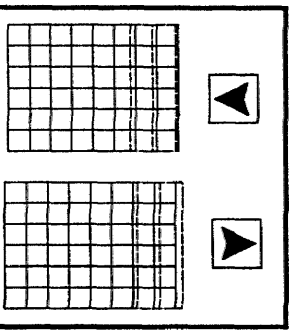
[2]Repeat Steps 7 and 8 to optimize the top center and top edge of the projected image.

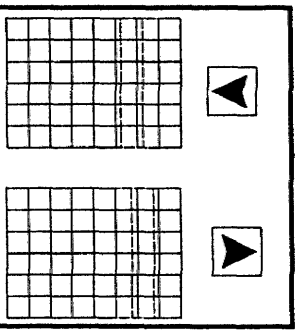
STEP 9. BOTTOM VERTICAL HEIGHT:	
Use the [⇑] or [⇓] arrow keys and adjust until the inner 2/3 of the bottom half overlays the inner 2/3 of the bottom half of the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, SIZE	OPTIONAL: RED, GREEN, BLUE, SIZE

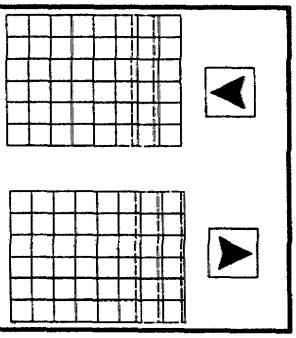
8.4.2.1 . . . . .RED,GREEN AND BLUE IMAGE ADJUSTMENTS (CONTINUED):

STEP 10. BOTTOM VERTICAL LINEARITY[1]:	
Use the [⇑] or [⇓] arrow keys and adjust the bottom edge until it overlays the bottom edge of the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, LIN, ▬ / OPTIONAL: RED, GREEN, BLUE, LIN, ▬	

[1]Repeat Steps 9 and 10 to optimize the bottom center and bottom edge of the projected image.

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.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, LIN, ◧ / OPTIONAL: RED, GREEN, BLUE, LIN, ◧	

STEP 12. RIGHT WIDTH:	
Use the [⇐] or [⇒] arrow keys and adjust the right inner 2/3 until it overlays the right inner 2/3 of the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, SIZE, ◧ / OPTIONAL: RED, GREEN, BLUE, SIZE, ◧	

STEP 13. RIGHT HORIZONTAL EDGE LINEARITY[2]:	
Use the [⇐] or [⇒] arrow keys and adjust the right outer edge until it overlays the right outer edge of the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, EDGELIN, ◧ / OPTIONAL: RED, GREEN, BLUE, EDGELIN, ◧	

[2]Repeat Steps 11,12 and 13 to optimize the right center/edge registration.

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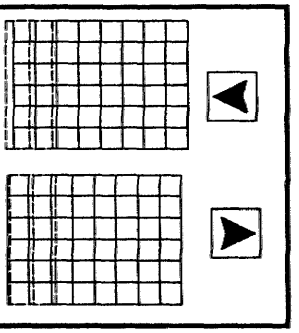
8.4.2.1 . . . . .RED, GREEN* AND BLUE IMAGE ADJUSTMENTS (CONTINUED):

STEP 14. LEFT HORIZONTAL LINEARITY:

Use the [⇐] or [⇒] arrow keys and adjust until the left edge overlays the left edge of the reference color.

REMOTE CONTROL KEYSTROKES:

STANDARD	OPTIONAL
RED BLUE LIN	RED GREEN BLUE LIN

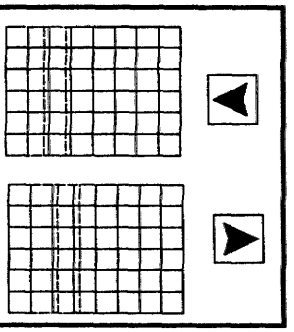


STEP 15. LEFT WIDTH:

Use the [⇐] or [⇒] arrow keys and adjust until the left inner 2/3 overlays the left inner 2/3 of the reference color.

REMOTE CONTROL KEYSTROKES:

STANDARD	OPTIONAL
RED BLUE SIZE	RED GREEN BLUE SIZE



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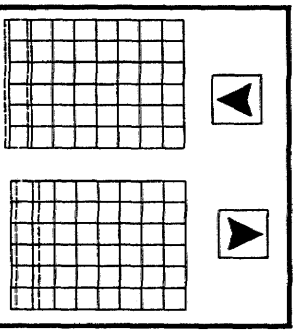
STEP 16. LEFT HORIZONTAL EDGE LINEARITY[1]:

Use the [⇐] or [⇒] arrow keys and adjust the outer most left edge until it overlays the outer most left edge of the reference color.

REMOTE CONTROL KEYSTROKES:

STANDARD	OPTIONAL
RED BLUE EDGELIN	RED GREEN BLUE EDGELIN



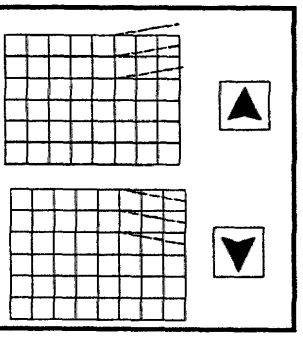
[1]Repeat Steps 14, 15 and 16 to optimize the left center/edge registration.

STEP 17. TOP RIGHT VERTICAL KEYSTONE:

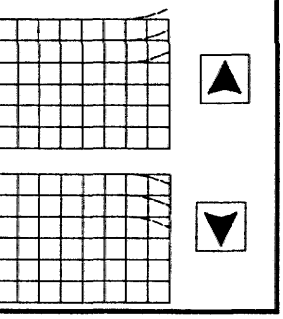
Use the [⇑] or [⇓] arrow keys and adjust until the top horizontal line in the upper right quadrant is straight and overlays the reference color.

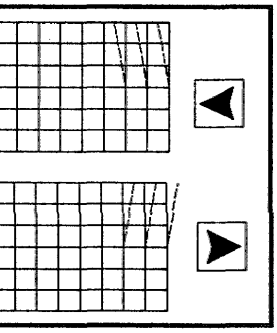
REMOTE CONTROL KEYSTROKES:

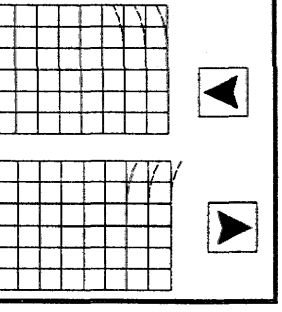
STANDARD	OPTIONAL
RED BLUE KEY	RED GREEN BLUE KEY



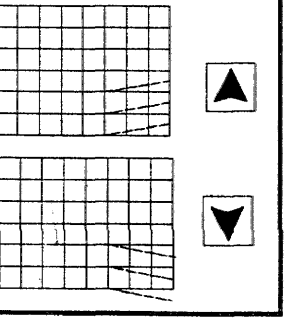
8.4.2.1 . . . .RED, GREEN* AND BLUE IMAGE ADJUSTMENTS:(CONTINUED)

STEP 18. TOP RIGHT VERTICAL PINCUSHION:	
Use the [⇑] or [⇓] arrow keys and adjust until the top horizontal line in the upper right quadrant is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, PIN, ▙ — OPTIONAL: RED, GREEN, BLUE, PIN, ▙	

STEP 19. TOP RIGHT HORIZONTAL KEYSTONE:	
Use the [⇐] or [⇒] arrow keys and adjust until the outermost vertical line in the upper right quadrant is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, KEY, ▙ — OPTIONAL: RED, GREEN, BLUE, KEY, ▙	

STEP 20. TOP RIGHT HORIZONTAL PINCUSHION[1]:	
Use the [⇐] or [⇒] arrow keys and adjust until the outermost vertical line in the upper right quadrant is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, PIN, ▙ — OPTIONAL: RED, GREEN, BLUE, PIN, ▙	

[1]Repeat Steps 17 through 20 to optimize the registration in the upper right corner of the projected image.

STEP 21. BOTTOM RIGHT VERTICAL KEYSTONE:	
Use the [⇑] or [⇓] arrow keys and adjust until the bottom horizontal in the lower right quadrant is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, KEY, ▙ — OPTIONAL: RED, GREEN, BLUE, KEY, ▙	

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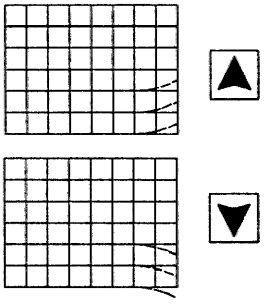
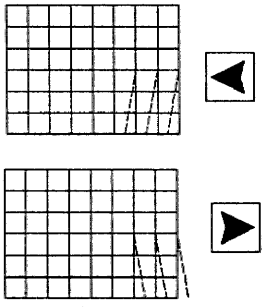
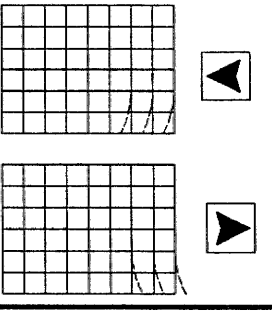
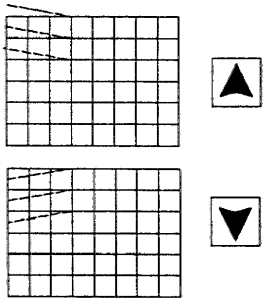
8.4.2.1 . . . . . RED, GREEN* AND BLUE IMAGE ADJUSTMENTS:(CONTINUED)

STEP 22. BOTTOM RIGHT VERTICAL PINCUSHION:	
Use the [⇑] or [⇓] arrow keys and adjust until the bottom horizontal line in the lower right quadrant is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, PIN, ▙ — OPTIONAL: RED, GREEN, BLUE, PIN, ▙	

STEP 23. BOTTOM RIGHT HORIZONTAL KEYSTONE:	
Use the [⇐] or [⇒] arrow keys and adjust until the right outermost vertical line is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, KEY, ▙ — OPTIONAL: RED, GREEN, BLUE, KEY, ▙	

STEP 24. BOTTOM RIGHT HORIZONTAL PINCUSHION[1]:	
Use the [⇐] or [⇒] arrow keys and adjust until the right outermost vertical line is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, PIN, ▙ — OPTIONAL: RED, GREEN, BLUE, PIN, ▙	

[1]Repeat Steps 21 through 24 to optimize the registration in the lower right corner of the projected image.

STEP 25. TOP LEFT VERTICAL KEYSTONE:	
Use the [⇑] or [⇓] arrow keys and adjust until the top horizontal line in the upper left quadrant is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, KEY, ▙ — OPTIONAL: RED, GREEN, BLUE, KEY, ▙	

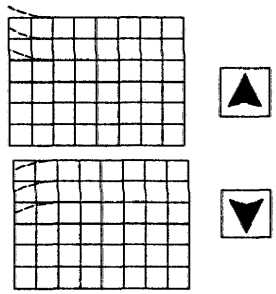
8.4.2.1 . . . . . RED, GREEN* AND BLUE IMAGE ADJUSTMENTS:(CONTINUED)

STEP 26. TOP LEFT VERTICAL PINCUSHION:

Use the [⇑] or [⇓] arrow keys and adjust until the top horizontal line in the upper left quadrant is straight and overlays the reference color.

REMOTE CONTROL KEYSTROKES:

STANDARD	OPTIONAL
RED BLUE PIN	RED GREEN BLUE PIN

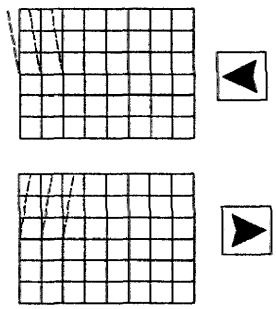


STEP 27. TOP LEFT HORIZONTAL KEYSTONE:

Use the [⇐] or [⇒] arrow keys and adjust until the left outermost vertical line in the upper left quadrant is straight and overlays the reference color.

REMOTE CONTROL KEYSTROKES:

STANDARD	OPTIONAL
RED BLUE KEY	RED GREEN BLUE KEY

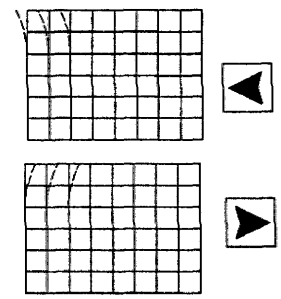


STEP 28. TOP LEFT HORIZONTAL PINCUSHION[1]:

Use the [⇐] or [⇒] arrow keys and adjust until the outermost vertical line in the upper left quadrant is straight and overlays the reference color.

REMOTE CONTROL KEYSTROKES:

STANDARD	OPTIONAL
RED BLUE PIN	RED GREEN BLUE PIN



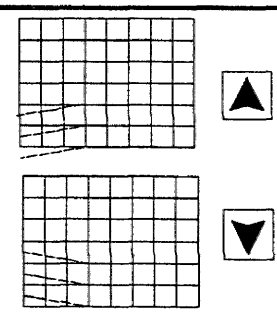
[1]Repeat Steps 25 through 28 to optimize the registration in the upper left corner of the projected image.

STEP 29. BOTTOM LEFT VERTICAL KEYSTONE.

Use the [⇑] or [⇓] arrow keys and adjust until the bottom horizontal line in the lower left quadrant is straight and overlays the reference color.

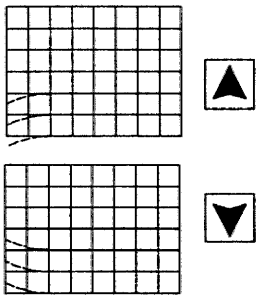
REMOTE CONTROL KEYSTROKES:

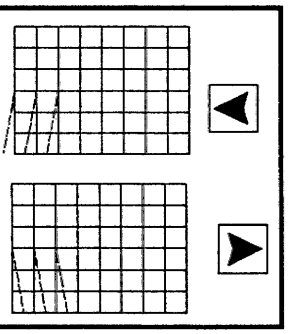
STANDARD	OPTIONAL
RED BLUE KEY	RED GREEN BLUE KEY



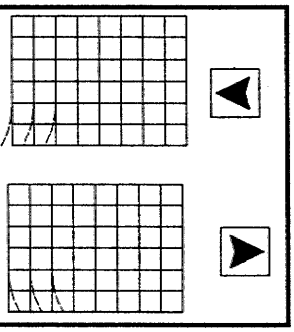
8

8.4.2.1 . . . . .RED, GREEN* AND BLUE IMAGE ADJUSTMENTS:(CONTINUED)

STEP 30. BOTTOM LEFT VERTICAL PINCUSHION:	
Use the [⇑] or [⇓] arrow keys and adjust until the bottom horizontal line in the lower left quadrant is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, PIN, [ ] — OPTIONAL: RED, GREEN, BLUE, PIN, [ ]	

STEP 31. BOTTOM LEFT HORIZONTAL KEYSTONE:	
Use the [⇐] or [⇒] arrow keys and adjust until the outermost vertical line in the lower left quadrant is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, KEY, [ ] — OPTIONAL: RED, GREEN, BLUE, KEY, [ ]	

8

STEP 32. BOTTOM LEFT HORIZONTAL PINCUSHION[1]:	
Use the [⇐] or [⇒] arrow keys and adjust until the outermost vertical line in the lower left quadrant is straight and overlays the reference color.	
REMOTE CONTROL KEYSTROKES:	
STANDARD: RED, BLUE, PIN, [ ] — OPTIONAL: RED, GREEN, BLUE, PIN, [ ]	

[1] Repeat Steps 29 through 32 to optimize the registration in the lower left corner of the projected image.

¤ NOTE: Upon completion of adjusting your new channel, enter 24 CODE to validate and write-protect your channel. Continue with procedure to align all your channels.

Chapter 9

RS - 232 INTERFACE DATA

9.1 .....GENERAL:

The ESPRIT 2000 Series, which includes the 1500Digital, 2000D and the 2000G Model Display Systems, features duplex RS-232 communication network capability. The projectors can be controlled from a remote, a computer or a third party controller 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 9-1 for network configuration example.

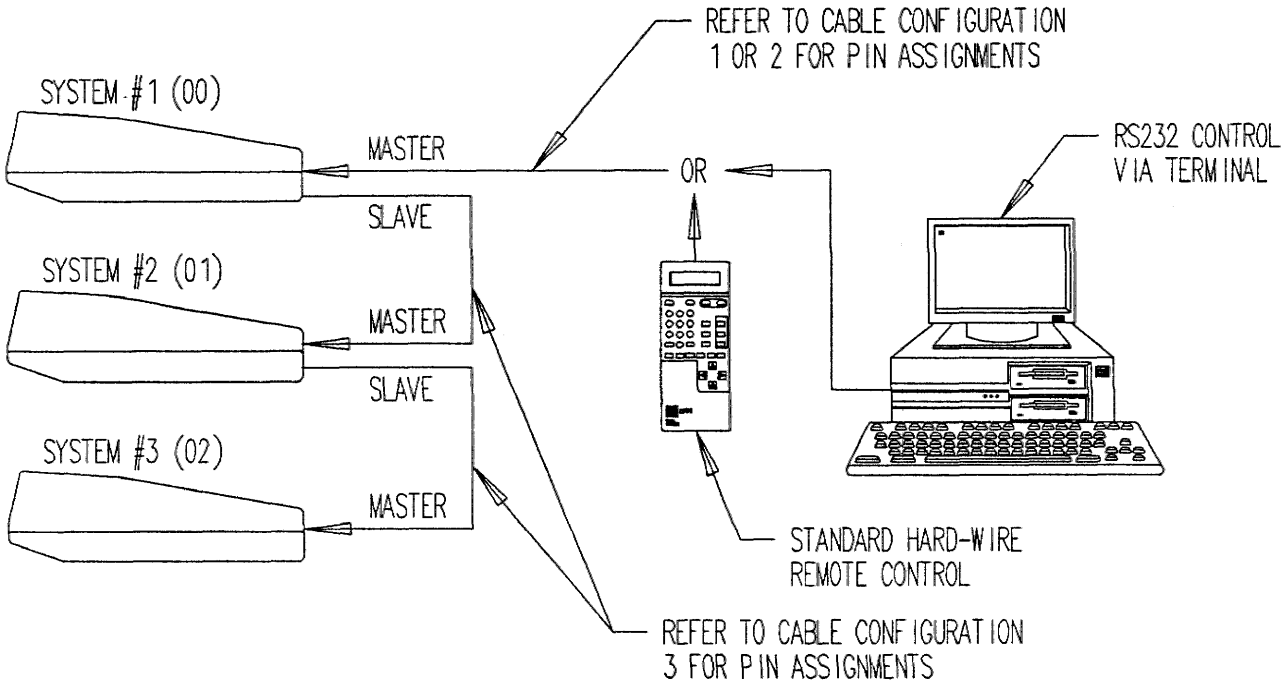


FIGURE 9-1. Multiple system control configuration.

9.2 .....HEXADECIMAL SWITCH CONFIGURATIONS:

The system has three hexadecimal rotary switches located on the CPU module. These switches are used to establish the operating baud rate and individual system address. Please refer to Supplement 3 of this manual for the exact location and instructions on setting the systems' address and baud rate.

9.2.1 .....REMOTE CONTROL BAUD RATE REFERENCE TABLE:

The baud rate of the standard hard-wired remote control may be set to match that of operating baud rates of external RS232 terminals. To change the baud rate of the remote control, please refer to Supplement 3.

9.2.2 . . . . 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 9-2 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.

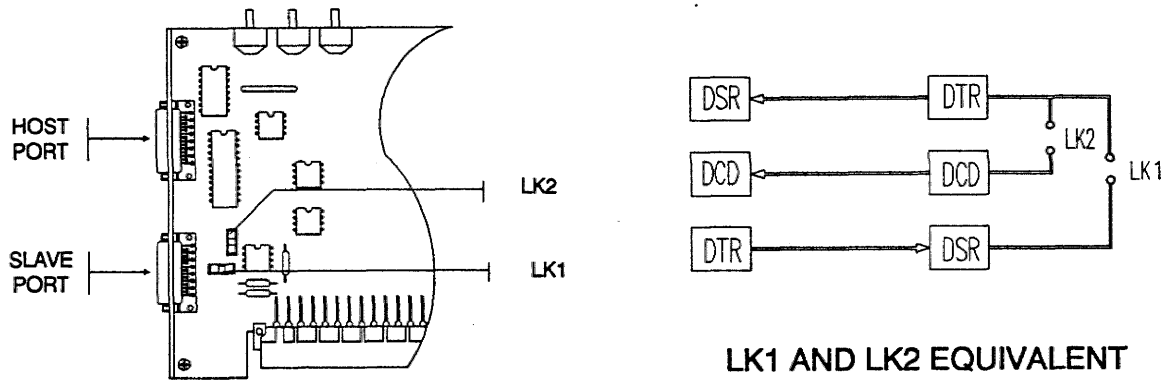


FIGURE 9-2.

JUMPERS LK1 AND LK2 LOCATION (CPU MODULE)

9

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

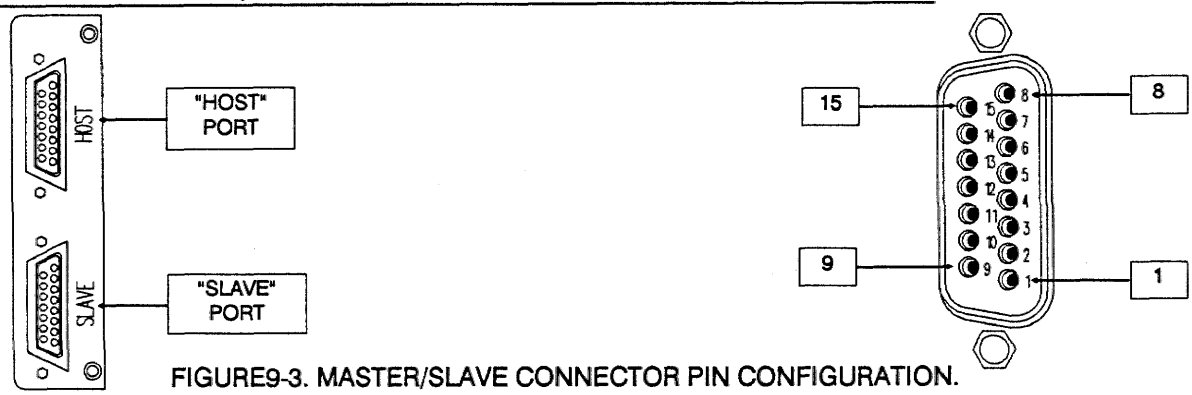


FIGURE9-3. MASTER/SLAVE CONNECTOR PIN CONFIGURATION.

PIN	HOST	SLAVE	PIN	HOST	SLAVE
1	GND	GND	9	N/C	N/C
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 9-1

9.3.1 . . . . CABLE CONFIGURATION 1: HOST TO PROJECTOR:

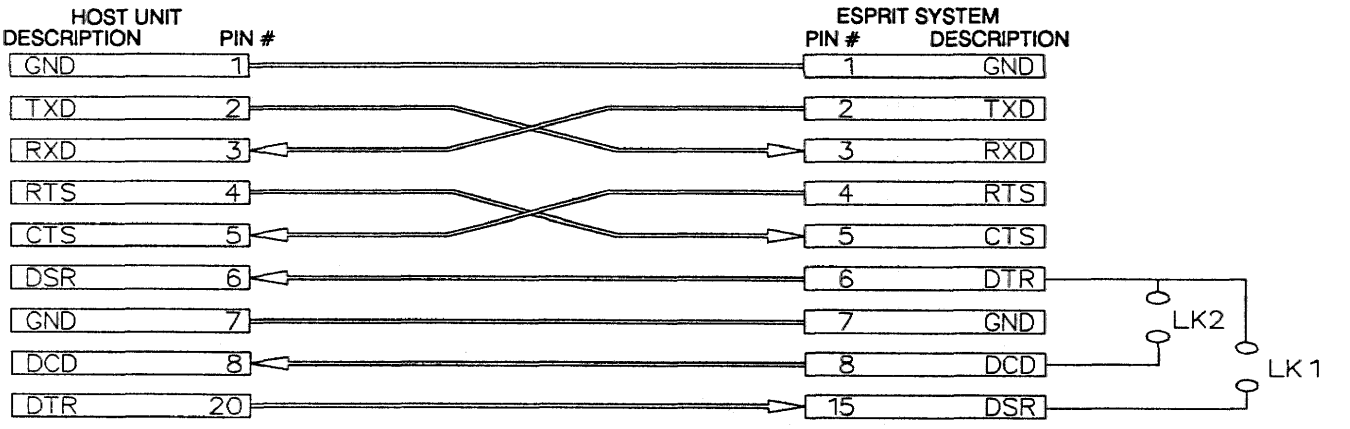


TABLE 9-1. DB25 (HOST) TO DB15 (PROJECTOR) CABLE.

9.3.2 . . . . . .CABLE CONFIGURATION 2: IBM® PC TO PROJECTOR:

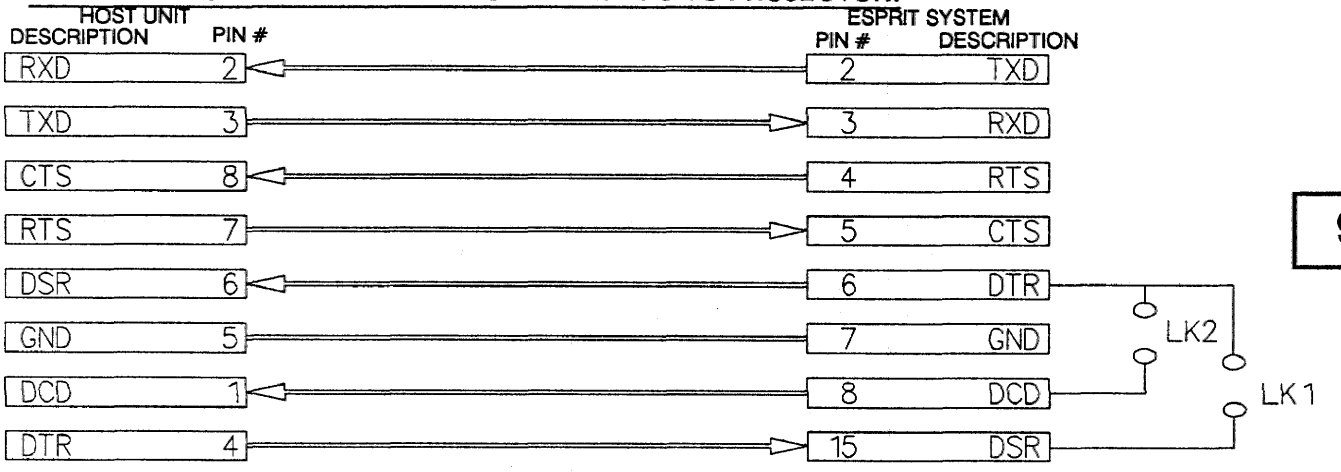


TABLE 9-3. DB9 (HOST) TO DB15 (PROJECTOR) CABLE.

9.3.3 . . . . . .CABLE CONFIGURATION 3: PROJECTOR TO PROJECTOR

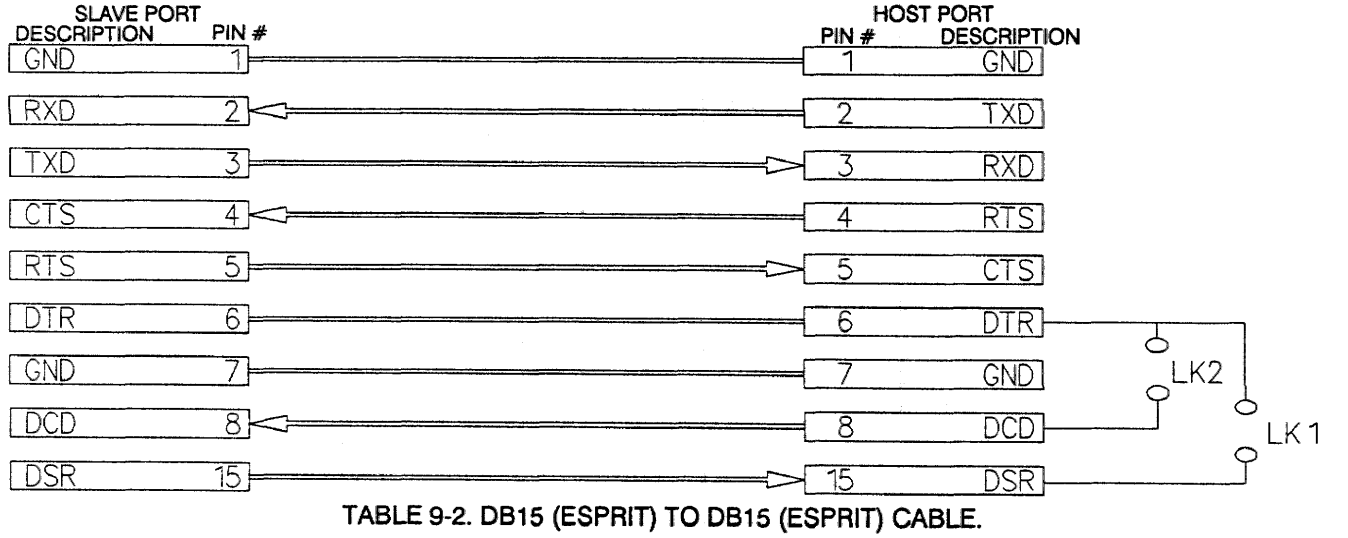


TABLE 9-2. DB15 (ESPRIT) TO DB15 (ESPRIT) CABLE.

¤ NOTE: TABLE 9-2 DOES NOT SHOW PINS11 AND 12 POWER CONNECTIONS. USE A ONE-TO-ONE PIN CONFIGURATION WHEN CONNECTING FROM PROJECTOR TO PROJECTOR.

9.4 . . . . . RS-232 OPERATION:

9.4.1 . . . . . .PROTOCOL:

The ESPRIT 2000 Series utilizes the standard RS-232 communication format; 8 Data Bits, No Parity, 1 Stop Bit

9.4.2 . . . . . MODE SELECTION COMMANDS:

COMMAND	FUNCTION	COMMAND	FUNCTION
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		

9.4.3 . . . . . ADJUSTMENT MODE COMMANDS:

COMMAND	FUNCTION	COMMAND	FUNCTION
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

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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% .

9.4.4 . . . . . .TOGGLE COMMANDS:

COMMAND	FUNCTION
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."
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."

9.4.4 . . . . . TOGGLE COMMANDS: (continued)

COMMAND	FUNCTION
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.

9.4.5 . . . . . .NUMERIC COMMANDS:

COMMAND	FUNCTION
!	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 the ROM revision, transmit **35#**.
=	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.

9.4.6 . . . . . .NETWORK COMMANDS:

COMMAND	FUNCTION
:	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.

9.4.7 . . . . . .EXPLICIT COMMANDS:

COMMAND	FUNCTION
(	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 [.

9.4.8 . . . . . .REGISTRATION COMMANDS:

The registration commands listed in RS-232 Command table, page 9-6, 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.

9.4.9 . . . MISCELLANEOUS COMMANDS:

COMMAND	FUNCTION
L	Display 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 (LINEFEED). This character emulates the CLEAR key on the remote control. Refer to Chapter 7, section 7.2.18, page 7-12 for additional information on the use of the clear command.

9.5 . . . . . .RS-232 COMMANDS TABLE :

ASCII	COMMAND	REMOTE KEY	ASCII	COMMAND	REMOTE KEY
A	RGB MODE	[RGB]	i	BOW	[BOW]
B	BRIGHTNESS	[BRITE]	j	KEYSTONE	[KEY]
C	COLOR	[COLOR]	k	PINCUSHION	[PIN]
D	DETAIL	[DETAIL]	l	SIZE	[SIZE]
E	PHASE	[PHASE]	m	EDGE LINEARITY	[EDGELIN]
F	RED SHIFT	[RED] [SHIFT]	n	LINEARITY	[LIN]
G	BLUE SHIFT	[BLUE] [SHIFT]	o	BLANKING	[BLANK]
H	TINT	[TINT]	p	TOP EDGE	
I	BLUE STATIC VERTICAL SHIFT	40 [CODE]	q	BOTTOM EDGE	
J	RED STATIC VERTICAL SHIFT	41 [CODE]	r	LEFT EDGE	
K	REGISTRATION ON/OFF (toggle)	55 [CODE]	s	RIGHT EDGE	
L	DISPLAY ROM REVISION	35 [CODE]	t	TOP LEFT QUADRANT	
M	MONOCHROME MODE (toggle)	49 [CODE]	u	TOP RIGHT QUADRANT	
N	NEXT TEST PATTERN	[STEP]	v	BOTTOM LEFT QUADRANT	
O	POWER ON/OFF (toggle)	[POWER]	w	BOTTOM RIGHT QUADRANT	
P	CONTRAST	[CONT]	x	NOT USED	NOT USED
Q	CHANNEL WRITE-PROTECT (toggle)	20 [CODE]	y	NOT USED	NOT USED
R	TEST MODE	[TEST]	z	NOT USED	NOT USED
S	STANDBY (toggle)	[STANDBY]	\n	CLEAR	[CLEAR]
T	VIDEO MODE	[B]	!	CHANNEL	[CHAN]
U	DISPLAY ACTIVE UNIT	[UNIT]	#	CODE	[CODE]
V	TTL/VGA OR RGB2 MODE	[A]	$	HELP	[HELP]
W	NOT USED	NOT USED	(	STANDBY "ON"	N/A
X	RED CUTOFF (toggle)	[CUTOFF] [RED]	)	STANDBY "OFF"	N/A
Y	GREEN CUTOFF (toggle)	[CUTOFF] [GREEN]	+	UP ARROW	
Z	BLUE CUTOFF (toggle)	[CUTOFF] [BLUE]	-	DOWN ARROW	
a	STATIC	[STATIC]	<	LEFT ARROW	
b	DYNAMIC	[DYN]	>	RIGHT ARROW	
c	CUTOFF	[CUTOFF]	:	GLOBAL LISTEN	256 [UNIT]
d	RED	[RED]	;	GLOBAL UN-LISTEN	[UNIT]
e	GREEN	[GREEN]	=	UNIT	[UNIT]
f	BLUE	[BLUE]	?	DISPLAY DIAGNOSTIC (toggle)	30 [CODE]
g	SHIFT	[SHIFT]	[	POWER "ON"	N/A
h	SKEW	[SKEW]	]	POWER "OFF"	N/A

Chapter 10

PREVENTATIVE MAINTENANCE AND SYSTEM TROUBLE SHOOTING

10.1 .....PREVENTATIVE 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 all three fan locations, 2 each bottom fans and 1 each rear panel fan. Refer to section 10.2 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 10.3 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.

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10.1.1 ..... PRECAUTIONS:

- 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.

10.2 . . . . 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, biweekly, monthly, etc. To remove and clean the filter media, follow the steps listed below.

- STEP 1. Remove the filter retainer by pulling the sides with the catch apart, then remove the filter media from between the retainer and the guard. Refer to Figure 10-1.
- STEP 2. Clean the filter media by shaking or blowing or washing. If washed, ensure the filter media is completely dry prior to reinserting.
- STEP 3. Repeat steps 1 through 3 for each filter.
- STEP 4. Place the filter media between the filter guard and the retainer. Push the retainer until the catches lock in place.

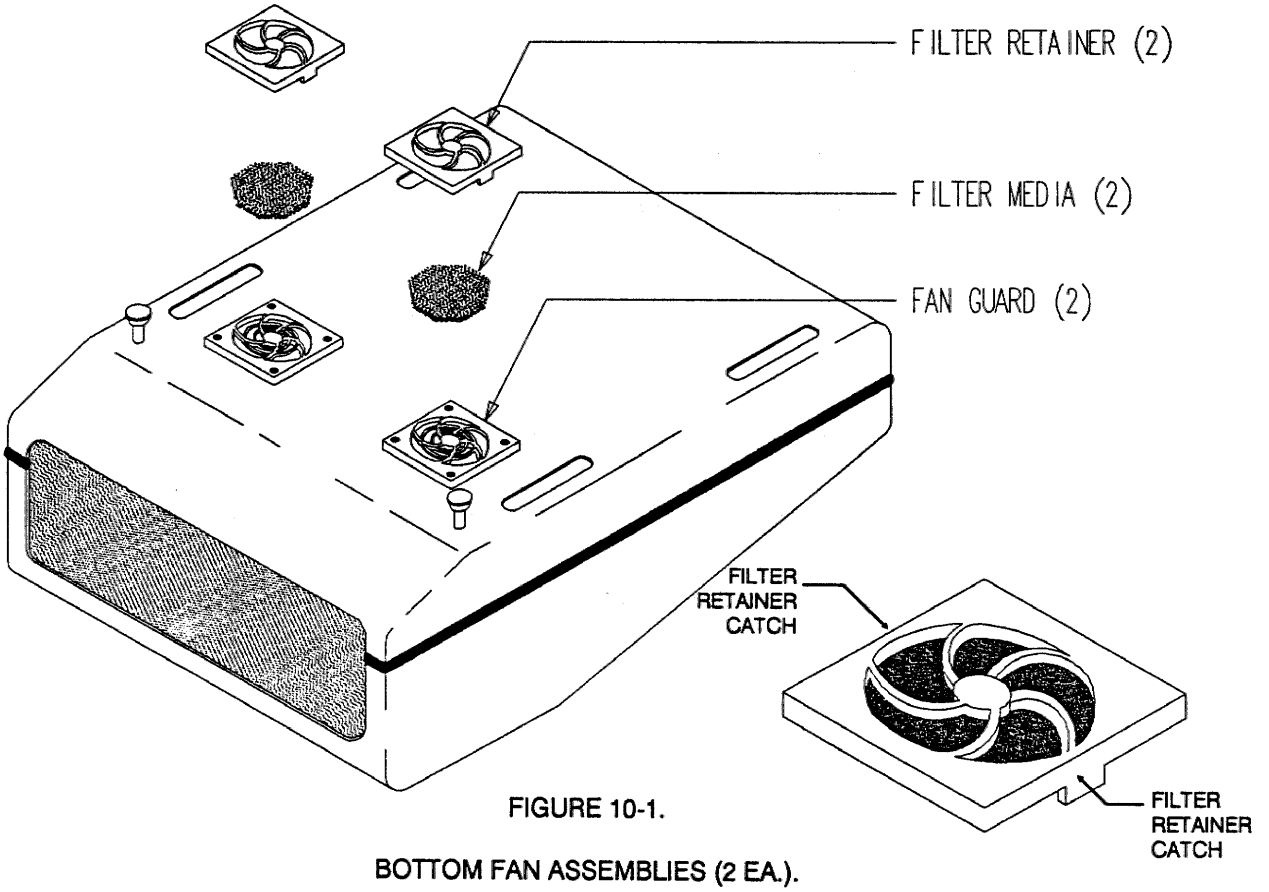

FIGURE 10-1.

BOTTOM FAN ASSEMBLIES (2 EA.).

10.2.1 . . . REAR PANEL FILTER REMOVAL:

Like the two bottom fans, the filter for the rear panel fan is reusable and is provided to maintain a clean environment within the system. To remove and clean the filter media, follow the steps listed below.

- STEP 1. Remove the filter retainer by gently pulling it out of the filter housing.
- STEP 2. Remove the filter media from between the retainer and guard.
- STEP 3. Clean the filter media by shaking, or washing. If washed, ensure the filter media is completely dry prior to reinserting the filter media.

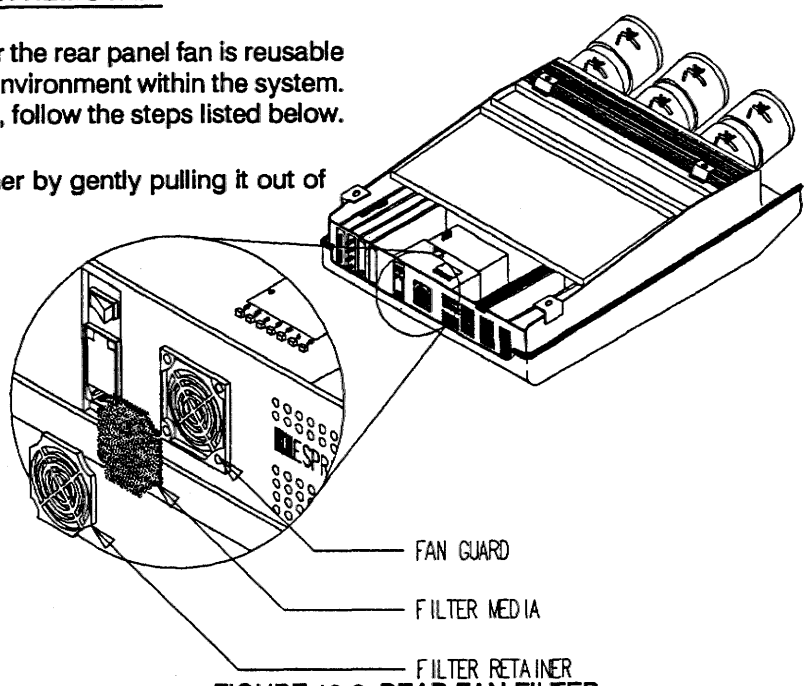

FIGURE 10-2. REAR FAN FILTER.

10.3 . . . . . .LENS CARE AND CLEANING:

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When your Data/Graphics Display System is not being used for prolong 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.

10.3.1 . . . . .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.

10.4 . . . . . TROUBLE SHOOTING:

SYMPTOM	POSSIBLE CAUSE	SOLUTION
The unit is connected to an active AC outlet, the rocker switch is in the "on" position, but there is no LCD read-out.	Faulty line cord	Replace line cord
	Open main fuse	Check and replace fuse
	Wrong voltage selected	Check and/or select proper voltage and main fuse.
	Hard-wired remote control not connected.	Connect remote control to "HOST" port.
	Faulty Remote control or cable.	If available, try another remote control/cable.
No LCD read-out on remote control, but LCD back light functions properly.	Units' address switches are not set properly.	Refer to Supplement 3 for switch(es) configurations.
	Baud Rate switch not properly set.	Refer to Supplement 3 for switch configuration.
The LCD indicates the model number, but the system does not turn on when the [POWER] button is depressed.	Remote control may be faulty.	If available, try another remote control.
	If an extended cable is being used.	Remove the extension cable from the system.
The projector is "on", no error messages are displayed,but no image is being display.	Lens covers are still installed.	Remove lens covers
	Unit is is the standby mode.	Depress the standby key.
	Wrong mode of operation is selected.	Select the proper mode of operation.
	Source is not turned on.	Enable source.
	Contrast and/or brightness levels are set too low.	Increase the contrast and brightness levels.
	Blanking is not set properly.	Enable blanking and adjust the top,bottom,left and right blanking.

TABLE 10-1

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10.5 . . . . 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 10.5.1, tables 10-2A, 10-2B and 10-2C 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 1500Digital, or "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 10.5.2 for additional operational status error messages.

10.5.1 . . . . . .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.	Enter numeric code within range. Refer to Chapter 7, section 7.2.17.
BAD TTL MODE	TTL mode of operation outside of range entered .	Enter proper mode of operation. Refer to Chapter 7, section 7.2.15.
BAD VIDEO MODE	Video mode of operation outside of range entered.	Refer to Chapter 7,section 7.2.16 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.

TABLE 10-2A

10.5.1 . . . . . MODE STATUS ERROR MESSAGES:

ERROR MESSAGE	POSSIBLE CAUSE	SOLUTION
ERROR # AT # (I^2C ERROR)	Communication failure between internal modules.	Contact a service technician
ERROR CODE 1000	Incompatiblility between internal modules has occurred.	Call factory
ERROR CODE 1001	Incompatiblility between internal modules has occurred.	Call factory
ERROR CODE 1002	Incompatiblility between internal modules has occurred.	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 has occurred.	Contact a service technician.
INVALID	Unrecognized command.	Retry command.
INVALID CHANNEL	Channel number outside of range (1-50) entered.	Enter channel number within given range.
INVALID TEST	Test number outside of range entered.	Refer to Chapter 7, section 7.2.12.
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 between 0-100.
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 7.2.5-10.
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 7.2.5-10.
NETWORK DISABLED	Unit number other than 1 has been entered, with the network capability disabled.	Refer to Supplement 3.
NOT INSTALLED	Optional mode selected with no optional module installed.	Refer to Chapter 1, section 1.1.1 or 1.1.6
OPEN INTERLOCK	Missing or loose module/connector.	Verify or re-seat all modules / connectors.

TABLE 10-2B

10.5.1 . . . MODE STATUS ERROR MESSAGES: (continued)

ERROR MESSAGE	POSSIBLE CAUSE	SOLUTION
OVER FREQUENCY	Source selected outside of specified frequency range.	Refer Chapter 1, Table 1-1.
RED OR BLUE ONLY	Wrong area of adjustment selected for desired color.	Refer to Chapter 7, the desired function.
RIGHT OR LEFT ONLY	Wrong area of adjustment selected for desired function.	Refer to Chapter 7, the desired function.
SELECT QUADRANT	Wrong area of adjustment selected for desired function.	Refer to Chapter 7, the desired function.
WRITE PROTECTED	Attempts to adjust predetermined parameters are being made to a channel location.	Refer to chapter 7 , Section 7.2.17.
WRONG DIRECTION	Wrong adjustment arrow selected for desired function	Refer to Chapter 7 , desired function.

TABLE 10-2C

10.5.2 . . . . . OPERATIONAL STATUS ERROR MESSAGES:

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

OPERATIONAL ERROR MESSAGES		
HIGH OR LOW VOLTAGE ERROR MESSAGES		
-9	+9	-20
+20	-25	+25
+40	+190	GRID 2
HIGH VOLTAGE		

WAVE FORM ERROR MESSAGES	
"NO H SYNC" (NO HORIZONTAL SYNC)	"NO H RESET" (NO HORIZONTAL RESET PULSE)
"NO V SYNC" (NO VERTICAL SYNC)	"NO V RESET" (NO VERTICAL RESET PULSE)
"H SWEEP FAIL" (HORIZONTAL SWEEP FAIL)	"G1 FAIL LOW" (GRID 1 VOLTAGE LOW)
"V SWEEP FAIL" (VERTICAL SWEEP FAIL"	NO INPUT (CHECK SOURCE)

10

10.6 . . . . . 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:

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Appendix A

INTENSITY MODULATION

Intensity modulation provides the ability to increase or decrease the contrast/color level over the entire or portions of the projected image presenting an "even field" of white from the center to the edges of the image. Intensity modulation is useful to overcome possible shading of the image, when using curve, high gain screens causing "hot spots" and overlaying of multiple projected images.

Intensity modulation allows the contrast and color balance of the top, bottom, left, right and all four corners of the projected image to be adjusted individually. The center of the image serves as a reference point for the surrounding zones and can only be adjusted with the master contrast control. As with the other adjustments on the ESPRIT systems, intensity modulation is designated within a channel location. Each channel may have unique intensity modulation settings. Use the following procedure to perform intensity modulation adjustments for the active channel.

☐ NOTE: The following procedure makes the assumption that the system has been completely and correctly installed , aligned and an acceptable grayscale has been achieved.

☐ PATTERN REQUIRED: White field at the desired frequency.

☐ TEST EQUIPMENT: Light meter /photometer i.e., Tektronix® J16 photometer , Photo Research® PR650 SpectraColorimeter™ or equivalent.

A1.0 . . . . . .PROCEDURE:

- STEP 1. Divide the white field pattern into 9 zones. Refer to Figure B-1. Note the area selection keys and the affected zone.
- STEP 2. Select desired mode of operation with a white field input.
- STEP 3. Using the remote control set brightness to 75% and contrast to 65%

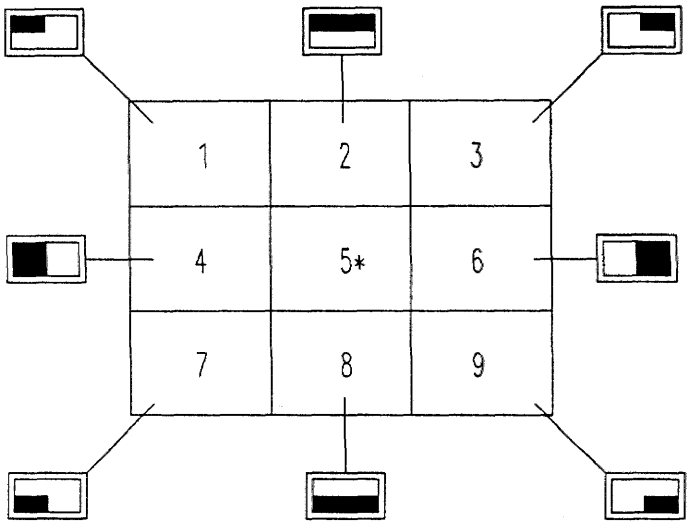


FIGURE A-1.

*** ZONE 5 (CENTER OF IMAGE) SERVES AS A REFERENCE POINT FOR THE SURROUNDING ZONES AND CAN ONLY BE ADJUSTED BY THE MASTER CONTRAST CONTROL.**

A1.0 . . . . . PROCEDURE: (continued)

- STEP 4. Turn the Red and Blue CRTs "OFF".
- STEP 5. GREEN ONLY! Measure and record the readings of each zone indicated in Figure B-1.
- STEP 6. Set zone 5 (Figure B-1) to the lowest reading (recorded above), with the **[CONT]**button.
- STEP 7. Enter 92 **[CODE]** , to enable intensity modulation operation.
- STEP 8. Select **[GREEN]**, *then select an EDGE and use the [⇑] and [⇓] down arrow keys to adjust* zone 2, 4, 6, and 8 light levels to equal the light level of zone 5.
- STEP 9. Once the edges have been set, select and adjust the QUADRANTS for zones 1, 3 , 7 and 9 to equal that of zone 5 as in Step 8.
- STEP 10. RED ONLY then BLUE ONLY . Measure the light level of zone 5 of the red and set all other zones of the red image to equal zone 5. Repeat the process for the blue image.

¤ Start your adjustments with the edge controls for zones 2, 4, 6 and 8, as the settings of these edges will *affect the light level of the quadrants (corners), i.e., the setting of zone 2 will affect the levels of zone 1 and* zone 3 and always finish your adjustments with the quadrant controls for zones 1, 3, 7, and 9.

A1.1 . . . . . .NOTES:

- Enter 92 **[CODE]** to enable intensity modulation adjustment for the active channel. If any other adjustment other than Master brightness and contrast is made , 92 **[CODE]** will have to be re-entered.
- Pressing the **[GREEN]** (MASTER) button will select simultaneous adjustment of RED, GREEN and BLUE intensity. Press the **[RED]** or **[BLUE]** button to select individual adjustment of the RED or BLUE intensity.

A

- Use the edge and quadrant keys to select the desired side or corner of the projected image to be adjusted. Always start your adjustments with the edge controls and finish with the quadrant controls.
- Use the Up or Down arrow key to increase or decrease the level of the selected intensity modulation adjustment.
- Enter 93 **[CODE]** to null the process or reset (set to 50%)the settings for the intensity modulation.
- Use the following template to record your readings.

R= G= B=	R= G= B=	R= G= B=
R= G= B=	R= G= B=	R= G= B=
R= G= B=	R= G= B=	R= G= B=

Appendix B

INFRARED REMOTE CONTROL SYSTEMS

B1.0 .....FEATURES:

B1.1 ..... TECHNICIAN INFRARED REMOTE KIT (69092):

The ESPRIT Technician Infrared Remote Transmitter (P/N 69092) is a small, push-button unit powered with a 9 volt battery supply. The transmitter can be utilized at distances within fifty feet (15.2 m) by simply pointing the unit at the infrared receiver and depressing the desired function key. Included with the Technician IR Transmitter, is the IR Receiver, and a "Y" adapter, which permits interfacing the Infrared Receiver with the display system and the standard hard-wired remote control. Some of the functions include the image quality adjustments, store/recall of channels, control one or multiple units and, by pressing the HELP key, enable the Guided Setup mode of operation, see Figure B-8, page B-6.

B1.1.1 ....EXECUTIVE INFRARED REMOTE KIT (69124):

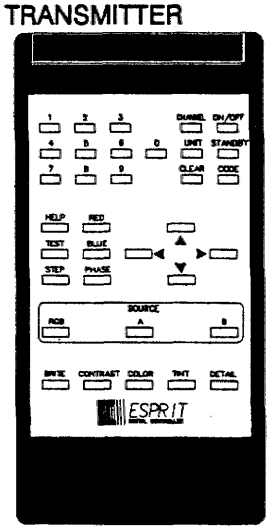
The ESPRIT Executive Infrared Remote kit (P/N 69124) transmitter can be used up to 50ft. (15.2m) and has available the following controls; On/Off, Standby and 8 channel selections. Refer to Figure B-9 for the name, location and a brief description of the controls on this remote transmitter. Included with the Executive IR Transmitter, is the IR Receiver, and a "Y" adapter, which permits interfacing the Infrared Receiver with the display system and the standard hard- wired remote control.

B1.2 .....INFRARED RECEIVER:

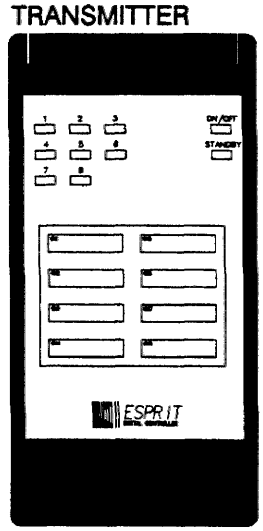
The ESPRIT Infrared Receiver (P/N 80703) is a compact and portable unit with a contemporary and decorative case design. The receiver may be used with various optional lengths of up to 100 ft. (30.4 m) of 12 conductor-shielded cable with a PVC jacket. Power to the receiver is supplied from the projection system via a 15 pin "DB" connector with thumb screw fasteners. The IR Receiver is included with either the Technician or Executive IR Remote kits.

B

TECHNICIAN IR TRANSMITTER



EXECUTIVE IR TRANSMITTER



IR RECEIVER AND "Y" ADAPTER, INCLUDED WHEN ORDERING EITHER THE TECHNICIAN OR EXECUTIVE IR KITS.

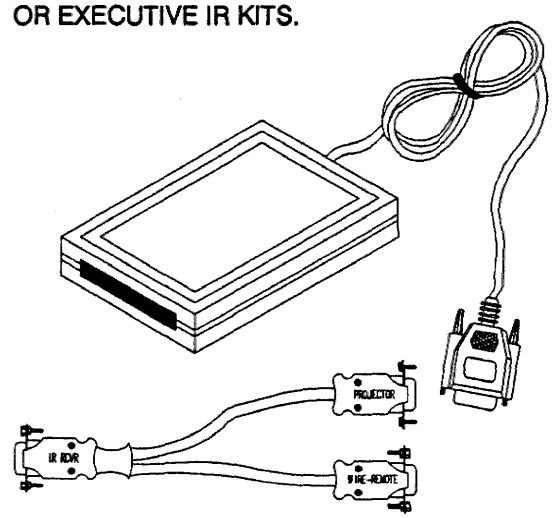


FIGURE B-1.

B2. . . . . RECEIVER INSTALLATION:

B2.1 . . . . . INSTALLATION PARAMETERS:

For direct control of one or more display systems and/or switchers simply plug the standard 6ft. (1.8m) cable into the "MASTER" port of the master system being controlled. For proper receiver installation/mounting configurations and other options refer to section B2.2.

When using the Infrared Remote Transmitter/Receiver, ensure you are within the effective operating area. The remote control unit will not function properly if strong light strikes the sensor window or if there are obstacles between the remote control transmitter and receiver. Refer to Figure B-2.

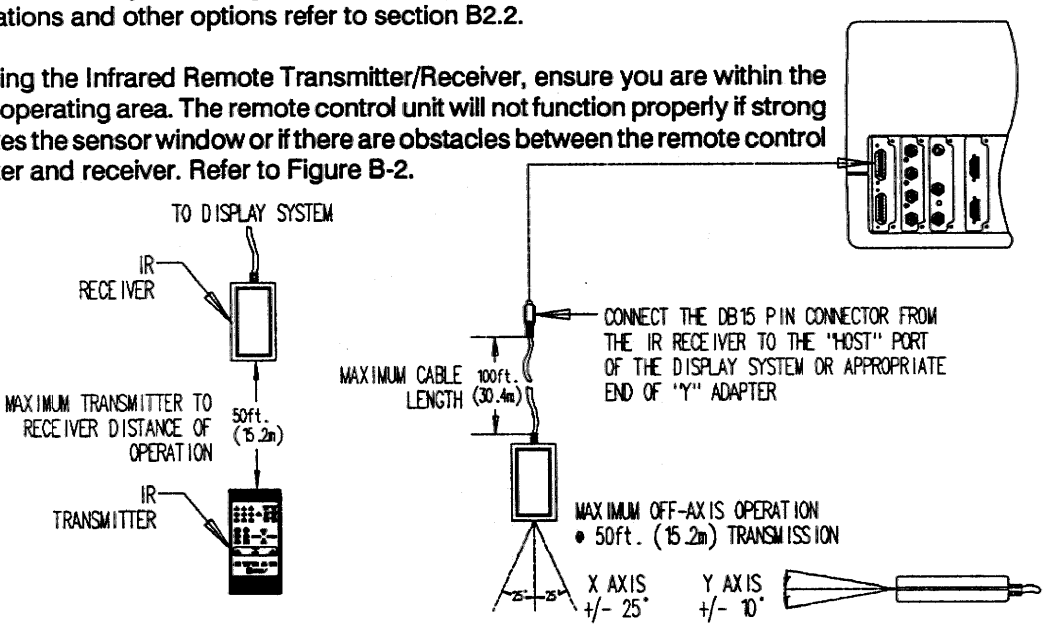


FIGURE B-2.

B2.2 . . . . . .IR RECEIVER OPTIONAL INSTALLATION / MOUNTING EXAMPLES:

The IR Receiver may be installed in various ways. However, one basic consideration that must be followed is that the IR Receiver sensor window be shielded from any external light source in particular, fluorescent lighting, as this type of lighting will interfere with the operation of your system.

B

Remote control of the ESPRIT is achieved by interfacing the remote controls with the display system via a "Y" adaptor supplied with the infrared receiver. Addtional, the optional RS232 switcher may be connected by another "Y" adapter supplied with the switcher. The ESPRIT system/switcher will operate with the standard hard-wired remote control or one of the IR remotes or by the front panel of the switcher. Refer to Figure B-3.

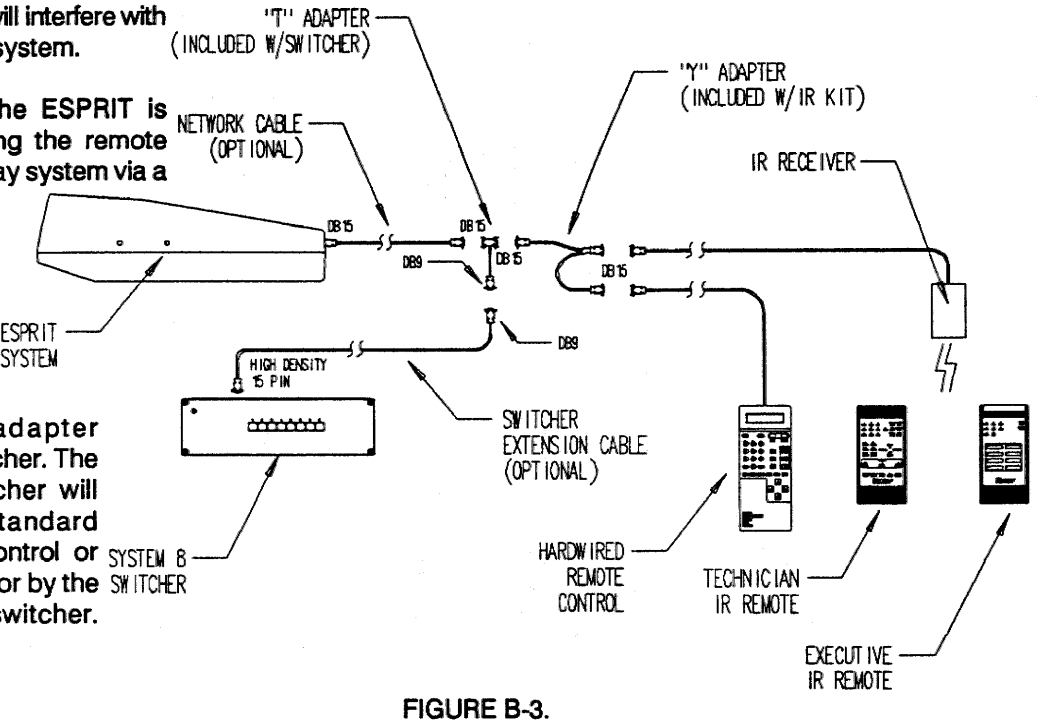


FIGURE B-3.

B2.2.1 . . . . . IR RECEIVER INSTALLATION EXAMPLE 1 (REAR SCREEN):

Figure B-5 illustrates one method of using both the IR receiver and hard-wired remote in a rear screen application with the use of the "Y" adapter and the optional RS232 wall plate.

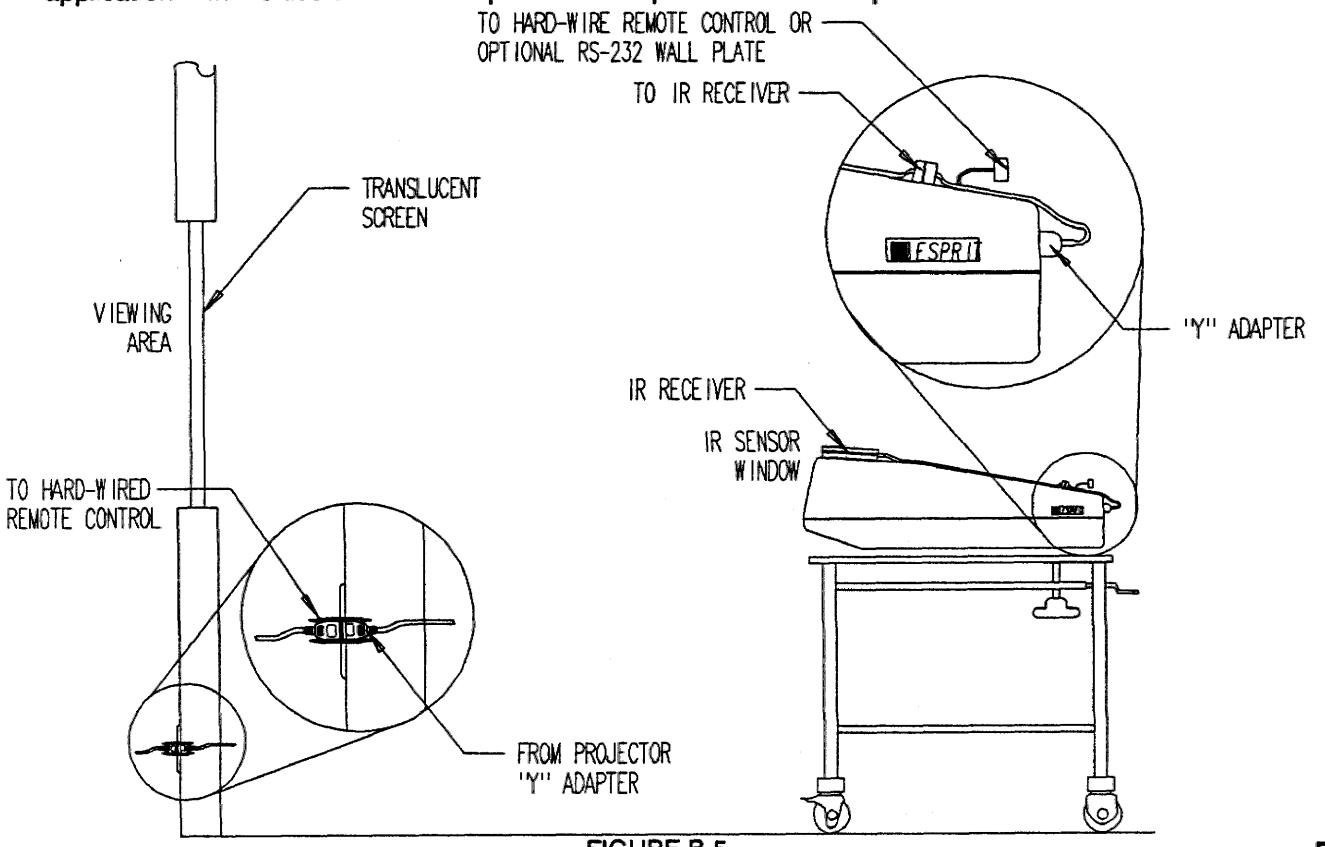


FIGURE B-5.

REAR SCREEN APPLICATION USING THE IR REMOTE, "Y" ADAPTER AND THE OPTIONAL RS232 WALLPLATE.

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B2.2.2 . . . . . .IR RECEIVER "Y" ADAPTER:

To maintain proper operation when using the "Y" adapter, both the IR receiver and the hard-wired remote control must be connected.

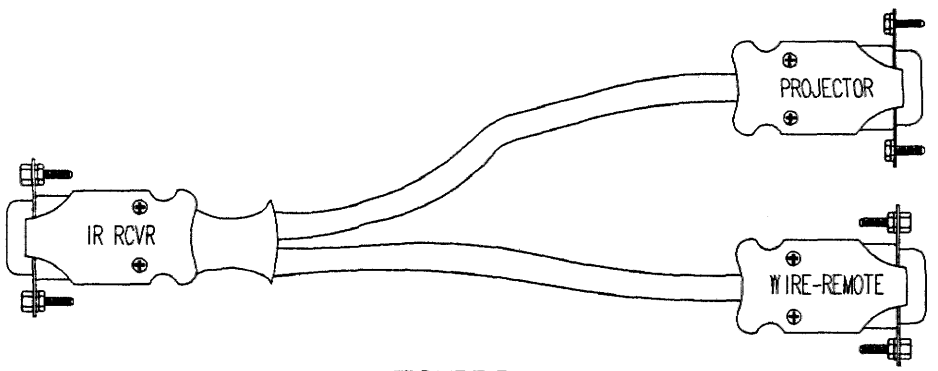

FIGURE B-4.

ESPRIT REMOTE CONTROL "Y" ADAPTER. PROVIDED WITH EITHER THE TECHNICIAN OR EXECUTIVE REMOTE CONTROLS.

B2.2.3 . . . . . OPTIONAL RS232 WALL PLATE:

The optional RS232 flush face wall plate allows the DB-15 connector to be recessed to protect it from damage. The RS232 wall plate is constructed of stainless steel and is used with any standard single gang electrical box. See Figure B-6.

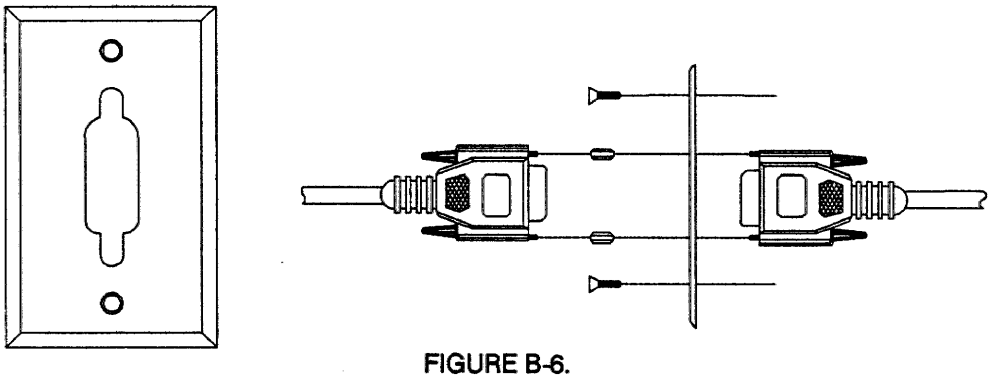

FIGURE B-6.

B3.0 . . . . . .TRANSMITTER BATTERY REPLACEMENT:

As previously mentioned the transmitter operates using a single 9 volt battery. If the range of operation has decreased replace the battery following the procedure listed below. Refer to figure B-7.

- STEP 1. Turn the transmitter over.
- STEP 2. Locate the battery compartment cover and slide this cover to the right.
- STEP 3. Remove the old battery and discard.
- STEP 4. Replace with a new battery: Duracell MN 1604 B or equivalent.
- STEP 5. Replace the battery compartment cover

B

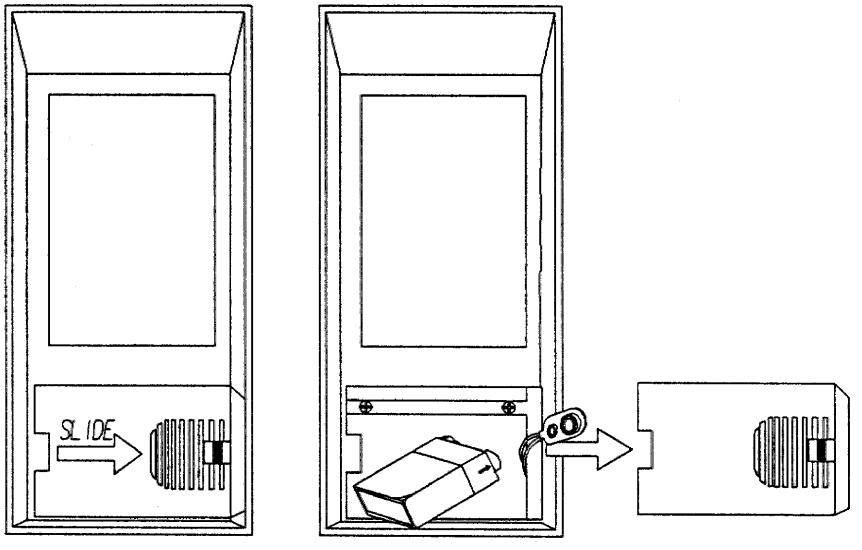

FIGURE B-7. BATTERY LOCATION/REPLACEMENT.

B3.1 . . . . SPECIFICATIONS:

B3.1.1 . . . . . .TECHNICIAN IR REMOTE TRANSMITTER:

RANGE:	50 ft. (15.2m) @ ± 25° off axis (X axis). See Figure 2 20 ft. (6.1m) @ ± 80° off axis (X axis).
RECEIVER CABLE:	6 ft. (1.82m) (standard) 12 conductor-shielded, PVC jacket, 15 pin "DB" connector with thumbscrew fasteners.
POWER:	9 volt battery in transmitter: Duracell MN 1604 B or equivalent.
REMOTE FUNCTION KEYS:	Power On/Off, Standby, Code, Channel, Unit, Clear, Help (Guided Setup), Test, Step, Red, Blue, Phase, RGB, A- Video mode, B- TTL/VGA or Analog RGB2, Brightness, Contrast, Color, Tint, Detail, a numeric keypad and the UP, Down, Left, Right arrow keys.
WEIGHT:	TRANSMITTER: 8oz. RECEIVER: 4oz.
SIZE:	TRANSMITTER: 6.0" (15.2 cm) x 1.3" (3.3cm) x 3.0" (7.6cm) RECEIVER: 4.56" (11.6cm) x 1.06" (2.7cm) x 0.9" (2.3cm)
TECHNICIAN IR TRANSMITTER SPECIFICATIONS	

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B3.1.2 . . . . . .EXECUTIVE IR REMOTE TRANSMITTER:

RANGE:	50 ft. (15.2m) @ ± 25° off axis (X axis). See Figure 2 20 ft. (6.1m) @ ± 80° off axis (X axis).
RECEIVER CABLE:	6 ft. (1.82m) (standard) 12 conductor-shielded, PVC jacket, 15 pin "DB" connector with thumbscrew fasteners.
POWER:	9 volt battery in transmitter: Duracell MN 1604 B or equivalent.
REMOTE FUNCTION KEYS:	Power On/Off, Standby, 8 Channel selections.
WEIGHT:	TRANSMITTER: 8oz. RECEIVER: 4oz.
SIZE:	TRANSMITTER: 6.0" (15.2 cm) x 1.3" (3.3cm) x 3.0" (7.6cm) RECEIVER: 4.56" (11.6cm) x 1.06" (2.7cm) x 0.9" (2.3cm)
EXECUTIVE IR TRANSMITTER SPECIFICATIONS	

B4.0 . . . . TECHNICIAN IR TRANSMITTER KEYPAD SUMMARY:

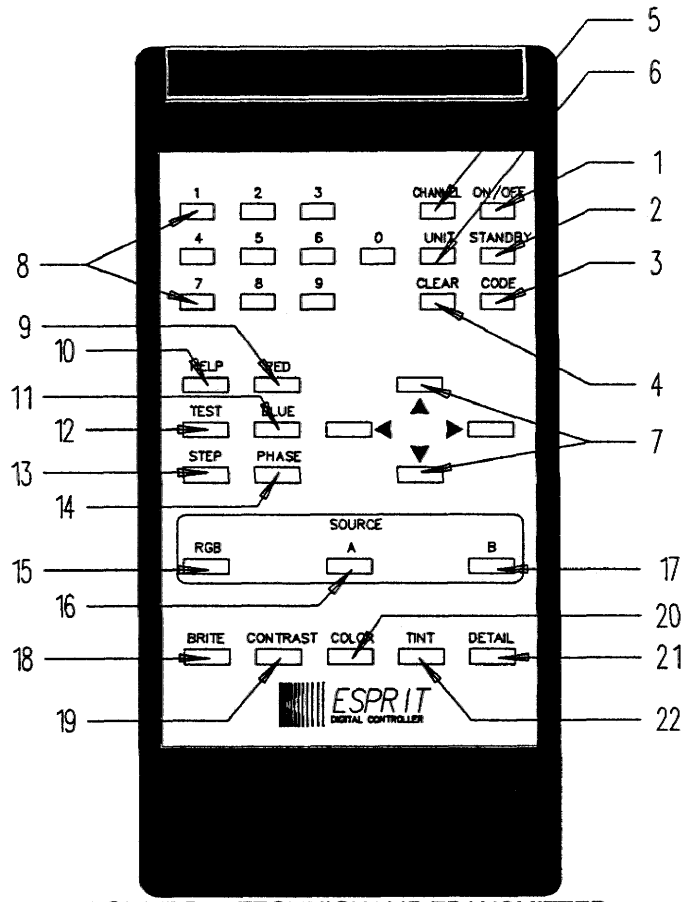

FIGURE B-8. TECHNICIAN IR TRANSMITTER.

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NO.	CONTROL	FUNCTION	NO.	CONTROL	FUNCTION
1	ON/OFF	TOGGLES MAIN POWER	12	TEST	TOGGLES INTO AND OUT OF THE INTERNAL TEST MODE OF OPERATION
2	STANDBY	TOGGLES STANDBY ON/OFF	13	STEP	ADVANCES TEST PATTERNS, USED WHILE IN THE HELP MODE
3	CODE	INPUTS INTERNAL CODE ASSIGNMENTS	14	PHASE	ENABLES PHASE CONTROL FOR HORIZONTAL AND VERTICAL
4	CLEAR	REMOVES AN ENTRY FROM THE ACCUMULATOR	15	RGB	SELECTS RGB1 MODE AND WHILE IN TEST, SELECTS INTERNAL 62.5kHz OPERATION
5	CHANNEL	INPUTS PREVIOUSLY SELECTED CHANNEL NUMBER	16	A	SELECTS EITHER TTL/VGA OR RGB2 MODE OF OPERATION. WHILE IN TEST, SELECTS INTERNAL 31kHz OPERATION
6	UNIT	INPUTS PREVIOUSLY SELECTED UNIT NUMBER OR USED WITH THE GLOBAL COMMAND	17	B	SELECTS QUAD VIDEO MODE. WHILE IN TEST, SELECTS INTERNAL 15kHz TEST MODE OF OPERATION
7	ARROWS	USED TO ADJUST IMAGE QUALITY, SHIFT AND REGISTRATION SETTINGS	18	BRITE	ENABLES BRIGHTNESS FOR ADJUSTMENTS
8	NUMERIC	USED TO INPUT CHANNEL/UNIT NUMBERS AND PERCENTAGE SETTINGS	19	CONTRAST	ENABLES CONTRAST FOR ADJUSTMENTS
9	RED	ENABLES RED SHIFT FUNCTIONS	20	COLOR	ENABLES COLOR FOR ADJUSTMENTS
10	HELP	ENABLES HELP MODE OF OPERATION	21	TINT	ENABLES TINT (HUE) FOR ADJUSTMENTS
11	BLUE	ENABLES BLUE SHIFT FUNCTIONS	22	DETAIL	ENABLES DETAIL (PEAK) FOR ADJUSTMENTS
NOTE: FOR ADDITIONAL INFORMATION ON THE ABOVE FUNCTIONS, PLEASE REFER TO CHAPTER 7.					

B4.1 . . . . . EXECUTIVE IR TRANSMITTER:

The ESPRIT Executive IR Transmitter provides a ease of use for the average user. The Executive IR can be use up to 50ft. (15.2m) and has On/Off, Standby, and 8 channel selection. Please refer to Figure B-10 for the name, location and a brief description of the controls.

NOTE: TO USE THE EXECUTIVE IR TRANSMITTER WITH THE ESPRIT DISPLAY SYSTEM, THE DISPLAY SYSTEM AND/OR OPTIONAL 8 CHANNEL SWITCHER MUST BE PLACED INTO THE EXECUTIVE MODE OF OPERATION USING **37 CODE.**

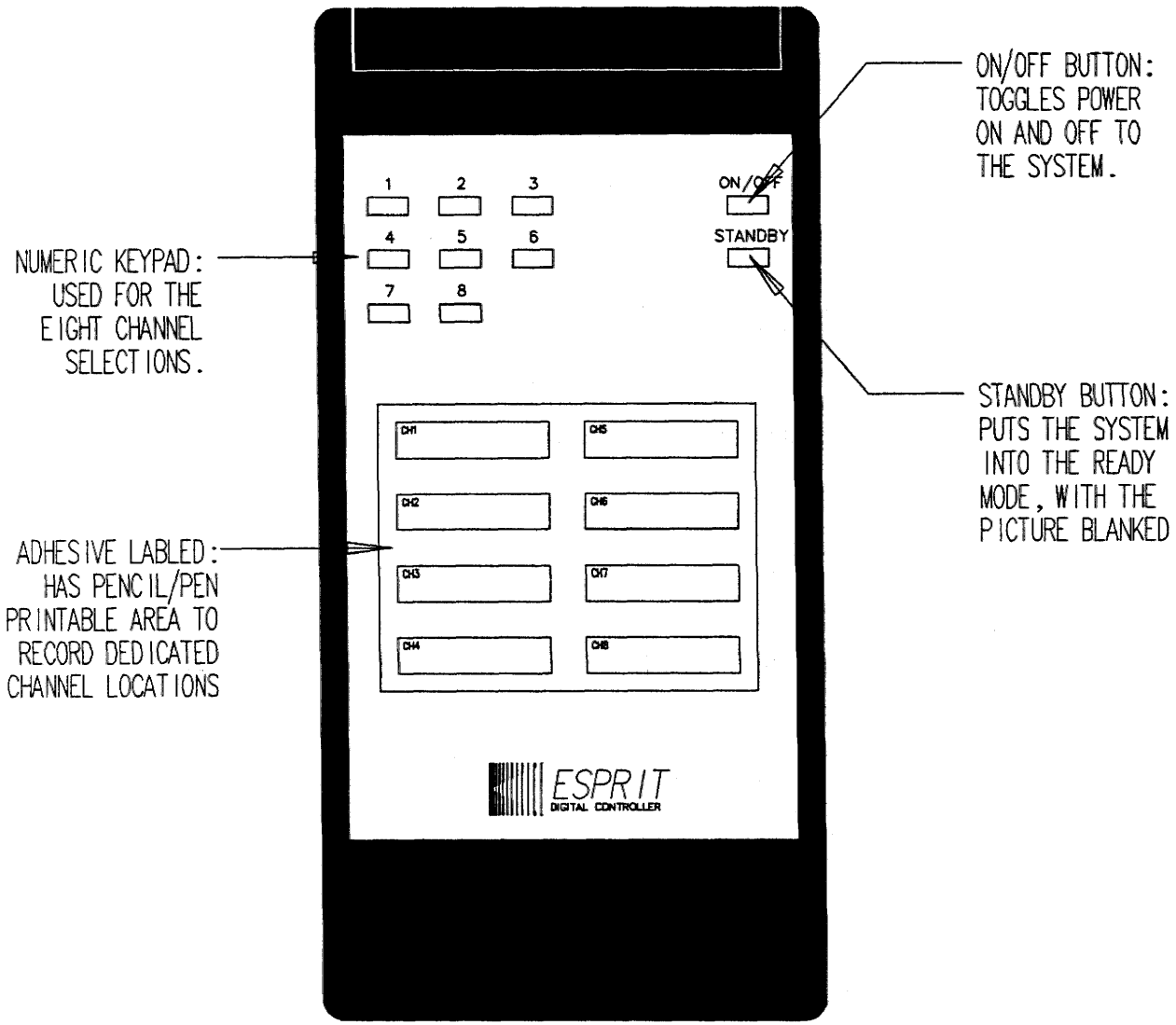


FIGURE B-9. EXECUTIVE IR TRANSMITTER.

B5.0 . . . . . ESPRIT SETUP USING THE TECHNICIAN IR REMOTE:

The function keys incorporated in the Technician IR Remote Control permit the user to perform an alignment of the ESPRIT Display Systems. The setup is performed by entering the HELP mode of operation and utilizing one of the setup programs.

NOTE: Since there will be no LCD read-out to lead you in the alignment process, please refer to your ESPRIT Operation Manual Chapter 8, section 8.4.2 and section 8.4.2.1 for the complete guided setup sequence.

☐ EXAMPLE 1: ENTERING THE COMPLETE GUIDED SETUP.

- 1. After completing your installation of your ESPRIT display system and the remote control system (transmitter/receiver), power the system up.
- 2. Depress the **[HELP]**key.
- 3. At the Main Menu select subject 3, "System Setup Menu".
- 4. At the System Setup Menu select subject 1, "Guided Setup Program".
- 5. At the Guided Setup Program select subject 1 and follow all on-screen instructions.

¤ NOTE: Refer to Chapter 9 for more information on the help mode of operation and the guided setup mode of operation.

B5.1 . . . . . .ACTIVE KEYS WHILE IN THE GUIDED SETUP:

▼
▲ ◄ ► Increase/decrease/move alignment function.

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

STEP Advance to next alignment page.

TEST Revert to previous alignment page.

CODE Exits guided registration program.

B

B5.2 . . . . . .ADDITIONAL COMMANDS (CODES):

When the guided setup (registration) of your system has been completed perform the normal channel assignments (See Chapter 8, page 8-5, section 3-CHANNEL BUTTON) for each individual source. While using the technician infrared remote control there are some functions , SIZING, BLANKING and CRT CUTOFFS that are not directly accessible with keys. To enable you to make these adjustments use the following CODES to perform these desired functions.

SIZE OPERATIONS:

- HORIZONTAL SIZE: 60 **[CODE]**

  To perform the horizontal size enter 60 , then CODE and use the LEFT and RIGHT arrow keys to adjust the image width.

- VERTICAL SIZE: 60 **[CODE]**

  To perform the vertical size enter 60, then CODE and use the UP and DOWN arrow keys to adjust the image height.

B5.2 . . . . . ADDITIONAL COMMANDS (CODES):

BLANKING OPERATIONS:

- TOP BLANKING: (61 CODE)

  To perform the top blanking enter 61, then CODE and use the UP and DOWN arrow keys and adjust the top vertical blanking.

- BOTTOM BLANKING: (62 CODE)

  To perform the bottom blanking enter 62, then CODE and use the UP and DOWN arrow keys to adjust the bottom vertical blanking.

- LEFT BLANKING: (63 CODE)

  To perform the left blanking enter 63, then CODE and use the LEFT and RIGHT arrow keys to adjust the left horizontal blanking.

- RIGHT BLANKING: (64 CODE)

  To perform the right blanking enter 64, then CODE and use the LEFT and RIGHT arrow keys to adjust the right horizontal blanking.

CRT CUTOFFS:

- RED CRT CUTOFF: (65 CODE)

  To toggle the red CRT ON/OFF enter 65, then CODE.

- GREEN CRT CUTOFF: (66 CODE)

  To toggle the green CRT ON/OFF enter 66, then CODE.

- BLUE CRT CUTOFF: (67 CODE)

  To toggle the blue CRT ON/OFF enter 67, then CODE.

B

NOTES:

B

Supplement 1

SWEEP REVERSAL PROCEDURES

WARNING

THE PROCEDURES OUTLINED IN THIS SUPPLEMENT ARE INTENDED TO BE USED AND PERFORMED BY ONLY QUALIFIED SERVICE PERSONNEL. DO NOT ATTEMPT TO MAKE ANY INTERNAL CHANGES IF YOU ARE NOT FAMILIAR WITH THIS SYSTEM AND THE STANDARD SAFETY PRECAUTIONS ASSOCIATED WITH ELECTRICAL/ELECTRONIC EQUIPMENT.

SECTION S1 INDEX

S1

S1.1 . . . . SWEEP REVERSAL PROCEDURE:

S1.1.1 . . . . . 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 horizontal sweep, turn the system "off" and disconnect the power cord.

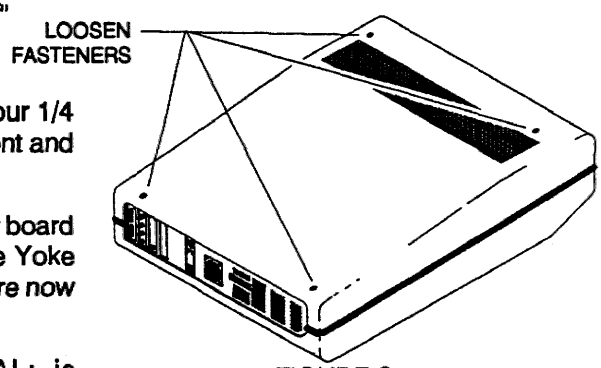


FIGURE S1-1.

- STEP 1. Remove the top cover. It is held on by four 1/4 turn fasteners on the top of the system near the front and rear. Refer to Figure S1-1.
- 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 are now exposed.
- STEP 3. HORIZONTAL SWEEP REVERSAL: is accomplished by reversing the horizontal sweep connectors on the Yoke Interface board(s). 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 S1-2.

PERFORM STEP 3 on all three Yoke Interface boards. RECHECK YOUR WORK!

S1

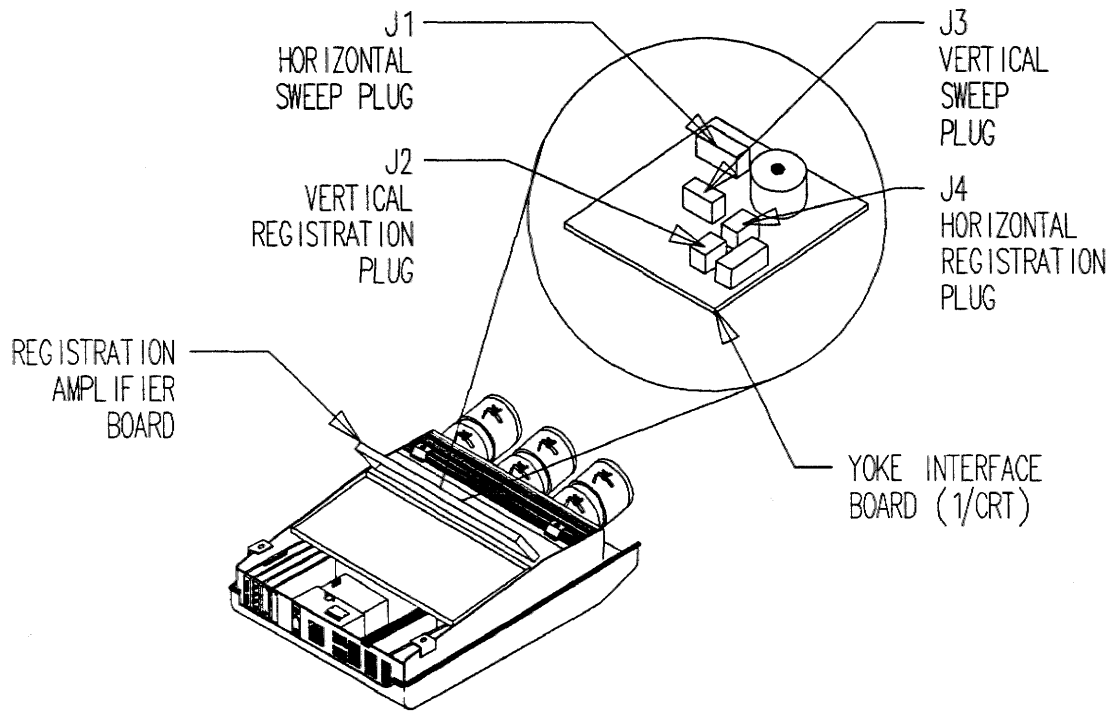


FIGURE S1-2.

S1.1.2 . . . VERTICAL SWEEP REVERSAL PROCEDURE:

WARNING

DO NOT CHANGE THE CONFIGURATION OF THE VERTICAL SWEEP, REGISTRATION PLUGS OR THE VERTICAL CONFIGURATION SWITCH WHILE THE SYSTEM IS ENERGIZED. FAILURE TO COMPLY WILL RESULT IN DAMAGE TO THE EQUIPMENT.

To reverse the vertical sweep, de-energize the system and disconnect the main power cord.

- STEP 1. Remove the top cover. Refer to Section S1.1.1, Step 1, and Figure S1-1.
- STEP 2. Unlock and tilt up the Registration Amplifier board, which is across the front of the system directly behind the lenses. The three Yoke Interface boards under the Registration Amplifier board are now exposed. See Figure S1-2.
- STEP 3. VERTICAL SWEEP REVERSE; is accomplished by reversing the Vertical Sweep (P3) and Registration plugs (P2).
- 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 reinsert it into (J3). See Figure S1-2.
- 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 S1-2.

Perform Steps 3A and 3B on all three Yoke Interface boards. RECHECK YOUR WORK!

- STEP 4. Once all plugs have been re-configured, lower and lock the Registration Amplifier into place.
- STEP 5. On the Vertical Deflection Module, (third module from the right, when view from the rear, per Figure S1-3), locate and change the position of the Vertical Configuration Switch. Configure switch for the following;

¤ NORMAL SWEEP: SWITCH UP

¤ REVERSE SWEEP: SWITCH DOWN

- STEP 6. Replace the top cover, plug in the power cord and energize the system.

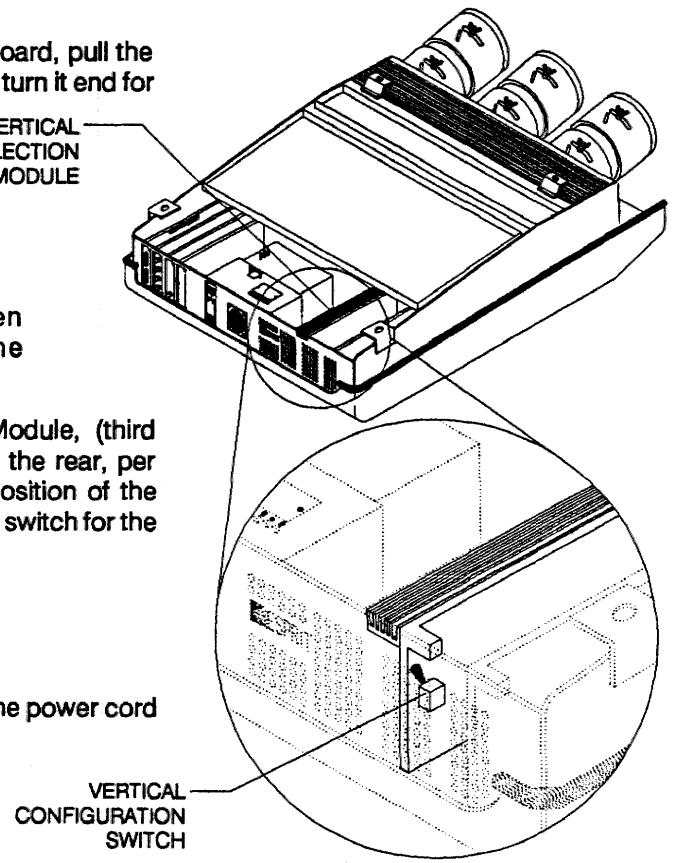


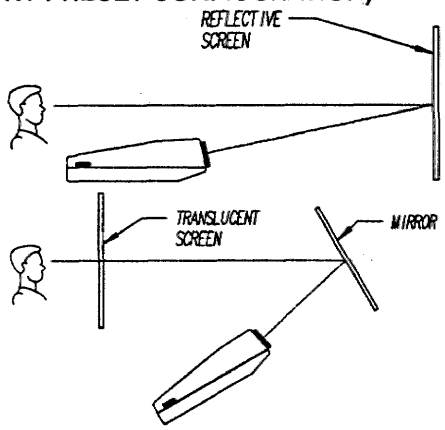
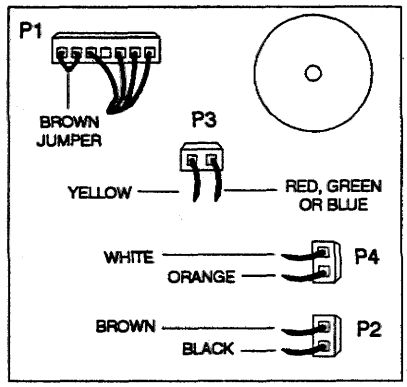
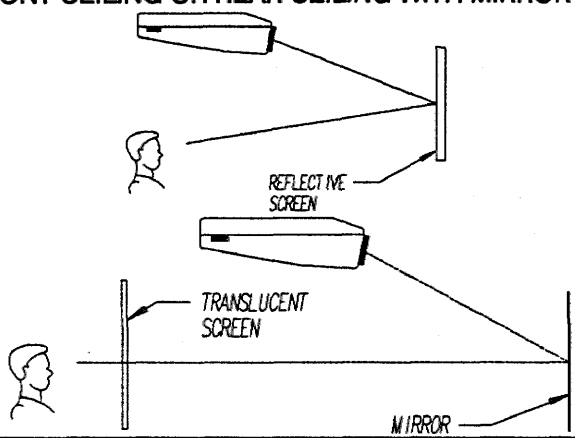
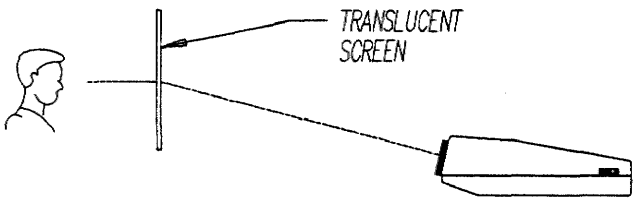
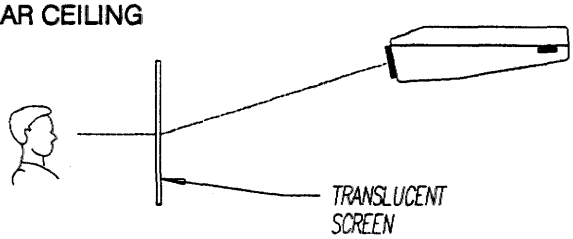
FIGURE S1-3.

S1

S1.2 . . . . SWEEP REVERSAL QUICK REFERENCE:

QUICK REFERENCE

Using this table make the necessary changes for your particular projection application. DOUBLE CHECK YOUR WORK! Refer to Sections S1.1.1 and/or S1.1.2 as required.

APPLICATION	CONFIGURATION	
FRONT TABLE OR REAR TABLE WITH MIRROR (FACTORY PRESET CONFIGURATION) 	YOKE INTERFACE PLUG CONFIGURATION 	VERTICAL SWITCH 
FRONT CEILING OR REAR CEILING WITH MIRROR 	ROTATE P1, P2, P3 AND P4 180° ON ALL THREE YOKE INTERFACE BOARDS 	SWITCH DOWN
REAR TABLE 	ROTATE P1 AND P4 180° ON ALL THREE YOKE YOKE INTERFACE BOARDS 	SWITCH UP
REAR CEILING 	ROTATE P2 AND P3 180° ON ALL THREE YOKE INTERFACE BOARDS 	SWITCH DOWN

S1

Supplement 2

LENS FOCUSING AND POSITIONING

S2.1 .....GETTING STARTED:

In order to focus and position the lenses it will be necessary to remove the top cover, which is secured with four ¼ turn fasteners located on the front and rear of the top cover.

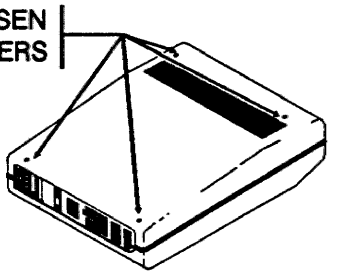


FIGURE 2-1.

- STEP 1. To remove simply turn the fasteners ¼ 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 tool required to focus and position the lenses is provided and located within the accessory box.

S2.2. .....REQUIRED TEST PATTERNS / USING THE HELP PROGRAMS:

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 7.2.12.). Turn registration "OFF" using 55 **[CODE]** .

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

S2

- Press the **[HELP]** button, then
- Enter SYSTEM SETUP MENU, subject 3, then;
- Select Focusing and Positioning of the Lenses, subject 3. NOTE: This program will automatically turn Registration "OFF."

or select;

- Guided Setup Programs, (selection 1), then again, select 1. This will allow you to select the complete setup program which takes you through the entire setup process, including lenses, static and dynamic registration.

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

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.

S2.1.1 . . . . .LENS TYPES:

There are several different types of lenses that may be used on your display system. The standard lenses for the ESPRIT 2000 Series Display Systems are the 6-element lenses, see Figure S2-2. The 6-element lenses fall into the category of dual adjustment lenses. The adjustment that gives the most effect is the primary focus adjustment (center) and the other adjustment is used to equalize the focus over the entire image (center and edge).

S2.1.1.1 . . . . FOCUS 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 S2-1, Step 1 for your particular configuration. You may be required to go back and forth between the adjustments.

SPECIFICATIONS
6-ELEMENT HYBRID HIGH RESOLUTION LENSES 10lp/mm WITH CENTER AND EDGE FOCUS. INFINITELY ADJUSTABLE FROM 4ft. (1.2m) TO 20ft. (6.1m)

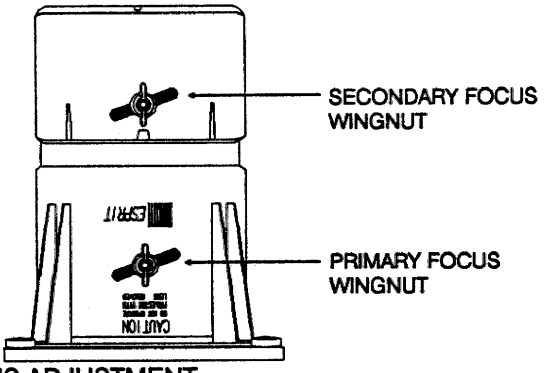


FIGURE S2-2. 6-ELEMENT LENS ADJUSTMENT.

S2.2.2 . . . . .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 S2-1 page S2-4 for procedures on other installation configurations.

S2

- CROSSHATCH PATTERN REQUIRED.
- STEP 1. Tighten all three lens adjustments, then turn counterclockwise ¾ of a turn. Refer to Figure S2-3.
- STEP 2. **Dual barrel lenses**. Adjust the primary and secondary lens barrel until the lower right corner of the projected image is focused.
- STEP 3. Repeat step 1 and 2 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 S2-3. 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 S2-3

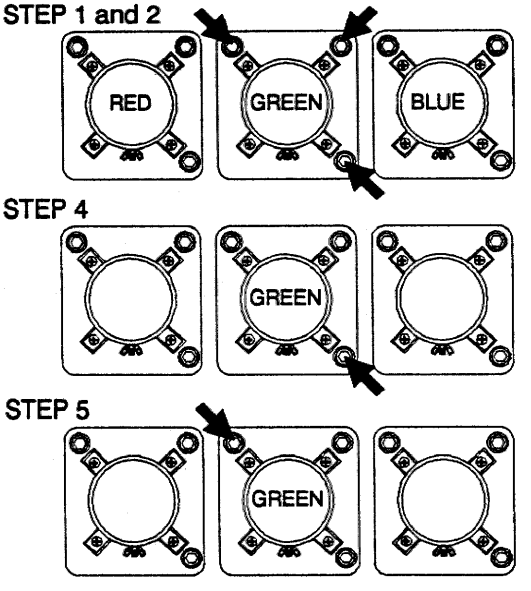


FIGURE S2-3.

S2.2.2 . . . LENS FOCUS AND POSITIONING: (continued)

- CROSSHAIR PATTERN REQUIRED.
- STEP 6. RED to GREEN lens positioning. Loosen the two 3/16 lens positioning hex head screws located directly behind the RED LENS/CRT assembly. Figure S2-4.
- 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 3/16 lens positioning hex head screws.

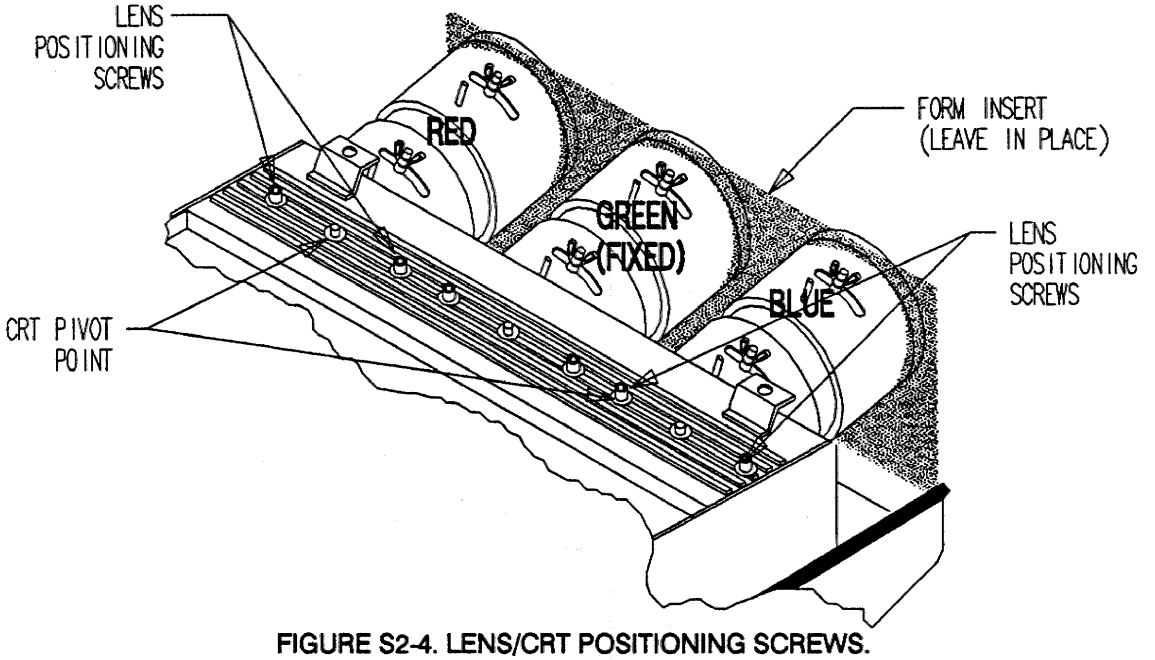
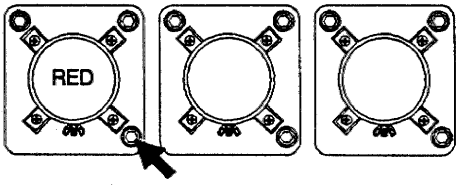


FIGURE S2-4. LENS/CRT POSITIONING SCREWS.

- 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 S2-5.
- STEP 10. RED ONLY ! Adjust the upper left lens adjustment for side to side focus. See Figure S2-5.
- STEP 11. Re-focus 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).

REPEAT STEPS 6 THROUGH 12 FOR **BLUE** TO **RED** ALIGNMENT.

STEP 9



STEP 10

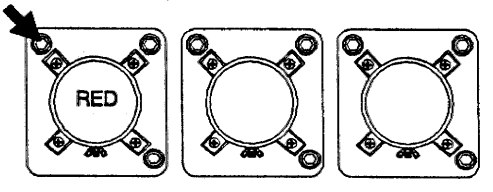


FIGURE S2-5.

S2

S2.3 . . . . . 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 S2.2..

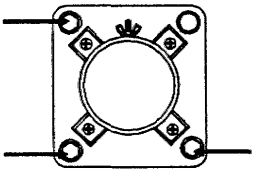
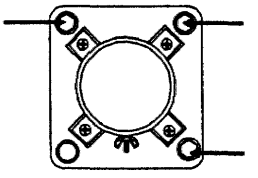
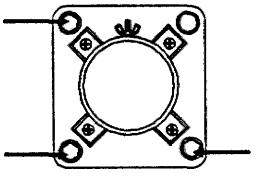
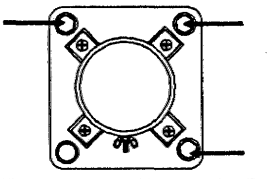
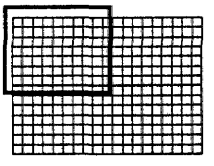
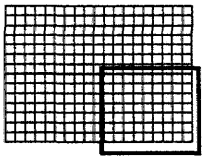
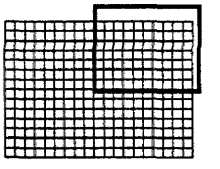
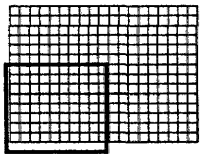
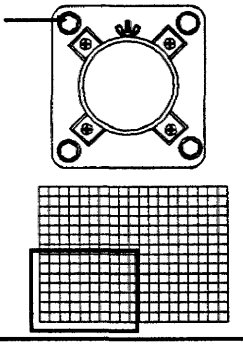
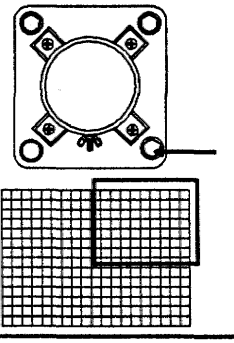
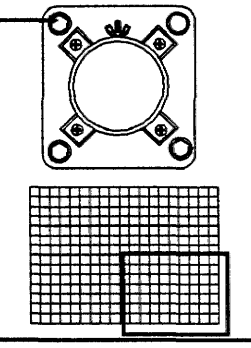
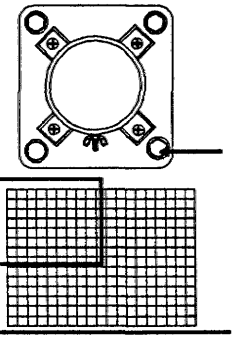
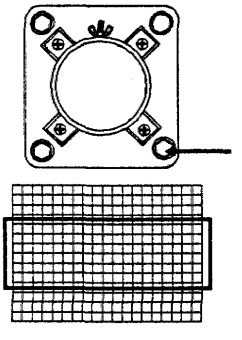
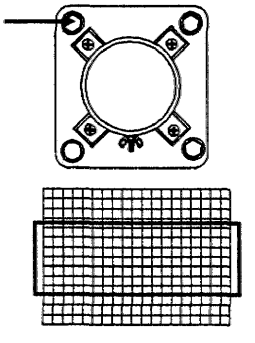
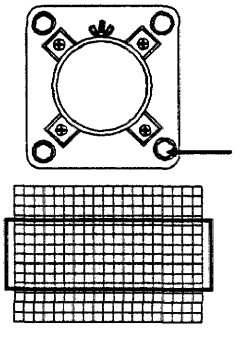
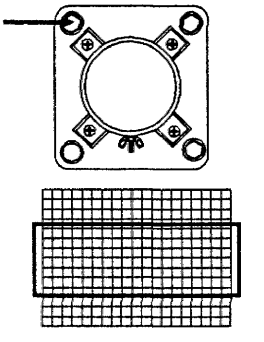
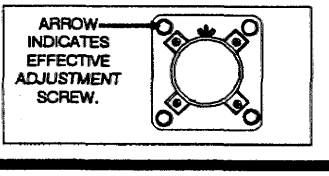
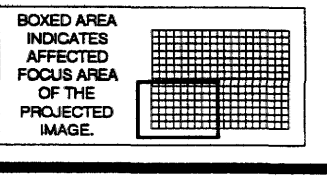
STEP	FRONT/TABLE	FRONT/CEILING	REAR/TABLE[1]	REAR/CEILING[1]
1. Tighten ALL three lens adjustments. Then turn (CCW) 3/4 of a turn.				
2. Adjust lens focus barrel(s) until the indicated corner of the projected image is optimized				
3. Adjust indicated screw to optimize corner focus of figure shown below.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

TABLE S2-1. LENS FOCUS/ADJUSTMENT REFERENCE TABLE.

NOTES:
1. [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 S2.2, steps 6, 7, and 8 for LENS/CRT positioning.





Supplement 3

ESPRIT 2000 SERIES BAUD RATE AND ADDRESS SWITCHES

S3.1 .....HEXADECIMAL SWITCH LOCATIONS:

The system has three hexadecimal rotary switches located on the CPU module (Figure S3-1). 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 within a network of projectors. Refer to Table S3- 2 for setting S1 and S2. The third switch from the rear panel is S3, which determines the communication baud rate. See Table S3-1 for baud rate information.

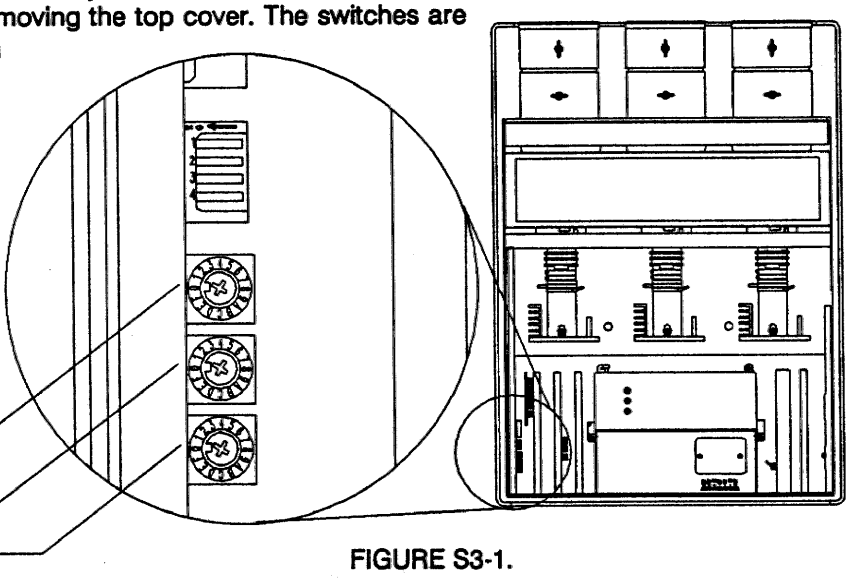


FIGURE S3-1.

S3.1.1 .....BAUD RATE SWITCH (S3) CONFIGURATION:

The tables below show the projector (CPU) and the hard-wired LCD remote control baud rate switch settings for a variety of baud rates. Under normal conditions, the remote control and CPU should always be set to communicate at 9600 baud. However, limitations of the overall RS232 network, i.e., slower devices connected to the network or lengthy cabling, may require that the baud rate of the CPU and remote control be reduced.

S3.1.2 .....CPU BAUD RATE (S3) REFERENCE TABLE:

The top cover of the ESPRIT display system must be removed to access CPU baud rate switch S3, which is a rotary hexadecimal switch located on the CPU module. See Figure S3-1. If the baud rate for the ESPRIT display system has been changed, please refer to Section S3.1.2.1 for information on changing the remote control baud rate to match that of the CPU.

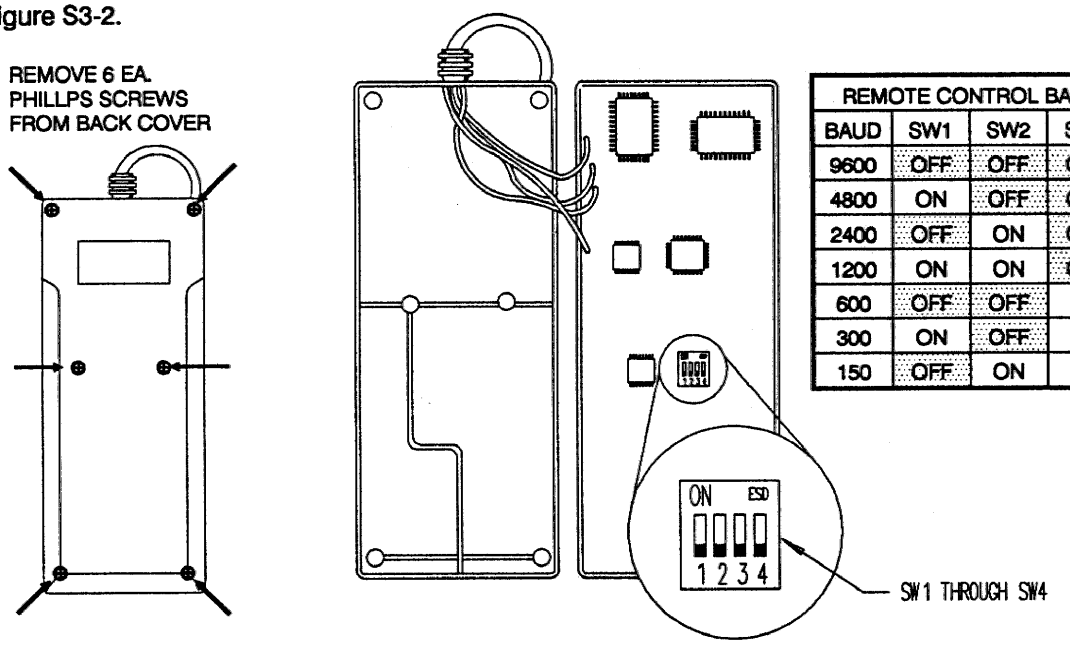
S3

S3	BAUD RATE	S3	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 S3-1. CPU BAUD RATE SELECTIONS

S3.1.3 . . . REMOTE CONTROL BAUD RATE SWITCH/REFERENCE TABLE:

The back cover of the remote control must be removed to access the remote control baud rate switches SW1 through SW4. These switches are housed in a 4 switch DIP and labeled 1 through 4, left to right. See Figure S3-2.



REMOTE CONTROL BAUD RATES				
BAUD	SW1	SW2	SW3	SW4
9600	OFF	OFF	OFF	OFF
4800	ON	OFF	OFF	OFF
2400	OFF	ON	OFF	OFF
1200	ON	ON	OFF	OFF
600	OFF	OFF	ON	OFF
300	ON	OFF	ON	OFF
150	OFF	ON	ON	OFF

FIGURE S3-2.

S3.2 . . . . . .ADDRESS SWITCHES S1 AND S2:

As mentioned previously, S1 and S2 will select the Display System's particular address or unit number, which is a requirement whether using one or multiple systems. In a singular configuration or a multiple system network, the first unit switches must be set at 0(SW1) and 0(SW2). Refer to Table S3-3 for multiple system operation numbering.

- NOTE 1: To determine the presently active unit, simply press **[UNIT]** button.
- NOTE 2: Table S3-3 indicates a 32 unit numbering sequence out of a maximum of 256 systems. Refer to a Decimal-to-Hexadecimal conversion chart for higher hexadecimal equivalents.
- NOTE 3: On the CPU module, ensure DIP switch SW4, position 2 is set to the "off" position when networking multiple systems.

S3

UNIT NUMBER	POSITION		UNIT NUMBER	POSITION		UNIT NUMBER	POSITION		UNIT NUMBER	POSITION	
	S1	S2		S1	S2		S1	S2		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 S3-3

Supplement 4

INTERNAL LED ERROR INDICATORS

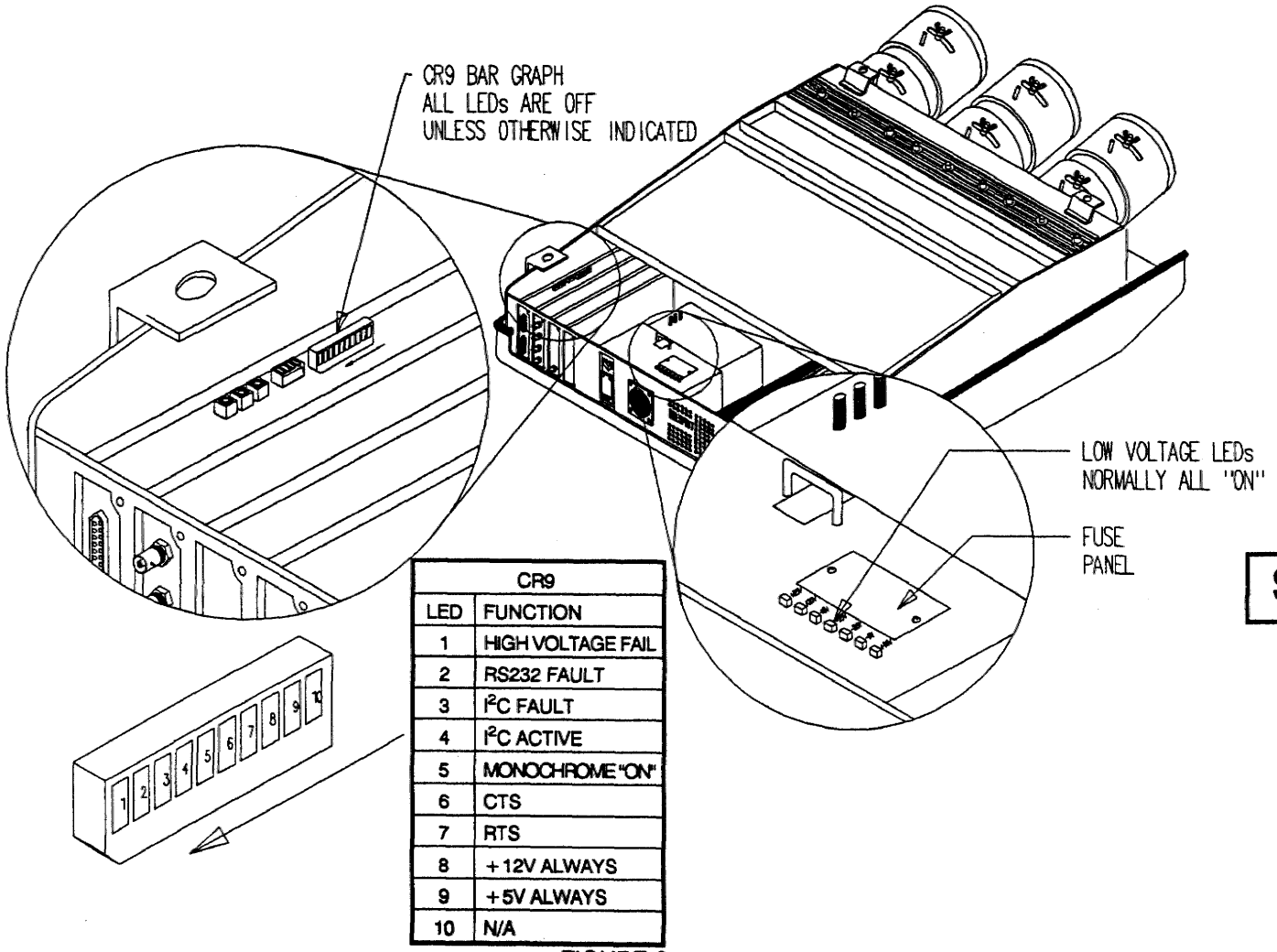
WARNING

S4.1 .....SMPS LOW VOLTAGE INDICATORS:

LOW VOLTAGE LEDs: The DC outputs of the switch mode power supply are fused and indicated by the LEDs located on the upper cover of the module. Additionally, these voltages are monitored by the CPU's diagnostics routines and may be accessed by entering 30 **[CODE]**. See Figure S4-1.

S4.2 .....CR9 LOCATION AND FUNCTION:

Located on the CPU module is a LED bar graph which indicates the internal I^2C or external RS232 communication status. CR9 LED 8 and 9 indicate the standby voltage condition. With the main ac applied, LED 8 and 9 should always be illuminated. Once the system has been energized, LED 8 and 9 should be lit and LED 4 (I^2C active) should be flashing. Refer to Figure S4-1.



CR9	
LED	FUNCTION
1	HIGH VOLTAGE FAIL
2	RS232 FAULT
3	I^2C FAULT
4	I^2C ACTIVE
5	MONOCHROME "ON"
6	CTS
7	RTS
8	+12V ALWAYS
9	+5V ALWAYS
10	N/A

FIGURE S4-1.

S4

NOTES:

S4

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OPTIONAL MODULE(S) INSTALLATION

S5.1 . . . . . .INSTALLATION PROCEDURE:

¤ NOTE: For the following installation procedure, de-energize the system and remove the main power cord and the top cover must be removed and the registration board unlocked and tilted up.

- STEP 1. Please refer to Figure S5-1 for the proper optional module slot position.

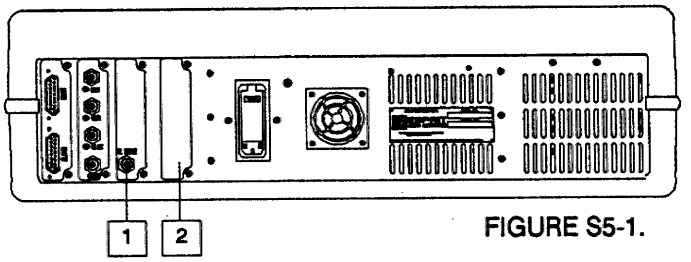

FIGURE S5-1.

MODULE CONFIGURATION		
SLOT	STANDARD	OPTIONAL
1	VERTICAL DRIVE PANEL	QUAD VIDEO DECODER (QVD)
2	TEST/TEXT INTERFACE	ANALOG RGB2 OR TTL/VGA

- STEP 2. Remove the existing module (panel) from the desired module position by removing the two 4-40 phillips head screws and lift out that particular module (panel).
- STEP 3. With the appropriate slot empty, insert the desired optional module and secure with the two 4-40 screws.
- STEP 4. Locate DIP switch SW4 on the CPU module. Change SW4-1 to the "ON" position, replace the power cord and energize the system. Refer to Figure S5-2.
- STEP 5. Once the system has been energized, use the numeric keypad and enter 70, then press the **[CODE]** button.
- STEP 6. Using the reference table below, enter the appropriate configuration number that applies to your system. **NOTE:** All 50 channel locations will be automatically reset to operate in the Analog RGB1 mode of operation. Channel reassignment will be required.

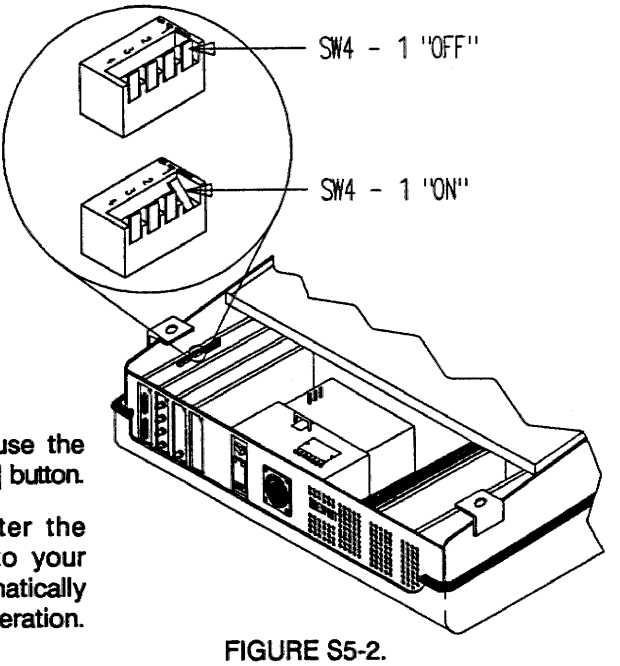

FIGURE S5-2.

MODULE INSTALLATION/REMOVAL REFERENCE TABLE			
ENTER	MODULE(S) INSTALLED	ENTER	MODULE(S) INSTALLED
0	RGB1	3	RGB1 + QUAD VIDEO DECODER + RGB2
1	RGB1 + QUAD VIDEO DECODER	4	RGB1 + TTL
2	RGB1 + RGB2	5	RGB1 + TTL + QUAD VIDE DECODER

S5

- STEP 7. Return SW4-1 (CPU module) to the "OFF" position and enter 44 then press the **[CODE]** button (READ SWITCHES).
- STEP 8. To verify your installation enter 34, then press the **[CODE]** button and view the LCD read-out.

¤ NOTE: Refer to your particular operation manual for the operation and selection of the Various Modes of operation.

NOTES:

S5