zenith

**PRO1200X
INSTALLATION MANUAL**

zenith

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INSTALLATION MANUAL**

OWNER'S RECORD

The article number (Art. No.) and serial number (Ser. No) are located at the rear of the projector. Copy these numbers in the spaces provided below. Refer to them whenever you call upon your ZENITH dealer regarding this product.

Article number :

Serial number :

Dealer :

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

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USA

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1 SAFETY INSTRUCTIONS AND WARNINGS

NOTICE ON SAFETY

Projectors are built in accordance with the requirements of the international safety standards UL 1950 and CSA C22.2 No. 950, which are the safety standards of information technology equipment including electrical business equipment.
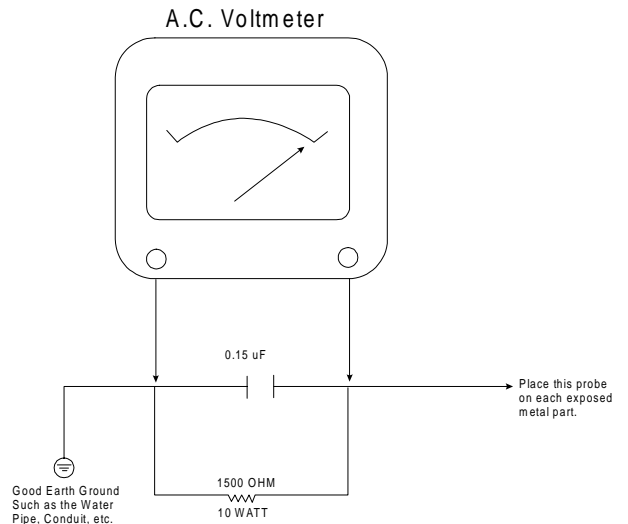
These safety standards impose important requirements on the use of safety critical components, materials and isolation, in order to protect the user or operator against the risk of electric shock and energy hazard, and having access to live parts.

Safety standards also impose to the internal and external temperature variations, radiation levels, mechanical stability and strength, enclosure construction and protection against risk of fire.

Simulated single fault condition testing ensures the safety of the equipment to the user even when the equipment's normal operation fails.

SAFETY WARNINGS

After re-assembly of the set, always m\perform an AC test on all exposed metallic parts of the cabinet to be sure that set is safe to operate without danger of electrical shock. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST. Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by a 0.15 mfd 150V AC type capacitor between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and 0.15 mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 5.25 volts RMS. This corresponds to 3.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

WARNING

RISK OF ELECTRIC SHOCK
DO NOT OPEN

WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

A.C. Voltmeter

0.15 uF

Place this probe
on each exposed
metal part.

Good Earth Ground
Such as the Water
Pipe, Conduit, etc.

1500 OHM
10 WATT

The lightning flash with an arrowhead within a triangle is intended to tell the user that parts inside this product risk electrical shock to persons.

The exclamation point within a triangle is intended to tell the user that important operating and/or servicing instructions are included in the technical documentation for this equipment.

On AC Power

1. This product should be operated from an AC power source only.
   This product is designed to operate from either a nominal system voltage of 120V or 240V.
   However, this product has been shipped from the factory equipped with a standard three conductor North American power supply cordset for connection to a 15 A, 125 V, 60 Hz branch circuit receptacle outlet.
   If you are not sure of the type of AC power available, consult your dealer or local power company.
   If the power supply is not the correct one, consult your dealer.

2. THIS EQUIPMENT MUST BE GROUNDED (EARTHED) via the supplied 3 conductor AC power cable. (If the supplied power cable is not the correct one, consult your dealer.)

3. Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord. To disconnect the cord, pull it out by the plug. Never pull the cord itself.

4. If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord does not exceed the extension cord ampere rating. Also make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.

On installation

* Before operating your projector please read this manual thoroughly, and retain it for future reference.

* Installation and preliminary adjustments should be performed by qualified ZENITH personnel or authorized ZENITH service dealers.

* Do not place this projector on an unstable cart, stand, or table. The projector may fall, causing serious damage to it.

* Do not use this projector near water.

* Use only the power cord supplied with your projector. While appearing to be similar, other power cords have not been safety tested at the factory and may not be used to power the projector. For a replacement power cord, contact your dealer.

* Slots and openings in the cabinet and the sides are provided for ventilation; to ensure reliable operation of the projector and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This projector should not be placed in a built-in installation or enclosure unless proper ventilation is provided.

On Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

To keep the cabinet looking brand-new, periodically clean it with a soft cloth. Stubborn stains may be removed with a cloth lightly dampened with mild detergent solution. Never use strong solvents, such as thinner or benzine, or abrasive cleaners, since these will damage the cabinet.

To ensure the highest optical performance and resolution, the projection lenses are specially treated with an anti-reflective coating, therefore : avoid touching the lens. To remove dust on the lens, use a soft dry cloth. Do not use a damp cloth, detergent solution, or thinner.

2   UNPACKING AND PROJECTOR DIMENSIONS

Unpacking

To open the banding around the carton, pull out the clip as shown below :

Pull
To open
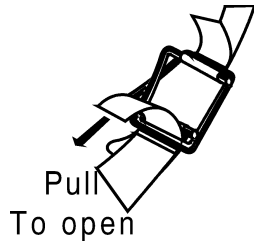
Take the projector out of its shipping carton and place it on a table.

Save the original shipping carton and packing material, which will come in handy if you ever have to ship your projector. For maximum protection, repack your projector as it was originally packed at the factory.

1   2   3   4   5
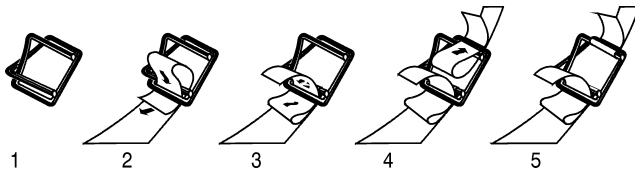
Contents of the shipping carton :

❏ 1 ZENITH PRO 1200X projector

❏ 1 Remote Control Unit plus 1 battery 9V

❏ 1 power cordset with outlet plug type ANSI 73.11

❏ 1 Owner's Manual

❏ 1 Installation Manual

Projector dimensions (in mm)

APPROXIMATE WEIGHT WITH HD8 LENS - 67 KG

CRT	CRT POINT	
	A	B
R7626572 R7626575 R7626576	806	209
R7627612 R7627615 R7627616	816	211

590

FRONT IR RECEIVER

1040
A
596
ROTATION COVER
SERVICE
169.5
GRAVITY POINT
CRT POINT
286
226
170
84
27
45.5
136
728
960
MAX 500
362
B

POWER SUPPLY
BACK IR RECEIVER
510
590

148
703
AIRFLOW
FIXATION POINT
4 X M8
AIRFLOW
MAX 428
AIRFLOW
MAX 1076
AIRFLOW

456
558
576
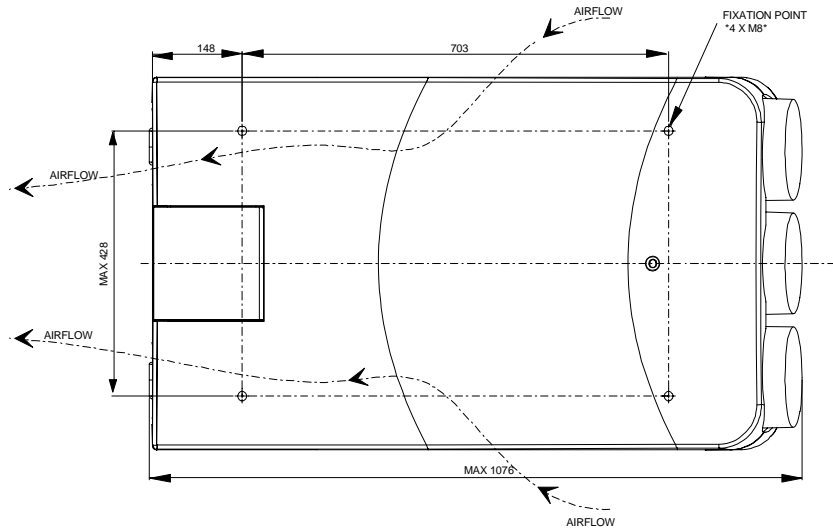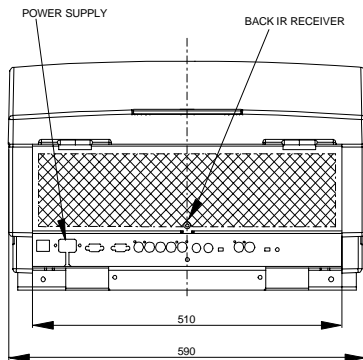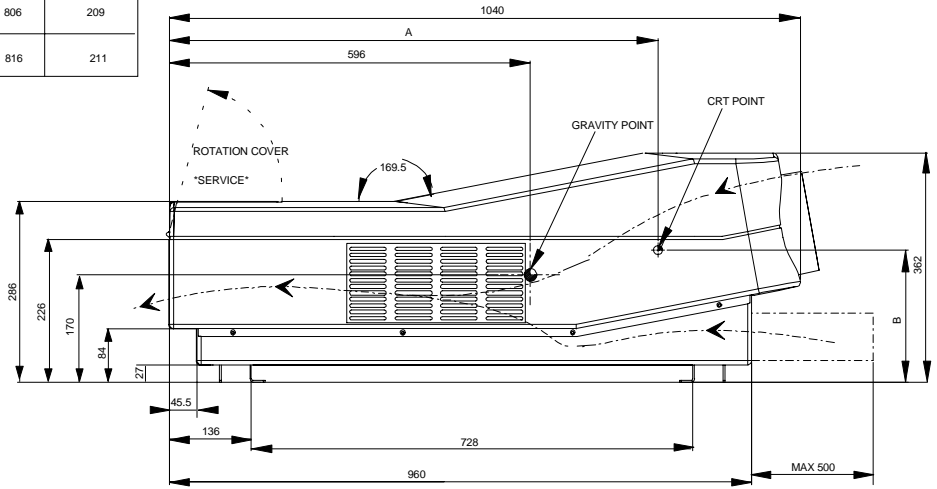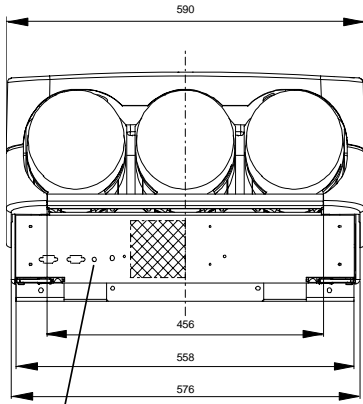
3 INSTALLATION GUIDELINES

Installation guidelines

Careful consideration of things such as image size, ambient light level, projector placement and type of screen to use are critical to optimize the use of the projection system.

Environment

Do not install the projection system in a site near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or humidity. Be aware that room heat rises to the ceiling; Make sure the temperature near the installation site is not excessive.

What about ambient light ?

The ambient light level of any room is made up of direct or indirect sunlight and the light fixtures in the room. The amount of ambient light will determine how bright the image will appear. So, avoid direct light on the screen as much as possible.

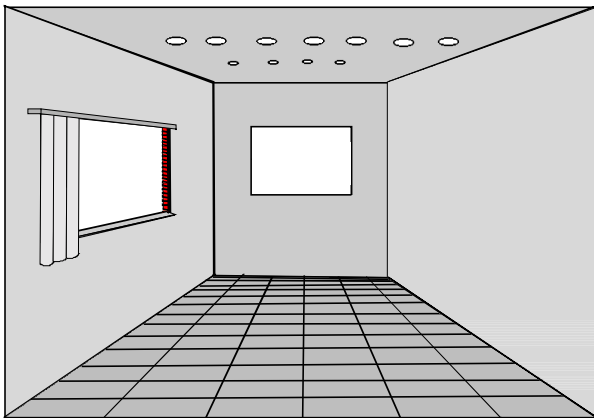Windows that face the screen should be covered by opaque drapery while the set is being viewed. It is desirable to install the projecting system in a room whose walls and floor are of non-reflecting material. The use of recessed ceiling lights and a method of dimming those lights to an acceptable level is also important. Too much ambient light results in a 'wash out' of the projected image. This appears as less contrast between the darkest and lightest parts of the image. With bigger screens, the 'wash out' becomes more important. As a general rule, darken the room to the point where there is just sufficient light to read or write comfortably. Spot lighting is desirable for illuminating small areas so that interference with the screen is minimal.

Which screen type?

There are two major categories of screens used for projection equipment. Those used for front projected images and those for rear projection applications.

Screens are rated by how much light they reflect (or transmit in case of rear projection systems) given a determined amount of light projected toward them. The 'GAIN' of a screen is the term used. Front and rear screens are both rated in terms of gain. The gain of screens range from a white matte screen with a gain of 1 (x1) to a brushed aluminized screen with a gain of 10 (x10) or more. Another important consideration is the degree the screen's gain varies with the horizontal and vertical viewing angle. The choice between higher and lower gain screens is largely a matter of personal preference.

In considering the type of screen to choose, determine where the viewers will be located and go for the highest gain screen possible. A high gain screen will provide a brighter picture but reduce the viewing angle.

For more information about screens, contact your local screen supplier.
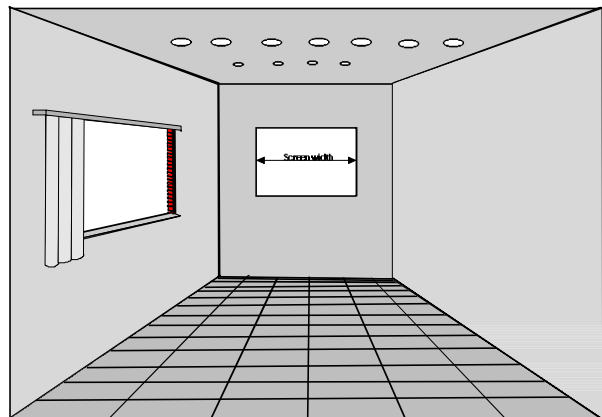
What image size? How big should the image be?

The projector is designed for projecting an image width from 1.4m (4.6') to 6m (20') with an aspect ratio of 4 to 3. It leaves the factory, adjusted as a ceiling/front projector for a screen width of 2.4m (7.8'). Changing the image size from the factory preset size requires a realignment of the projector.

Where to install the projector ?

To indicate a correct installation position it is necessary to know :

- The distance from projector to ceiling in case of Ceiling mounted or the distance from projector to floor in case of Table mounted;

- The distance from projector to screen.

To find the correct position for the projector, use the following formulas:

In metric :

$$PD[cm] = SW[cm] \times 1.1358 + 18.53[cm]$$

$$A[cm] = SW[cm] \times 0.142 - 25.26[cm]$$

In inch :

$$PD[inch] = 1.269 \times SW[inch] + 7.12$$

$$A[inch] = 0.12 \times SW[inch] - 9.70$$

Abbreviations used in the calculations and the drawings :

B = Distance between ceiling and top of the screen (Ceiling mounted) or distance between floor and bottom of the screen (Table mounted).

A = Correction Value, extra value to be added to B to obtain the correct installation position (In some cases the A value can be negative).

CD = Total distance between projector and ceiling (Ceiling mounted) or total distance between projector and floor (Table mounted). CD = A + B.

Ceiling Mounted : when the result is negative, enlarge the distance between ceiling and top of the screen, mount screen lower, until CD becomes zero or positive.

Table Mounted : when the result is negative, enlarge the distance between floor and bottom of the screen, mount screen higher, until CD becomes zero or positive.

SW = Screen width.

PD = Perpendicular distance between screen and projector's mount.

To obtain the right values, you can make use of the new option included in the Installation Adjustment Mode to let the projector calculate the parameters automatically. Please refer to Chapter 8 for details.

Ceiling Mount

To install the ZENITH PRO 1200x in the Ceiling configuration, use ZENITH'S *Ceiling Mount Kit (PJR1200CE).* Installation instructions are included with this kit.

Table Mount

ZENITH offers a *heavy-duty projection table* with adjustable height which allows the projector to be correctly positioned perfectly to the installation requirements.

Front view

Top view
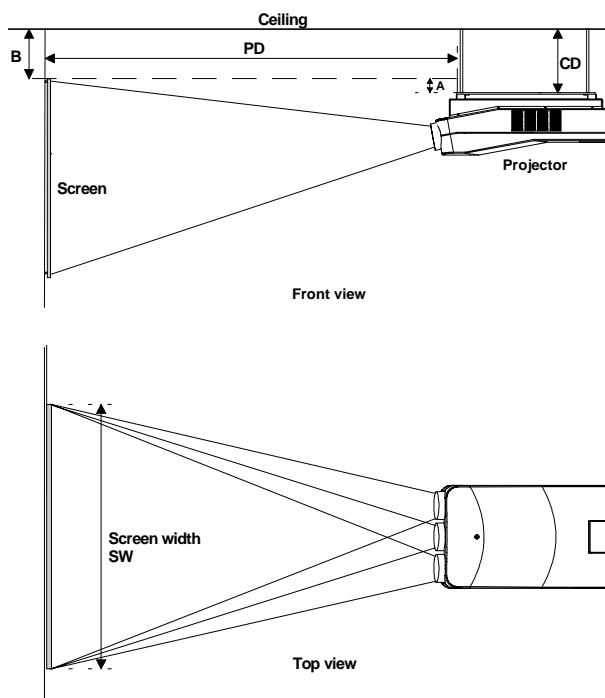
- Install the projector water levelled in both directions
- Install the projector perpendicular to the screen

Used phosphor width on the CRT faceplate (e.g. green CRT)

Mounting Configuration

11.5 cm (4.5 inch)

Green phosphor
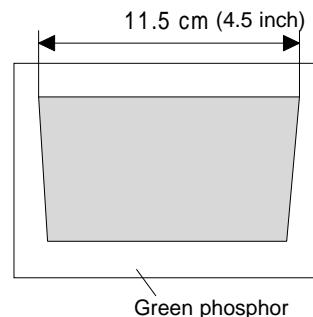
On illumination

In order to obtain the best quality for the projected image, it is essential that the ambient light which is allowed to fall on the screen be kept to an absolute minimum.

When installing the projector and screen, care must be taken to avoid exposure to ambient light directly on the screen. Avoid adverse illumination on the screen from direct sunlight or fluorescent lighting fixtures.

The use of controlled ambient lighting, such as incandescent spot light or a dimmer, is recommended for proper room illumination. Where possible, care should also be taken to ensure that the floors and walls of the room in which the projector is to be installed are non-reflecting, dark surfaces. Brighter surfaces will tend to reflect and diffuse the ambient light and hence reduce the contrast of the projected image on the screen.

4 INSTALLATION SETUP

WARNING :
Risk of electric shock !
**Installation only by ZENITH authorized service personnel !**

Access to Controls

Opening the top cover

During the projector setup and installation it is necessary to open the top cover. Follow the procedure described below :

- Turn the locking screw with a screwdriver counter clockwise;

- Lift up and pivot the top cover.

WARNING :

The projector's top cover is **not** supported with locking hinge. Open with care and support the cover with your hand.
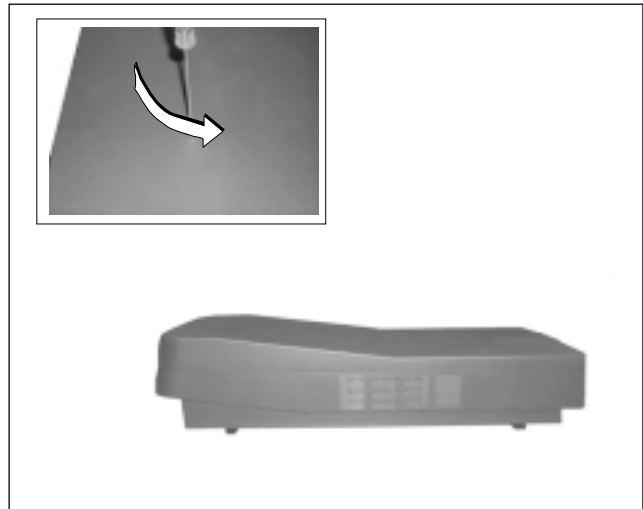
Removing the top cover

During some installations, it will be convenient to remove the top cover from the projector totally.

Proceed as follows :

- Pivot the top cover backwards 90° (fully extended);

- Push carefully the top cover to the left side (viewing from the rear of the projector) until the hinges are disengaged. This can be facilitated by pressing downwards on the spring tabs next to the hinges. Slide the top cover off the projector.
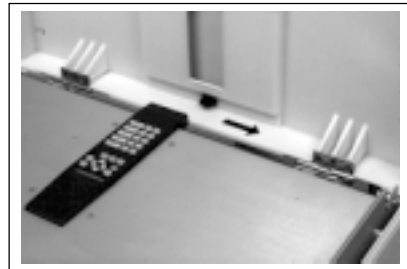
Reinstalling the top cover

To reinstall the top cover on the projector :

- Place the top cover in front of the hinges (as shown in the picture) and push in the direction of the black arrow until the cover locks into the hinges;

- Pivot the top cover to close;

- Secure the locking screw by turning it clockwise with a screwdriver.
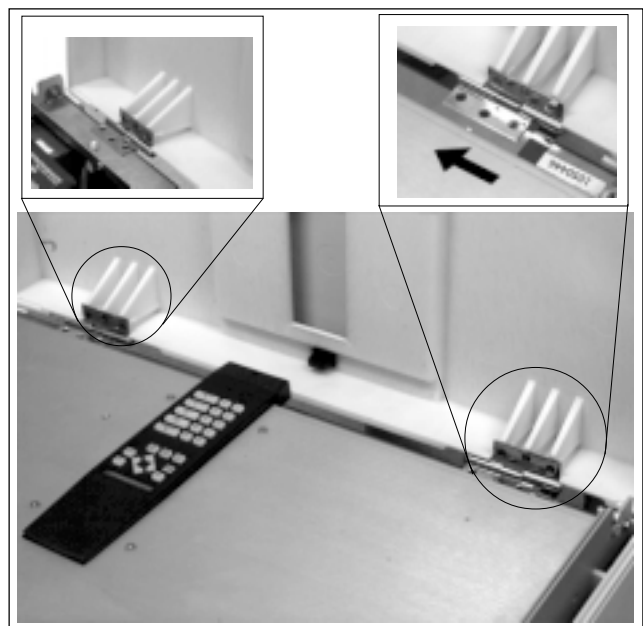
Scan Adaptation

The scan switches must be placed in the correct position which corresponds to the desired scanning configuration.

To change the scanning, it is necessary to remove the projector top cover and to open the protection plate.

For opening the projector's top cover, see 'Access to Controls'.

⚠

WARNING !
TURN OFF PROJECTOR AND UNPLUG THE POWER
CORD BEFORE CHANGING THE SCAN DIRECTION.

Getting access to the scan switches

- Open the top cover and remove it from the projector (see p.4-1);

- Loosen the 3 retaining screws on each side of the projector;

- Open the protection plate and pivot it forward (toward lenses).
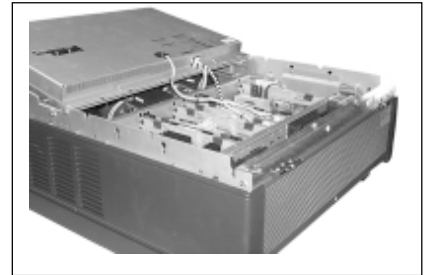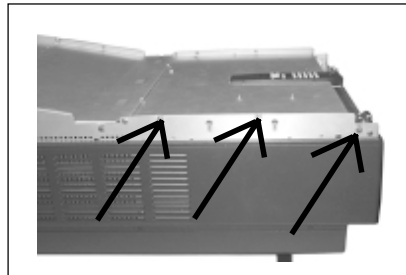
Horizontal Scan Switches

Three switches are used, one for each CRT. When changing the horizontal scan, insure that all three switches are set in the same position. See positions of the switches (diagram on next page) for the corresponding projector configuration.

To set the scan switches :

- Remove the horizontal deflection module (the second module viewing from the rear of the projector).

  To remove the horizontal deflection module :

  - Press the module lock and lift up the module handle;

Top view   **Side view**

Push ↑

Top view   **Side view**

Horizontal deflection module
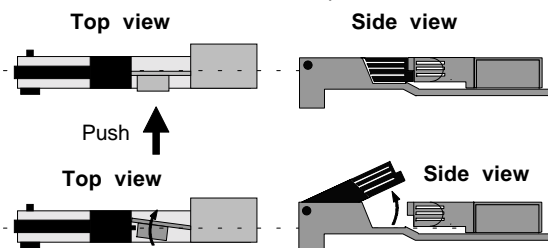
  - Repeat this action on both sides of the module and extract the module out of the main frame.

- Toggle the 3 horizontal scan inversion switches (located just underneath the horizontal amplitude module) to the correct positions (see p.4-3).

- Reinstall the horizontal deflection module.

Connectors for the horizontal deflection module

Horizontal scan switches

Horizontal amplitude module
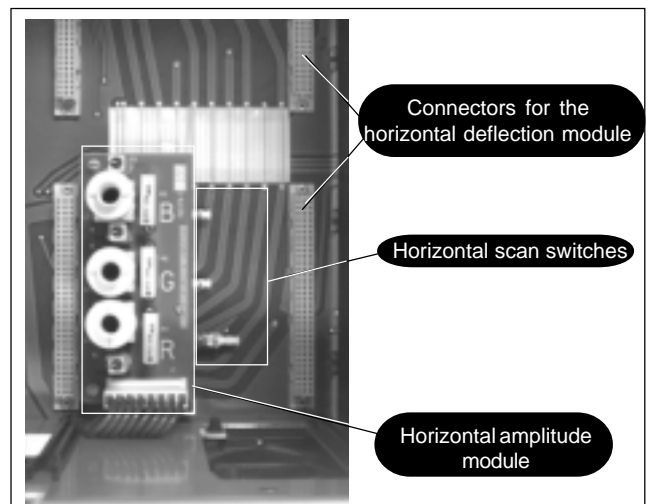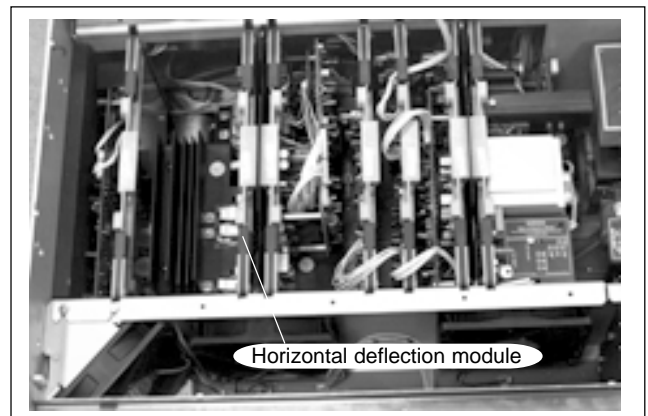
Vertical Scan Switch

One vertical switch is used for the three CRT's. See position of the switch (diagrams) for the corresponding projector configuration.

To set the vertical scan switch :

- Remove the vertical deflection module (the third module viewing from the rear of the projector).

    To remove the vertical deflection module :
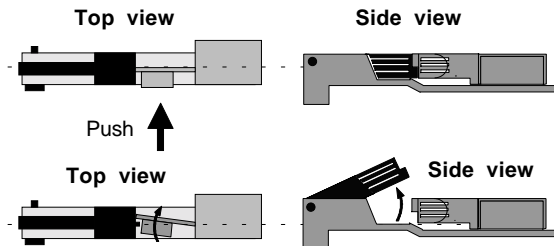
Push

- Press the module lock and lift up the module handle;
- Repeat this action on both sides of the module and extract the module out of the main frame.

- Toggle the vertical scan inversion switch to the correct position.

- Reinstall the vertical deflection module.

Vertical deflection module

Vertical scan switch

Positions of the scan switches for the different mounting configurations are illustrated on the right side.

Connectors for the vertical deflection module

After setting the scan switches, close the metal protection plate and secure it with the retaining screws.

Close the top cover and reconnect the power cord to the wall outlet.

Note : Switching over from Floor to Ceiling or vice versa requires a complete readjustment of picture geometry and convergence.

To check the current positions of the scan switches, proceed as follows:

Attention : This procedure can only be done after power (mains) connection. So, first continue with the projector setup and the connections and then return to this procedure.

- Switch on the projector. The projector starts up on the last selected source.

- Press the *<ADJUST>* key.

- Highlight *'SERVICE'* by pushing the control stick forward or backward and press the *<ENTER> key*: the *'SERVICE MODE MENU'* will be displayed.

```
┌─────────────────────────────┐
│      ADJUSTMENT MODE         │
│    Select a path from below: │
│                             │
│         GUIDED               │
│      RANDOM ACCESS           │
│      INSTALLATION            │
│        SERVICE               │
│       PROVERGE               │
│                             │
│               SOURCE 1       │
│                             │
│   Select with  ↑  or  ↓      │
│   then <ENTER>               │
│   <EXIT> to return           │
└─────────────────────────────┘
```
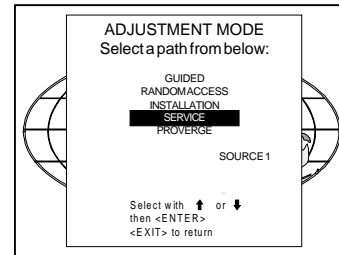
- Highlight *'IDENTIFICATION'* by pushing the control stick forward or backward and press the *<ENTER> key*.

```
┌─────────────────────────────┐
│        SERVICE MODE          │
│                             │
│       IDENTIFICATION         │
│       COPY A BLOCK           │
│       DELETE A BLOCK         │
│      DELETE ALL BLOCKS       │
│      CHANGE PASSWORD         │
│      CHANGE LANGUAGE         │
│        RUN TIME              │
│    DYNAMIC ASTIGMATISM       │
│                             │
│          MORE...             │
│   Select with  ↑  or  ↓      │
│   then <ENTER>               │
│   <EXIT> to return           │
└─────────────────────────────┘
```
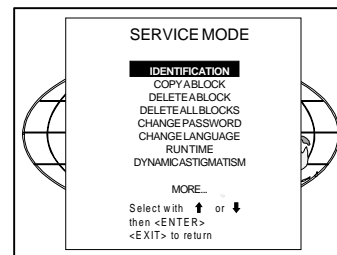
The projector will display the *'IDENTIFICATION SCREEN'*.

This screen gives the current information about the projector configuration in the line entitled *'Config'*.

All projectors leave the factory set for a ceiling/front configuration.

5

PROJECTOR SETUP

The DIP switches on the controller board allow the *SETUP* of the projector :

- 8 DIP switches for setting the projector address.

- 1 DIP switch for setting the powerup mode.

- 3 DIP switches for setting the baud rate for communication.

- 1 DIP switch for setting the password mode.

To gain access to the DIP switches :
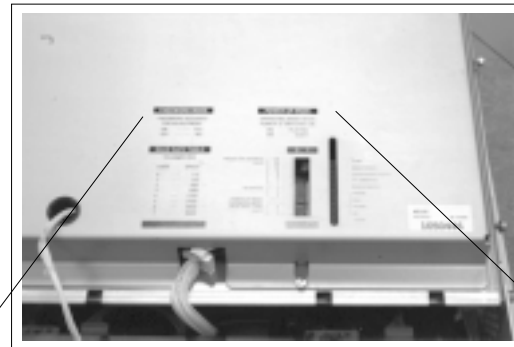
- Open the top cover.

- Loosen the retaining screws of the metal protection plate and pivot this plate to the lens side (Please refer to Chapter 4 'Installation setup').

The DIP switches are located on the back side of this metal protection plate.

PASSWORD MODE	POWER UP MODE
PASSWORD REQUIRED FOR ADJUSTMENT	OPERATING MODE WHEN POWER IS SWITCHED ON
ON ——— YES	ON ——PLAYING
OFF ——— NO	OFF ——— StdBY

BAUD RATE TABLE

TO COMPUTER

CODE	SPEED
0	110
1	150
2	300
3	600
4	1200
5	2400
6	4800
7	9600

PROJECTOR ADDRESS (sum): 128—1, 64—2, 32—3, 16—4, 8—5, 4—6, 2—7, 1—8

RESERVED: 1—1, 2—2, 3—3

POWER UP MODE —4
PASSWORD MODE —5
BAUD RATE CODE (sum): 4—6, 2—7, 1—8

OFF   ON

- StdBY
- MAIN POWER
- PROCESS CYCLE
- I²C SHORTED
- BLOCK MATCH
- ERROR
- RCU
- RCV DS
- PC
- PAUSE

Setting the projector address

The projector's address may be set to any value between 0 and 255.

When the address is set, the projector can be controlled now by :

- RCU for addresses between 0 and 9.

- IBM PC (or compatible) or Apple MAC for addresses between 0 and 255.

Addressable with RCU

Addressable with PC, MAC or workstation

0

9

255
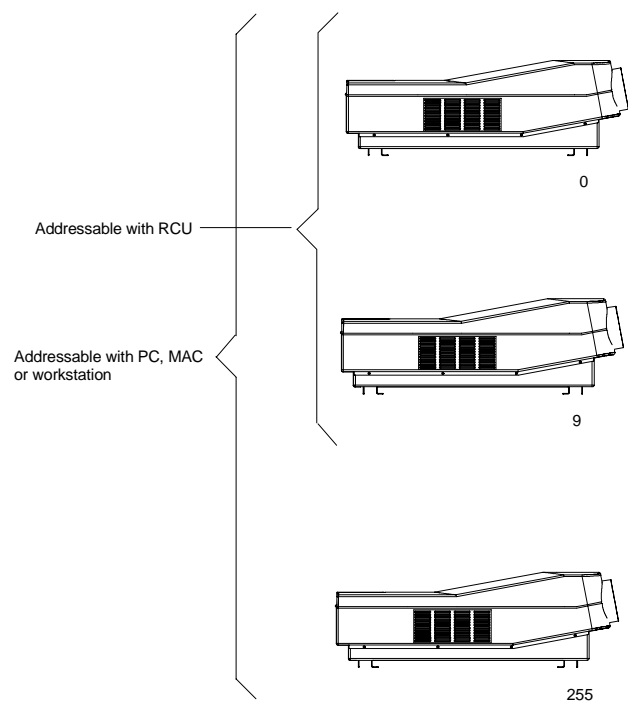
Setting the address is a hardware SETUP of your projector which must be done during installation. Use the 8 DIP switches provided on the controller board labelled 'Projector Address'.

Each DIP switch has its own decimal value. The sum of the values associated to those DIP switches gives the address. As shown in the table, if Switch No. 1 is set to ON, it represents a decimal value of 128, Switch No.2 for 64, Switch No.3 for 32, and so forth.

In the given example, the projector address is set to *202 :*

DIP switch No.   : 1 2 3 4 5 6 7 8
Position ON/OFF : 1 1 0 0 1 0 1 0

Sum : 1x128 + 1x64 + 0x32 + 0x16 + 1x8 + 0x4 + 1x2 + 0x1 = 202

Factory preset address = 0

Note :
When the address button on the RCU is pressed, the projector will display its own address on the screen. Once the address button is pressed, to continue using your RCU, it is necessary to enter an address, even when the displayed address is correct. Use the numeric keys to enter the address.
For more information, please refer to the projector Owner's Manual .

Switch No	Value
1	128
2	64
3	32
4	16
5	8
6	4
7	2
8	1

OFF ON

PROJECTOR
ADRESS
001
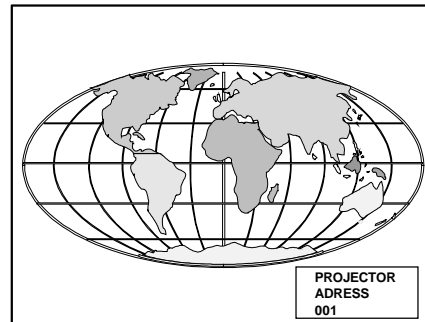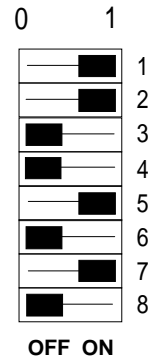
Powerup mode

The projector can start up in two different modes. The start-up mode is determined by the position of DIP Switch No. 4 of another set of 8 DIP switches on the controller board (one set of 8 switches are used for projector address setting).

Position of the DIP Switch No. 4 (powerup mode) :
  ON : operational mode.
  OFF: standby mode (Factory preset).

Power-up mode —

OFF ON
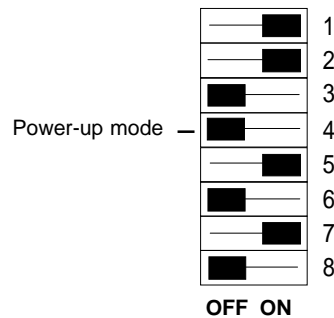
• **Operational mode**

When the power switch on the rear of the projector is pressed, the projector displays the last selected source if available, otherwise it remains on that source number until the source becomes available.

The on screen indication is only available when the "Text" function is set to "ON".

Source 2
Fh= 15.6 kHz
Fv= 50 Hz
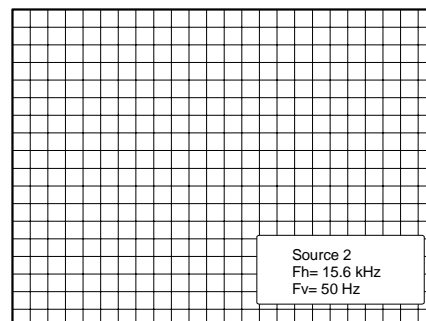
• **Standby mode**

When the power switch on the rear of the projector is pressed, the projector starts up in the standby mode. The standby key on the RCU is used to turn the projector ON and OFF.

Baud Rate for communication with a computer

The communication speed between the projector and the computer has 8 possible settings. With DIP Switch No. 6, No.7 and No.8 of the 8 DIP switches on the controller board, labelled as 'Baud rate code (sum)', it is possible to select the baud rate (communication speed). Each DIP switch has its own decimal value. The sum of the values associated to those DIP switches gives the baud rate code. Each baud rate code corresponds an communication speed.
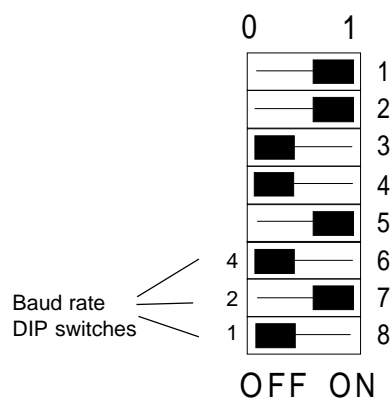
Position of DIP switches and baud rate codes :

Binary	Baud rate code	Speed
000	0	110
001	1	150
010	2	300
011	3	600
100	4	1200
101	5	2400
110	6	4800
111	7	9600

Factory preset baud rate = 9600

More information about computer communication with the ZENITH PRO 1200X is available in the Projector Control Software manual.

Password mode

With DIP Switch No.5 of the second set of 8 DIP switches on the controller board, the projector adjustments can be protected with a password. When the password feature is enabled, the user has to enter a password before he can enter the adjustment mode (For more information about password setting and reprogramming the password, see Installation Adjustment).

When the password menus are disabled (adjust mode is unprotected), the adjust mode can be selected by pressing the *<ADJUST>* key. This position of the DIP switch is useful for qualified service technicians because they do not need a password to enter the adjust mode.

Position of DIP Switch No.5 :

   ON   : password mode enabled.
   OFF : password mode disabled.

Factory preset password mode : OFF.
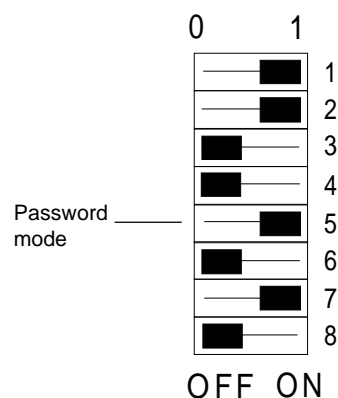
6 SOURCE CONNECTIONS

Signal input connection

The following signals can be connected to the projector through the inputs on the back panel of the projector :

- Composite Video
- S-Video
- RGB
- Component Video
- RGB with Tri-level sync
- Component video with Tri-level sync

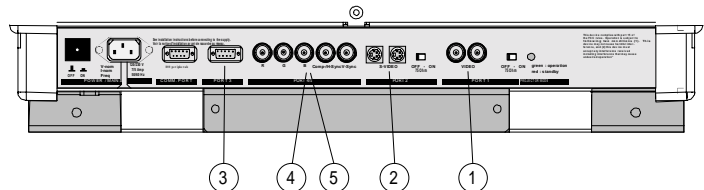| Port No	Projector input	Numeric button	Description of input signal
1	Composite Video	1	
2	S-Video / Composite Video	2	S-video : Y/C (luma/chroma). The Composite video can also be connected to Port 2. It can be selected inside the "Picture Tuning" menu. Please refer to the Owner's Manual of this projector.
3	RGB	3	R, G and B with composite sync on Green; R, G and B with separate composite or with separate Horizontal and Vertical sync.
4/5	RGB	4 or 5	R, G and B with composite sync on Green; R, G and B with separate composite or with separate Horizontal and Vertical sync.
4/5	Component video	6	R-Y, Y, B-Y with composite sync on Y; or with separate composite or with separate Horizontal and Vertical sync.
4/5	RGB with Tri-level sync	7	R, G and B with Tri-level sync on Green; R, G and B with separate Tri-level sync or with separate Horizontal and Vertical Tri-level sync.
4/5	Component video with Tri-level sync	8	R-Y, Y, B-Y with Tri-level sync on Y; or with separate Tri-level sync or with separate Horizontal and Vertical Tri-level sync.

Connecting a Composite Video source to Port 1

Composite video signals coming from a VCR, OFF air signal decoder and so on can be connected to Port 1.

To select the video input :

Press the *numeric button 1* on the RCU or the local keypad.

75 W Termination Switch for Video

Terminate the video input of the projector using the 75W switch next to the video input, when the projector operates alone or when the projector is the last unit in a loop-through configuration.

The switch is set to "ON" : signal terminated.
The switch is set to "OFF" : signal not terminated.
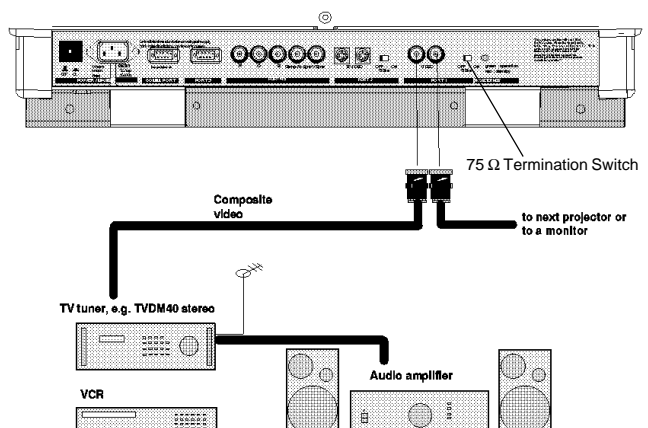
Connecting a S-Video (or Composite Video) source to Port 2

Separate Y-luma/C-chroma signals for higher quality playback of Super VHS signals can be connected to Port 2 . The composite video can also be connected to this port.

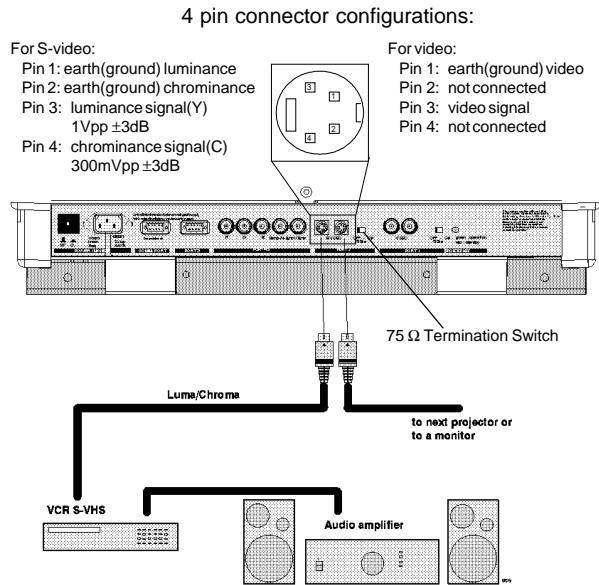**To select the S-video input :**

Press the *numeric button 2* on the RCU or the local keypad.

In case of using Port 2 for connecting the Composite Video, the selection of this source have to be done inside the "Picture Tuning" menu. Please refer to the Owner's Manual of this projector.

75 W Termination Switch for S-video

Terminate the S-video input of the projector using the 75 W switch next to the S-video input when the projector operates alone or when the projector is the last unit in a loop-through configuration.

The switch is set to "ON" : signal terminated.
The switch is set to "OFF" : signal not terminated.

4 pin connector configurations:

For S-video:
Pin 1: earth(ground) luminance
Pin 2: earth(ground) chrominance
Pin 3: luminance signal(Y)
        1Vpp ±3dB
Pin 4: chrominance signal(C)
        300mVpp ±3dB

For video:
Pin 1: earth(ground) video
Pin 2: not connected
Pin 3: video signal
Pin 4: not connected

75 Ω Termination Switch

Lume/Chroma

to next projector or to a monitor

VCR S-VHS

Audio amplifier

## Connecting a RGB Analog source to Port 3

Connect a RGB Analog signal via an interface (e.g. RGB 120MHz interface, part number 98 26570) to Port 3: RGB analog input with automatic sync detection (Separate H and V sync inputs, with composite sync input or with sync signals on green).

Pin configuration of the D9 (male) connector of the Analog input :

1	not connected
2	ground RGBS
3	RED
4	GREEN
5	BLUE
6	ground RGBS
7	ground RGBS
8	Horizontal /composite sync
9	Vertical sync

RGB 120MHz interface

To select the RGB analog Input :

Press the *numeric button 3* on the RCU or the local keypad*.*
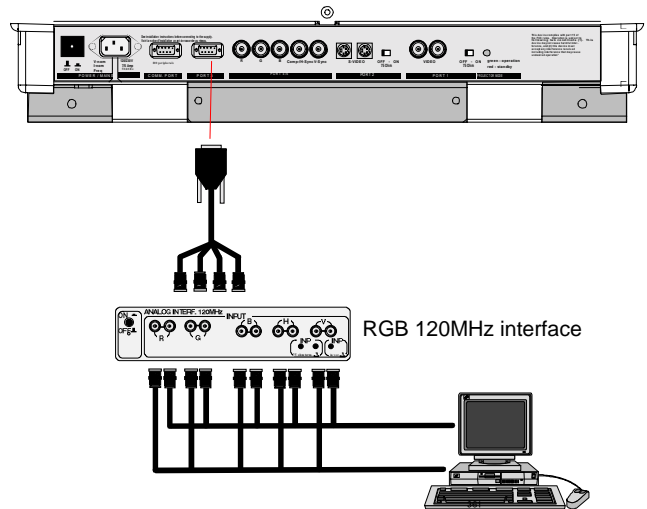
Locations of the Termination Resistors and Switches on the RGB Input Auto Sync Tracking Module

When changing a switch position or removing a resistor, turn off the projector and unplug the power cord from the wall outlet.

75 W Termination resistors

In case of chaining (loop-through) the projectors, the 75W line termination resistors must be removed from the RGB Input Auto Sync Tracking Module when the projector is <u>NOT</u> the last unit in the chain. In case of a stand-alone projector, do not remove the resistors.

75 W resistors on the module :   line terminated.
75 W resistors removed   :   line not terminated.

S2 Blue in Green (ON=yes)

R101 Vsync
R81 Hsync
R41 (Blue)
R21 (Green)
R1 (Red)

S1 Force Negative Sync (ON=yes)

Line termination 75 Ω resistors
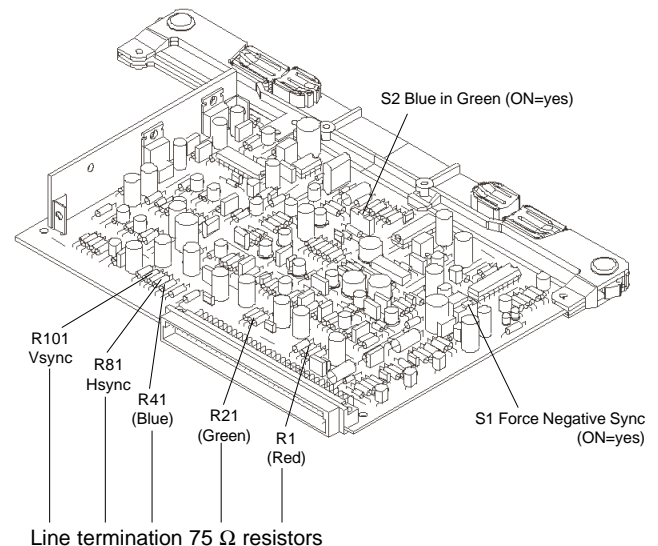
Procedure to remove the line termination resistors :

- Turn off the projector and unplug the projector power cord.

- Remove the top cover from the projector (see p.4-1).

- Remove the RGB Input Auto Sync Tracking Module from the main frame.

- Unsolder and remove the resistors.

To remove the RGB Input Auto Sync Tracking Module, follow the same procedure as described in p.4-2 for removing the Horizontal Deflection module :

- Press the module lock and lift up the module handle;

- Repeat this action on both sides of the module and extract the module out of the main frame.

RGB Input Auto Sync Tracking Module
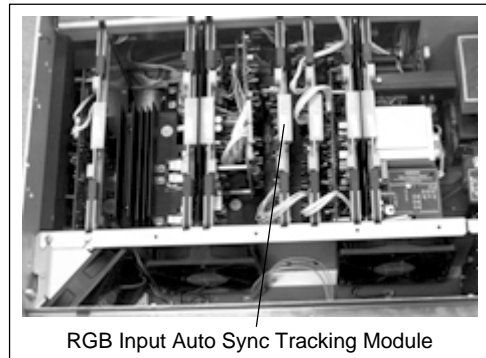
Blue in Green Switch on the RGB Input Auto Sync Tracking Module

Blue characters are difficult to read, therefore the blue text will be displayed as cyan so that the readability becomes better.

Switch in the ON position   : Blue in Green active.

Switch in the OFF position : Blue in Green disabled.

WARNING : Leaving the switch in the ON position will result in abnormal color balance of the projected image.

Force Negative Sync on the RGB Input Auto Sync Tracking Module

Switch in the ON position   :   the sync pulses must be negative.
Switch in the OFF position :   the sync polarity will be automatically
                                            detected.

Connecting a RGB Analog source to Port 4/5

RGB analog input terminals with separate H and V sync inputs, composite sync input or sync signals on green can be connected to the projector via Port 4/5. The projector automatically detects where the sync signal is located.

An interface is recommended when connecting a computer and local monitor to the projector.

To select the RGB input :

Press the *numeric button 4 or 5* on the RCU or the local keypad.

Interface
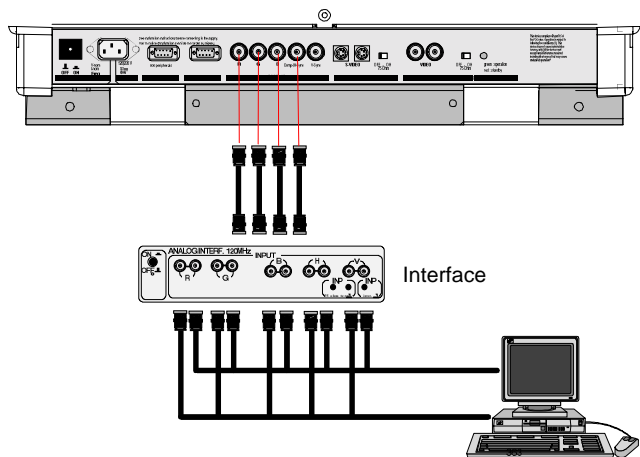
## Connecting a Component Video source to Port 4/5

A component video (R-Y, Y, B-Y) with sync signals can be connected to the projector via Port 4/5. The projector automatically detects where the sync signal is located.

To select the component video input :

Press the *numeric button 6* on the RCU or the local keypad.
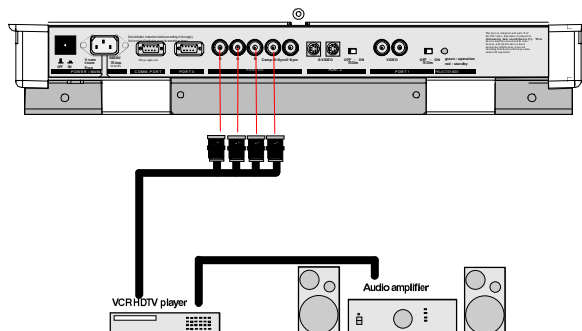

VCR HDTV player   Audio amplifier

Connecting a RGB Analog source with Tri-level sync to Port 4/5

RGB analog input terminals with Tri-level sync input or with Tri-level sync on green can be connected to the projector via Port 4/5. The projector detects automatically where the sync signal is located. This feature requires an optional Tri-Level Sync Module.

To select the input :

Press the *numeric button 7* on the RCU or the local keypad.
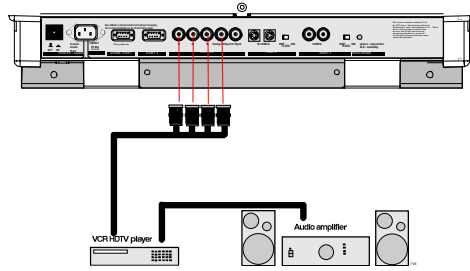
Connecting a Component Video source with Tri-level sync to Port 4/5

Component video inputs with Tri-level sync signal can be connected to the projector via Port 4/5. The projector detects automatically where the sync signal is located. This feature requires an optional Tri-Level Sync Module.

To select the input :

Press the *numeric button 8* on the RCU or the local keypad.

7 INSTALLATION ADJUSTMENT MODE
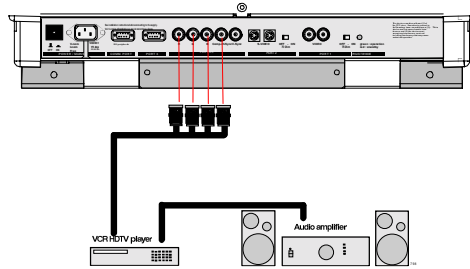
Access to Installation Adjustment Mode

It will be necessary to perform several mechanical adjustments while in the Installation Adjustment Mode. It will be required to open and remove the projector's top cover in order to gain access to the adjustment points.

To enter into the installation adjustment mode :

- Press the *<ADJUST>* key to start up the adjustment mode.

- Push the control stick forward or backward to highlight the path *INSTALLATION* in the "Adjustment mode" menu and then press the *<ENTER>* key.

- A warning will be displayed on the screen. If you are a qualified and authorized service person, press the *<ENTER>* key to start up the installation mode. Otherwise, press the *<EXIT>* key to return.

- When entering the installation mode, the projector will automatically switch to the internal pattern on 15 kHz/60 Hz.

- When the password mode is active (see p.5-3), you will be requested to enter the 4 digit password.

  Enter the digits with the numeric keys on the RCU or the local keypad.

  Example : Password as 2 3 1 9

  For each digit entered, a 'X' appears on the screen under the displayed text 'enter password'.

  If the entered password is correct, you get access to the 'Installation Adjustment Mode'.

  If the entered password is wrong, The message *"Wrong password!!!"* will be displayed. The projector stays on the previous selected item.

  Factory programmed password :

  0 0 0 0

```
ADJUSTMENT  MODE

Select a path from
below:
   GUIDED
   RANDOM ACCESS
   INSTALLATION
   SERVICE
   PROVERGE
```

```
WARNING
RISK OF ELECTRICAL SHOCK
NO USER ADJUSTABLE PARTS
INSIDE

THE FOLLOWING INSTALLATION
MENUS ARE RESERVED TO AND TO
BE PERFORMED BY ZENITH
PERSONNEL OR ZENITH
AUTHORIZED DEALERS

IF QUALIFIED, PRESS <ENTER> TO
CONTINUE OR
```

```
enter
password
```

```
Wrong Password !
```
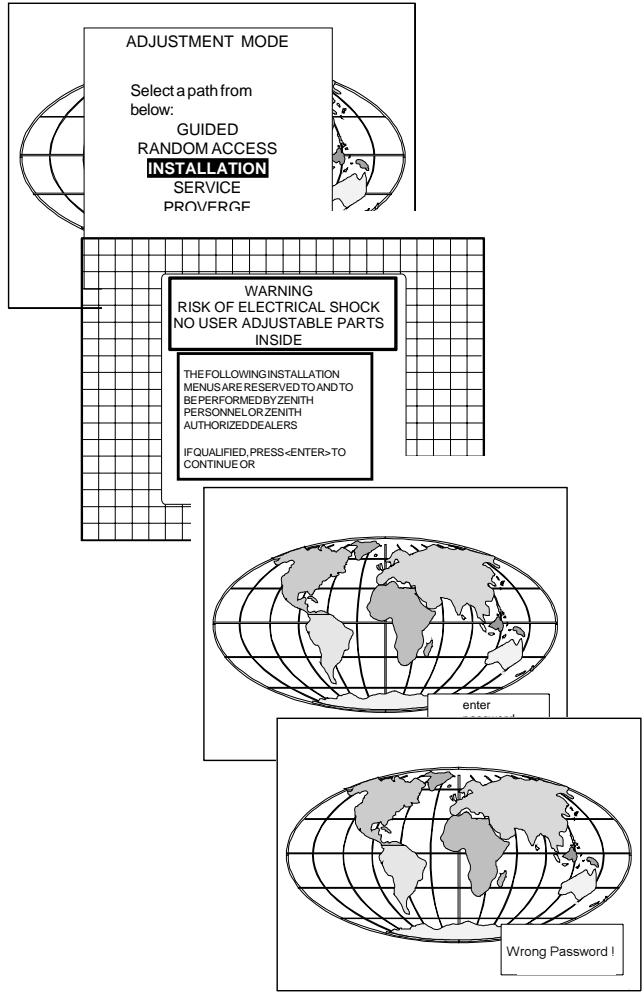
Overview flowchart of the Installation Adjustment Mode

| Adjustment Mode |

| Installation | → | Projector Distance | → | Optical Lens Focusing | → | Raster Centering |

→ | CRT Projection Angle Adjustment |
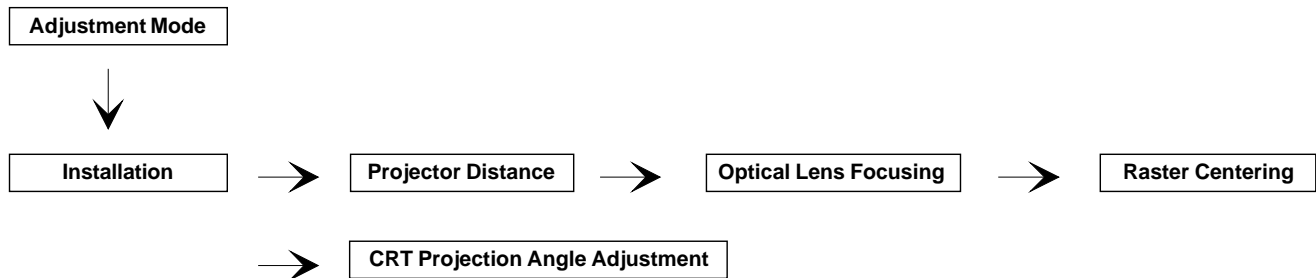
Important : Access to adjustments
The top cover of the projector should be removed in order to gain access to the adjustments.
Please refer to p.4-1 for how to remove the top cover.

Projector Distance

On the screen, a drawing will be displayed together with parameters indicating a correct installation position.

To change the screen width :
- Push the control stick to the left or to the right to highlight the item *SW* in the "Projector Distance 1" menu and then press the *<TEXT>* key.
- If the *<ENTER>* key is pressed, the "Optical Lens Focusing" will be displayed.
- If the *<EXIT>* key is pressed, the projector will return to the previous menu.
- After the *<TEXT>* key is pressed, the next menu "Projector Distance 2" will be displayed on the screen. It allows the user to change the Screen width.
- Push the control stick to the left or to the right to highlight the digit needed to be changed, and enter the desired digit with the numeric keys on the RCU or the local keypad.
- Press the *<ENTER>* key to confirm the changes. The projector will redisplay the "Projector Distance 1" menu with updated values for the three parameters.
- Press the *<ENTER>* key to continue with the "Optical Lens Focusing".

  If the *<EXIT>* key is pressed, the projector will return to the previous menu.

The same applies to the PD (projector distance). You can use the above-mentioned procedure to obtain a correct updated value of SW (screenwidth) after entering a new value of PD (projector distance).
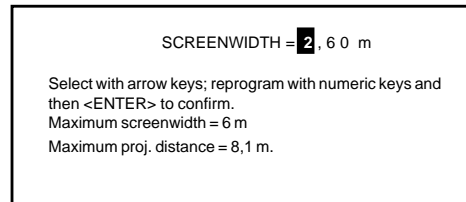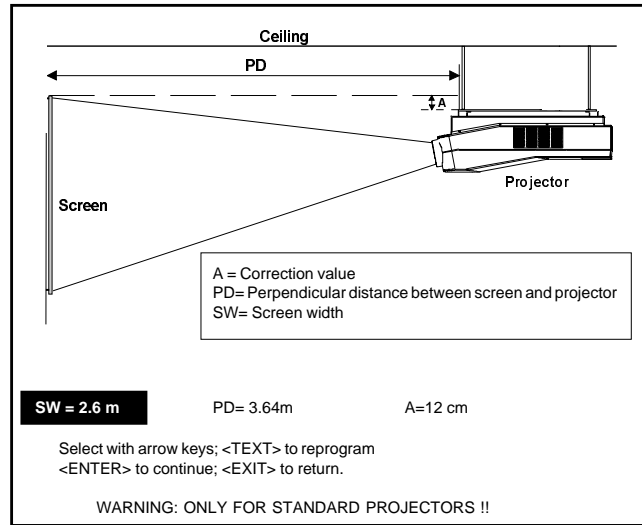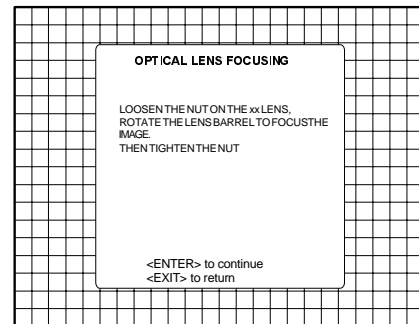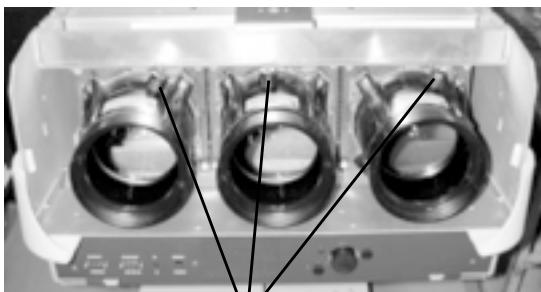
Optical Lens Focusing

The optical focusing procedure is performed separately for each lens. The appropriate CRT will be switched on as the user proceeds through the optical focusing adjustment sequence.

Each lens has one focus adjustment points. The the projected image is focused by loosening the wing nut of the lens and rotating the lens barrel until the the image is clearly focused.

Press the *<ENTER>* key to continue. After finishing focusing of the three lenses, press the *<ENTER>* key to enter the Raster centering.
Press the *<EXIT>* key to return to operational mode.
Press the *<ADJUST>* key to return to operational mode.


```
                           Ceiling
                    PD
                                              A
    Screen
                                           Projector

        A = Correction value
        PD= Perpendicular distance between screen and projector
        SW= Screen width

   SW = 2.6 m        PD= 3.64m          A=12 cm

   Select with arrow keys; <TEXT> to reprogram
   <ENTER> to continue; <EXIT> to return.

        WARNING: ONLY FOR STANDARD PROJECTORS !!
```

```
   SCREENWIDTH = 2, 6 0  m

   Select with arrow keys; reprogram with numeric keys and
   then <ENTER> to confirm.
   Maximum screenwidth = 6 m
   Maximum proj. distance = 8,1 m.
```



```
        OPTICAL LENS FOCUSING

   LOOSEN THE NUT ON THE xx LENS,
   ROTATE THE LENS BARREL TO FOCUS THE
   IMAGE.
   THEN TIGHTEN THE NUT

        <ENTER> to continue
        <EXIT> to return
```

xx = Green, Blue, Red

Focusing

Raster Centering

The raster must be centered on the CRT faceplate of each tube, therefore, it is necessary to look into the lenses.

Caution : To avoid eye discomfort while performing these adjustments, reduce the contrast and gradually increase the brightness level until the raster becomes visible behind the image.

> **Warning : In order to ensure maximum CRT longevity and to avoid CRT damage, do not shift the raster outside the phosphor area of the CRT.**

Press the *<ENTER>* key to display the raster on the green CRT.

Look into the green lens and shift the raster with the control stick until it is centered in the middle of the CRT faceplate.

Press the *<ENTER>* key to activate the raster on the Red CRT faceplate.
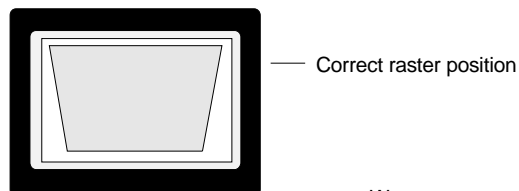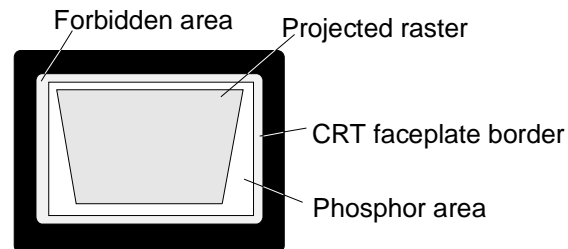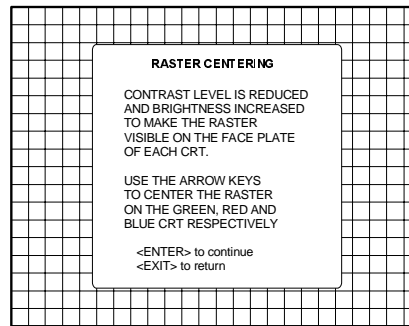Shift the Red raster with the control stick until the raster is centered on the CRT faceplate.

Press the *<ENTER>* key to activate the raster on the Blue CRT faceplate.
Shift the Blue raster with the joy stick until the raster is centered on the CRT faceplate.

Press the *<ENTER>* key to continue with the CRT projection angle adjustment.

Press the *<EXIT>* key to return to Optical focusing.
Press the *<ADJUST>* key to return to Operational mode.

RASTER CENTERING

CONTRAST LEVEL IS REDUCED AND BRIGHTNESS INCREASED TO MAKE THE RASTER VISIBLE ON THE FACE PLATE OF EACH CRT.

USE THE ARROW KEYS TO CENTER THE RASTER ON THE GREEN, RED AND BLUE CRT RESPECTIVELY

<ENTER> to continue
<EXIT> to return

Forbidden area   Projected raster

CRT faceplate border

Phosphor area

Correct raster position

Wrong raster position
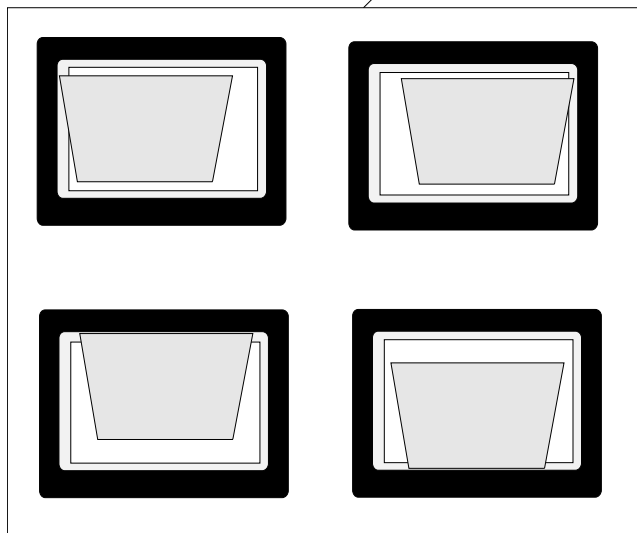
CRT Projection Angle Adjustment

The projection angle of the red and blue CRT's is dependent on the desired size of the projected image. If the centers of green, blue and red do not coincide, the CRT projection angle must be adjusted.

NOTE : Never try to correct this misalignment with the shift correction or the static convergence controls. These controls may only be applied to correct small errors which cannot be corrected by the CRT angle adjustment.
Note: The Horizontal Shift and Vertical Shift for Red and Blue should be set near 50%.

Be sure that the rasters are centered on the CRT faceplate.

Press the <*ENTER*> key to start the CRT angle adjustment procedure.
Press the <*ENTER*> key to continue with the second part of the CRT projection angle adjustment.
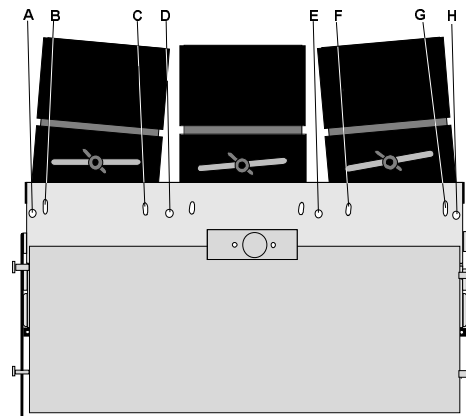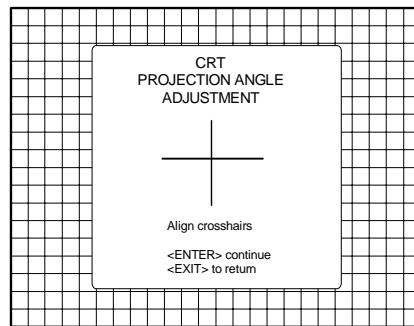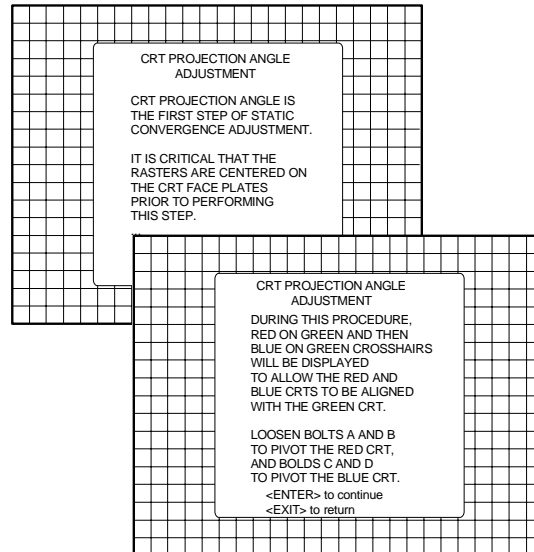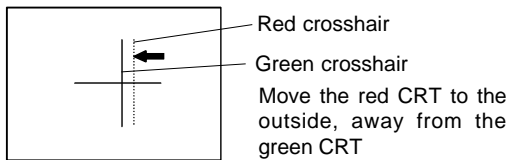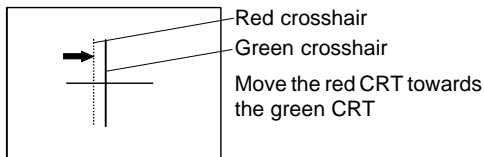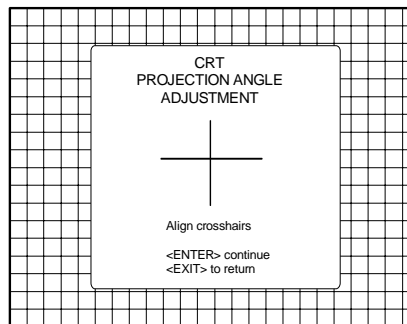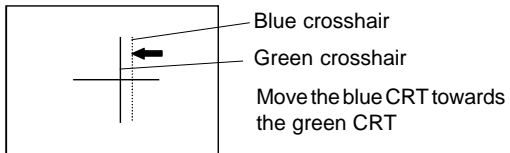
Press the <*ENTER*> key to continue with the crosshairs alignment.
Press the <*EXIT*> key to return to the previous menu.
Press the <*ADJUST*> key to return to Operational mode.

Loosen bolts A, B, C and D to pivot the red CRT until the center of the Red image and the center of the Green image coincide. When the angle of the red CRT is corrected, tighten the four bolts.
Press the <*ENTER*> key to continue with blue and green crosshairs.
Press the <*EXIT*> key to return to the CRT projection angle adjustment menu.

CRT PROJECTION ANGLE ADJUSTMENT

CRT PROJECTION ANGLE IS THE FIRST STEP OF STATIC CONVERGENCE ADJUSTMENT.

IT IS CRITICAL THAT THE RASTERS ARE CENTERED ON THE CRT FACE PLATES PRIOR TO PERFORMING THIS STEP.

CRT PROJECTION ANGLE ADJUSTMENT
DURING THIS PROCEDURE, RED ON GREEN AND THEN BLUE ON GREEN CROSSHAIRS WILL BE DISPLAYED TO ALLOW THE RED AND BLUE CRTS TO BE ALIGNED WITH THE GREEN CRT.

LOOSEN BOLTS A AND B TO PIVOT THE RED CRT, AND BOLDS C AND D TO PIVOT THE BLUE CRT.
<ENTER> to continue
<EXIT> to return

CRT PROJECTION ANGLE ADJUSTMENT

Align crosshairs

<ENTER> continue
<EXIT> to return

Red crosshair
Green crosshair
Move the red CRT towards the green CRT

Red crosshair
Green crosshair
Move the red CRT to the outside, away from the green CRT

A B   C D   E F   G H

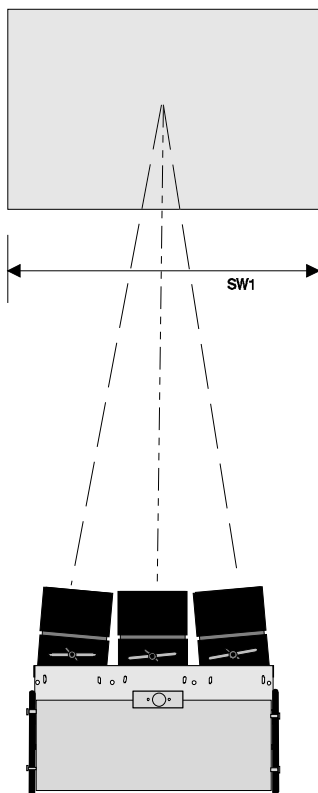Loosen bolts E, F, G and H to pivot the blue CRT until the center of the Blue image and the center of the Green image coincide. When the angle of the blue CRT is corrected, tighten the four bolts.
Press the *<ENTER>* key to continue with the diagonal focusing menu.
Press the *<EXIT>* key to return to the CRT projection angle adjustment.

CRT
PROJECTION ANGLE
ADJUSTMENT

Align crosshairs

<ENTER> continue
<EXIT> to return

Blue crosshair
Green crosshair
Move the blue CRT to the outside, away from the green CRT

Blue crosshair
Green crosshair
Move the blue CRT towards the green CRT
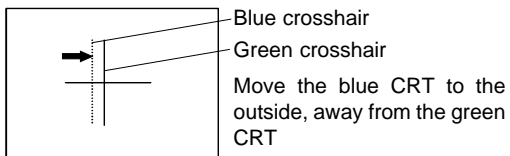
Projection angle correctly aligned for screen width SW1.

The same projection angle is misaligned for new screen width SW2. Realignment is necessary. Each screen width change requires readjustment of the projection angle.

SW1

SW2
(SW1 > SW2)
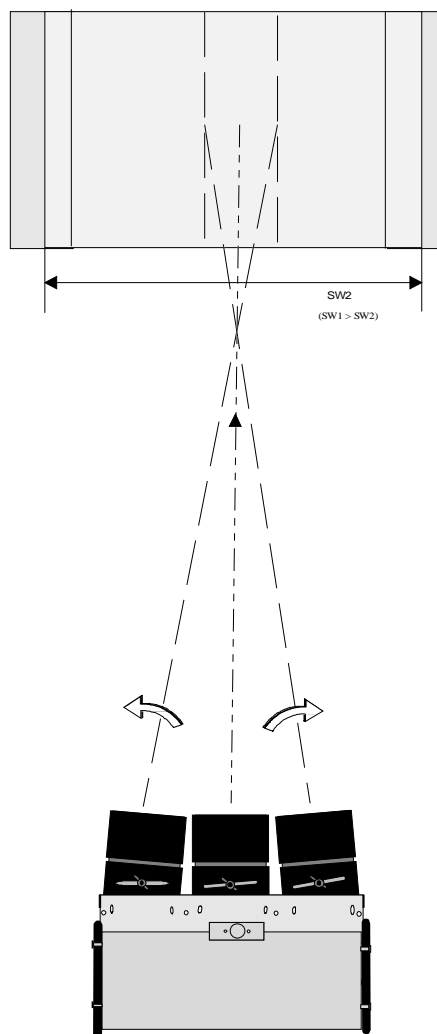
Scheimpflug adjustment

To adjust the Scheimpflug correction for each colour, follow the next procedure:

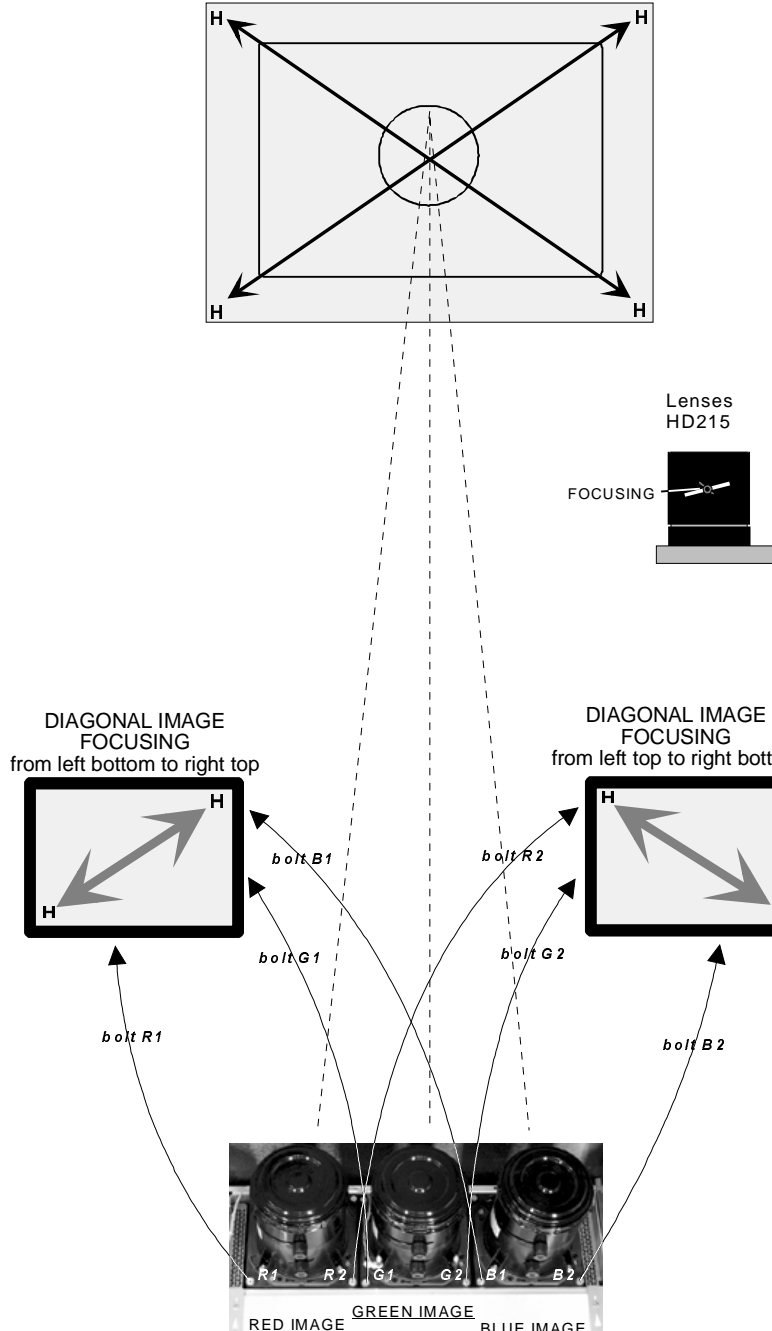| Step	Action
1	**First, be sure that the CRT projection angle is correctly adjusted, to ensure proper overall focus of the image.**
2	*Example : diagonal focusing of the GREEN image.* Equalize diagonally the focus from left (bottom) to right (top) by turning screw G1 and from left (top) to right (bottom) by turning screw G2.
3	Repeat the same procedure for the RED and BLUE image using the corresponding screws.
4	To optimize the image focusing, repeat the optical lens focusing.

Lenses
HD215

FOCUSING

DIAGONAL IMAGE
FOCUSING
from left bottom to right top

DIAGONAL IMAGE
FOCUSING
from left top to right bottom

bolt B1

bolt R2

bolt G1

bolt G2

bolt R1

bolt B2

R1   R2   G1   G2   B1   B2

RED IMAGE   GREEN IMAGE   BLUE IMAGE

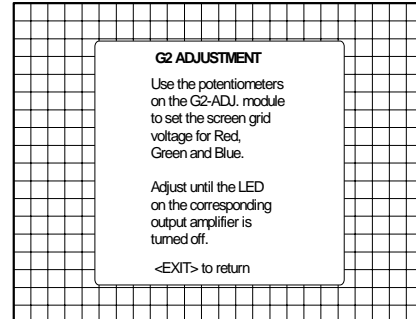# 8 MESSAGES, WARNINGS AND FAILURE CODES

SOURCE 01
Fh= 15.6 kHz
Fv= 060 Hz

When selecting a new source, information about this source will be displayed on the screen. Source number, horizontal and vertical frequencies of the displayed source.

WARNING :

source not
available

The input is a valid input but the source is not connected to the input terminals or the input source is switched off.

SOURCE 01
Fh= 15.6 kHz
Fv= 060 Hz

Announcement of the selected source.

WARNING :

invalid
key entry

When a wrong key is pressed on the RCU.

---

enter
password
xxxx

Message to enter your password. Password contains 4 digits.

WARNING :

invalid
code entry

Message when the entered password is wrong.

---

text on

These messages will be displayed on the screen when pushing the *<TEXT>* key.

Text ON : the *'Bar scale indication'* will be enabled during the change of an analog control in the *'Operational mode'.* All warning and failure messages will be displayed.

Text OFF : the *'Bar scale indication'* will be disabled during the change of an analog control in the *'Operational mode'.* All warning and failure massages will not be displayed.

text off

WARNING :

end of ad-
just range

End of adjustment range.

WARNING :
input no
longer
available

Message will be displayed when the input source is no longer available. The following message then appears: *'check input signal or select new source'.*

PROJECTOR
ADDRESS :
003

Indication of the projector address when activating the *'ADDRESS'* button on the RCU with a pencil or other small object.

---

check input signal
or select
new source

This message will be displayed after the message *'input no longer available'.* It asks to check the connections between the source and the projector or to check if the source is switched on.

WARNING :

input not
available

When using the projector with the RCVDS, this warning will be displayed when selecting an input slot of an RCVDS where the input board is missing.

WARNING :
input selector
not
available

It warns you to check the power connection or the power status of the RCVDS.
Next message will appear immediately on the screen : *'go to standby'.*

WARNING : **go to** **stand by**	Projector will switch to *'Standby'* when the RCVDS is no longer available.

FAILURE **RWI commu-** **nication** **error**	Hardware failure. Call a qualified service technician.

WARNING : **invalid** **frequency** **input**	The entered frequency or applied frequency of the source is out of the projector's range.

FAILURE **ProVerge commu-** **nication** **error**	Communication error between ProVerge and the projector. Call a qualified service technician.

WARNING : **default** **settings** **loaded in** **the E2PROM**	Adjustment settings are lost. Reload using Projector Control Software via PC or MAC (if this option is available), or readjust image.

WAIT **starting** **up** **ProVerge**	Message during the start up of the ProVerge. Message will disappear when the ProVerge is ready to accept commands.

table is **deleted**	Message to inform that selected table is deleted. This message will be followed by *'confirm message'*, on which the user has to answer.

FAILURE **invalid** **RWI soft** **version**	Wrong software version in your projector. Call for technical support.

FAILURE **I²C error** **addr. : 7FH3**	Hardware failure. Call a qualified service technician for repair.

FAILURE **short** **circuit on** **I²C bus**	Hardware failure. Call a qualified service technician for repair.

A G2 ADJUSTMENT

Once the on-screen menu "G2 ADJUSTMENT" is displayed, proceed as follows :

G2 ADJUSTMENT

Use the potentiometers on the G2-ADJ. module to set the screen grid voltage for Red, Green and Blue.

Adjust until the LED on the corresponding output amplifier is turned off.

<EXIT> to return

- Remove the top cover from the projector (see p.4-1) and open the front metal protection cover by turning out the 3 retaining screws on both sides.

- A green LED is mounted on each of CRT sockets (see Photo 2).

  When selecting the G2 adjustment menu, these green LEDs must be out. If not, follow the procedure below to adjust the G2 :

  - Open the second metal cover by turning out the retaining screws on both sides and pivot the cover to the front side of the projector (see Photo 1);

  - Adjust the G2 potentiometers (see Photo 3) very slowly with a plastic tweaker until the LED of the corresponding amplifier just stops illuminating. Repeat the adjustment for the other colors;

  - After the three G2 potentiometers have been correctly adjusted, close both metal covers and secure with the retaining screws.

1

Retaining screws

3

Green potentiometer

Red potentiometer

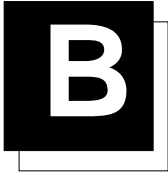Blue potentiometer

2

Green LEDs
.
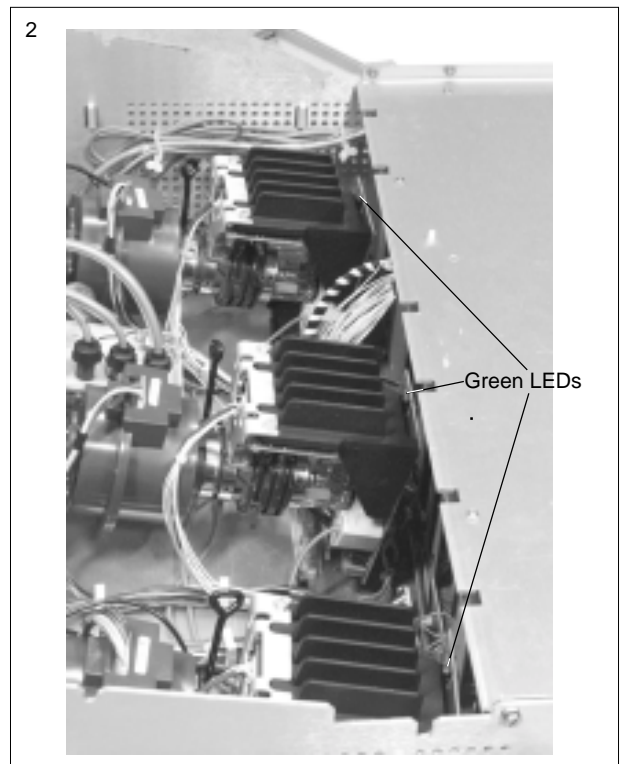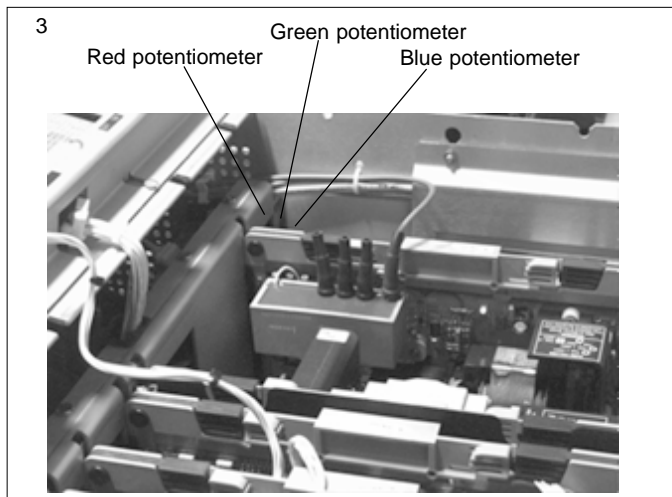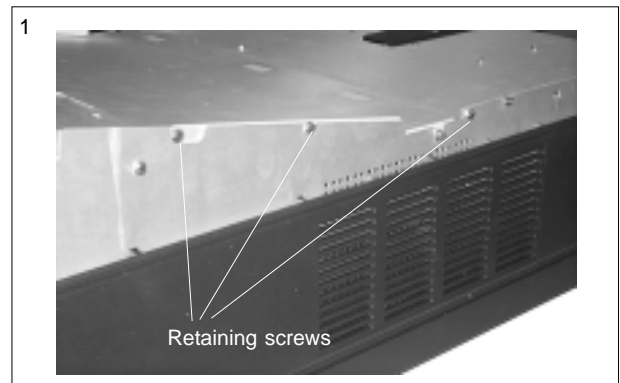
After finishing the adjustments :

Press the <ENTER> key to continue with the *"SERVICE"* menu.
Press the <EXIT> key to return to the *"SERVICE"* menu.
Press the <ADJUST> key to return to Operational mode.

B **GAMMA CORRECTIONS**

When entering the gamma corrections, a warning will be displayed :

"RISK OF INCORRECT ADJUSTMENT OF THE PROJECTOR. THE GAMMA CORRECTIONS ARE FACTORY ADJUSTED USING AN ACTAS COLOR ANALYZER ! THEREFORE, ONLY QUALIFIED INSTALLATION OR SERVICE PERSONNEL SHOULD PERFORM THESE ADJUSTMENTS ! "

If you are qualified, press the *<ENTER>* key to continue.

Gamma Corrections

Three items can be selected inside the "Gamma Corrections" menu: the Blue Gamma Correction, the R & B midlights and the factory preset.

To carry out the Blue Gamma Correction :

- Push the control stick forward or backward to highlight the item *BLUE GAMMA CORRECTION* in the menu and then press the *<ENTER>* key.

  If the *<EXIT>* key is pressed, the projector will return to the *Service* menu.

- After the *<ENTER>* key is pressed, a text box with the message, "Adjust with arrow key", will be displayed on the screen.

- Push the control stick forward or backward to adjust the slope, a text box with a bar scale (Min to Max) will be displayed to visualize the magnitude of the correction.

- Push the control stick to the left or to the right to adjust the breakpoint, a text box with a numeric bar scale (0-99) will be displayed to visualize the magnitude of the correction.

- Press the *<ENTER>* key to return to the "Gamma Corrections" menu.


```
WARNING
RISK OF INCORRECT
ADJUSTMENT OF THE
PROJECTOR.

THE GAMMA CORRECTIONS ARE
FACTORY ADJUSTED USING AN
ACTAS COLOR ANALYZER !
THEREFORE, ONLY QUALIFIED
INSTALLATION OR SERVICE
PERSONNEL SHOULD PERFORM
THESE ADJUSTMENTS !
```
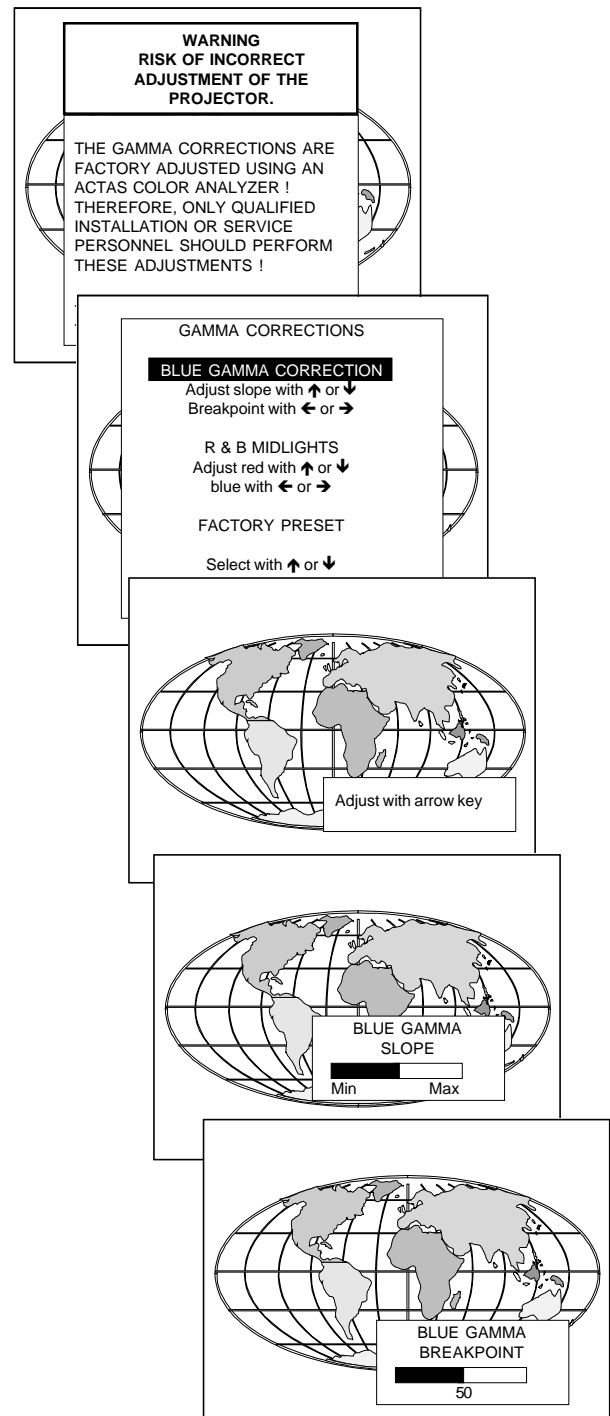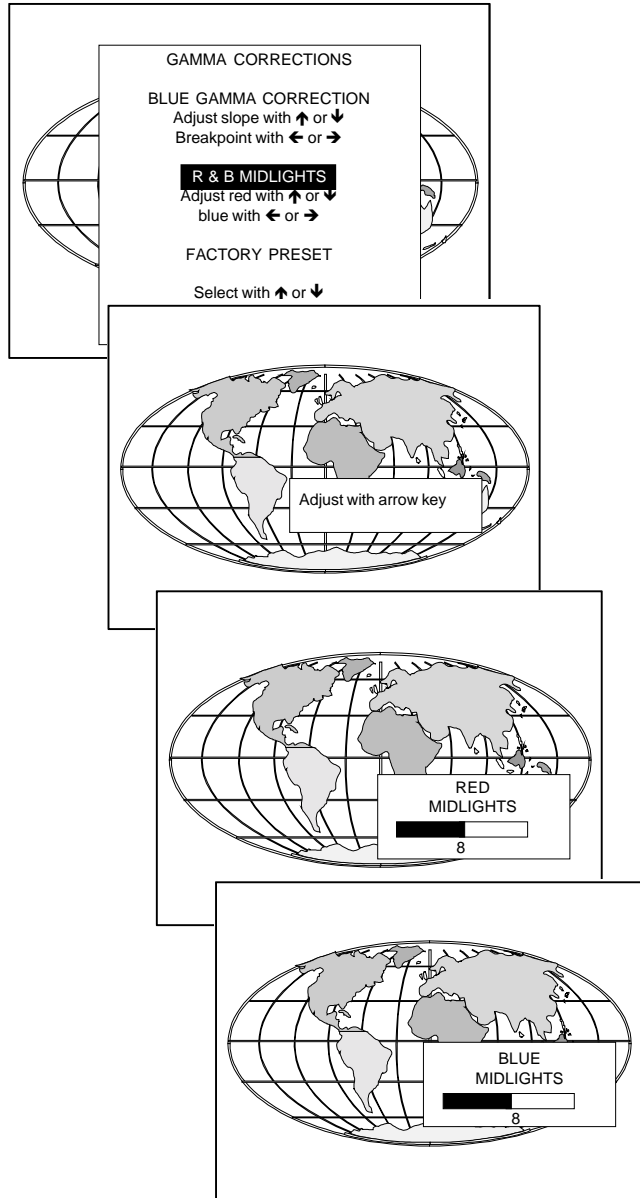
```
GAMMA CORRECTIONS

BLUE GAMMA CORRECTION
Adjust slope with ↑ or ↓
Breakpoint with ← or →

R & B MIDLIGHTS
Adjust red with ↑ or ↓
blue with ← or →

FACTORY PRESET

Select with ↑ or ↓
```

Adjust with arrow key

```
BLUE GAMMA
SLOPE
Min        Max
```

```
BLUE GAMMA
BREAKPOINT
50
```

To carry out the Red and Blue Midlights Correction :

- Push the control stick forward or backward to highlight the item *R & B MIDLIGHTS* in the menu and then press the *<ENTER>* key.

  If the *<EXIT>* key is pressed, the projector will return to the *Service* menu.

- After the *<ENTER>* key is pressed, a text box with the message "Adjust with arrow key", will be displayed on the screen.

- Push the control stick forward or backward to adjust the Red Midlights, a text box with a bar scale (0-16) will be displayed to visualize the magnitude of the correction.

- Push the control stick to the left or to the right to adjust the Blue Midlights, a text box with a bar scale (0-16) will be displayed to visualize the magnitude of the correction.

- Press the *<ENTER>* key to return to the "Gamma Corrections" menu.

GAMMA CORRECTIONS

BLUE GAMMA CORRECTION
Adjust slope with ↑ or ↓
Breakpoint with ← or →

R & B MIDLIGHTS
Adjust red with ↑ or ↓
blue with ← or →

FACTORY PRESET

Select with ↑ or ↓

Adjust with arrow key

RED
MIDLIGHTS

8

BLUE
MIDLIGHTS

8

To set the parameters back to the factory preset values :

- Push the control stick forward or backward to highlight the item *FACTORY PRESET* in the menu and then press the *<ENTER>* key.

- Press the *<EXIT>* key to return to the *Service* menu.

GAMMA CORRECTIONS

BLUE GAMMA CORRECTION
Adjust slope with ↑ or ↓
Breakpoint with ← or →

R & B MIDLIGHTS
Adjust red with ↑ or ↓
blue with ← or →

FACTORY PRESET

Select with ↑ or ↓
then <ENTER>;
<EXIT> to return.