BARCO Projection Systems
Noordlaan 5 B-8520 Kuurne

BARCO

BARCO DATA 650

90 00610
90 00619

INSTALLATION MANUAL

Date :
15/01/91

16F1
UL LISTED
E.D.P. EQUIPMENT

ART. NR. :
59 75354

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

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INSTALLATION INSTRUCTIONS

Before operating the set please read this manual thoroughly, and retain it for future reference.

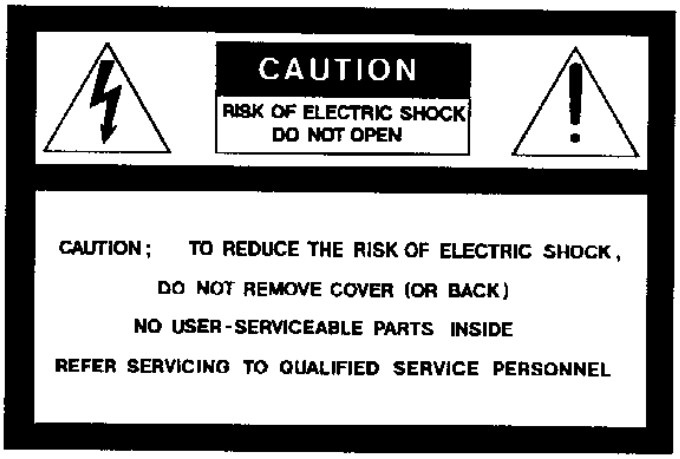
Installation and preliminary adjustments should be performed by qualified BARCO personnel or BARCO authorised service dealers.

OWNER'S RECORD

The part number and serial number are located at the rear side. Record these numbers in the spaces provided below. Refer to them whenever you call upon your BARCO dealer regarding this product.

PART NUMBER: _____	**BARCO Projection Systems**
CH. ___ **SER. NUMBER** _____	**BELGIUM**

SAFETY INSTRUCTIONS



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

WARNING
TO PREVENT FIRE OR ELECTRICAL SHOCK HAZARD, DO NOT EXPOSE THIS PROJECTOR TO RAIN OR MOISTURE

FEDERAL COMMUNICATION COMMISSION (FCC STATEMENT)

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

SAFETY INSTRUCTIONS

* All the safety and operating instructions should be read before using this unit.

* The safety and operating instructions manual should be retained for future reference.

* All warnings on the projector and in the documentation manuals should be adhered to.

* All instructions for operating and use of this equipment must be followed precisely.

ON SAFETY

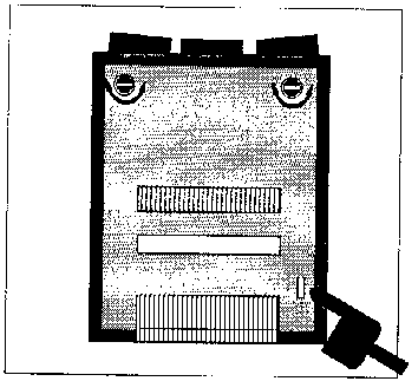
1. This product should be operated from the type AC power source indicated on the marking label, visible through the clear window on the top cover of the projector.

Operating AC power voltage of the projector:

BARCODATA 650
Art.Nr 90 00610 (*220V AC*)
Art.Nr.90 00619 (*110V AC*)

If you are not sure of the type of AC power available, consult your dealer or local power company.

2. This product is equipped with a 3-wire grounding plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.

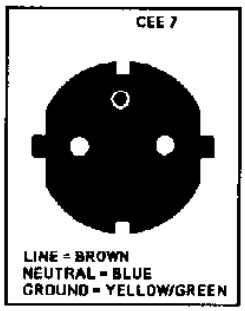


WARNING:THIS APPARATUS MUST BE GROUNDED (EARTHED)

WARNING FOR THE CUSTOMERS: THIS APPARATUS MUST BE GROUNDED (EARTHED) via the supplied 3 conductor AC power cable in accordance with the following instructions:

SAFETY INSTRUCTIONS

A. Mains lead (AC Power cord) with CEE 7 plug:



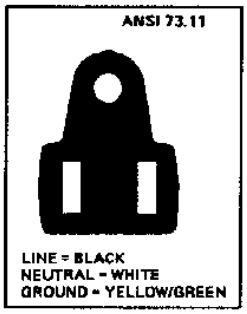
As the wires of the mains lead are colored in accordance with the following code:

Green-and-yellow:	Earth (safety earth)
Blue:	Neutral
Brown:	Live

As the colors of the wires in the mains lead of this projector may not correspond with the colored markings identifying the terminals in your plug, proceed as follows.

The green-and-yellow wire must be connected to the terminal in the plug which is marked with the letter E or by the safety earth symbol ⏚ or colored green or green-and-yellow.
The blue wire must be connected to the terminal which is marked with the letter N or colored black.
The brown wire must be connected to the terminal which is marked with the letter L or colored red.

B. Power cord with ANSI 73.11 plug:



The wires of the power cord are colored in accordance with the following code.

Green/yellow:	ground
White:	neutral
Black:	live

3. Do not allow anything to rest on the power cord. Do not locate this product where persons 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.

5. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock.

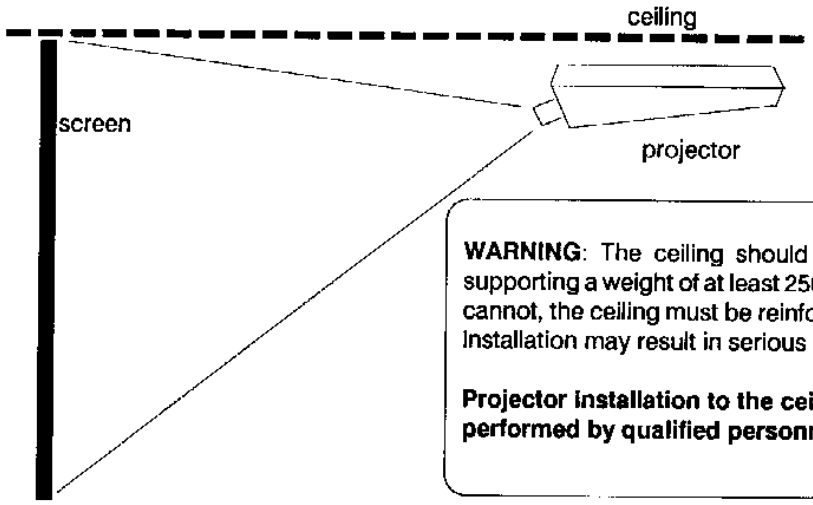
Never spill liquid of any kind on the product. Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified service personnel before resuming operations.

6. Lightning - For added protection for this video product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the projector due to lightning and AC power-line surges.

SAFETY INSTRUCTIONS

ON INSTALLATION

STANDARD CONFIGURATION



WARNING: The ceiling should be capable of supporting a weight of at least 250Kg(551LB). If it cannot, the ceiling must be reinforced. Improper installation may result in serious personal injury.

Projector installation to the ceiling should be performed by qualified personnel only.

The projector is factory preset for front screen projection/ceiling mounted and adjusted for a screen size of 2.40m x 1.80m (7.87Ft x 5.90Ft).

The projector can also operate in other configurations as well I.e. rear projection, table mounted and for different screen sizes.
The screen sizes are limited to: - min screen size: 1.00m x 0.75m (3.28Ft x 2.46Ft)
- max screen size: 6.00m x 4.50m (19.68Ft x 14.76Ft)

WARNING: Only a qualified service representative or BARCO service center is authorized to change the configuration of this projector!

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

2. Do not use this projector near water.

3. Slots and openings in the cabinet and the back or bottom 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 vertillation is provided.

SAFETY INSTRUCTIONS

ON SERVICING

Do not attempt to service this projector yourself, as opening or removing covers may expose you to dangerous voltage potentials and risk of electric shock! **Refer all sevicing to qualified service personnel.**

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power cord or plug is damaged or frayed.

b. If liquid has been spilled into the projector.

c.If the product has been exposed to rain or water.

d. If the product does not operate normally when the operating instructions are followed.
Adjust only those controls that are covered by the operating instructions since improper adjustment of the other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation;

e. If the product has been dropped or the cabinet has been damaged;

f. If the product exibits a distinct change in performance, indicating a need for service.

Replacement parts - When replacement parts are required, be sure the service technician has used original BARCO replacement parts or authorized replacement parts which have the same characteristics as the BARCO original part. Unauthorized substitutions may result in degraded performance and reliability, fire, electric shock or other hazards. Unauthorized substitutions may void warranty.

Safety check - Upon completion of any service or repairs to this projector, ask the service technician to perform safety checks to determine that the projector is in proper operating condition.

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.

SAFETY INSTRUCTIONS

ON REPACKING

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

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 florescent 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.

UNPACKING

DIMENSIONS

UNPACKING

UNPACKING

Take the projector out of its shipping carton and place it on a table.
For transportation utilities, the projector is mounted on a plank with 4 bolts. Use two 13 mm wrenches to loosen these bolts.

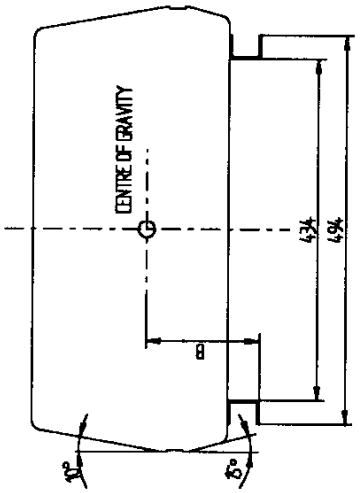
Save the original shipping carton and packing material : they will come in handy if you ever have to ship your projector. For maximum protection, repack your projector as it was originally packed at the factory.

Contents of the shipped box :

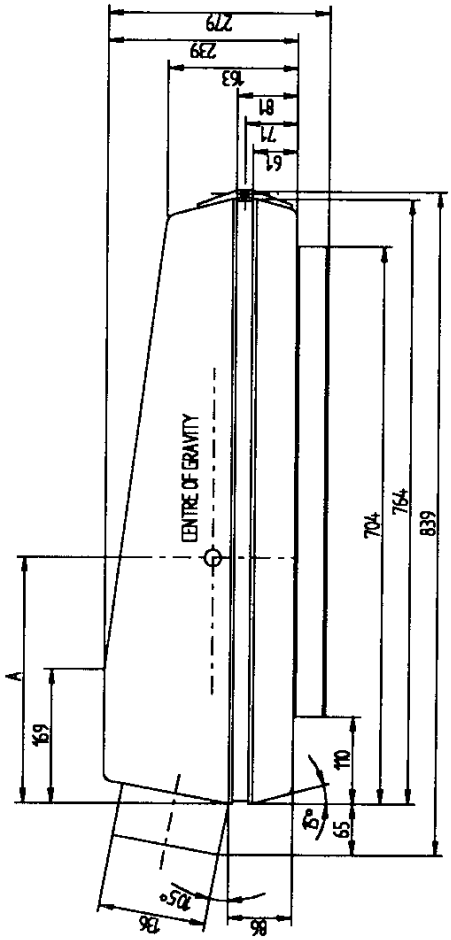
- 1 BARCODATA 650
- 1 power cable with outlet plug type CEE7 or ANSI 73.11.
- 4 supporting legs
- 1 connector clamp
- 1 control box extension cable
- 1 owner's manual
- 1 installation manual (only for qualified technicians)

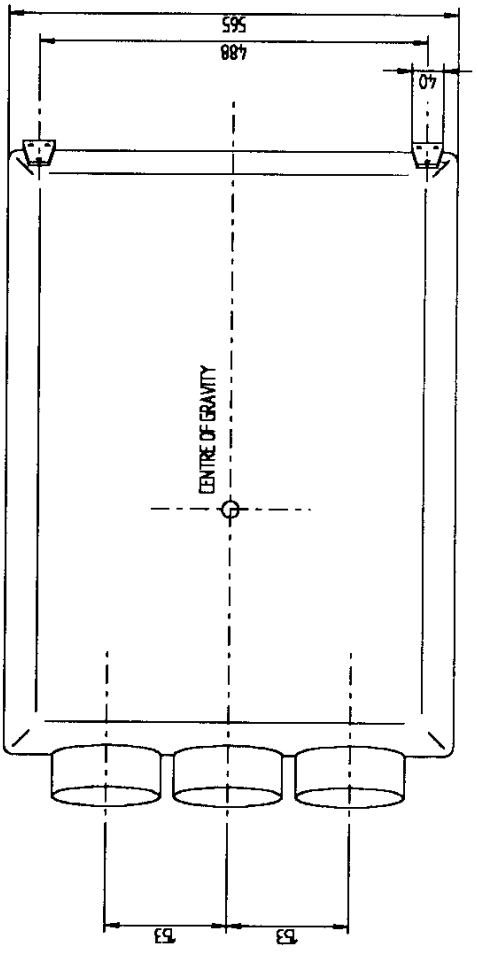
PROJECTOR DIMENSIONS

PROJECTOR DIMENSIONS



Name	Type of lens	A (mm)	B (mm)
BD650	HD16	310	146





Notes

INSTALLATION GUIDELINES

ENVIRONMENT

WHAT ABOUT AMBIENT LIGHT?

WHICH SCREEN TYPE?

WHAT IMAGE SIZE? HOW BIG SHOULD THE IMAGE BE?

WHERE TO INSTALL THE PROJECTOR?

HOW TO INSTALL THE PROJECTOR?

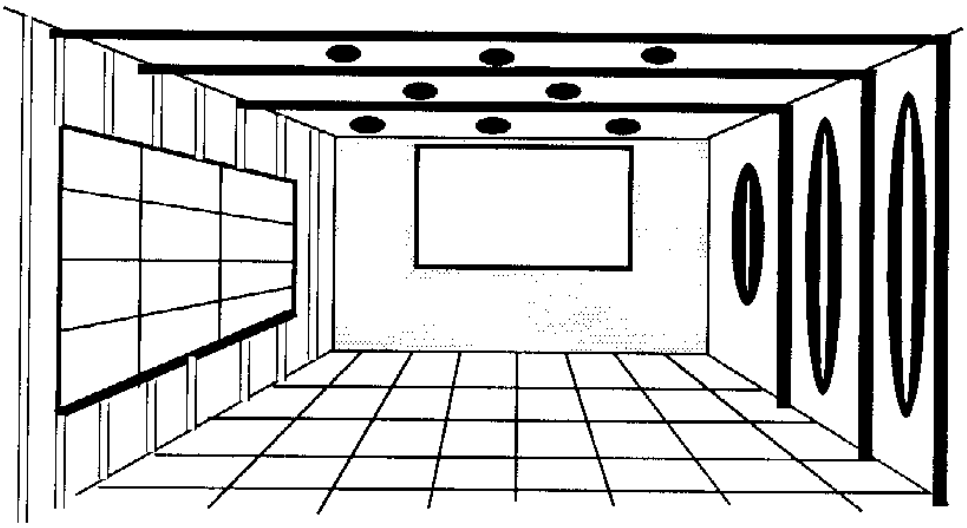
INSTALLATION GUIDELINES

INSTALLATION GUIDELINES

Careful consideration of things as image size, ambient light level, projector placement and type of screen to use are critical to the optimum 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; check that 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.
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. That appears as a less of 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.

INSTALLATION GUIDELINES

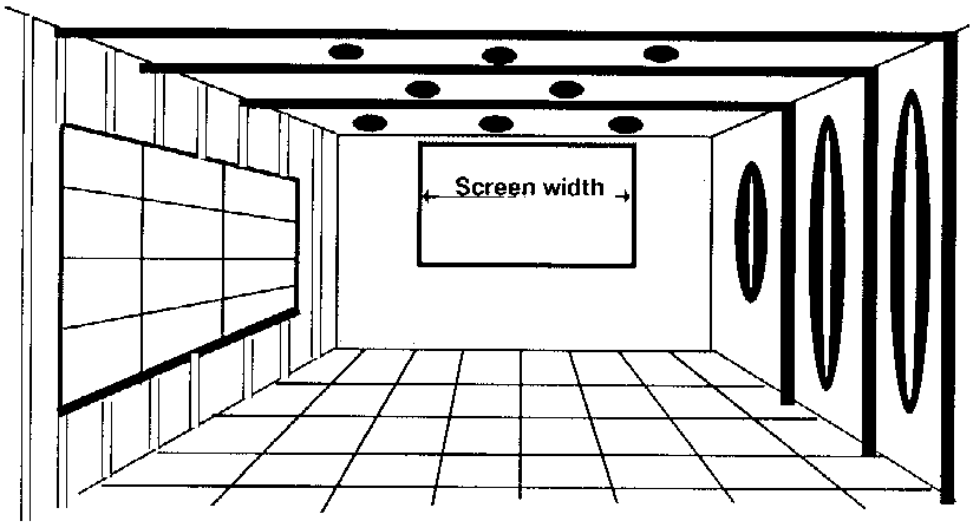
*** Which screen type?**

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 the 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) of more. The choice between higher and lower gain screens is largely a matter of personal preference and another consideration called the Viewing angle.

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 BARCODATA 650 is designed for projecting an image size from1.2m (4') to 6m (19.8') with a aspect ratio of 4 to 3. It leaves the BARCO factory, adjusted as a ceiling front projector for a screen size of 2.40 x 1.80 m. Changing the image size from the factory preset requires a realignment of the projector.

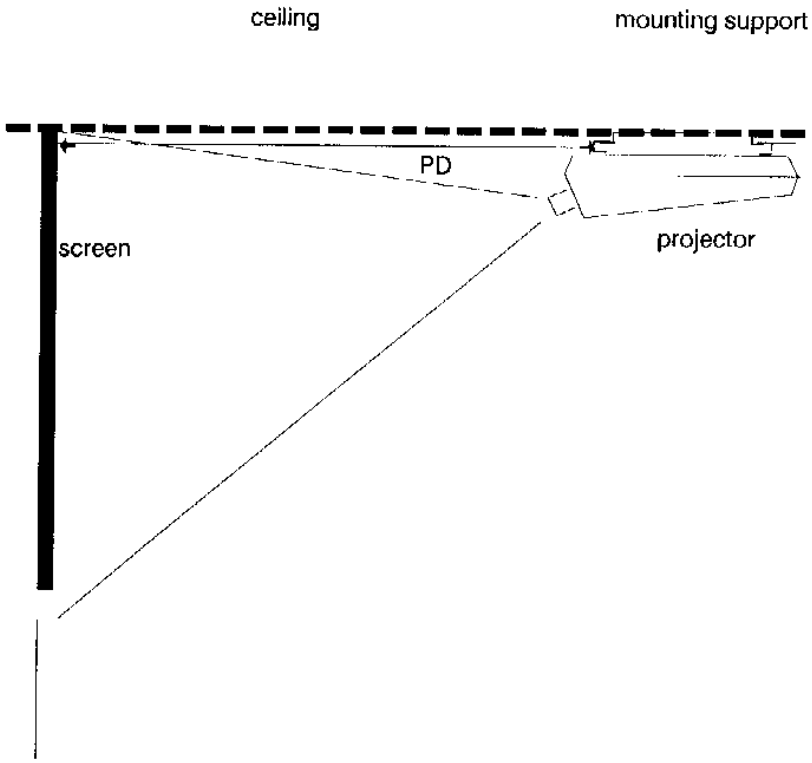
INSTALLATION GUIDELINES

*** Where to install the projector?**

To indicate a correct installation position it is necessary to know the distance :
- projector - screen

To find this correct position for the BARCODATA 650, 3 possible ways are indicated in the next paragraphs.

- a diagram which indicates the distances in function of the screen width.
- a table which gives immediately the correct position for different screen widths.
- a formula which gives directly the correct position.

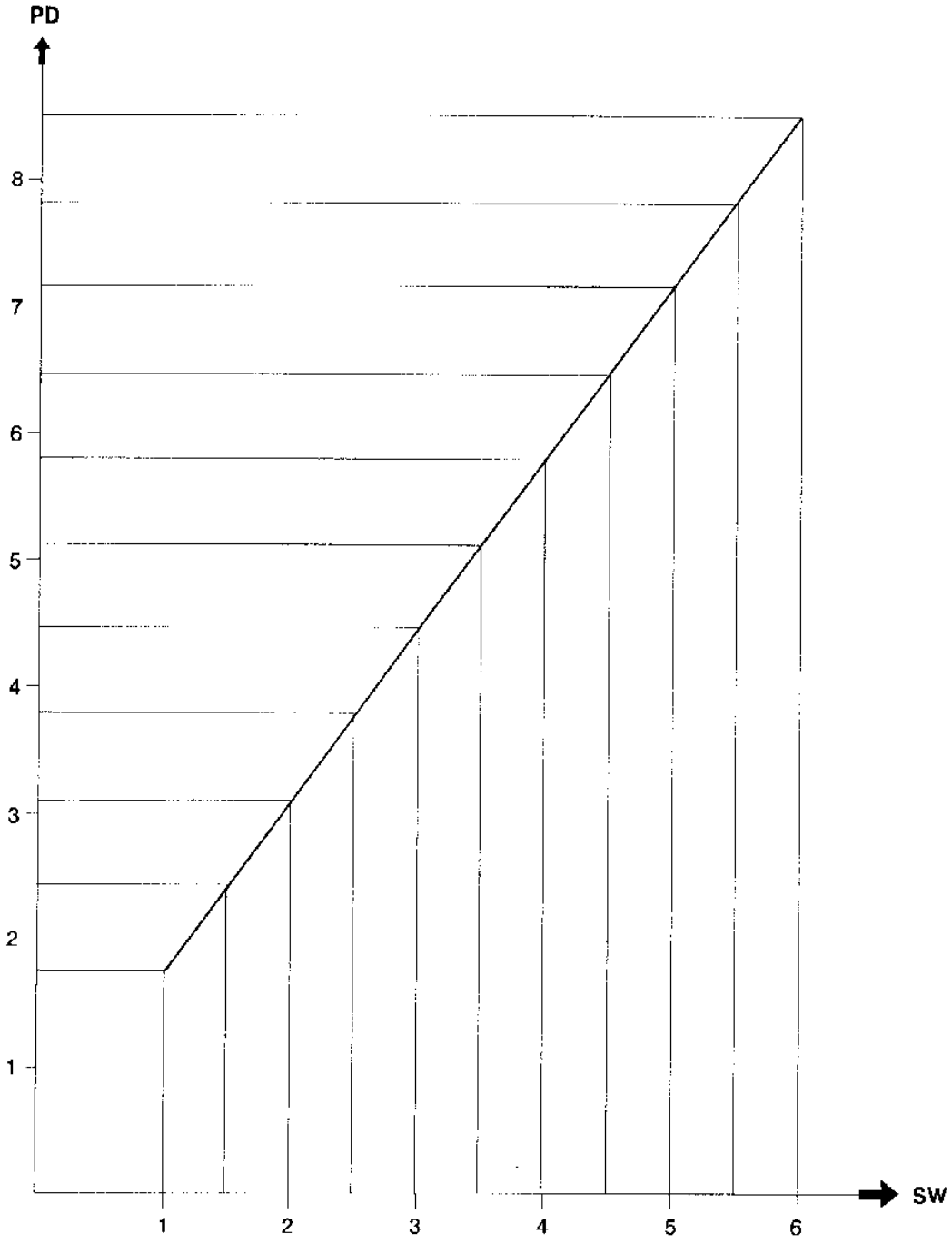


INSTALLATION GUIDELINES

Lens diagrams for HD6 lens.

Projector screen distance in function of the screen width (metric)

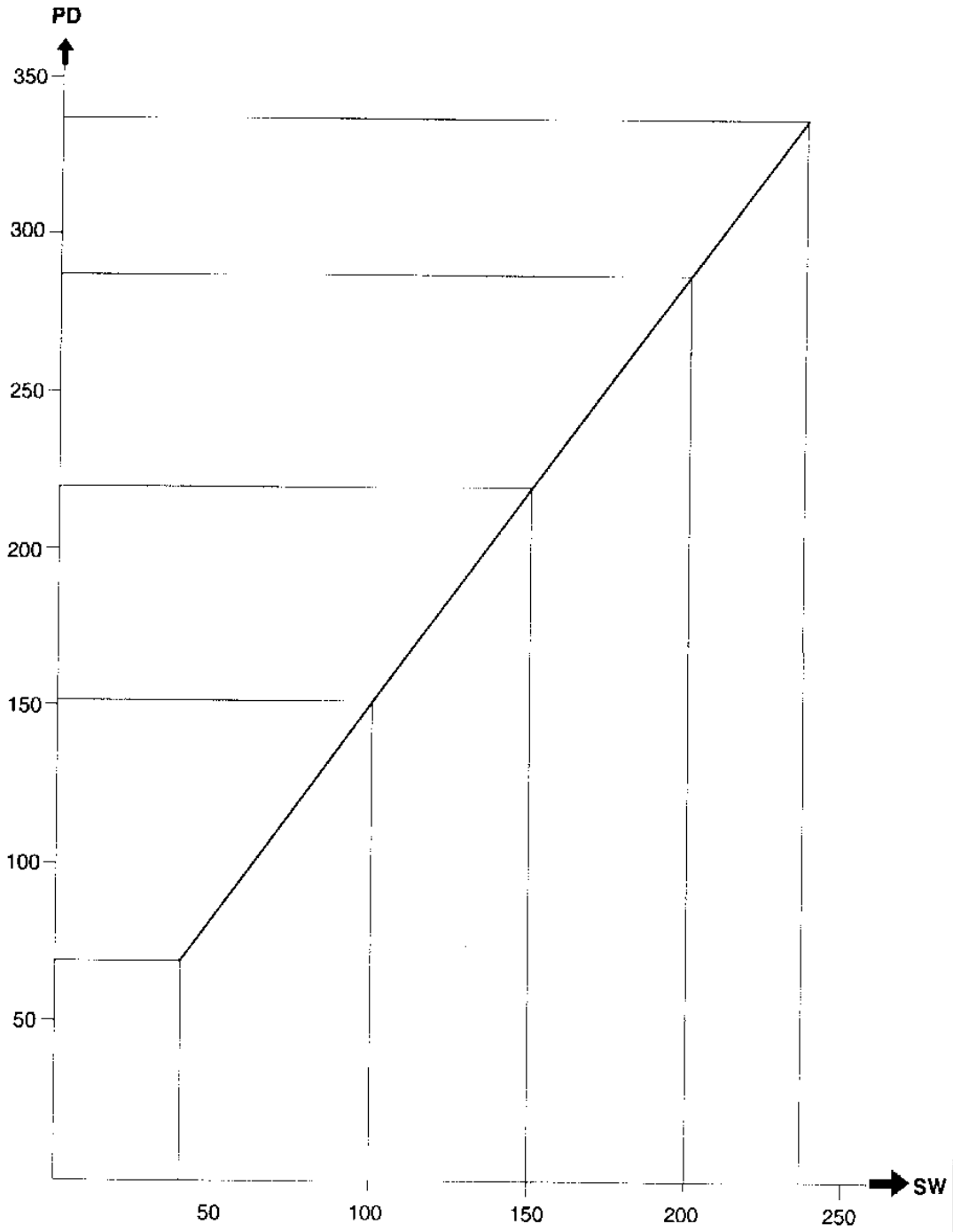
Scale : 2 cm = 1 m



INSTALLATION GUIDELINES

Projector screen distance in function of the screen width (inch)

Scale : 1 inch = 50 inch



INSTALLATION GUIDELINES

Distance tables and formulas (metric)

SW [m]	PD [m]
1.00	1.75
1.10	1.89
1.20	2.02
1.30	2.16
1.40	2.29
1.50	2.43
1.60	2.56
1.70	2.70
1.80	2.83
1.90	2.97
2.00	3.10
2.10	3.24
2.20	3.37
2.30	3.51
2.40	3.65
2.50	3.78
2.60	3.92
2.70	4.05
2.80	4.19
2.90	4.32
3.00	4.46
3.10	4.59
3.20	4.73
3.30	4.86
3.40	5.00
3.50	5.14
3.60	5.27
3.70	5.41
3.80	5.54
3.90	5.68
4.00	5.81
4.10	5.95
4.20	6.08
4.30	6.22
4.40	6.35
4.50	6.49
4.60	6.62
4.70	6.76
4.80	6.89
4.90	7.03
5.00	7.17
5.10	7.30
5.20	7.44
5.30	7.57
5.40	7.71
5.50	7.84
5.60	7.98
5.70	8.11
5.80	8.25
5.90	8.38
6.00	8.52

formula (metric)

$$PD[m] = 1.354 \times SW[m] + 0.396$$

Distance tables and formulas (inch)

SW [inch]	PD [inch]
40	69.75
45	76.52
50	83.29
55	90.06
60	96.83
65	103.6
70	110.37
75	117.14
80	123.91
85	130.68
90	137.45
95	144.22
100	150.99
105	157.76
110	164.53
115	171.30
120	178.07
125	184.84
130	191.61
135	198.38
140	205.15
145	211.92
150	218.69
155	225.46
160	232.23
165	239.00
170	245.77
175	253.54
180	259.31
185	266.08
190	272.85
195	279.62
200	286.39
210	299.93
220	313.47
230	327.01
236	335.13

formula (inch)

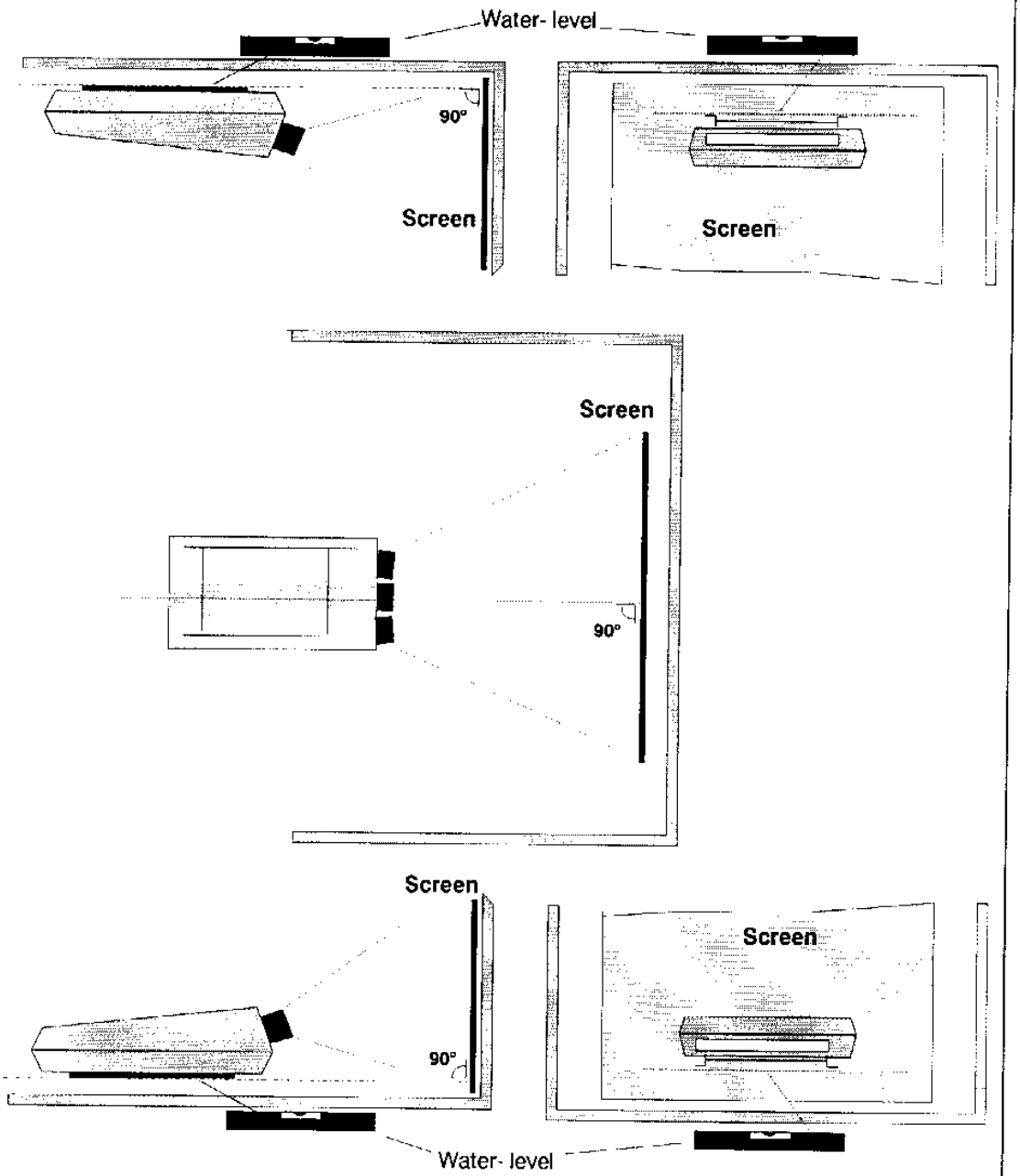
$$PD[inch] = 1.354 \times SW[inch] + 15.59$$

INSTALLATION GUIDELINES

*** How to install the projector?**

In order to avoid any convergence faults, be sure that :

- the projector is always installed level (therefore, use a water-level)
- the projector axis is perpendicular on the screen surface.



INSTALLATION GUIDELINES

*** Ceiling mount or table mount ?**

To install the **BARCODATA 650**, always apply the BARCO kits which are specially designed for this function.

For *ceiling mount*, a *suspension system* is available (98 25550).

For *table mount*, a *projection table* is avallable (98 27200).

See "OPTIONS" for more information.

INSTALLATION SET UP

ACCESS TO CONTROLS

SCAN ADAPTATION

ADAPTATION FOR SCREEN WIDTH HIGHER THAN 4M

INSTALLATION SET UP

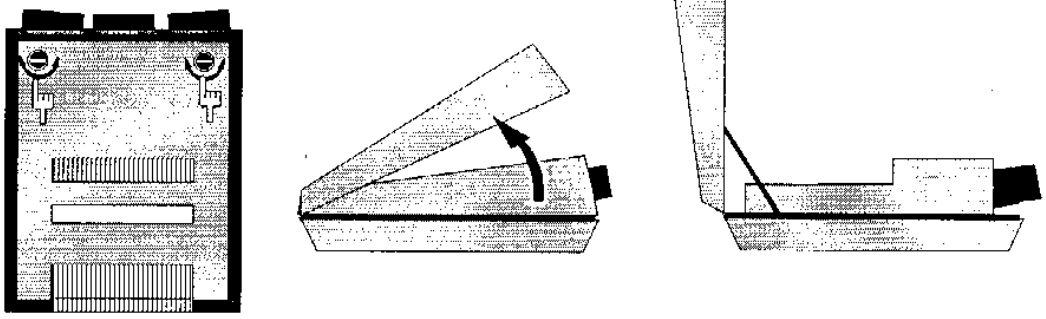
Getting access to projector controls

Top cover

All installation adjustments, such as geometry, convergence, etc. are located inside the projector. To get access to these adjustments, handle as follow.

* Turn both lock screws with a screwdriver or a coin counter clockwise.

* Lift up and pivot the top cover. It will be supported by an incorporated support.



INSTALLATION SET UP

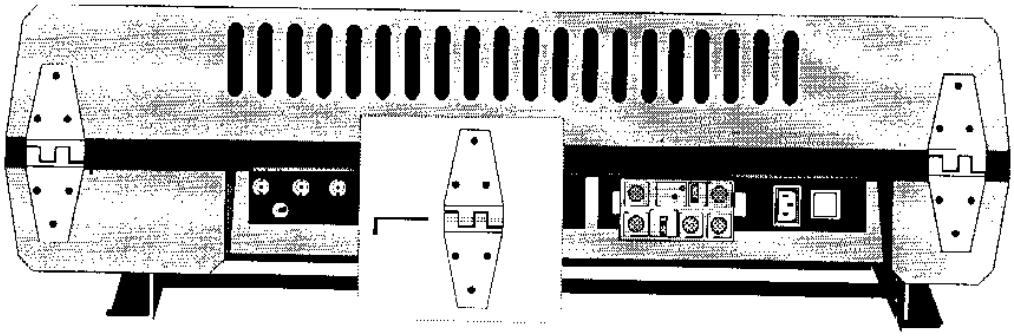
During some installations it will become handy to remove the top cover totally during the alignment procedure.
Therefore,

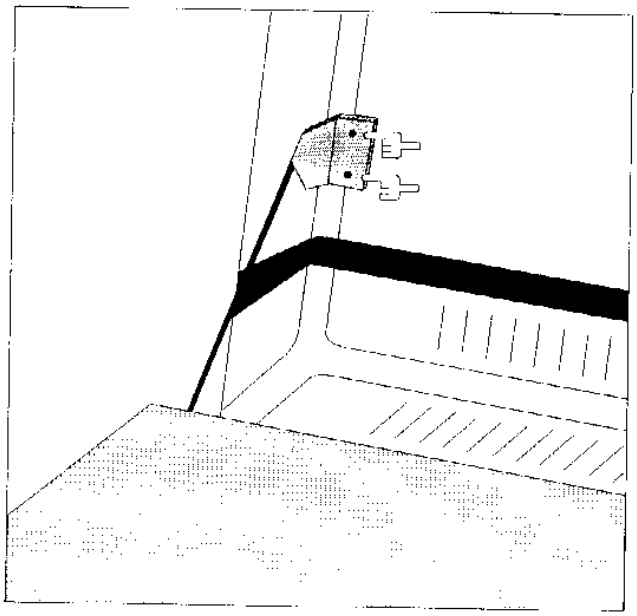
- turn out the screws of the incorporated support (drawing 1)

and

- pull out the two hinge-joints. (drawing 2)

Note : when turning out the screws of the incorporated support, do not forget to support the cover. Otherwise it will flip over and damage the hinges.





Re-install the cover :
Hook the top cover to the cabinet and insert the hinge-joints. Fixate the incorporated support. Pivot the top cover and secure the lock screws by turning clockwise with a screwdriver.

INSTALLATION SET UP

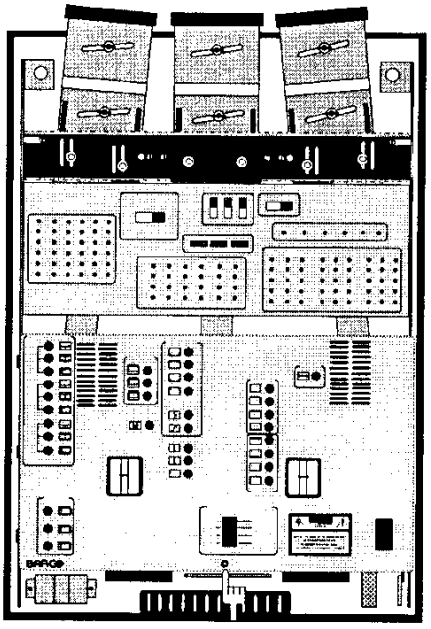
Protection cover

The module chassis is covered by a protection cover. This cover is screened with the adjustment icons just next to the adjustment holes. All adjustments can be done with a small non- metallic screwdriver through the holes of the cover.

There are only a few exceptions where the cover has to be removed :
- power adaptation
- scan adaptation
- RGB signal adjustment

To remove the cover, proceed as follow :
- remove the fixation screw.
- lift up the protective cover and remove.

Attention : reinstall the protective cover always when finished.



INSTALLATION SET UP

SCAN ADAPTATION

As the projector can operate as a front-rear, ceiling-table projector, it is necessary to place the scan switches in the correct position. (Default configuration when leaving the factory : front-ceiling).

Warning :
turn off the projector and unplug the power cord before changing a scan switch position.

A. Horizontal scan inversion

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

B. Vertical scan inversion

One switch for the three CRT's is used. See position of the switch (diagrams on next page) for the corresponding projector position.

Procedure :

Make sure that the projector is switched off and the power cord is disconnected (unplugged)

- open the top cover and remove the protective cover.

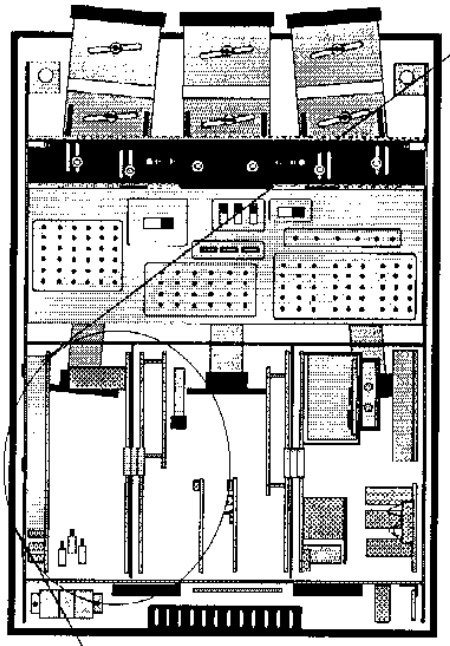
For horizontal scan inversion
- turn out the three retaining screws of the metal protection plate on the Horizontal deflection + EHT module.
- toggle the position of the three horizontal scan inversion switches.
- reinstall the metal plate and turn in the retaining screws.

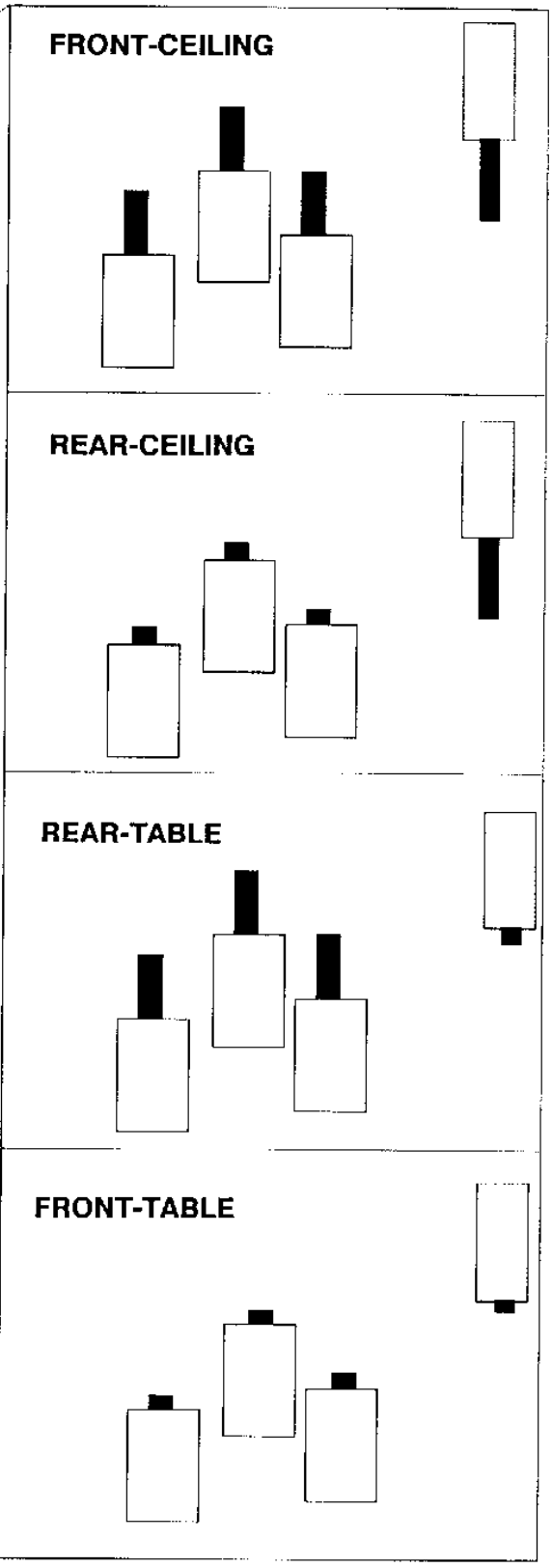
For vertical scan inversion
- toggle the position of the vertical scan inversion switch.

After scan inversion, reinstall the protection cover and close the top cover. 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.

INSTALLATION SET UP





INSTALLATION SET UP

ADAPTATION FOR SCREEN WIDTHS MORE THAN 4M

The projector is factory assembled for screen widths LESS than 4 m. However, the mechanical chassis is designed to reassemble the CRT lens unit to be used for screen widths MORE than 4m. The following corrections have to be implemented :

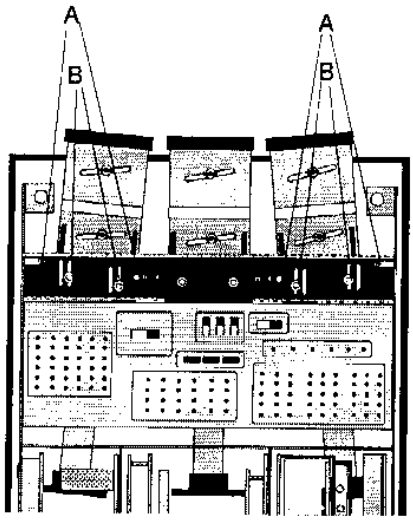
- mechanical displacement of the Red and Blue CRT lens unit.
- angle correction between lens and CRT.

Mechanical displacement of the CRT lens unit.

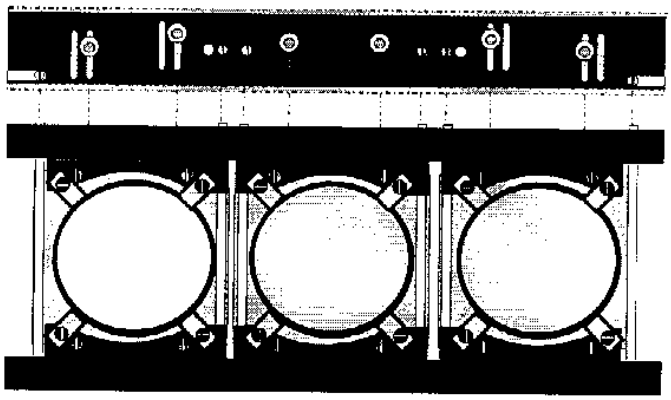
To obtain screen widths of more than 4m, the distance between the Red and Blue lenses has to be widened.

Proceed as follows :

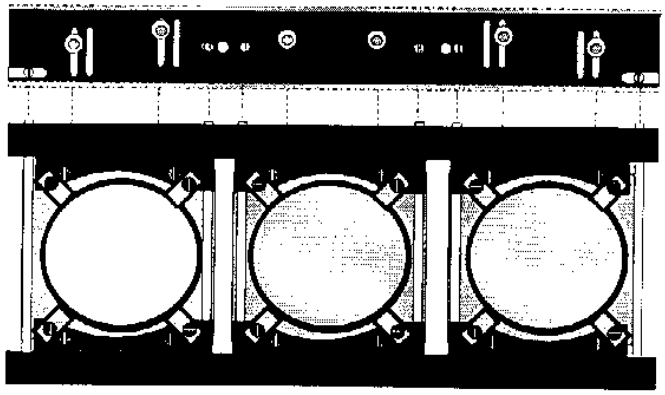
- lift up the top cover.
- remove the two cheese-head screws (A) and the two hexagon screws (B) fastening the cooling house of the red and blue tube to the upper and lower fixation lath.
- move the cooling block of red and blue to the outside until the fixation holes of the respective blocks fit with the other provided holes.
- screw in the respective screws.



Position of CRT-lens unit for screen widths smaller than 4 m.



Position of CRT-lens unit for screen widths higher than 4 m.

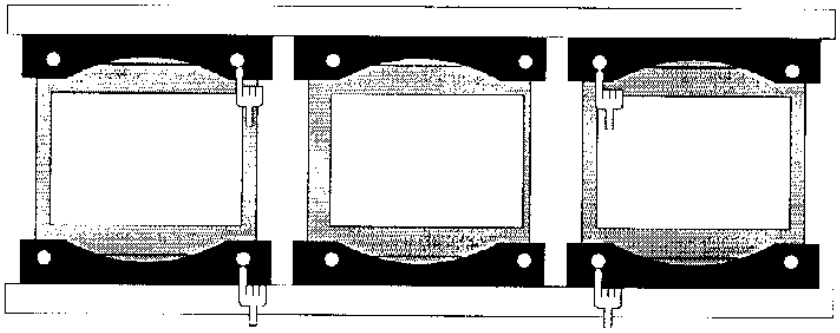


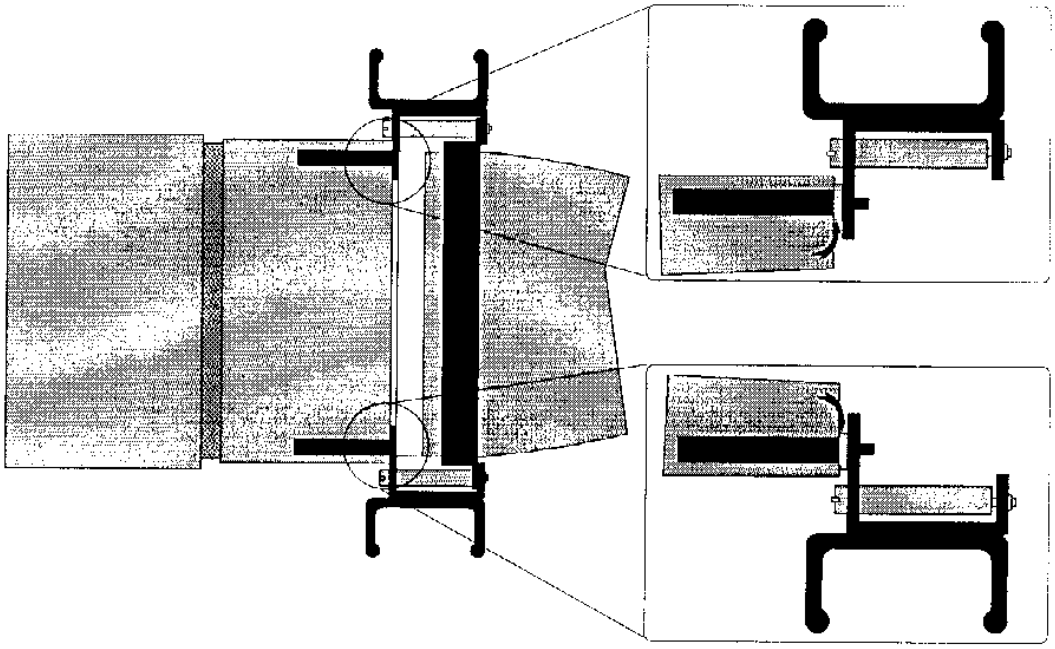
INSTALLATION SET UP

Angle correction between lens and CRT

1. lens for blue and red picture

For a screen width more than 4m : remove the washers between the lens and the CRT. (These washers are factory mounted as the projector is aligned for a screen width of 2.4m)

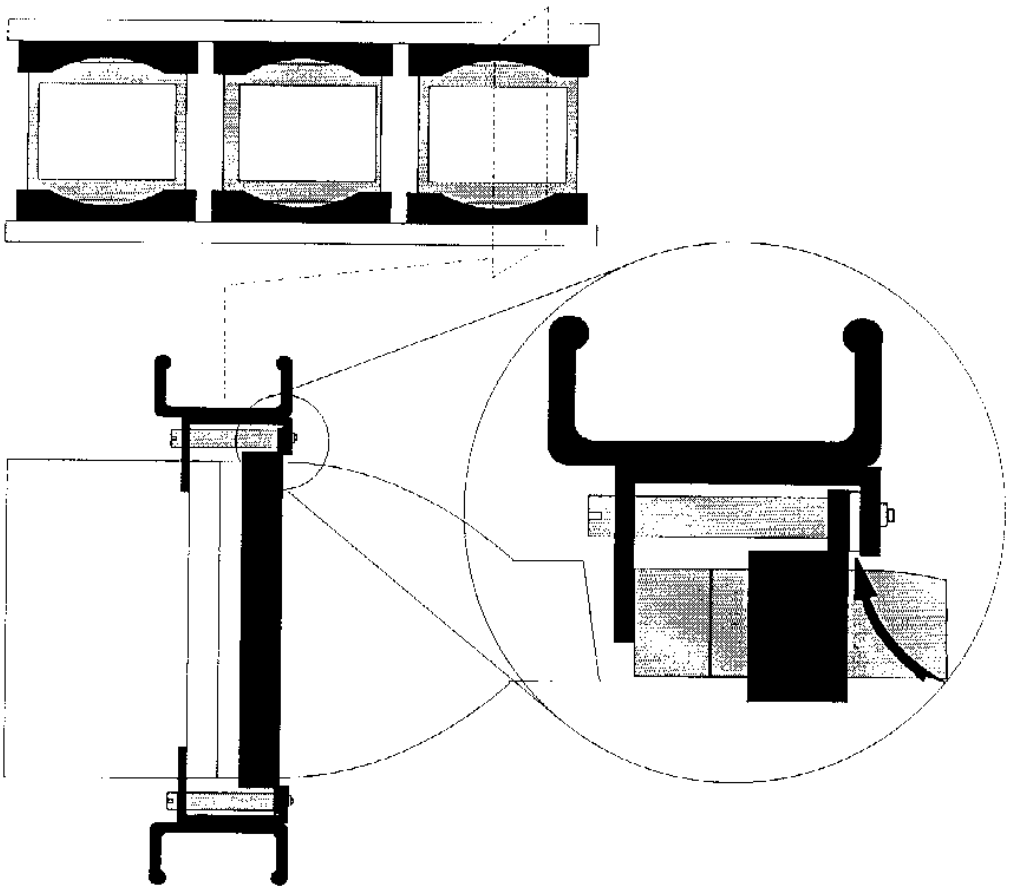




INSTALLATION SET UP

2. Correction for all three CRT's

For a screen width more than 4m : insert a adj. plate of 0.5mm thickness between the CRT and the CRT fixation lath.



CONNECTIONS

POWER (MAINS) CONNECTION.

SOURCE CONNECTIONS

CONNECTIONS

CONNECTIONS

I. POWER (MAINS) CONNECTION.

Warning : This apparatus must be grounded (earthed).

1. Preparation

Power cord : the power line cord is supplied with the projector (see : projector accessories).
This projector may be connected to an IT-power system.

A. Mains lead (power cord) with CEE7 plug :

As the colors of the wires in the mains lead of this apparatus may not correspond with the colored markings identifying the terminals in your plug, proceed as follows :

- The Green/Yellow wire must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or colored green and yellow.

- The Blue wire must be connected to the terminal marked with the letter N or colored black.

- The Brown wire must be connected to the terminal marked with the letter L or colored red.

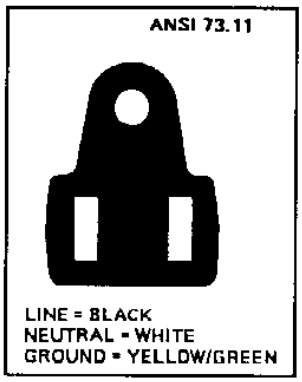
The wires of the delivered mains lead (power cord) are colored in accordance with the following code :

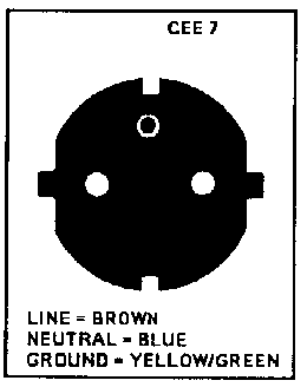
Green and Yellow : ground
Blue : neutral
Brown : live

B. Power cord with an ANSI 73.11 plug.

The wires of the delivered mains lead (power cord) are colored in accordance with the following code :

Green and yellow : ground (earth)
White : neutral
Black : live





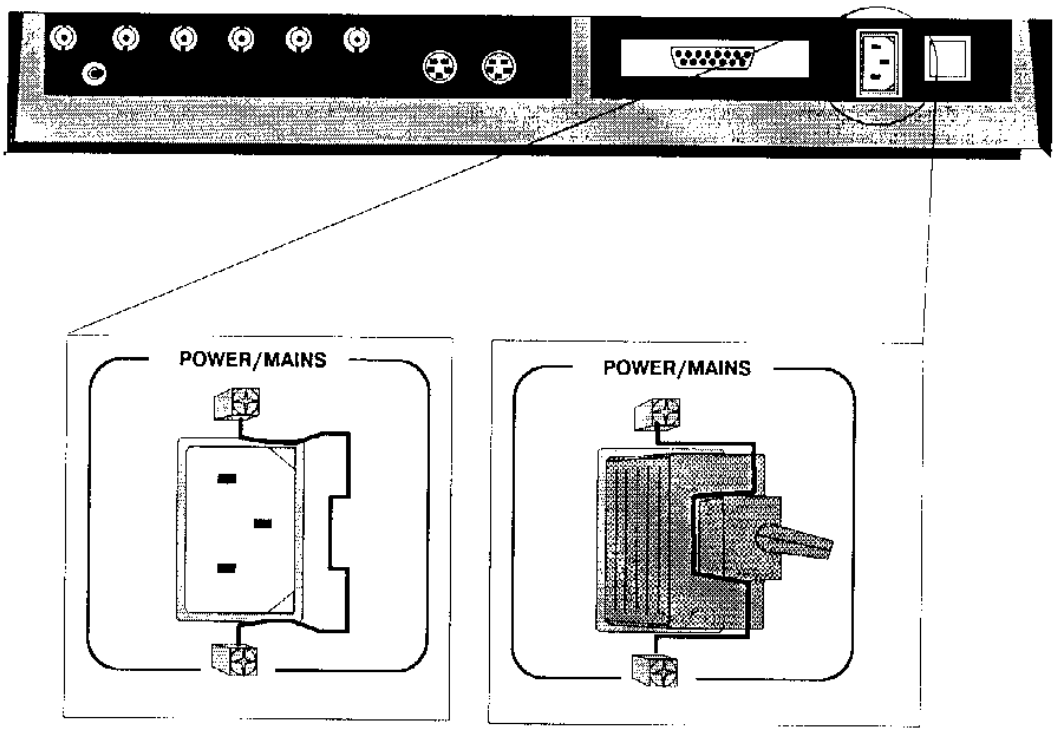
CONNECTIONS

2. Power (mains) cord connection

Power (Mains) input : Male power connector at the rear of the projector.

Attention :

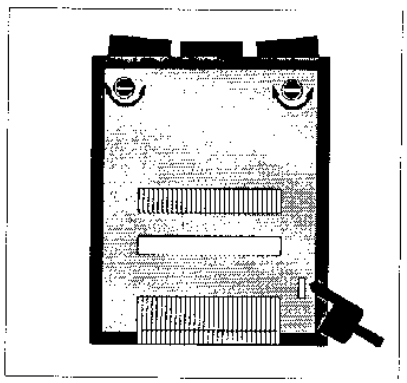
Before plugging the female power connector into the male connector on the projector put the connector clamp in the clamp holder.



** Power check*

Warning
Check by looking through the little window on the top cover if the indicated power voltage corresponds to that of the wall outlet in the room.

If the indication is different from that of the wall outlet, perform the input power (mains) voltage adaptation of the projector.(see next page)



CONNECTIONS

Input power (mains) voltage adaptation.

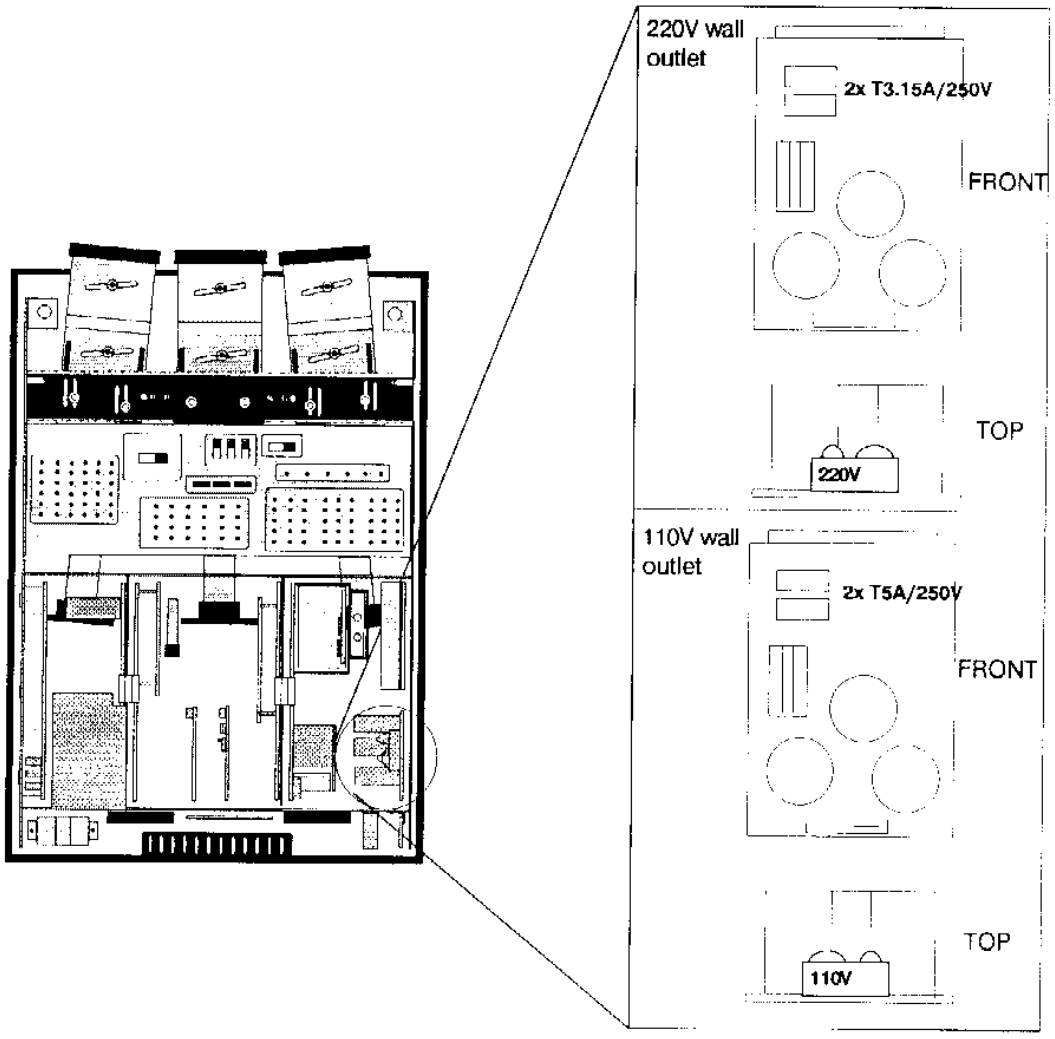
Attention

The BARCODATA 650 - 90 00610 leaves the factory to operate on a mains (power) input of 220 Vac.
The BARCODATA 650 - 90 00619 leaves the factory to operate on a mains (power) input of 110 Vac.

Adaptation of the power input of the projector between 220 Vac and 110 Vac or vice versa is possible. Follow the procedure as described below.

Procedure

1. Open the top cover (see § Top cover).
2. Remove the protection cover to get access to the 'Power input board'
2. Unscrew the retaining screw of the power input board and pull out this board.
3. Pull out the *'power selector plug'* and re-insert it as illustrated in the drawing below, depending on the wall outlet in the room.
4. Pull out the fuses and place the correct fuses in their sockets. Refer to table on next page for the correct fuses.
5. Re-insert the power input board and secure it with the retaining screw.
6. Re-install the protection cover and close the top cover.



CONNECTIONS

Fuses

Warning

For continued protection against fire hazard :

- replace with the same type of fuse
- refer replacement to qualified service personnel

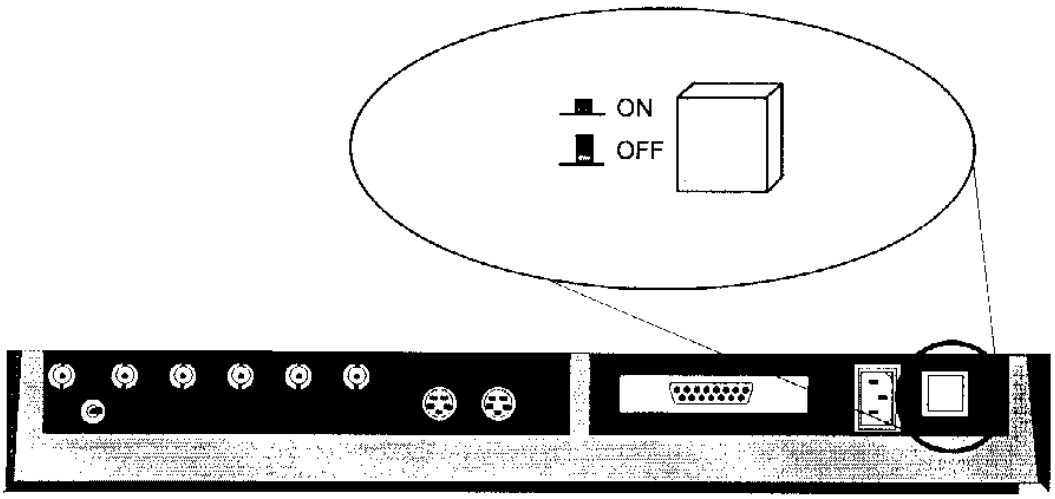
F1, F2	BARCO ord. no.
For 220 Vac (2x) T3.15A/250V	31 4103
For 110 Vac (2x) T5A/250V	31 4104

SWITCHING ON

The projector is switched ON and OFF using the power switch ON/OFF.

pressed : ON state
not pressed : OFF state

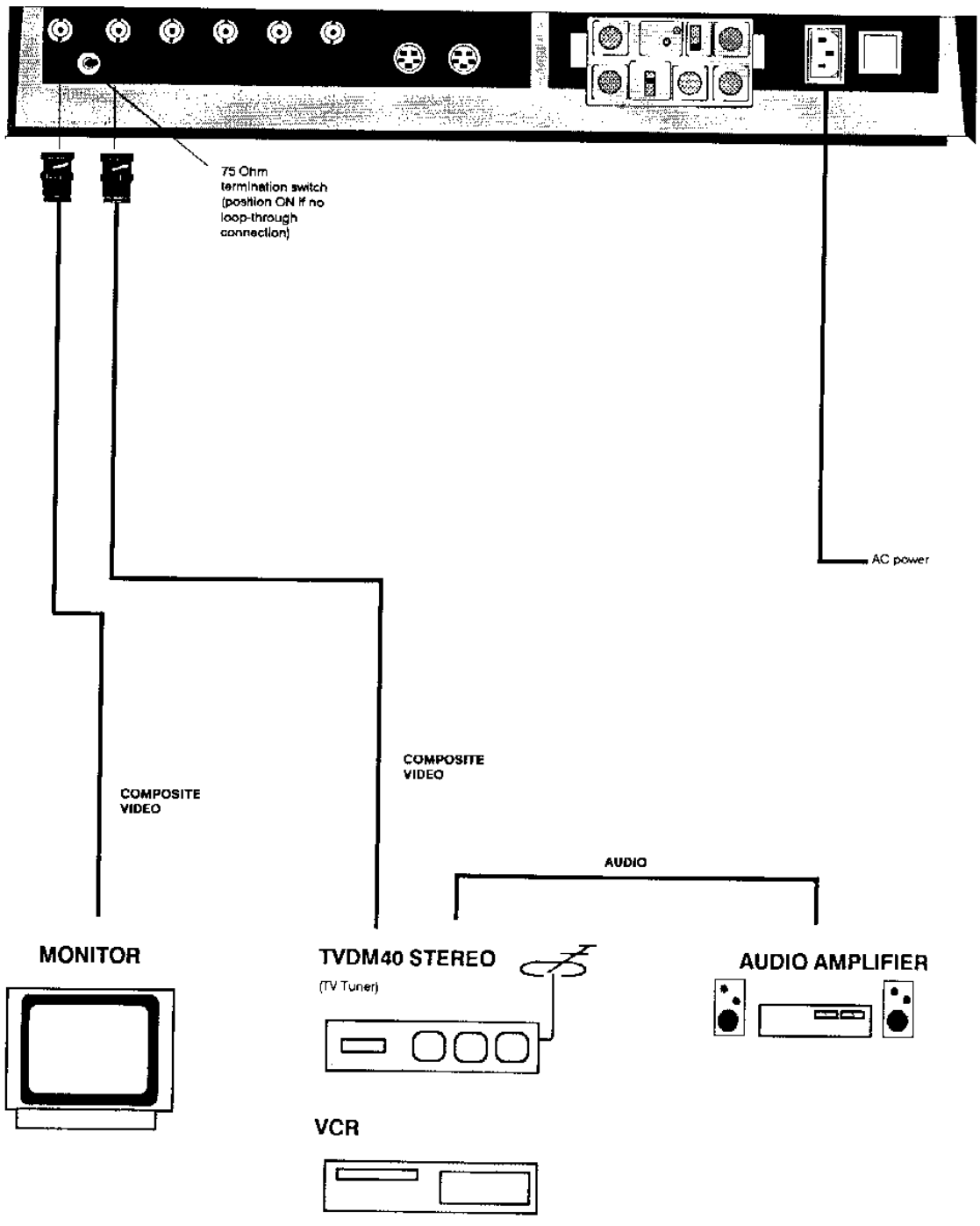
The lighting of the built-in control lamp indicates the ON state of the projector.



CONNECTIONS

Connecting a composite video source to the video input

Composite video signal from VCR, OFF air signal decoder, etc.



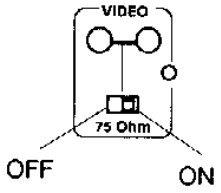
Connect the composite video source to the video input of the projector using a coaxial cable with a BNC connector.

For more information about cables and connectors : order BARCO's 'Identification of cables and connectors' information sheets. BARCO order number : 59 75923. All cables in customer lengths with connectors can be ordered at BARCO.

75 ohm termination switch.

Terminate the video input of the projector using the 75 ohm switch under the video input on the input panel when the projector operates alone or when it is the last projector on the video line when the projectors are connected in a loop through configuration.

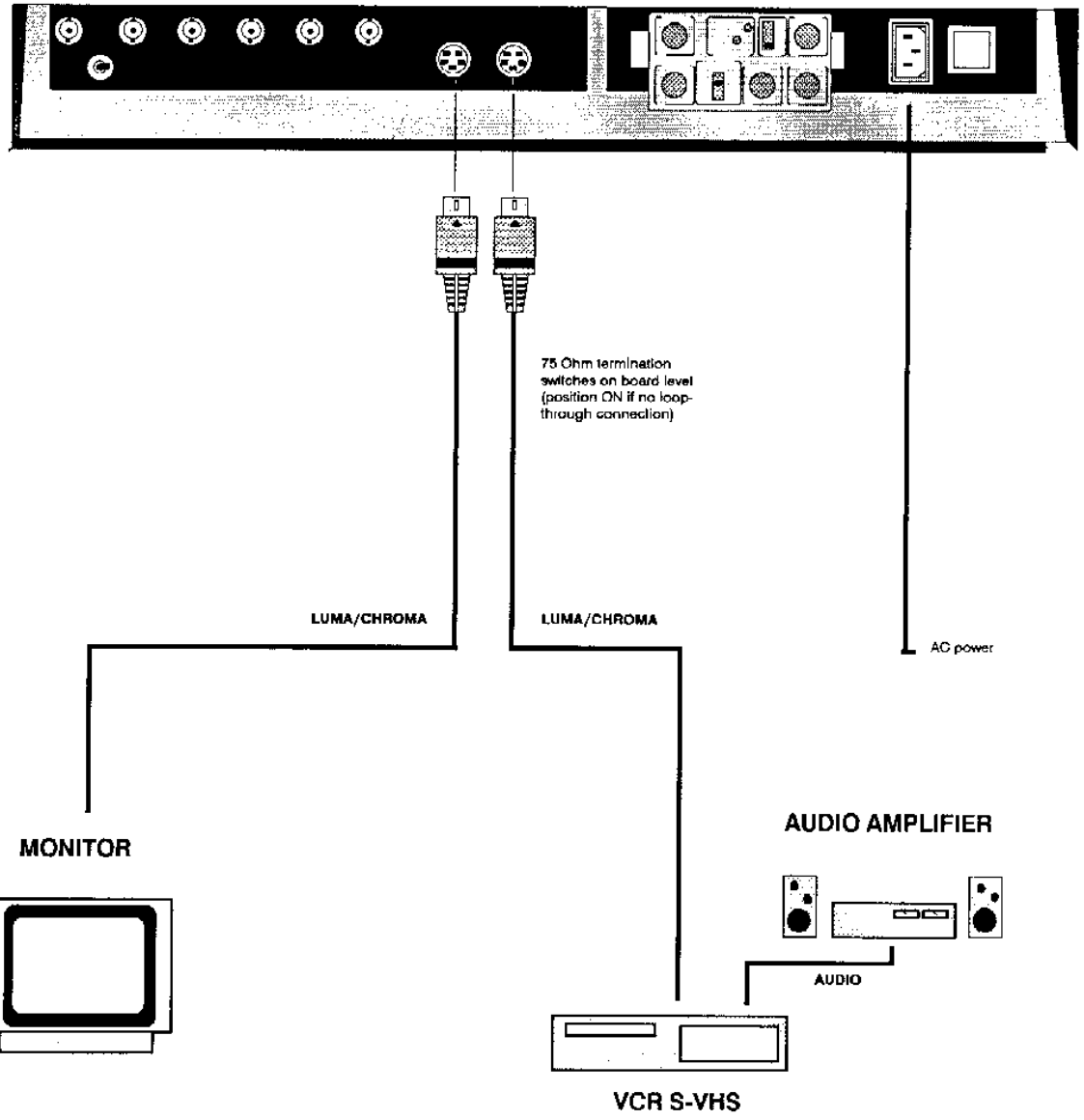
ON : signal terminated
OFF : signal not terminated



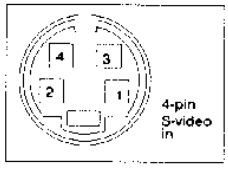
CONNECTIONS

Connecting a S-Video source to S-Video input.

Separated Y-Luma/C-Chroma signal inputs for higher quality playback of Super VHS signals
Connect the seperate Y-luma/C-chroma signals to the S-video input (4 pins connector)



Pin configuration input connector.
- pin 1 : earth (ground) luminance
- pin 2 : earth (ground) chrominance
- pin 3 : luminance (Y) signal 1Vpp ±3 dB
- pin 4 : chrominance (C) signal 300 mVpp ±3dB



CONNECTIONS

75 ohm termination switch

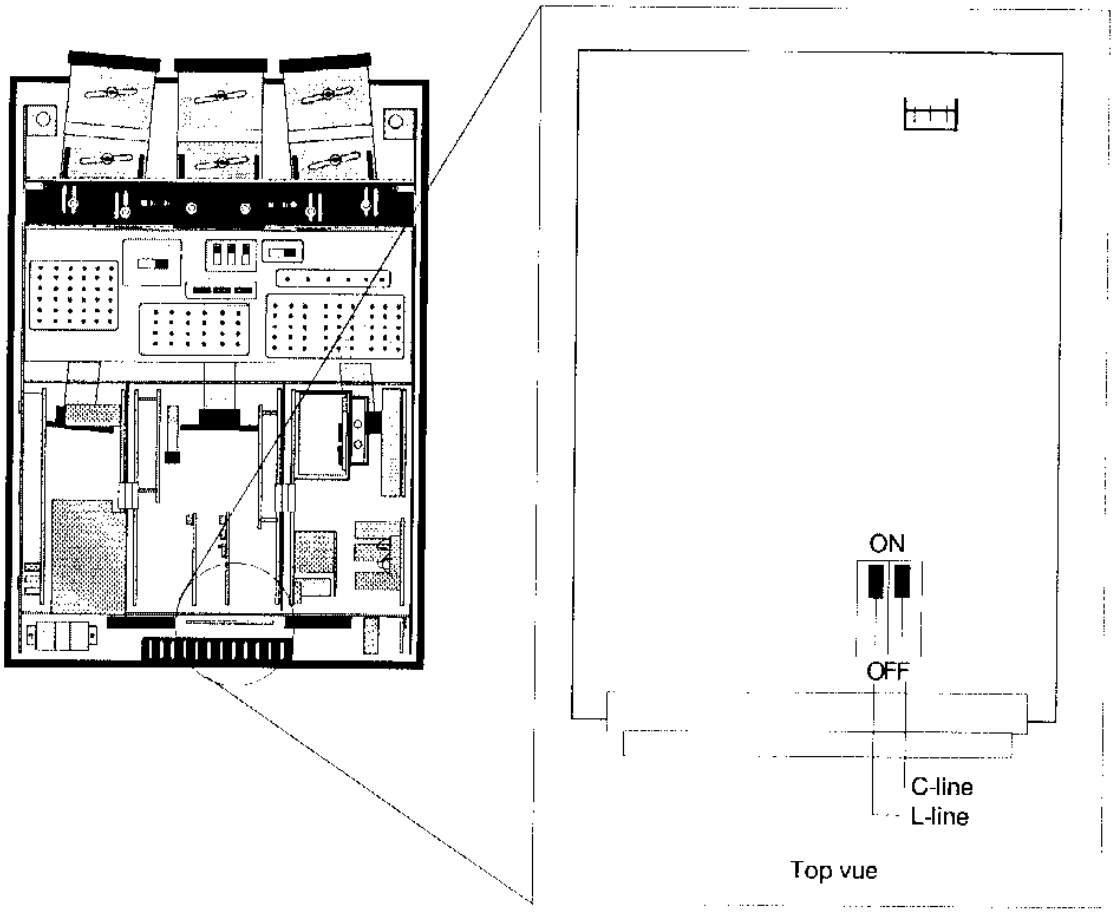
Terminate the S-video input of the projector using the 75 ohm switches on the input board when the projector operates alone or when it is the last projector on the video line when the projectors are connected in a loop through configuration.
Both luminance and chrominance lines are terminated separatetly.

When switches are in position ON : line 75 ohm terminated
OFF : line not terminated

Default setting when leaving the factory : ON (75 ohm terminated)

Warning :

When the position of the switches has to change:
switch off the projector and unplug the power plug. Remove the top cover and change the position of the switches with a small screwdriver (2mm).

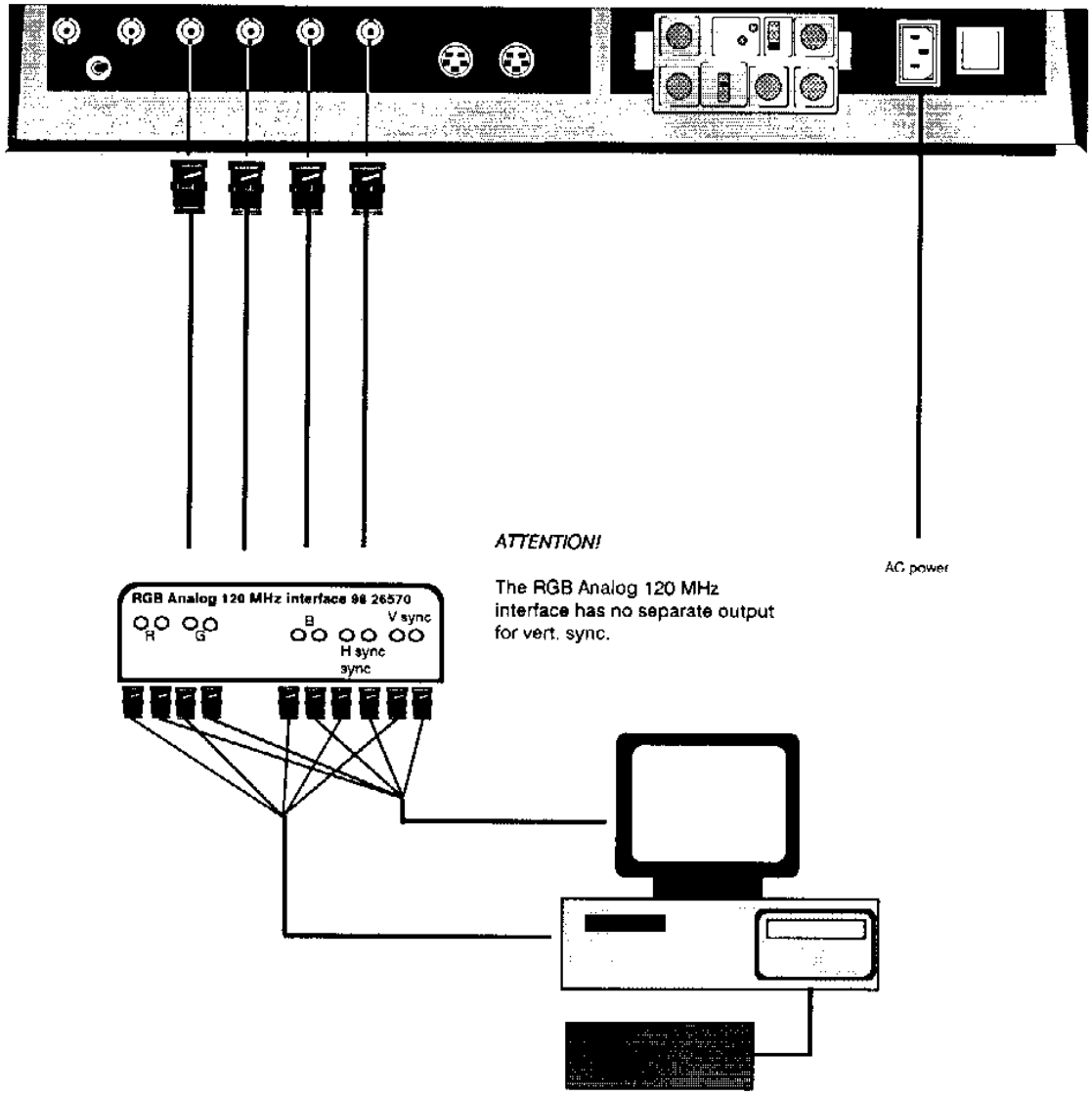


CONNECTIONS

Connecting a RGB Analog source to the analog inputs of the projector.

75 ohm, RGB analog Input terminals with composite sync input or with sync signals on green. Always use an interface when a computer with a local monitor has to be connected to the projector. Interfaces to be applied :

- universal analog interface. Order number 98 26100
- RGB 120 MHz analog interface. Order number 98 26570



Important : line termination switches (normal position : line terminated) and input polarity adaptation switches (normal position : inputs accept a pos. input signal) are located in the interface unit.

For cable information : order information sheets about 'Identification of cables and connectors'. Order number : 59 75923.

CONNECTIONS

In case of chaining the projectors with T-BNC connectors (BARCO order number : 31 3668) the 75 ohm line termination switch must be set in the correct position. Those switches are provided on the RGB analog input board.

Warning :
When the position of the switches on the input board has to change :
- Power down the projector and unplug the projector power cord.
- Open the top cover and remove the protectoin cover.
- take off the fixation cap by screwing out the retaining screw.
- Unplug the signal cables from the S-Video and decoder amplifier board.
- Pull out the RGB analog input board.
- Change the position of the switches with a small screwdriver (2mm)

1. 75 ohm termination switches :

The R,G,B and SYNC input of the projector must be 75 ohm terminated using the 75 ohm switches (ON position). In case of chaining the projector with T-BNC connectors on the respective inputs, only the termination switches of the last projector must be set in the ON position)
on : 75 ohm terminated
off : not terminated
Default position when leaving factory : ON position.

2 Sync level adaptation switch :

The seperate sync input accepts normally a sync level of 4 Vpp (switch in the 4V position). If the sync signal is about 1 Vpp, the input is adapted for that level when the switch is set in the 1V position. The switches must be placed in the ON position (75 ohm terminated) when the projector is used as a stand alone projector or when it is the last projector in a loop through configuration.

3. Blue in green switch ('Enhanced blue') :

'Blue in green' or 'Enhanced blue' is obtained when the switch is in the ON position. The blue color will be displayed as cyanic. The amount of green added to the blue is adjustable with the 'Blue in green' adjustment potentiometer on the module itself.

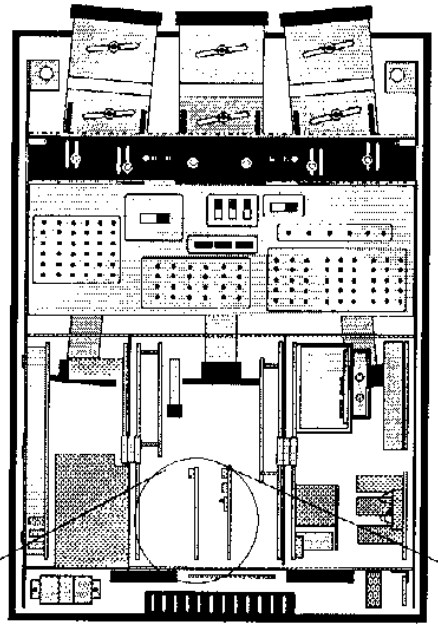
Inportant : For displaying graphics however, this 'blue in green' function could falsify the color reproduction. In this case put the 'Blue in green' switch in the OFF position.

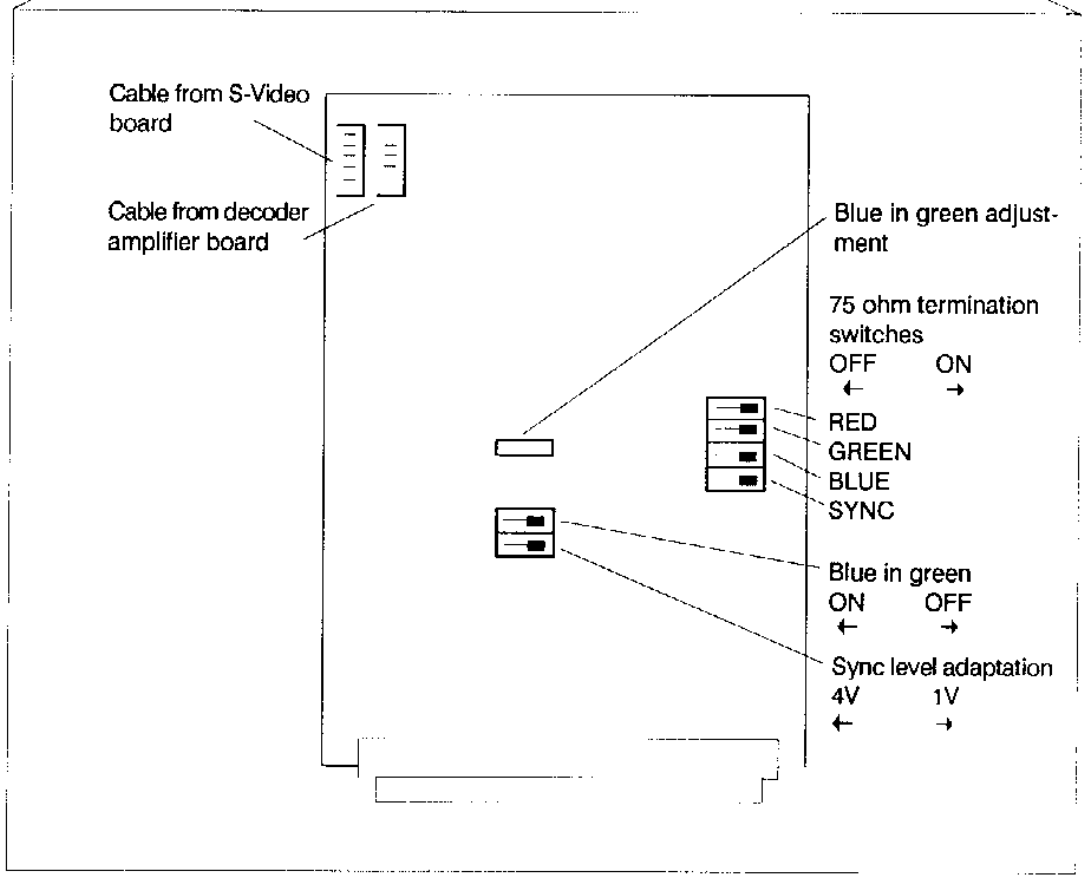
When the switches are in the correct position, proceed as follow :

- re-insert the RGB analog input module.
- reconnect the signal cabes from the S-Video and the decoder amplifier board.
- put the fixation cap back and secure the retaining screw.
- reinstall the protection cover.
- close the top cover.
- plug in the power plug to the wall outlet.
- switch on the projector.

CONNECTIONS

Location of switches and ajustment potentiometer.





CONTROLLING

CONTROL-SWITCH BOX

DEFINITION AND LOCATION OF CONTROLS

CONTROLLING

1. The control switch box

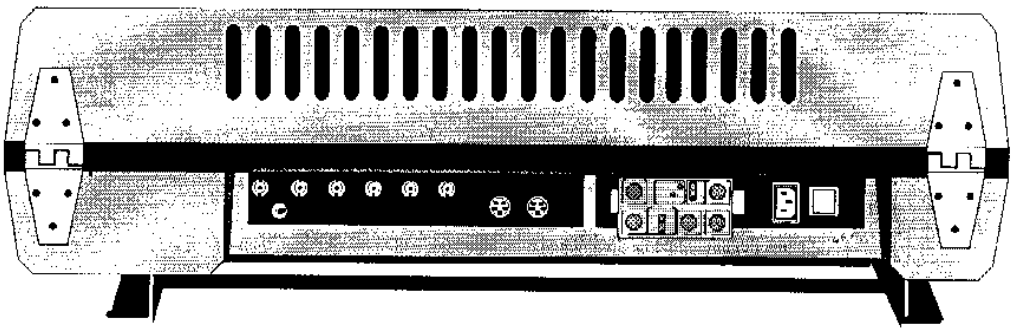
The projector can be controlled via the control switch box. This switch box can be mounted on two posible ways :

Directly to the projector (default when leaving the factory)

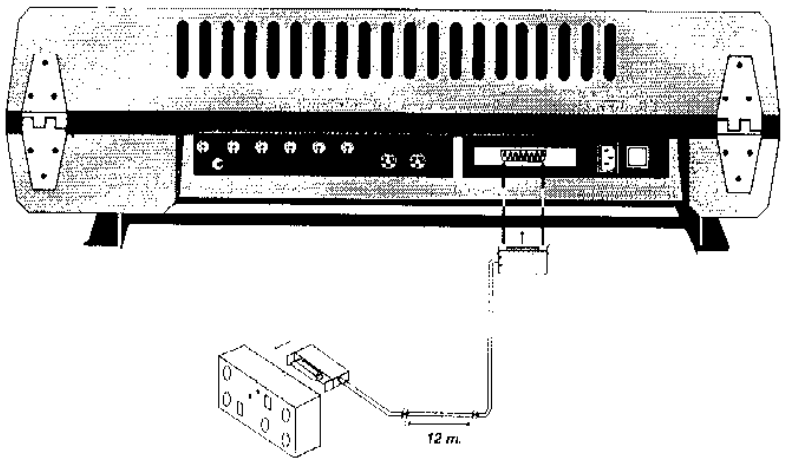
or

Mounted via the delivered remote cable.

a) Control switch box on projector

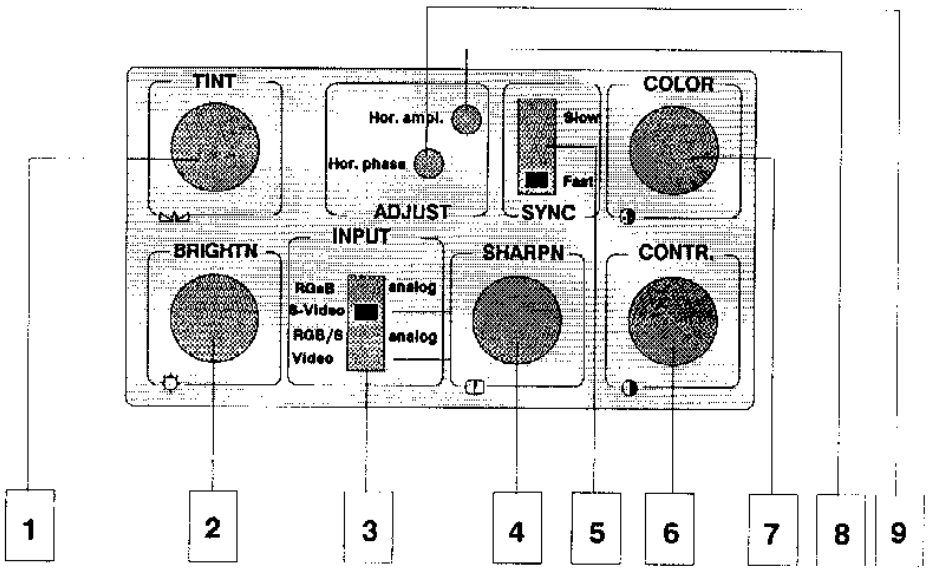


b) control switch box via remote cable connected to the projector.



CONTROLLING

2. Definition and location of controls.



1 *Tint control*
Tint control is active for video and S-Video when applying the NTSC 3.58 or NTSC 4.43 signal. Turn the 'TINT' control until the colors of the objects appear 'natural' (e.g. skin color). Turning right gives a greenisher image, turning left gives a purpler image.

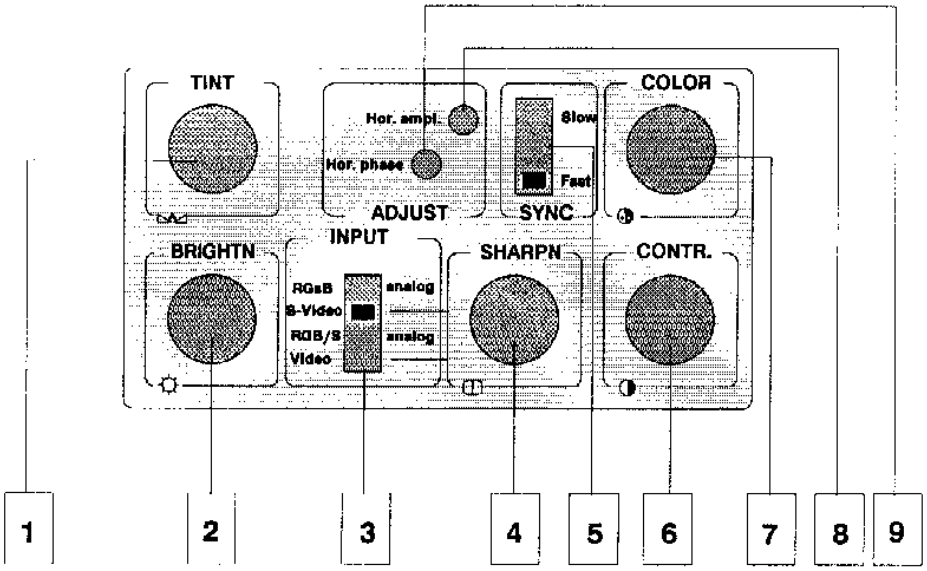
2 *Brightness control*
Brightness control for video, S-video and RGB analog signals.
A correct 'BRIGHTNESS' setting is important for a good color reproduction.
Turning right gives a brighter image, turning left a darker image.

3 *Input selection switch*
Select the desired input by sliding the switch handle to the corresponding position indicated on the box. These positions are :
- RGBS analog
- S-Video
- RGsB analog
- Video

4 *Sharpness control*
Sharpness control for video and S-video.
When turning to right, the image becomes sharper,when turning to left, the image becomes softer.

5 *Sync speed switch*
The sync speed switch can be in the 'slow' or 'fast' position.
Slow sync is adequate for most applications, fast sync used to compensate for unsteady sync pulses from older video playback equipment.

CONTROLLING



6 *Contrast*
Contrast control for Video, S-Video and RGB analog.
A correct 'CONTRAST' setting is important for a good color reproduction.
Turning the contrast control changes the ratio between the highest and the darkest portion of an image.
Turning right gives a higher contrast, turning left a lower.

7 *Color*
Color saturation for video and S-video.
Adjust until the desired color is obtained
Turning right gives richer colors, turning left gives lighter colors.

8 *Horizontal amplitude*
This control adjusts the horizontal amplitude for RGB signals. Adjust the horizontal amplitude until the desired image width is obtained. The maximum possible width will be the same as for a video source.

9 *Horizontal phase*
Adjust the horizontal phase for full character display at the left side of the projected image.

PROJECTOR ADJUSTMENT

A. MECHANICAL ALIGNMENT DURING INSTALLATION

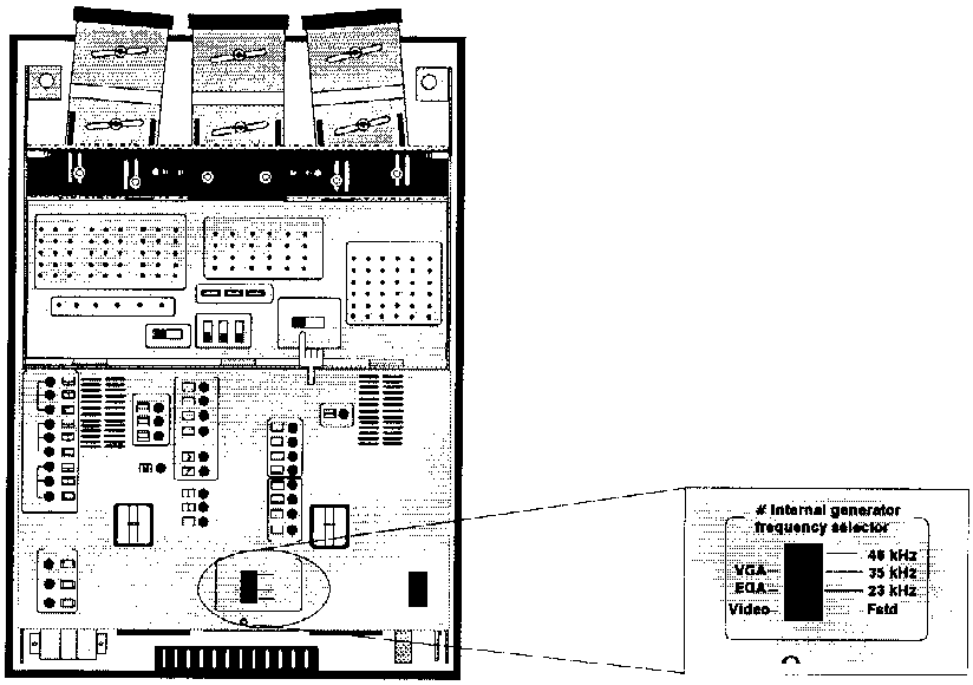
B. GEOMETRY ALIGNMENT

C. CONVERGENCE ALIGNMENT

PROJECTOR ADJUSTMENT

Introduction to projector alignment.
After the projector is correctly installed and all electrical connections are made, start with the image adjustment procedure.

An internally generated grid test pattern is available at 15 kHz, 23 kHz, 35 kHz and 46 kHz horizontal frequency. The vertical frequency is for each horizontal frequency 50 Hz. This test pattern can be activated in the following way :
- put the switch '#pattern/video rgb generator' in the '# pattern' position.
- select the desired horizontal frequency with the frequency selection switch on the protection cover.



Start the projector alignment always with the geometry corrections (mechanically and electrically) and continue with the convergence corrections.

Before starting the convergence corrections, warm up the projector for at least 15 minutes.

For product safety : use always a non-metalic screwdriver.

PROJECTOR ADJUSTMENT

Preparation : Disable the convergence corrections by switching the convergence ON/OFF switch in the OFF position.

A. Mechanical alignment during installation.

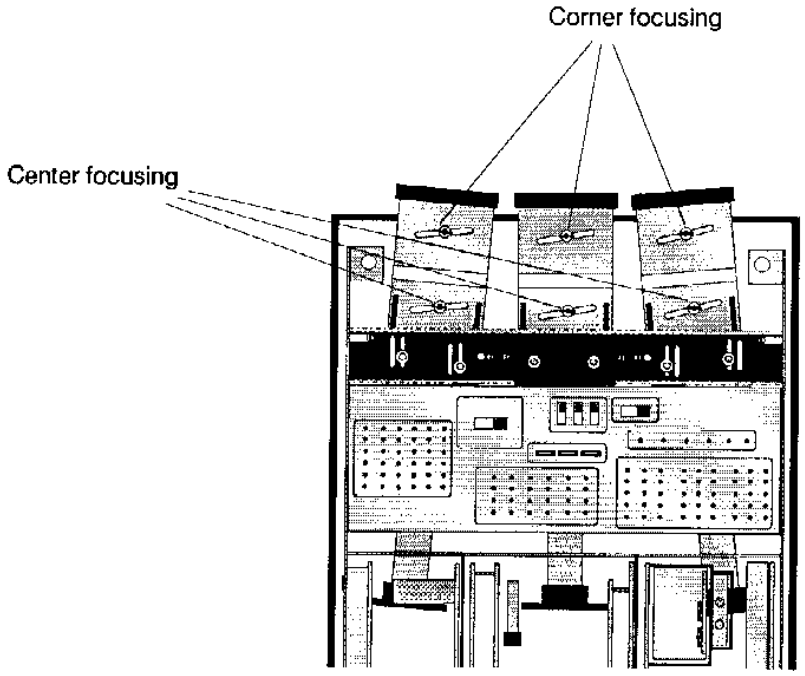
Image focus adjustment

Image focus adjustment for the projector is divided into two separate adjustments;
Optical lens focusing
and
Electrical focusing.

Adjust the focus for each color separately. Remove the two other colors by covering the corresponding lens with the lens-cap or by switching off the respective color switches (OFF position).

Optical lens focusing.

The optical lens focusing procedure is performed separately for each lens.
Each lens has two focus adjustment points, one at the rear of the lens and one at the front. The center of the projected image is focused by loosening the wing nut at the rear of the lens and rotating the lens barrel until the center of the image is clearly focused. The corners of the projected image are focused by loosening the wing nut at the front end of the lens and rotating the lens barrel until the corners of the image are clearly focused. Repetition of these adjustments may be necessary to optimize optical focusing.



PROJECTOR ADJUSTMENT

Electrical focusing

The electrical focusing for red, green and blue is factory preset. When they have to be readjusted, follow the procedure as described below :

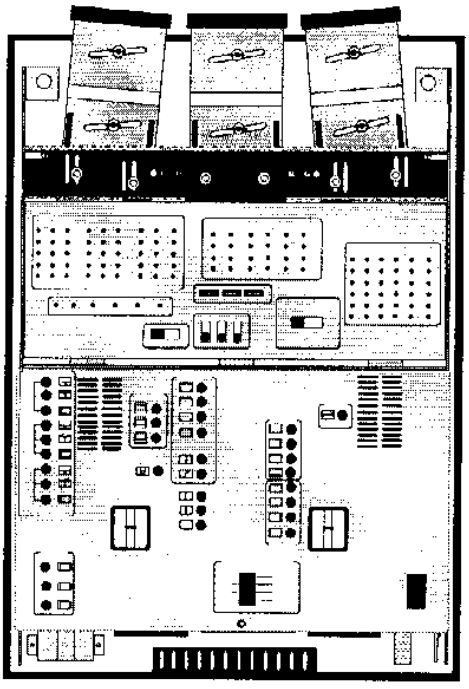
Electrical focus adjustment has to be done with a reduced contrast and brightness level.

- Be sure the lenses are correctly focused.
- Open the top cover.
- Adjust separately the focus control for red, green and blue for the sharpest image on the screen. Do it by hand or with a small non-metalic screwdriver. Be aware not to touch anything else than the color buttons, the other parts are under a high voltage.

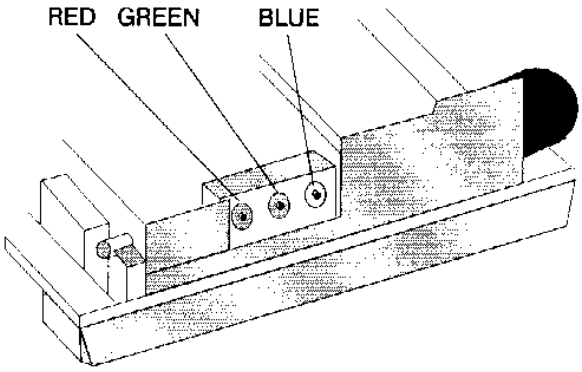
Warning :

Do not try to adjust the electrical focus with a metalic screwdriver. Use always the colored protective buttons.

When the protective cover, covering the high voltage parts of the focus module is damaged, switch off the projector and unplug the power plug from the wall outlet. Call a qualified technician to replace the damaged cover.



Electrical focus



PROJECTOR ADJUSTMENT

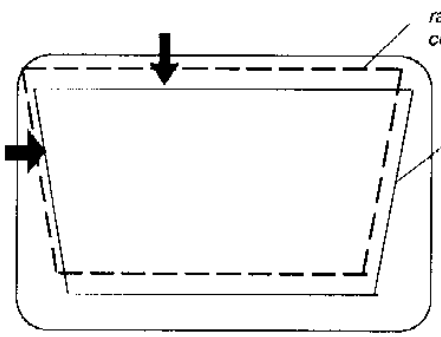
Raster centering

Centering on the CRT faceplate.

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

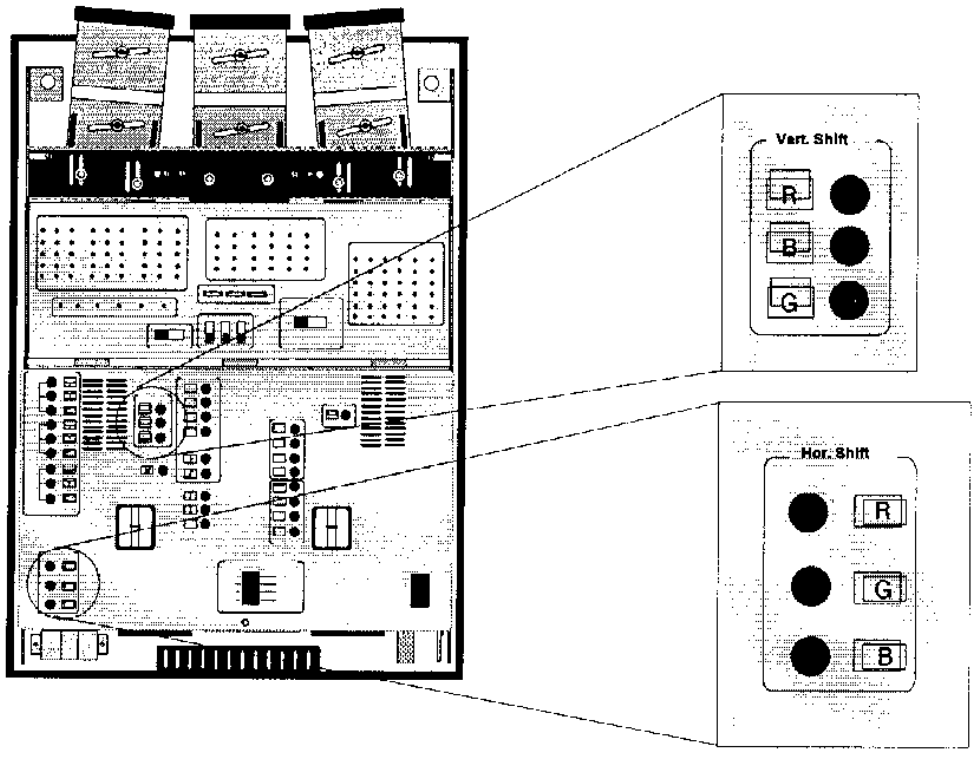
Caution : To avoid eye disconfort while performing these adjustments, reduce the contrast and gradually increase the brightness level until the raster becomes visible behind the image.

Look into the green lens and shift the raster with 'Hor Shift G' and 'Vert Shift G' until it is centered in the middle of the CRT faceplate.
Repeat this procedure for Blue and Red.



Attention : for product safety, use a non metalic screwdriver to adjust the shifts.

When looking into the lenses the view next or the upside down view will be displayed. The shape of the image on the CRT faceplate depends on the position of the scan switches.



PROJECTOR ADJUSTMENT

Centering on the projection screen.

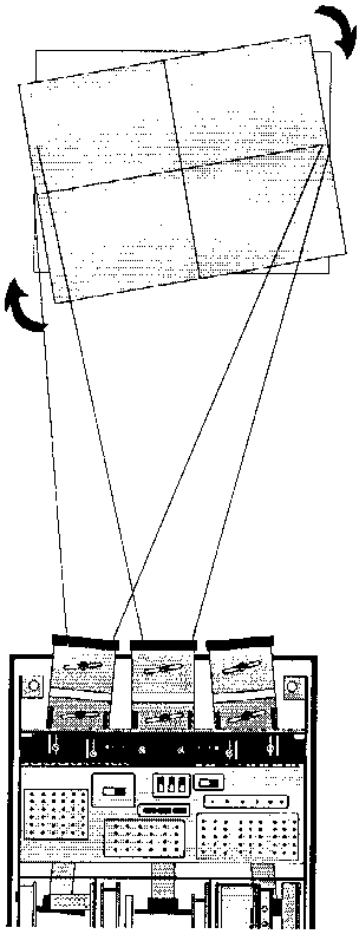
Adjust brightness and contrast for image display on the screen.

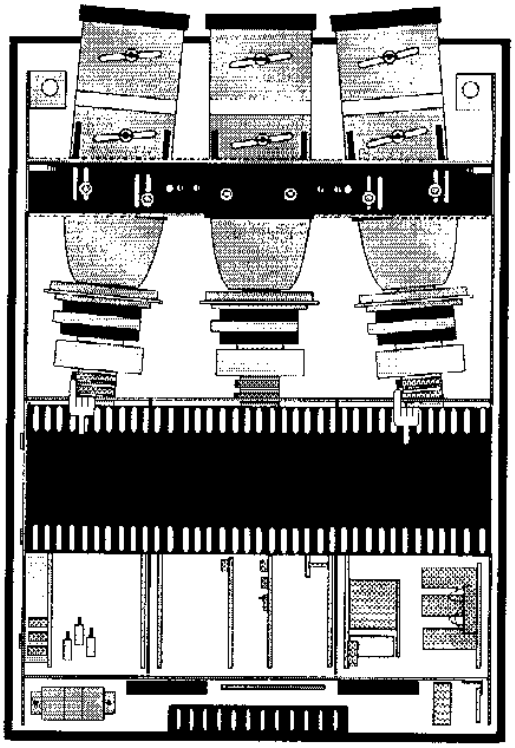
Raster tilt correction

Make sure that no raster tilt occurs on one of the projected images. Otherwise it is not possible to converge the Image correctly.

Check on the projection screen if the horizontal line of the three color images runs parallel in the vertical center.
In case of non-parallelism of one of the these lines, proceed to the following adjustments.

Warning : High voltage is fed to the image tubes and the CRT sockets. Avoid touching any parts of the image tubes or CRT sockets. This voltage can kill you.





- loosen the convergence retaining screws and pivote the convergence.
- loosen the nut on the deflection housing of the respective image tube.
- rotate deflection yoke until parallelism of the horizontal lines with the other grid pattern is obtained in the vertical center.
- secure the nut of the deflection housing.

PROJECTOR ADJUSTMENT

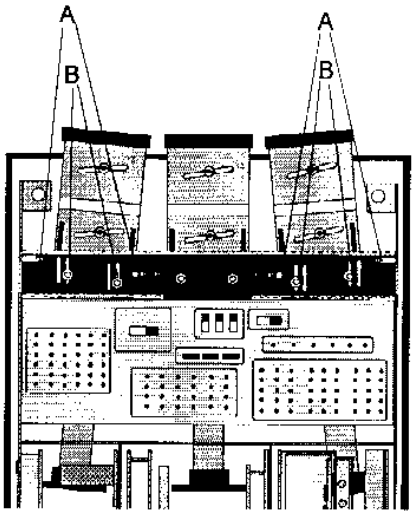
CRT projection angle correction

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. Never try to correct this misalignment with the shift corrections or the static convergence controls. These controls may only be applied to correct small errors which cannot be corrected by the CRT angle adjustment.

Be sure the rasters are centered on the CRT faceplate.

Proceed as follows :

- lift up the top cover.
- loosen the two hexagon screws A, upper fixation latch, and screws B, lower fixation latch. These screws fasten the cooling house of the red and blue tube to the upper and lower latch.

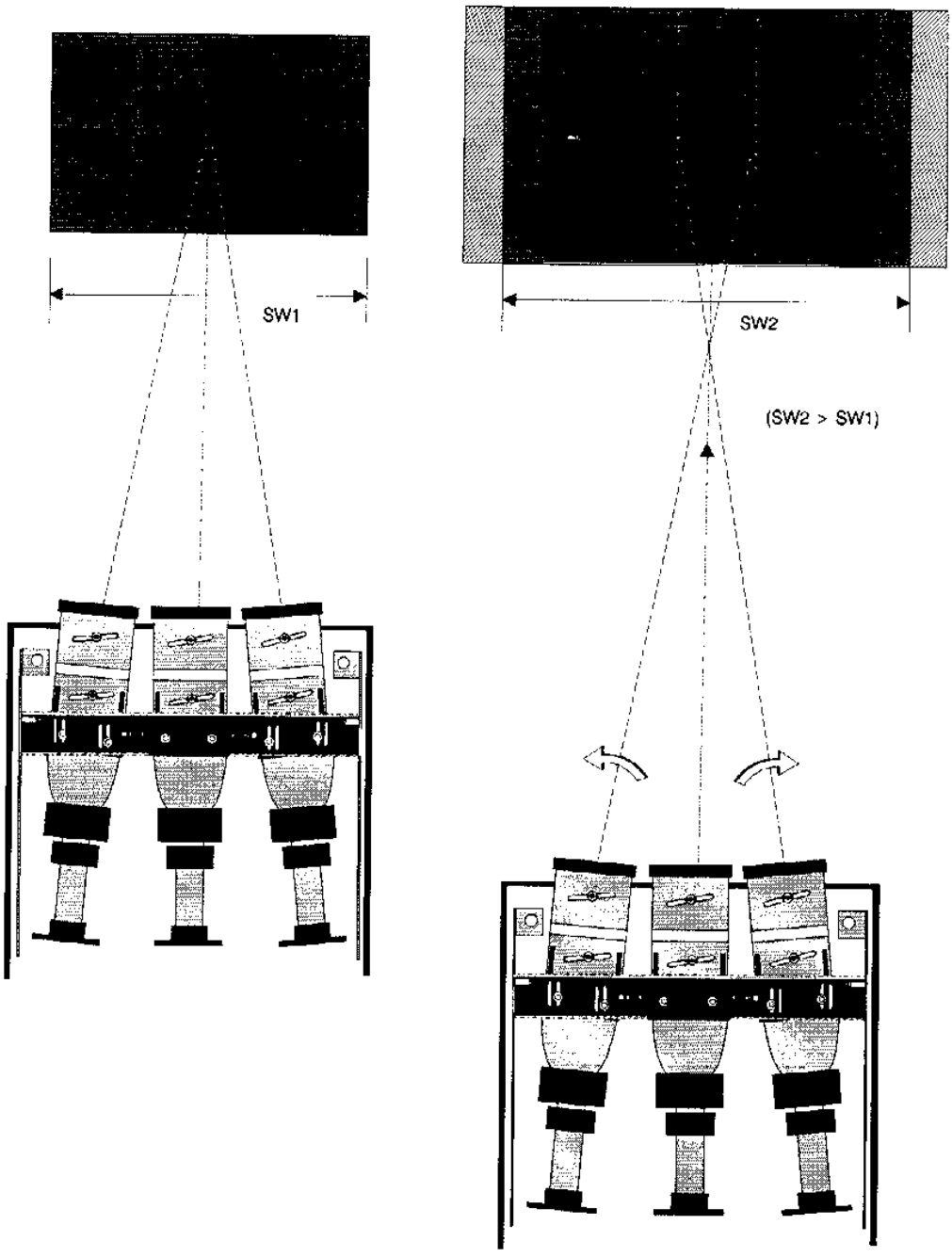


- move the red and blue lens-CRT unit in a horizontal plane until the vertical center lines coincides with the green line.
- secure the right position of the lens-CRT unit by fastening the respective screws.

Next page gives an example for an enlarged image projection.

The original screen size is smaller than the new screen size. It is necessary to change the projection angle to obtain coincidence of the vertical red and blue lines in the horizontal center.

PROJECTOR ADJUSTMENT



PROJECTOR ADJUSTMENT

B. Geometry alignment

Image geometry corrections.

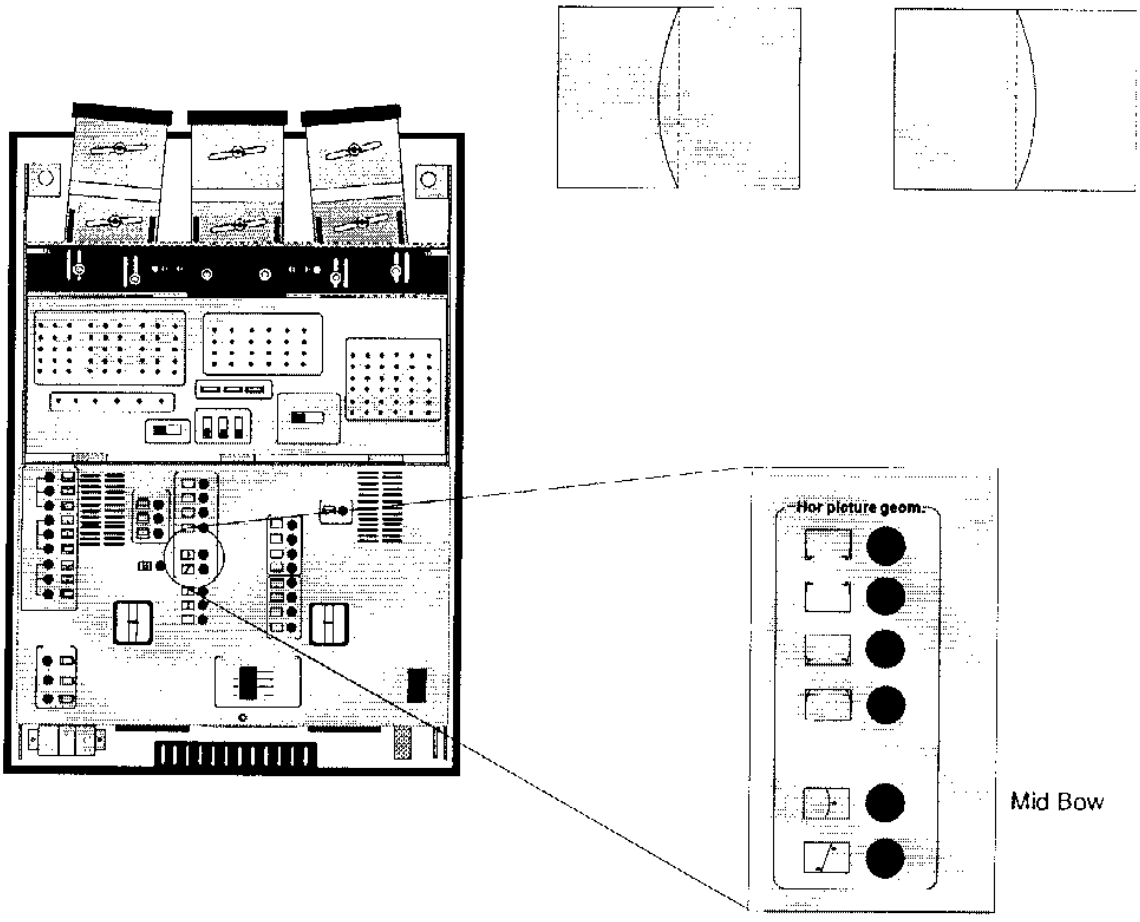
Left-right corrections (east-west)

Left-right adjustments affects only the vertical lines of the setput pattern. These adjustments have to be done only on one color image, e.g. green image. The red and blue images will automatically be corrected in the same manner. So cover the red and blue lens with the lens cap or switch off the respective color switches. Be sure the convergence corrections are switched off.

Use always a non-metalic screwdriver.
Follow the adjustments as described below :

Vertical center line bow adjustment.

Adjust the the control 'MID BOW' until the vertical center line is straight.

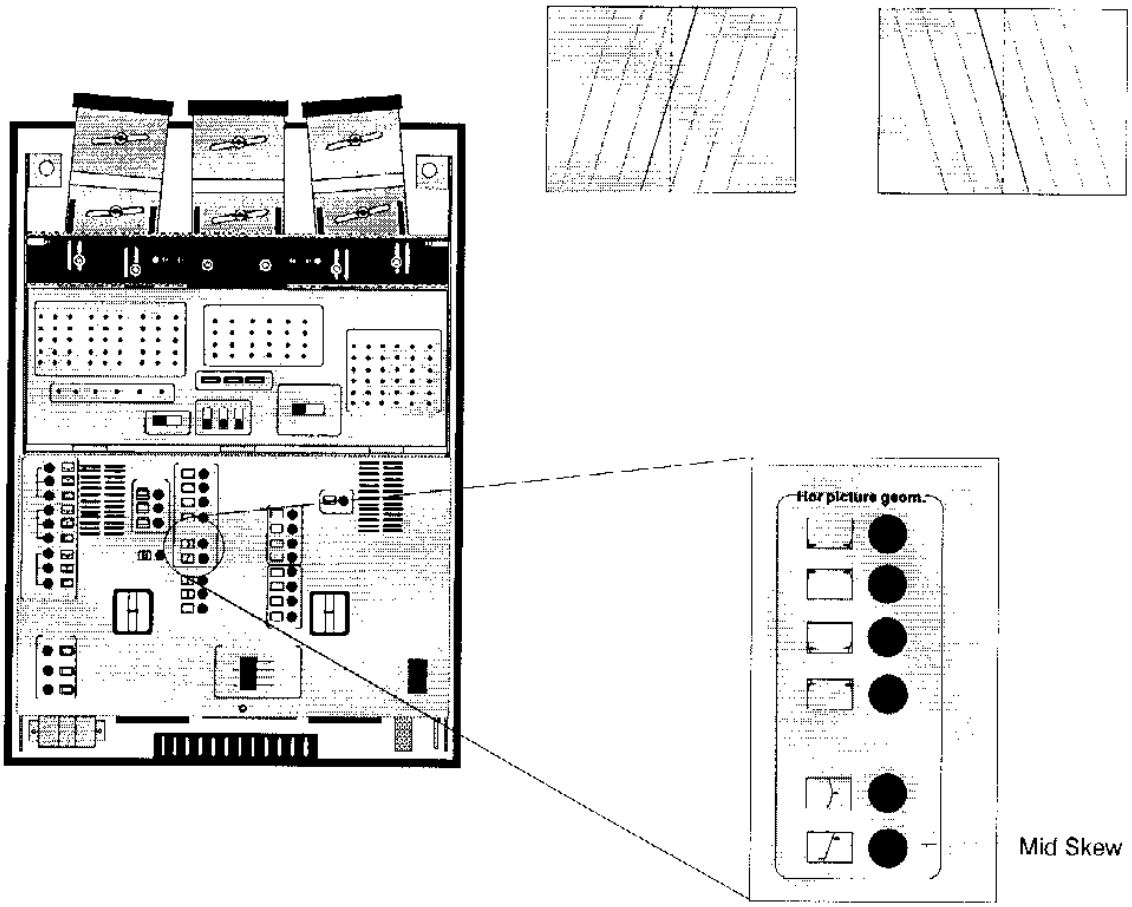


PROJECTOR ADJUSTMENT

Vertical center line skew adjustment.

Adjust the control 'MID SKEW' until the vertical center line is straight.

Misalignment of the outer vertical lines will be corrected with the bow and keystone corrections.



PROJECTOR ADJUSTMENT

Left-right vertical line corrections.

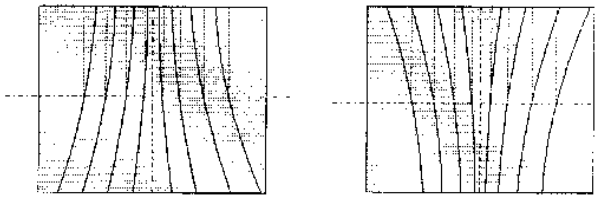
The projected image is split up into two parts. In both parts, keystone and bow corrections are available to correct the misalignment.

- Upper part of the screen.
Adjust the TOP BOW and TOP KEYSTONE controls for the upper part of the image until the vertical lines at the left and right side of the projected image are straight.

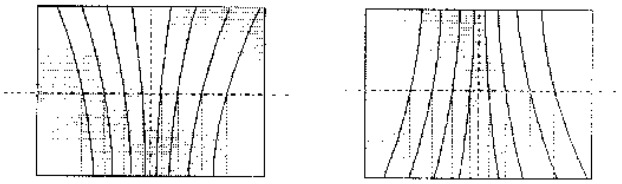
- Lower part of the screen.
Adjust the BOT BOW and BOT KEYSTONE controls for the lower part of the image until the vertical lines at the left and right side of the projected image are straight.

Important :
In order to obtain a perfect correction in the respective area, an alternating adjustment between BOW an KEYSTONE will be necessary in most cases.

Upper part of the screen



Lower part of the screen



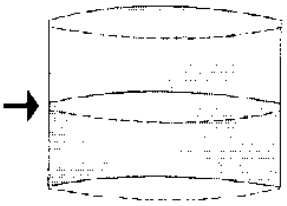
PROJECTOR ADJUSTMENT

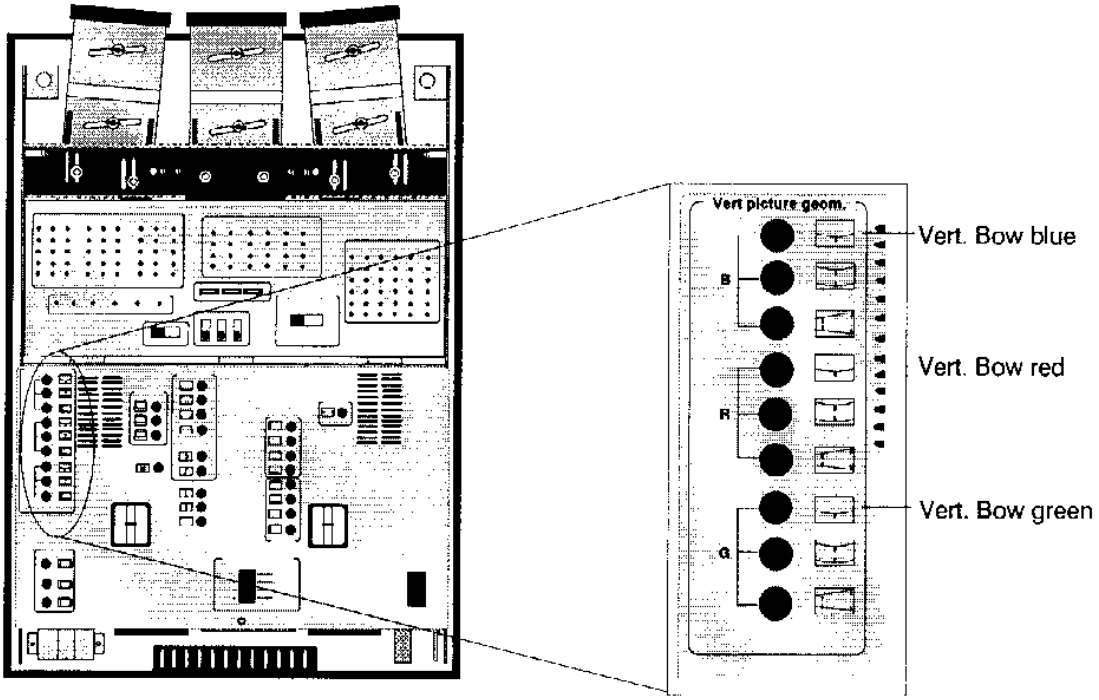
Top-bottom (north-south) adjustments.

Top-bottom adjustments affect only the horizontal lines of the projected image. These adjustments have to be done on all three color images. Start with the green image first and repeat if necessary with the red and/or blue image while superimposed on the green image.
Adjust first the horizonal centerline bow and proceed than with an altenating adjustment of the N/S amplitude and the keystone distortion.

Horizontal centerline bow.

Adjust the vertical bow control until the horizontal centerline is straight.





PROJECTOR ADJUSTMENT

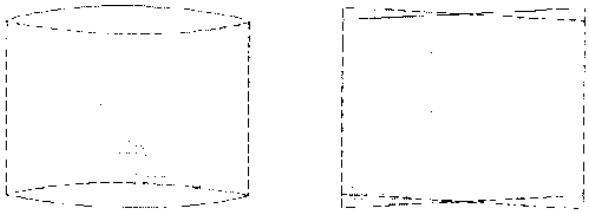
N/S amplitude

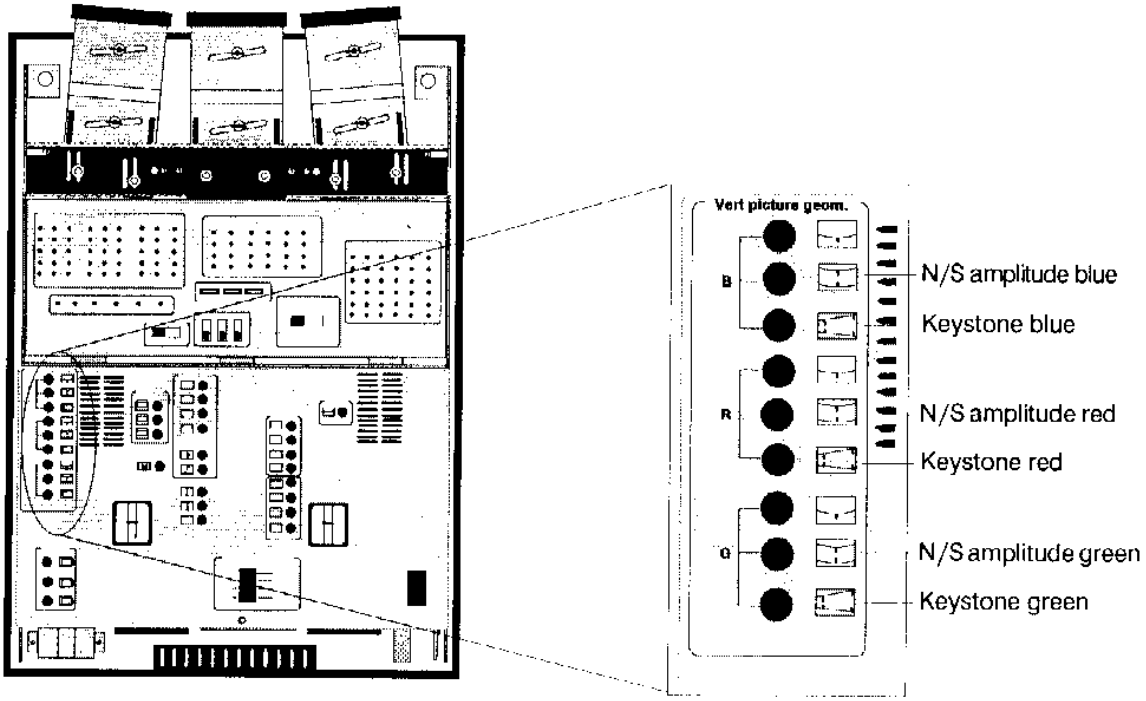
Adjust the N/S amplitude until the bow misalignment on top and bottom of the image is corrected.

Keystone distortion

Adjust the keystone distortion until the horizontal lines on top and bottom part of the image are straight.

All non coincidences of the red and blue image to the green image have to be corrected later with the controls on the convergence panel.





PROJECTOR ADJUSTMENT

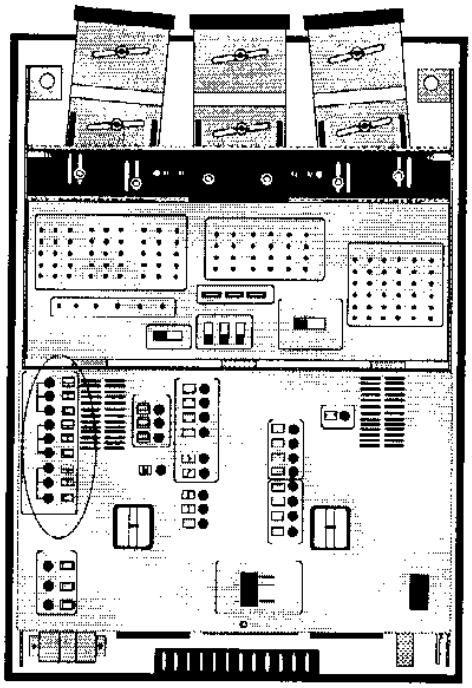
Horizontal image width

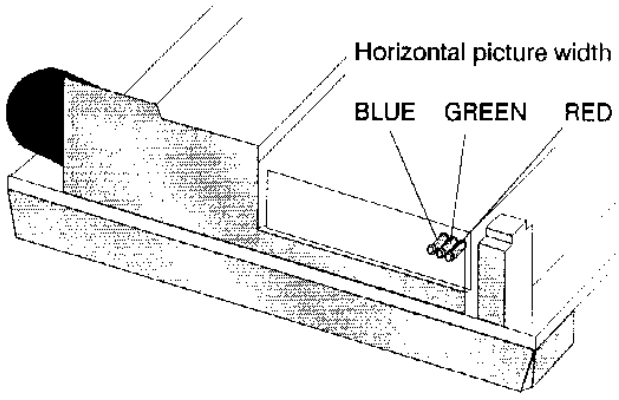
The possibility exists to correct the image width for the green, red and blue image separately. Adjust the coils T80, T90and T100 for the same image width for the three colors.

Warning : Always use a non-metalic screwdriver to adjust the coils. Never touch the electrical parts, otherwise you will receive an serious electrical shock.

Handle as follows :

- Turn the core of each coil fully inside the coil.
- Measure the image width of each color image.
- The color image with the smallest width has to be taken as reference. Do not touch the corresponding coil. The core stays fully turned in.
- Adjust the two other coils in order to obtain the same image width.





PROJECTOR ADJUSTMENT

Linearity and amplitude corrections.

These adjustments have to be done on only one image color. The other colors are automatically corrected in the same way. Therefore, switch off the blue and red image by covering the corresponding lens or by switching the color switches in the OFF position.

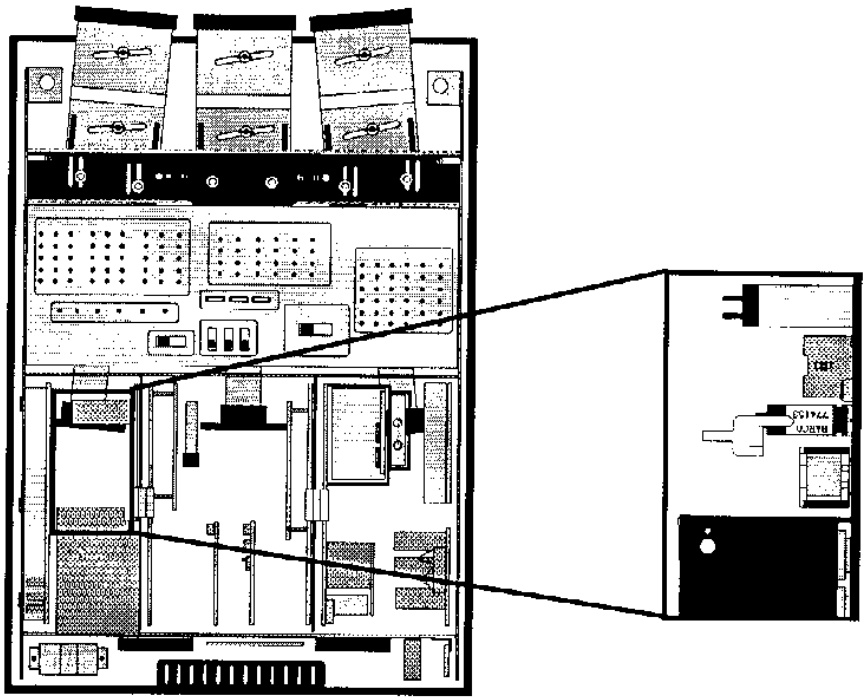
Horizontal linearity

The HOREZONTAL LINEARITY is factory preadjusted. Only when service has taken place, it can be necessary to readjust the horizontal linearity if the crosshatch squares have different widths.

Warning : Use a non-metalic screwdriver and never touch any electronical part.

Proceed as follow :

- Open the top cover.
- Take off the protective cover.
- Switch on the crosshatch generator on the convergence panel.
- Adjust the horizontal linearity control for horizontal equal size of the crosshatch squares on the screen.
- Reinstall the protective cover and close the top cover.



PROJECTOR ADJUSTMENT

Horizontal amplitude

Two controls allow image width adjustment :

* Image width adjustment on the SM Power module.

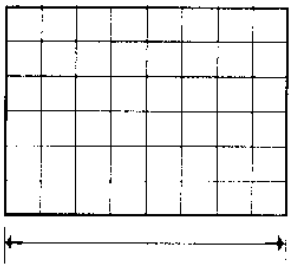
This control is factory pre-adjusted. Re-adjustment is only necessary after service. Proceed as follows :
- Add a video signal to the projector and switch the input switch on the CSB in the video position.
- Look up the corresponding screen width with the projector/screen distance in the used configuration.
- Adjust the 'picture width control' on the SM power supply module in order to obtain the corresponding screen width.

Warning : For product safety, use alsways a non-metalic screwdriver.

* Horizontal amplitude control on the control switch box.

This amplitude control affects only the RGB analog signals. Adjust this control until the desired width is obtained. The maximum width cannot be higher than the factory pre-adjusted width with the control on the SM power supply module.

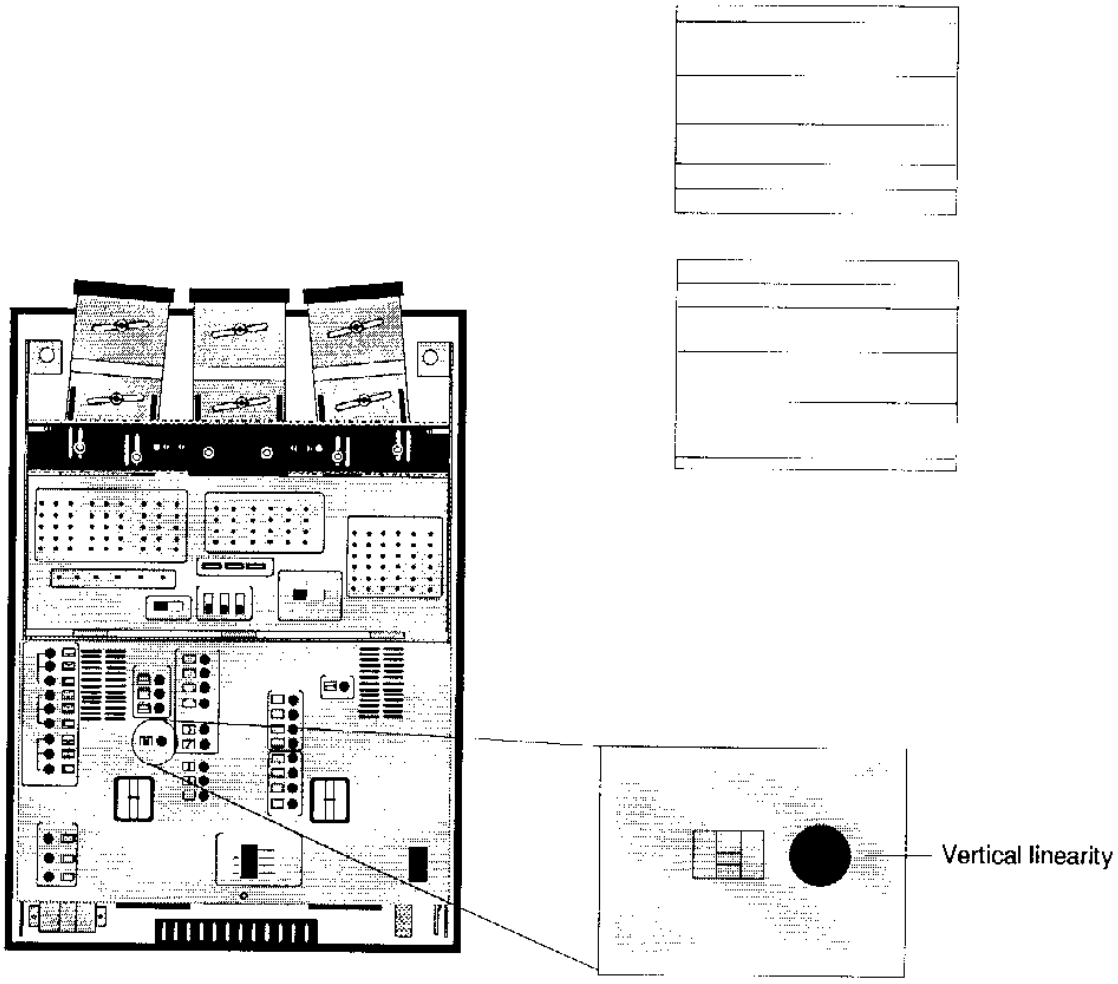
Hint : In order to avoid loss of resolution in the projected image and to ensure maximum CRT longevity, do not use an exessively small horizontal size setting.



PROJECTOR ADJUSTMENT

Vertical linearity

Adjust the vertical linearity control until the distance between the horizonal lines of the set up pattern are equal .



PROJECTOR ADJUSTMENT

Vertical amplitude for RGB analog signals

Note : adjust always first the horizontal amplitude.

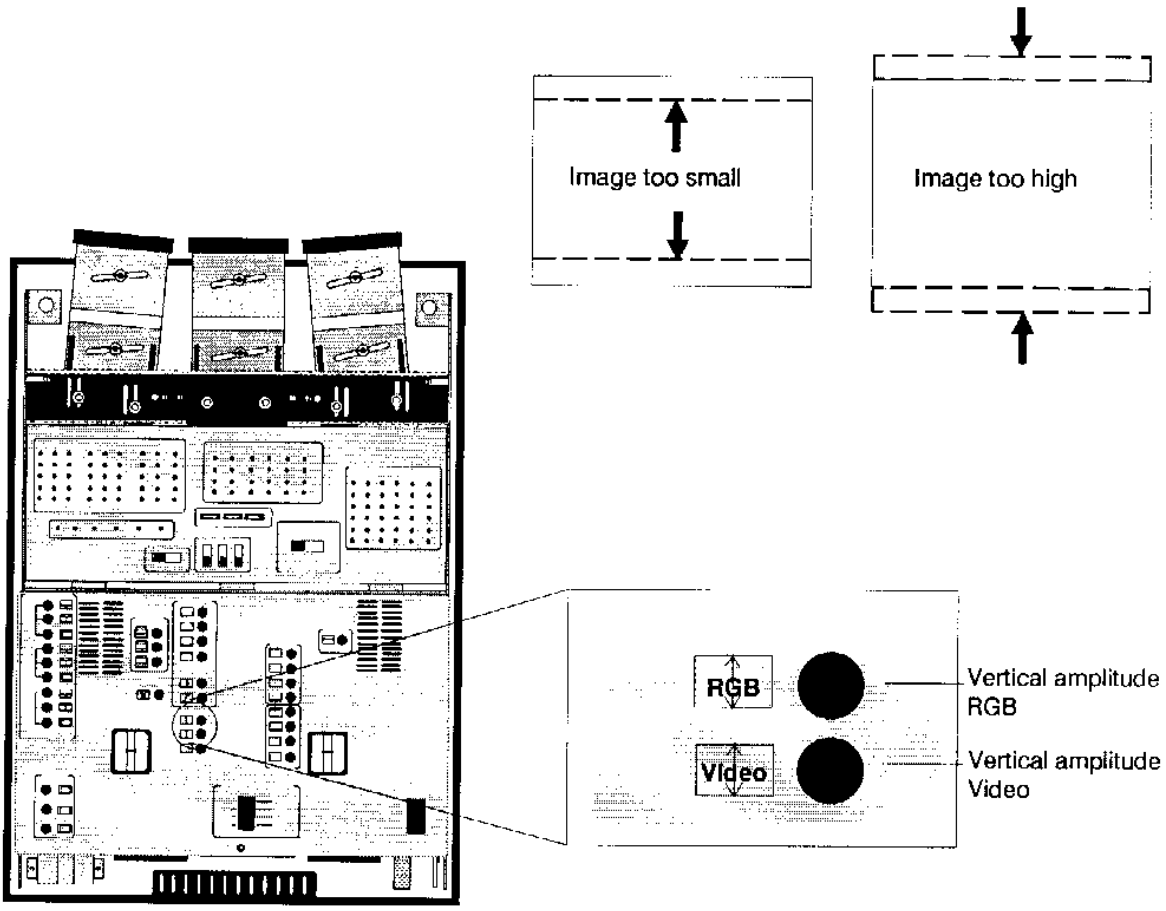
Adjust the vertical amplitude control for correct picture ratio, width-height 4 by 3.

Hint : In order to avoid loss of resolution in the projected image and to ensure maximum CRT longevity, do not use an exessively small vertical size setting.

Vertical amplitude for video signals

Adjust this vertical amplitude control for correct picture ratio, width-height 4 by 3.

Hint : In order to avoid loss of resolution in the projected image and to ensure maximum CRT longevity, do not use an exessively small vertical size setting.



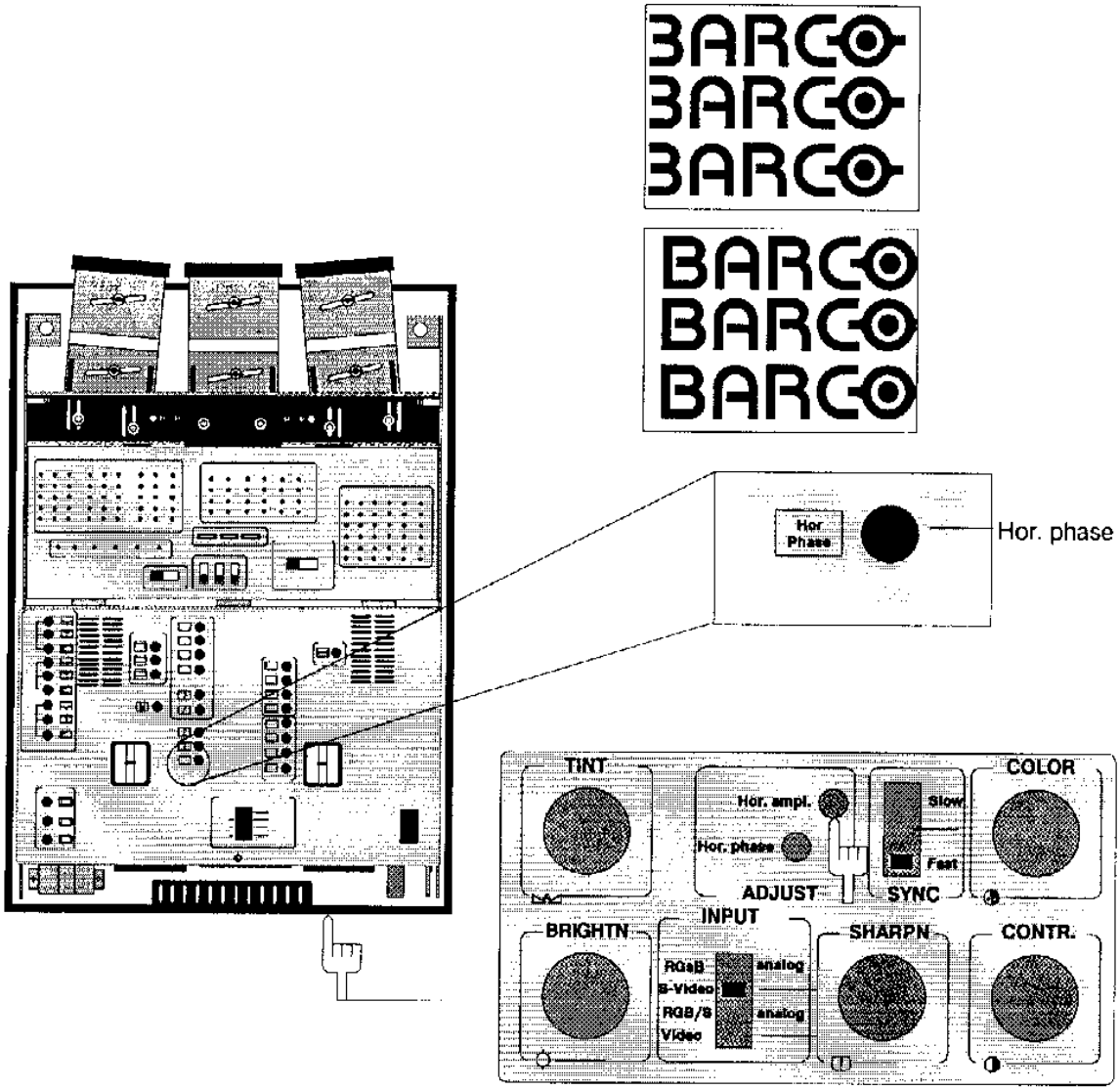
PROJECTOR ADJUSTMENT

Horizontal phase adjustment

Use the potentiometer covered by the protection cover to adjust the horizontal video phase.
Use the potentiometer on the CSB box to adjust the horizontal RGB phase.

Adjust the horizontal phase for video signals and RGB signals seperately until full characters are displayed on the left and right side of the picture.
In order to optimize the image quality, the image should be shifted to the 'end of scan' side of the raster. For front screen applications, the 'end of scan' side of the raster is on the right hand side of the screen. For rear screen applications, it is on the left hand side.

Decrease the contrast and increase the brightness level until the raster becomes visible on the screen. Use the indicated potentiometer to shift the setup pattern to the proper position on the raster. Restore the brightness and contrast to normal levels after performing the horizontal phase adjustment.



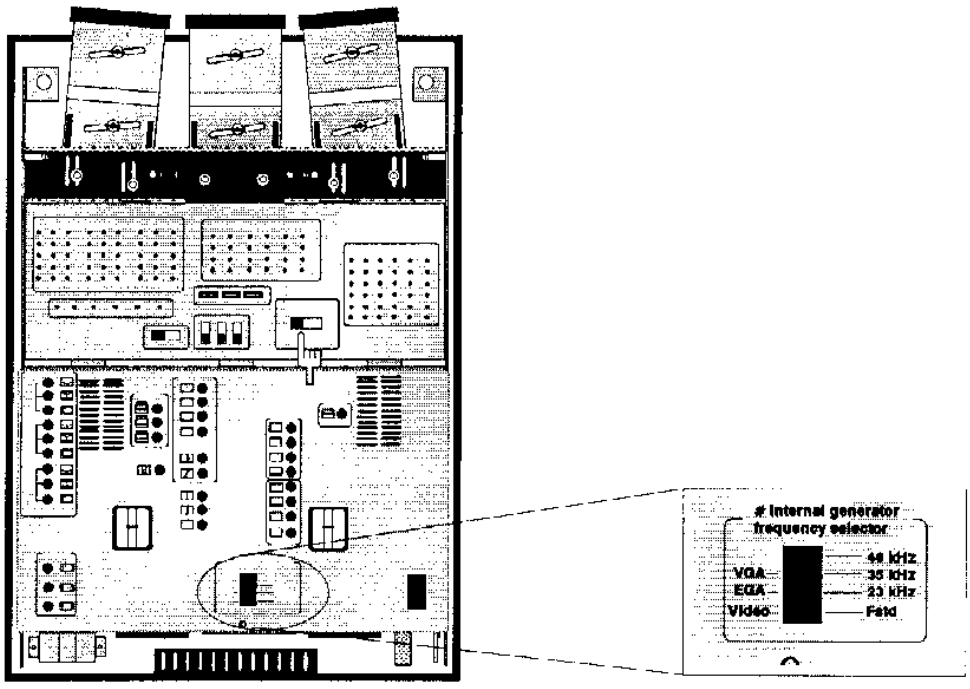
C. Convergence corrections

Enable the convergence corrections by switching the convergence ON/OFF switch in the ON position.
Eventual mislanding in the center of the image due to the convergence enableling must be corrected first with hor. and vert. shift adjustments before starting the dynamic convergence adjustments.

Preparation before converging :
- display the internal generated cross hatch pattern.
Put the switch '# PATTERN/VIDEO RGB OPERATION' on the convergence module in the position '#PATTERN'.

- Four different horizontal frequencies are available on the cross hatch generator module.
These frequencies are :
  Fstd (Video)
  23 kHz (EGA)
  35 kHz (VGA)
  46 kHz
Use on non-metalic screwdriver to select another horizontal frequency.

Start first with the static convergence adjustment and continue with the dynamic convergence adjustment on standard frequency. Continue with the dynamic convergence adjustment in the area 15-23 kHz, 23-35 kHz and end with the area 35-50 kHz.

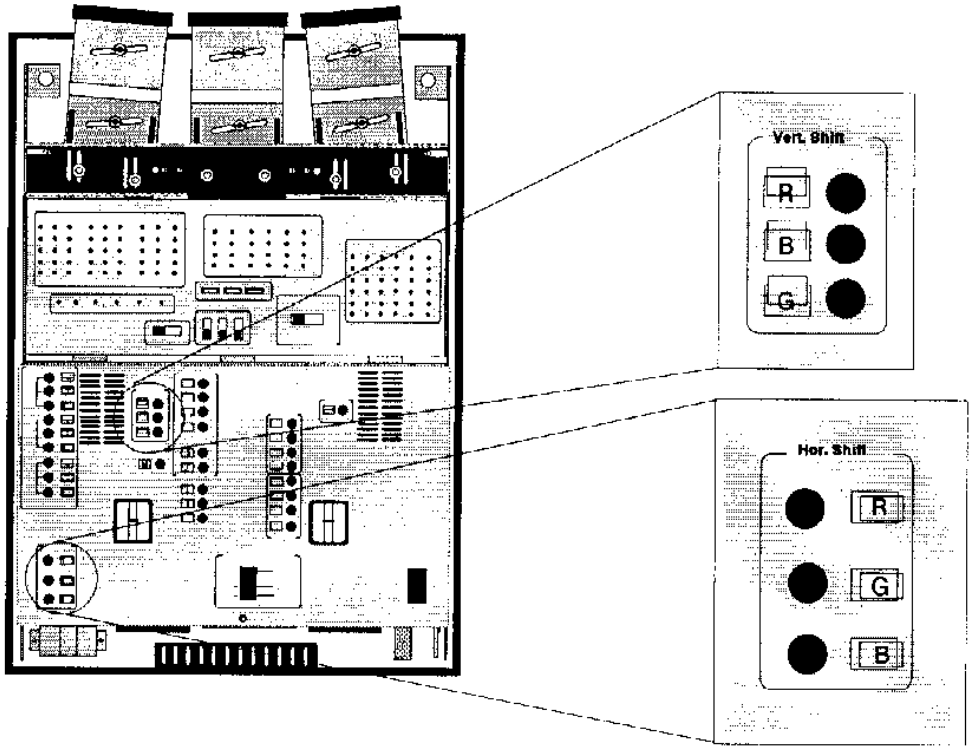


PROJECTOR ADJUSTMENT

1. Static convergence adjustment.

Start with the green image. Shift the green image until the center of the image is returned to its original position on the screen. (= position without convergence corrections).

Converge the horizontal and vertical center of the blue and red image for coincidence with the green image. Use the respective Hor. and Vert. shift controls.

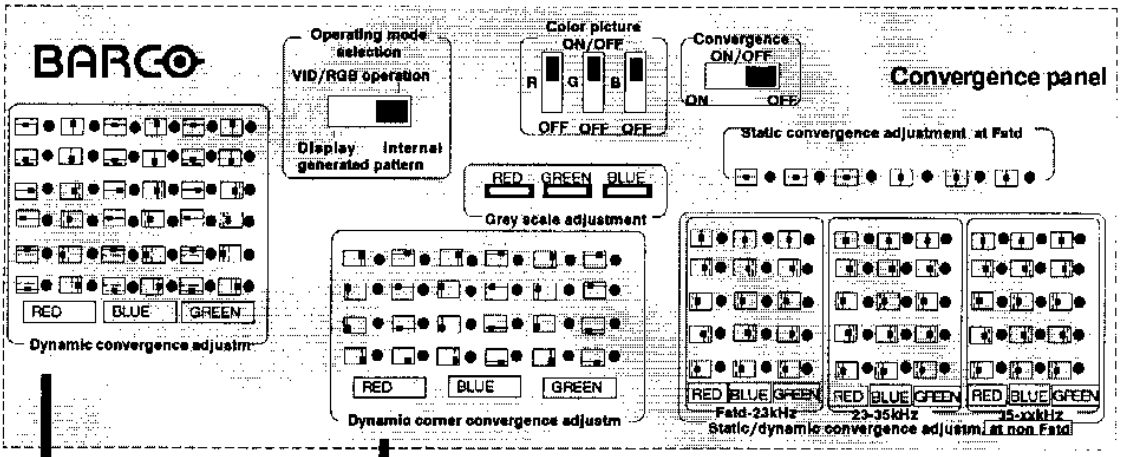


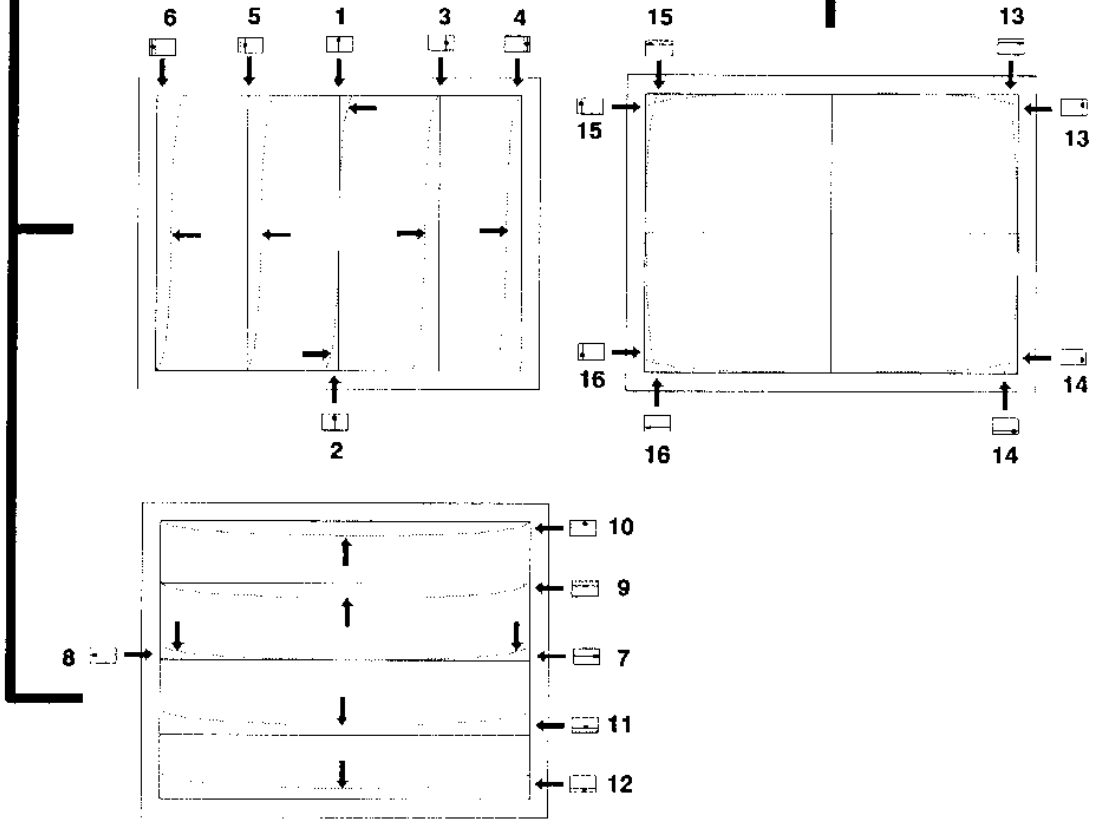
PROJECTOR ADJUSTMENT

2. Dynamic convergence adjustment at Standard frequency.

Red on green convergence adjustment.

- switch off the blue color image.
- adjust the convergence controls for the Red image at standard frequency. Start with the dynamic convergence adjustment and continue with the dynamic corner adjustments. Follow the order as mentioned on the drawing. As general rule : start in the middle of the image (area 1 and 2) and continue with next area (3), go futher until the edges are converged.

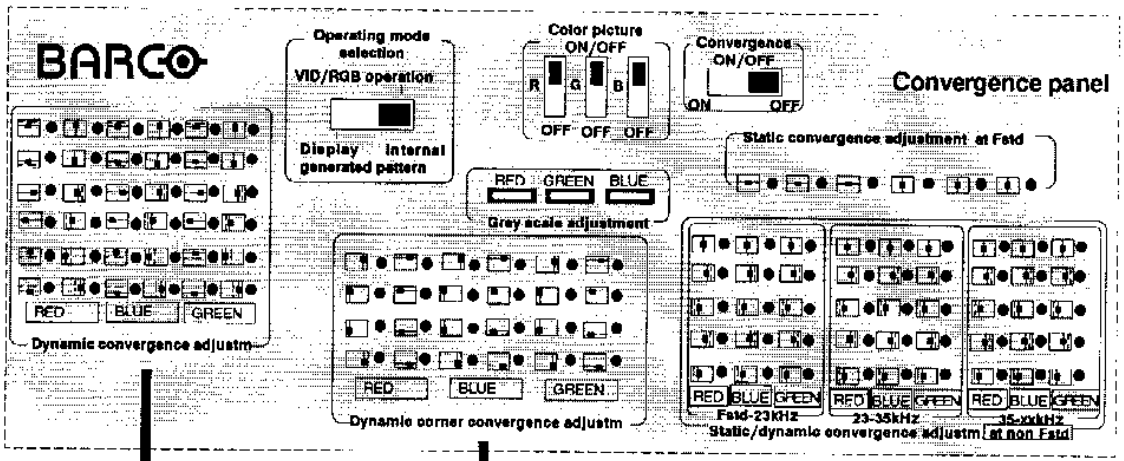


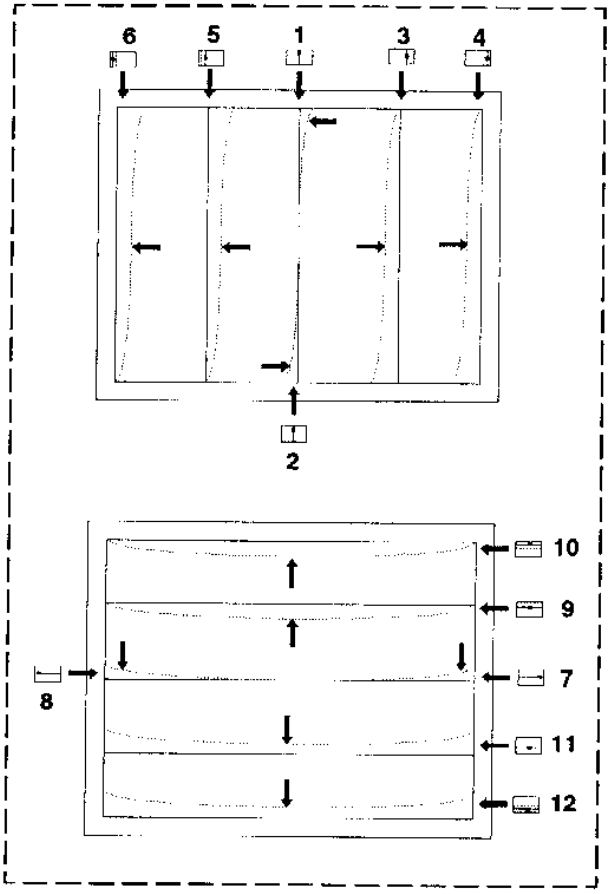


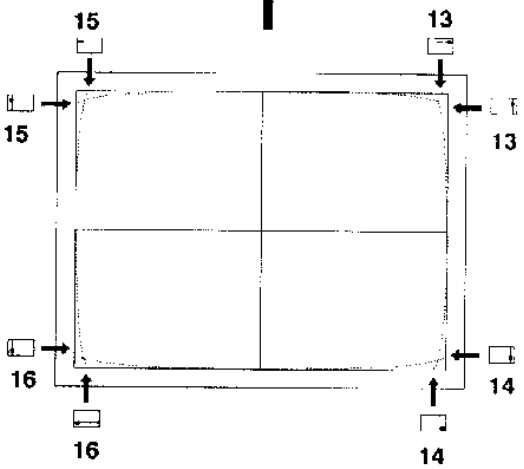
PROJECTOR ADJUSTMENT

Blue on green convergence adjustment.

- switch on the blue image and switch off the red image.
- adjust the convergence controls for blue in the same order as for red.







3. Dynamic and static convergence adjustment at Non-standard frequencies.

Note : before starting the convergence corrections at non-standard frequecy, be sure the convergence at standard frequency is correctly adjusted.

To obtain a correct convergence adjustment over the whole range, the convergence adjustment have to be done at three different frequenciesranges :

a. range Fstd - 23 kHz
b. range 23 kHz - 35 kHz
c. range 35 kHz - 50 kHz

Important : For correct convergence setting, use a line frequency in the near of the highist frequency in the mentioned ranges.

e.g. : use the internal # pattern, the following frequencies are available ; Fstd, 23 kHz, 35 kHz and 46 kHz.
When using an external test pattern generator, set the 'Operating mode selection' switch in the 'Vid/RGB operation' position.

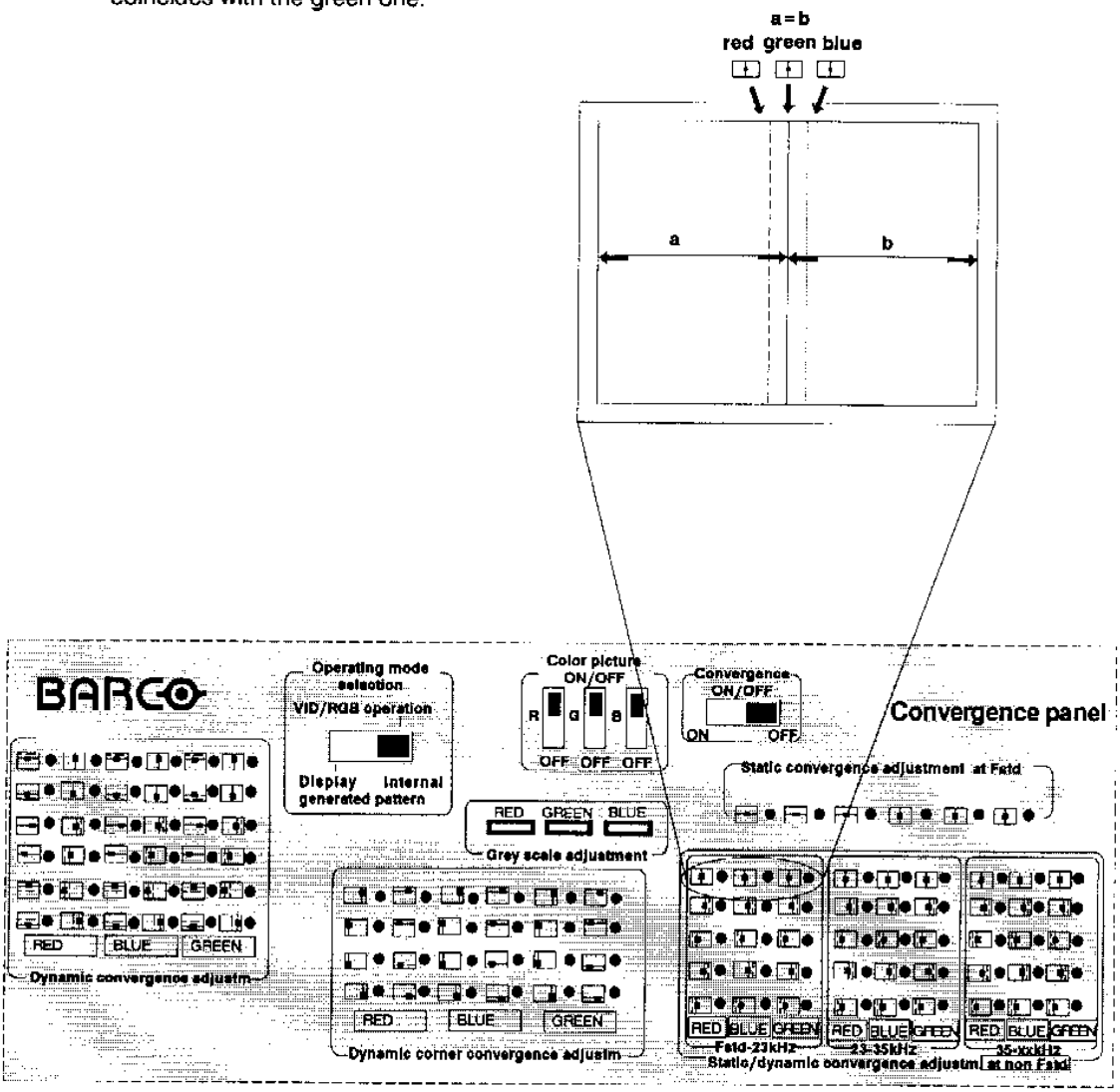
Always start with the Static convergence corrections and continu with the Dynamic convergence corrections within the same range.

4. Static and dynamic convergence adjustments within frequency range Fstd - 23 kHz.

It is recommended to use a line frequency in the near of 23 kHz to obtain optimal convergence setting.

Static convergence

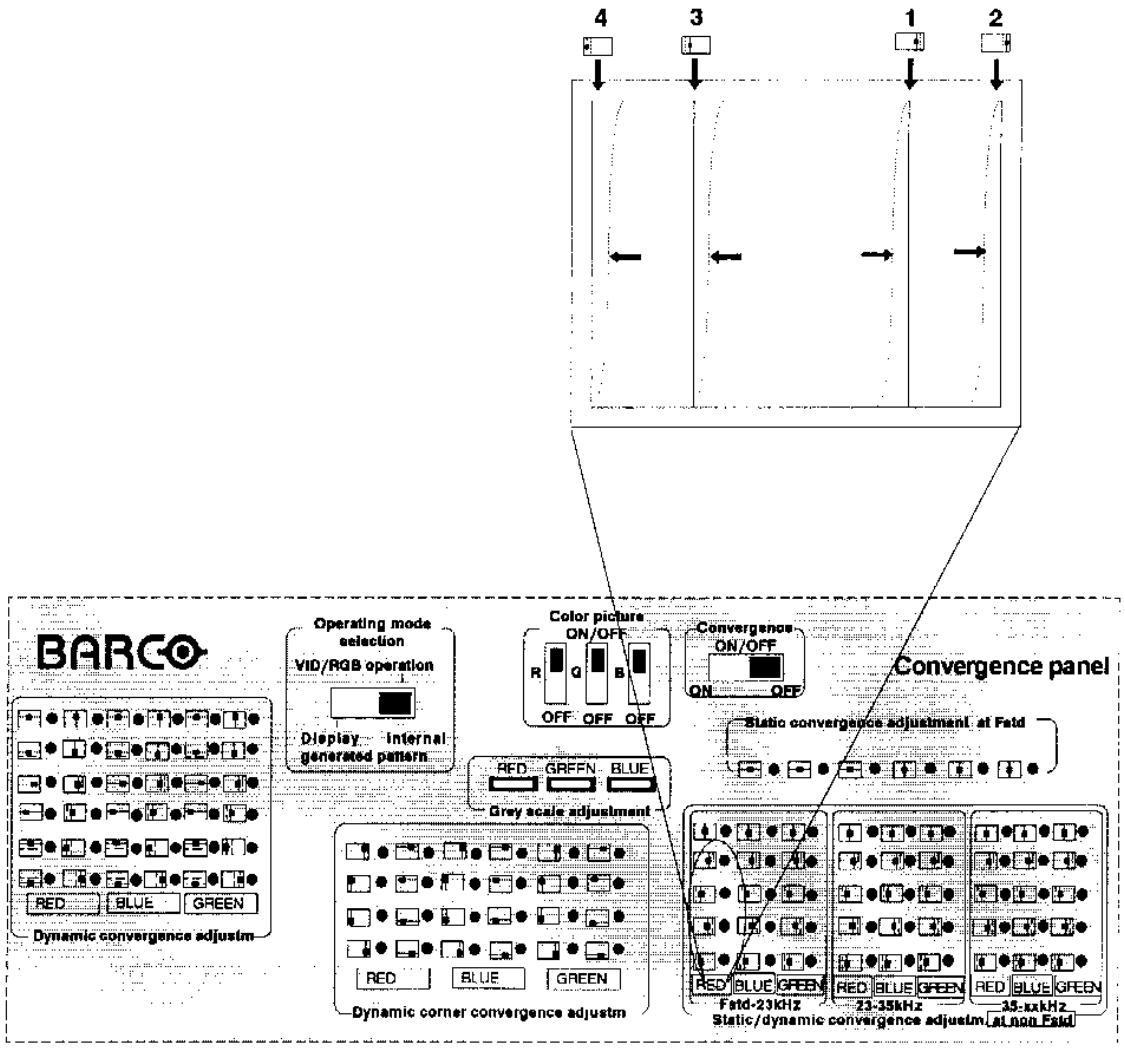
- switch off the blue and red image.
- adjust the green static control until the vertical center line is in the middle of the screen (a = b)
- switch on the blue and red image.
- adjust the static controls for blue and red until the vertical center line of the blue and red image coincides with the green one.



PROJECTOR ADJUSTMENT

Dynamic convergence for the RED image.

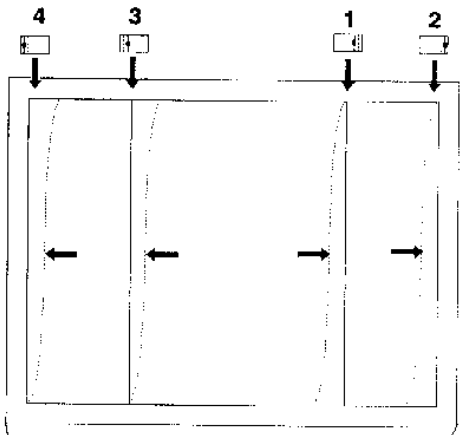
- switch off the blue color image.
- adjust in the respective area the convergence controls for the RED image in the order given on the drawing below.

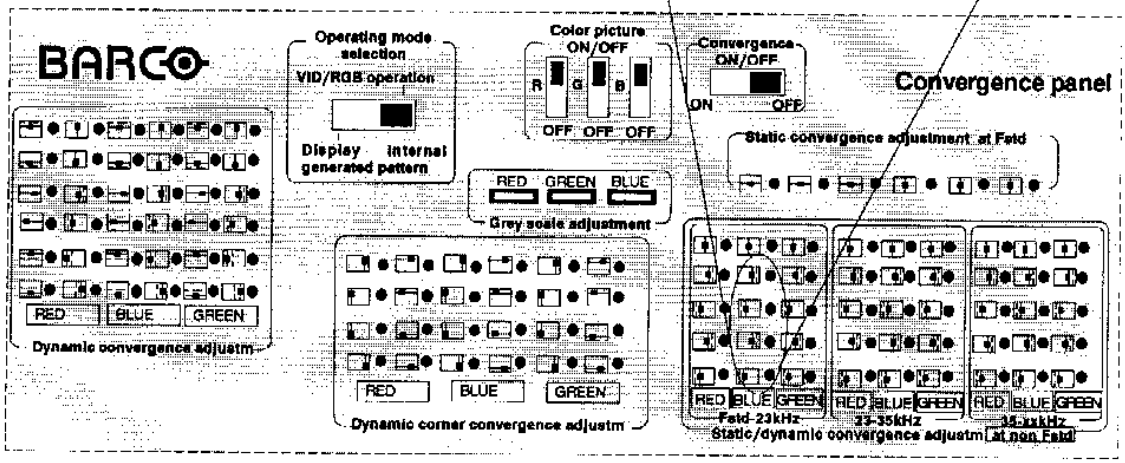


PROJECTOR ADJUSTMENT

Dynamic convergence for the BLUE image.

- switch off the red color image.
- adjust in the respective area the convergence controls for the BLUE image in the order given on the drawing below.





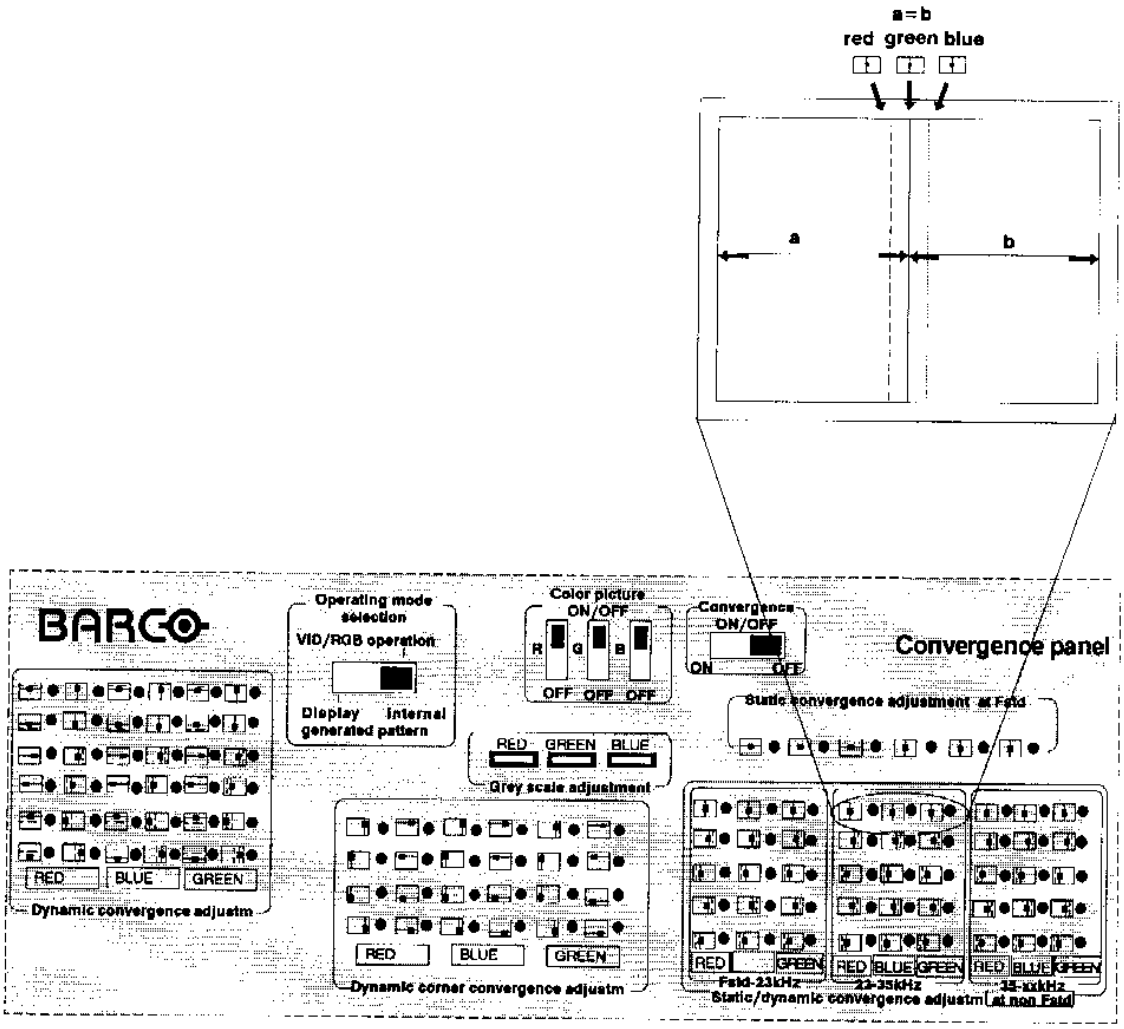
PROJECTOR ADJUSTMENT

5. Static and dynamic convergence adjustments within frequency range 23 kHz - 35 kHz.

It is recommended to use a line frequency in the near of 35 kHz to obtain optimal convergence setting.

Static convergence

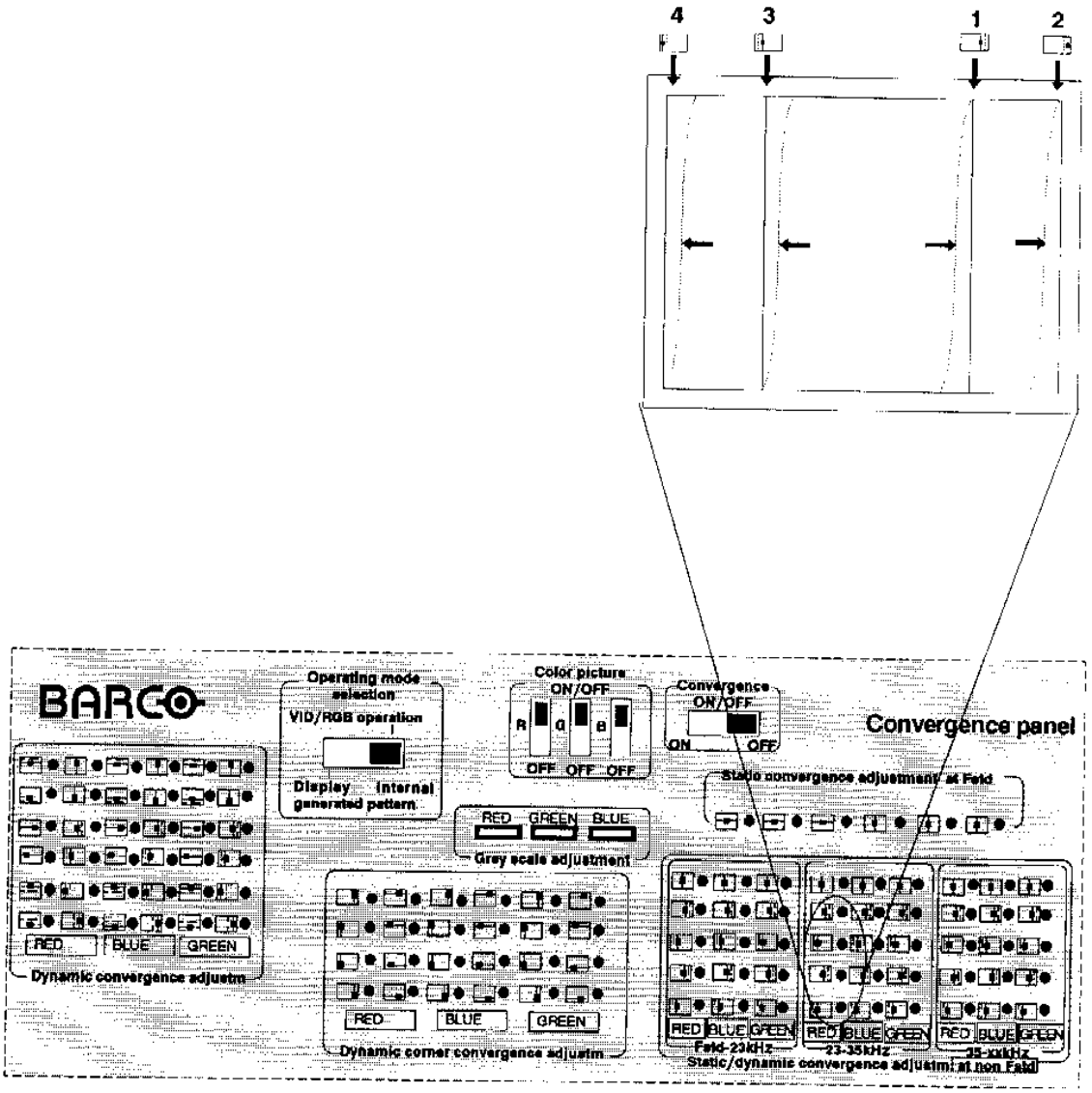
- switch off the blue and red image.
- adjust the green static control until the vertical center line is in the middle of the screen (a = b)
- switch on the blue and red image.
- adjust the static controls for blue and red until the vertical center line of the blue and red image coincides with the green one.



PROJECTOR ADJUSTMENT

Dynamic convergence for the RED image.

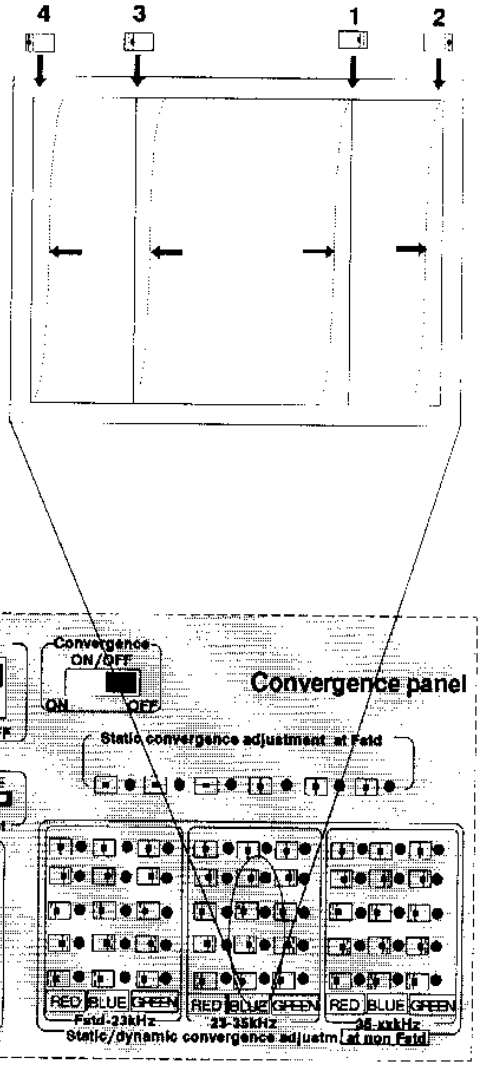
- switch off the blue color image.
- adjust in the respective area the convergence controls for the RED image in the order given on the drawing below.



PROJECTOR ADJUSTMENT

Dynamic convergence for the BLUE image.

- switch off the red color image.
- adjust in the respective area the convergence controls for the BLUE image in the order given on the drawing below.

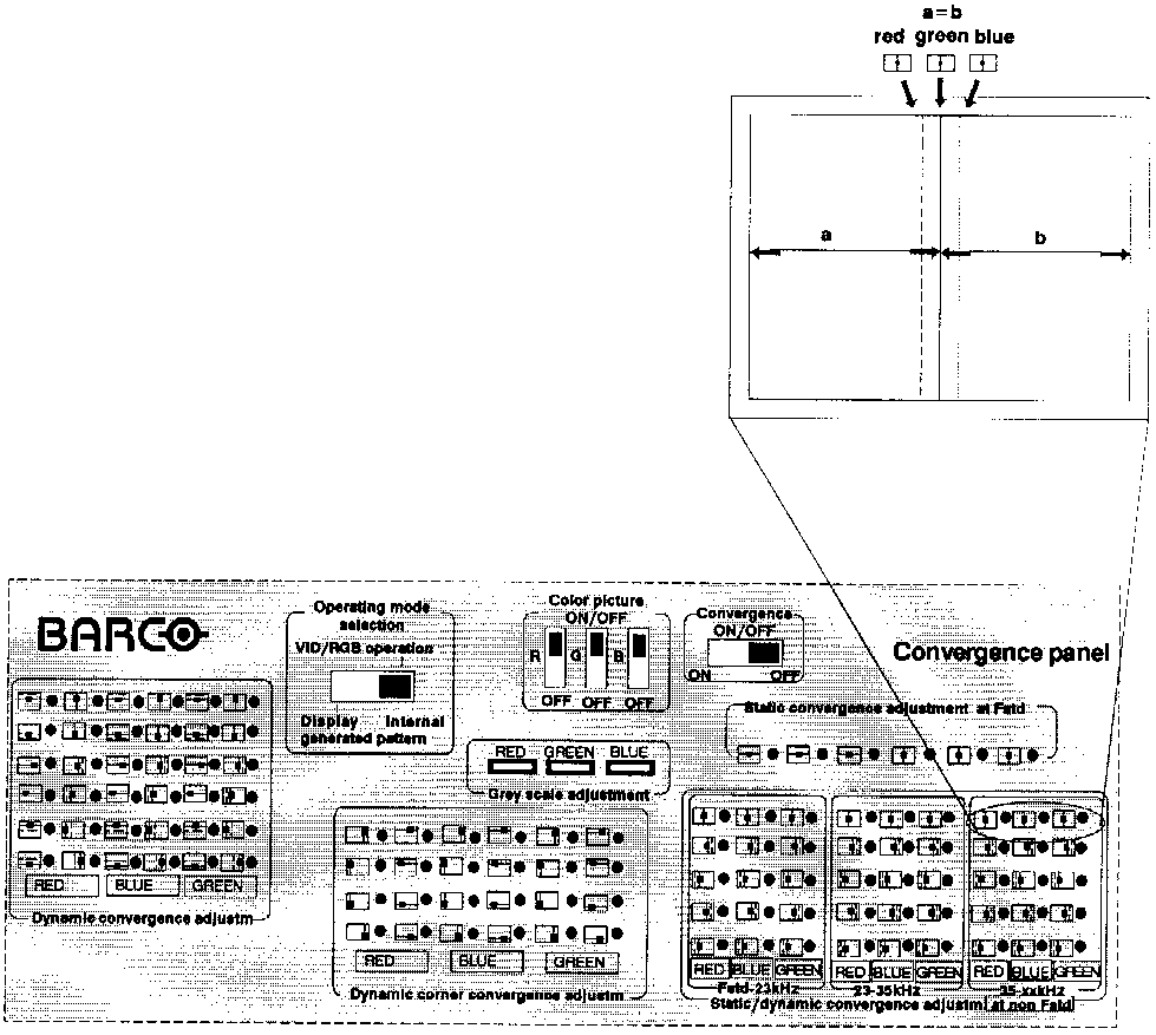


6. Static and dynamic convergence adjustments within frequency range 35 kHz - 50 kHz.

It is recommended to use a line frequency in the near of 50 kHz to obtain optimal convergence setting.

Static convergence

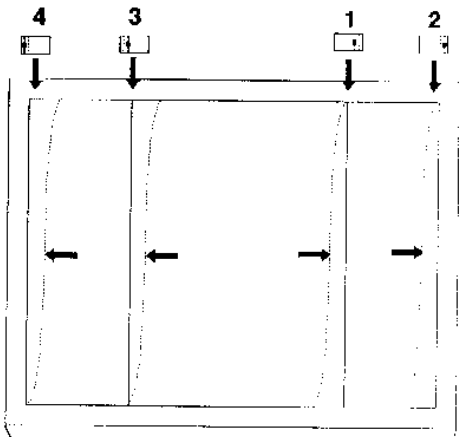
- switch off the blue and red image.
- adjust the green static control until the vertical center line is in the middle of the screen (a – b)
- switch on the blue and red image.
- adjust the static controls for blue and red until the vertical center line of the blue and red image coincides with the green one.

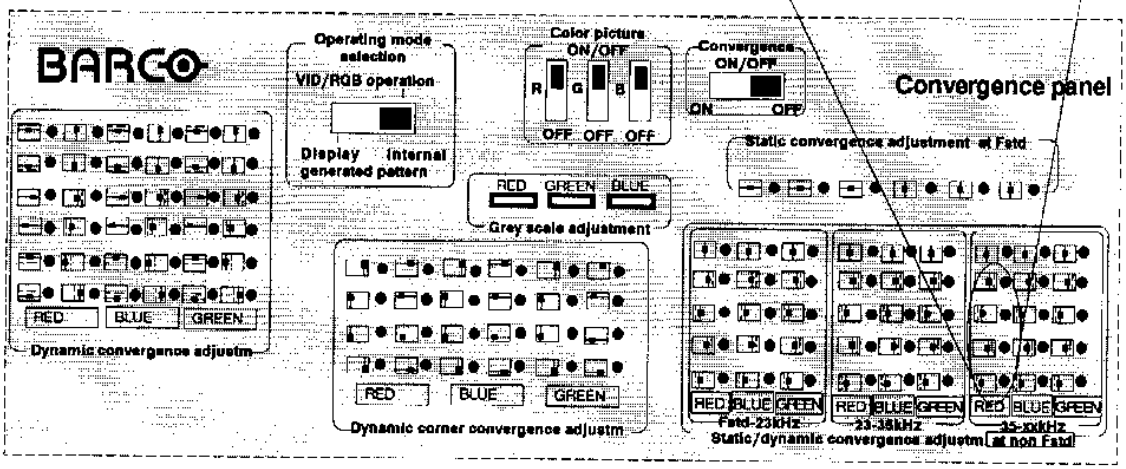


PROJECTOR ADJUSTMENT

Dynamic convergence for the RED image.

- switch off the blue color image.
- adjust in the respective area the convergence controls for the RED image in the order given on the drawing below.

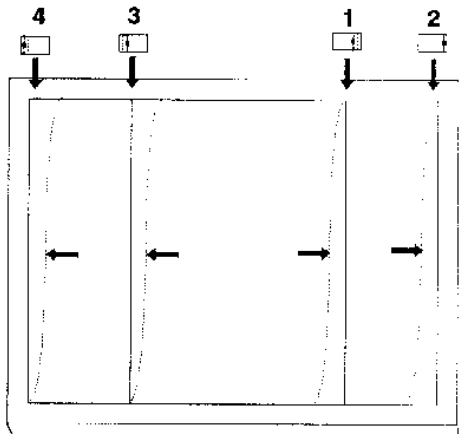


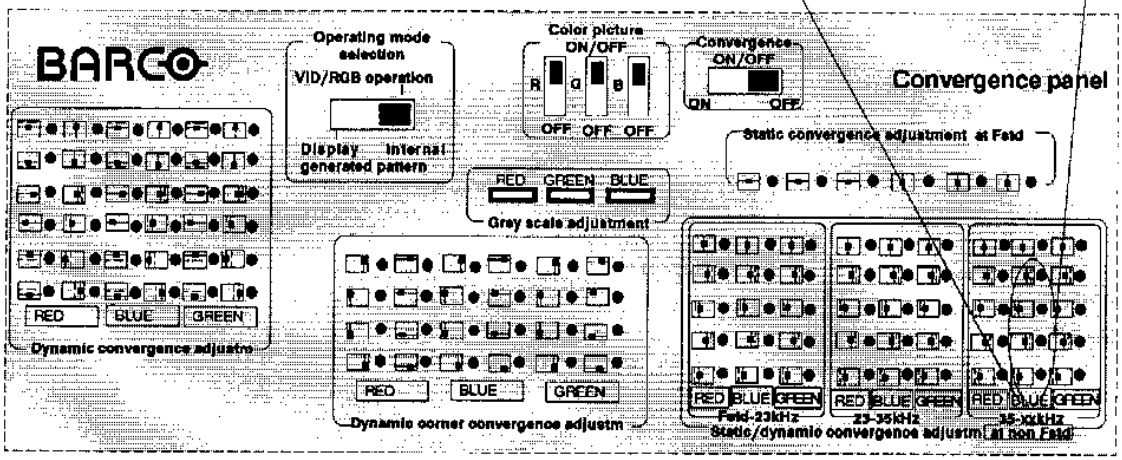


PROJECTOR ADJUSTMENT

Dynamic convergence for the BLUE image.

- switch off the red color image.
- adjust in the respective area the convergence controls for the BLUE image in the order given on the drawing below.





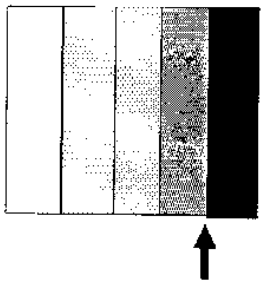
PROJECTOR ADJUSTMENT

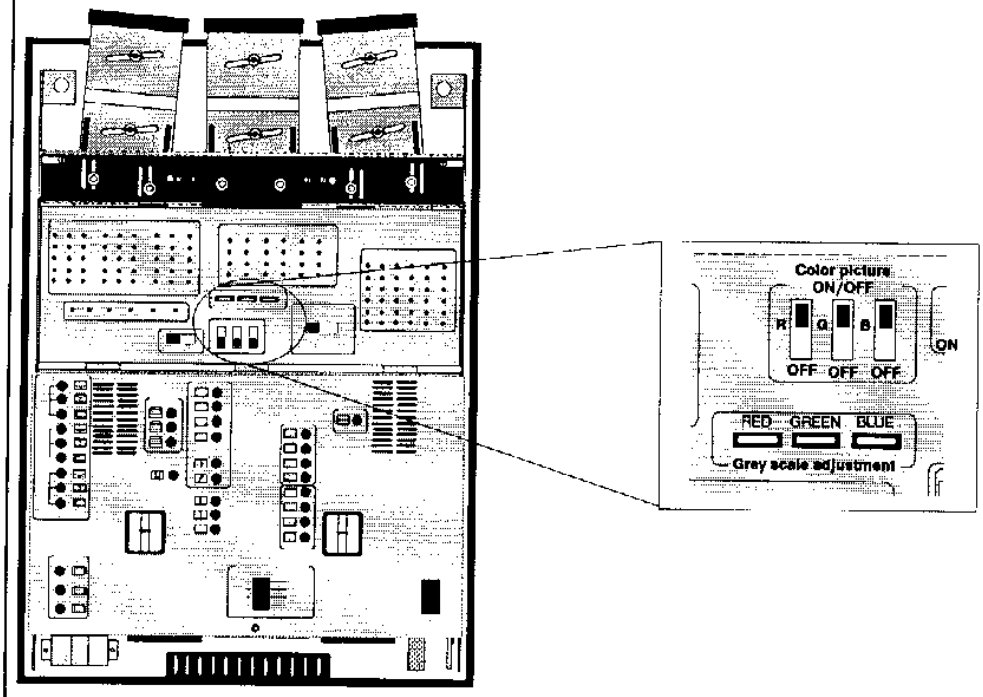
Grey scale adjustment

- Place the 'operating mode selection ' switch in the 'Vid/RGB operation' mode.
- Feed a standard color bar test pattern signal to the projector input (video or RGB).
- Select the corresponding input on the Control switch box.
- Turn brightness and contrast in the mid position.
- Switch off the blue and red images.

Adjust the GREY SCALE CONTROL for green until the black bar is black. Note : the first green bar next to the black bar must be distinguishable from the black bar.

- switch on the blue and red image and adjust the grey scale controls for the blue and red image for a correct grey scale tracking in the bright parts of the image.



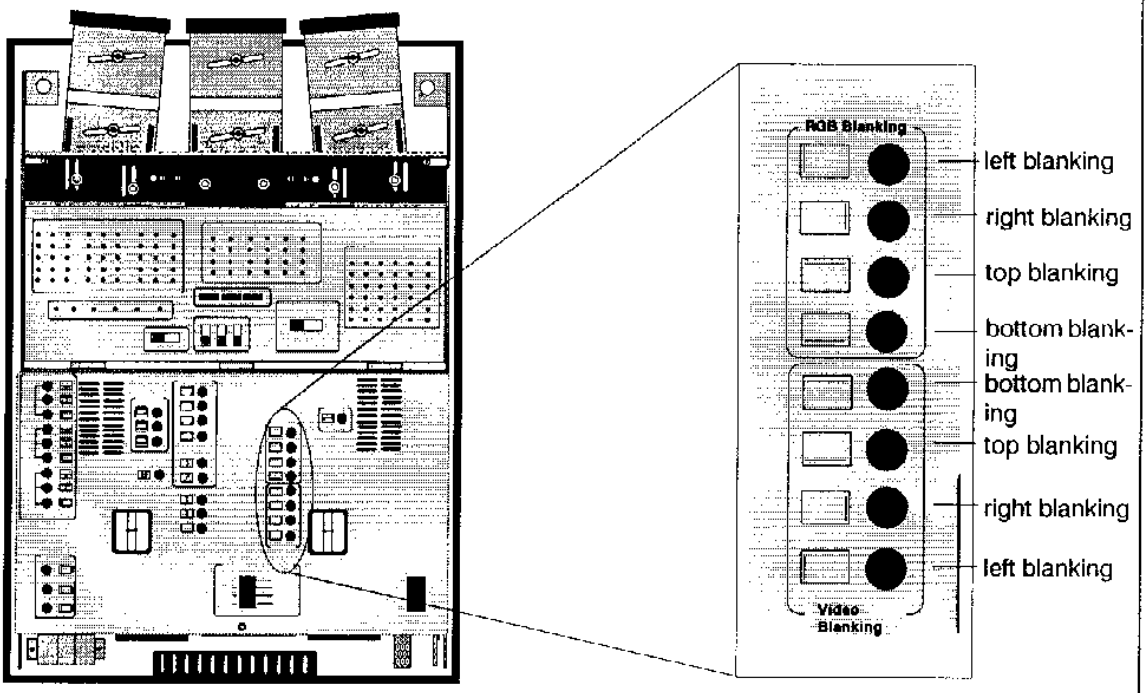


PROJECTOR ADJUSTMENT

Blanking adjustments

Blanking adjustments affect only the edges of the projected image an are used to frame the projected image on to the screen. The following blanking corrections are available for video and RGB images separately :

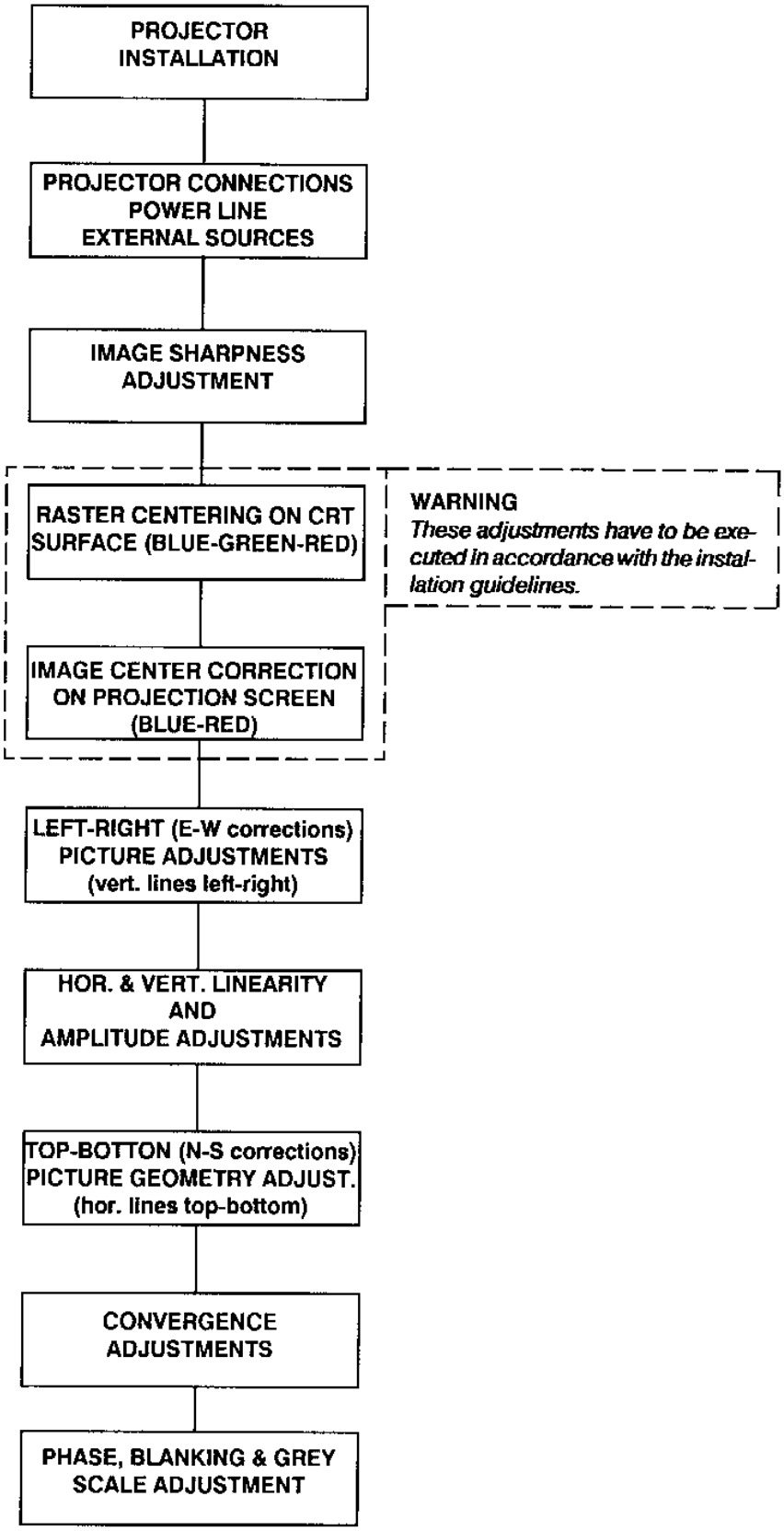
- top blanking
- bottom blanking
- left blanking
- right blanking



PROJECTOR ADJUSTMENT

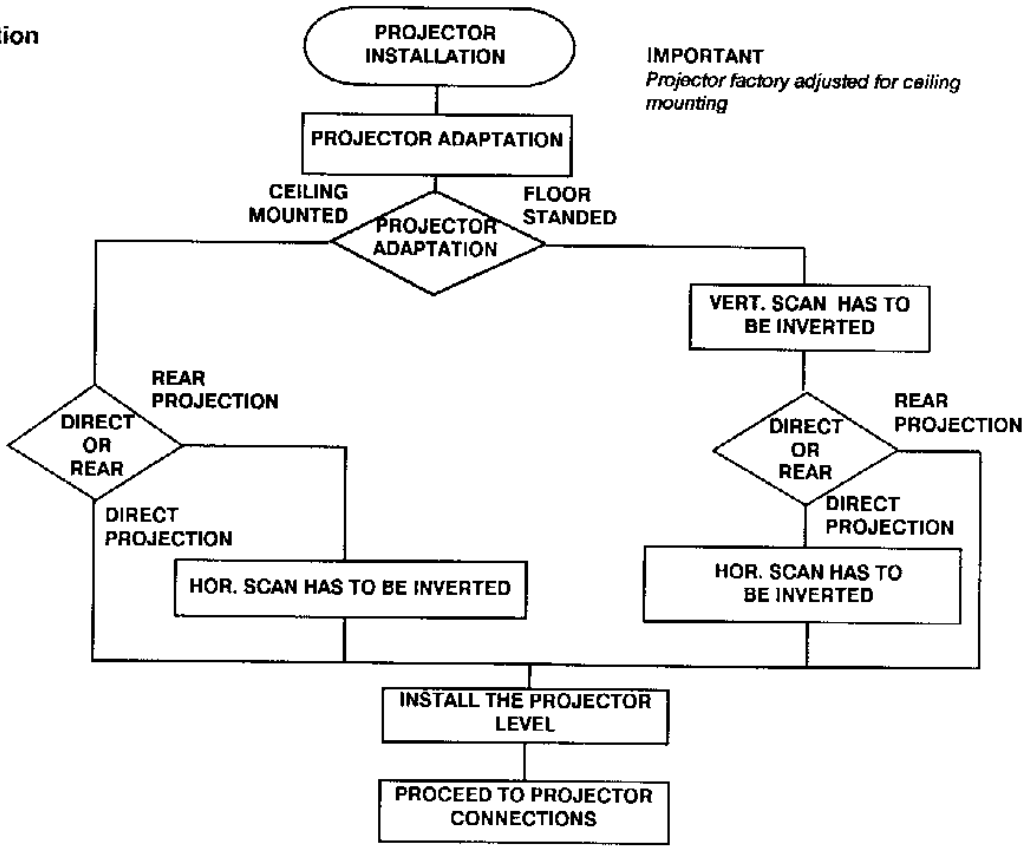
ADJUSTMENT FLOWCHARTS

ADJUSTMENT FLOWCHARTS

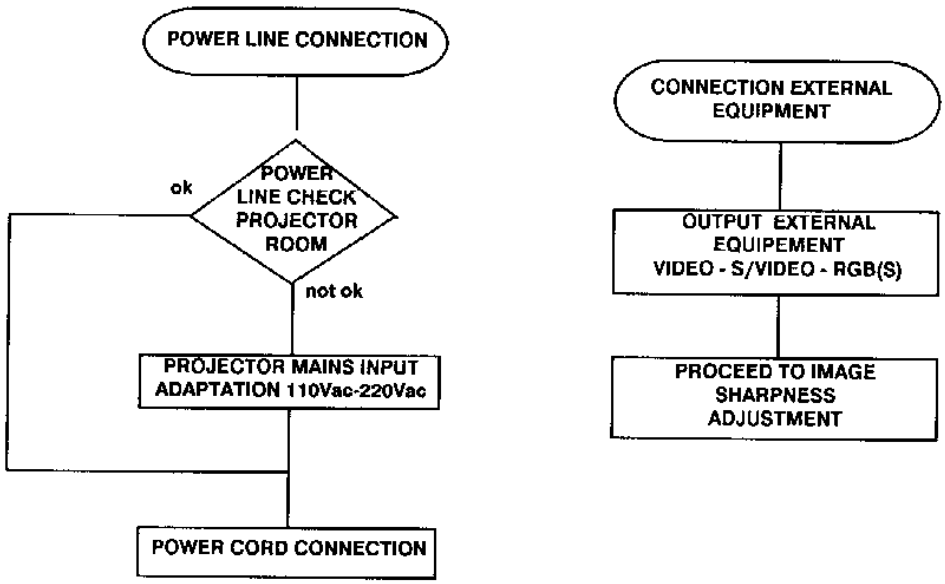


ADJUSTMENT FLOWCHARTS

I. Installation

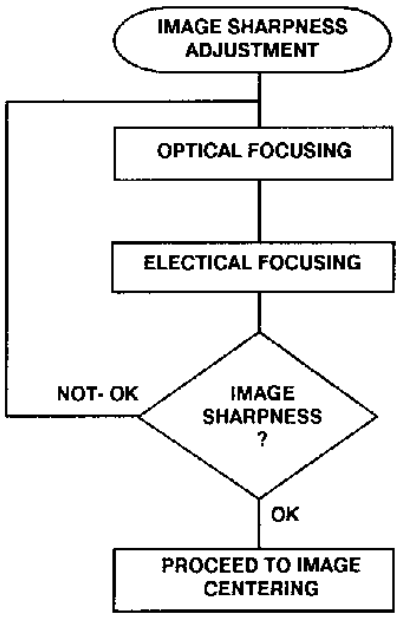


III. Connections

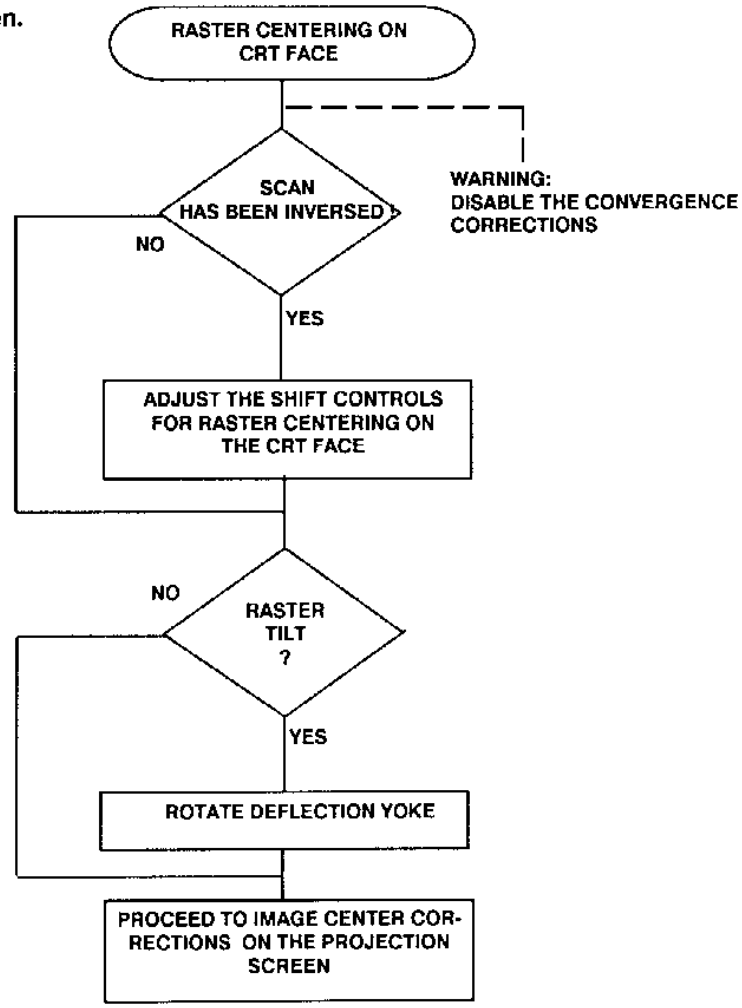


ADJUSTMENT FLOWCHARTS

IV. Picture sharpness adjustment

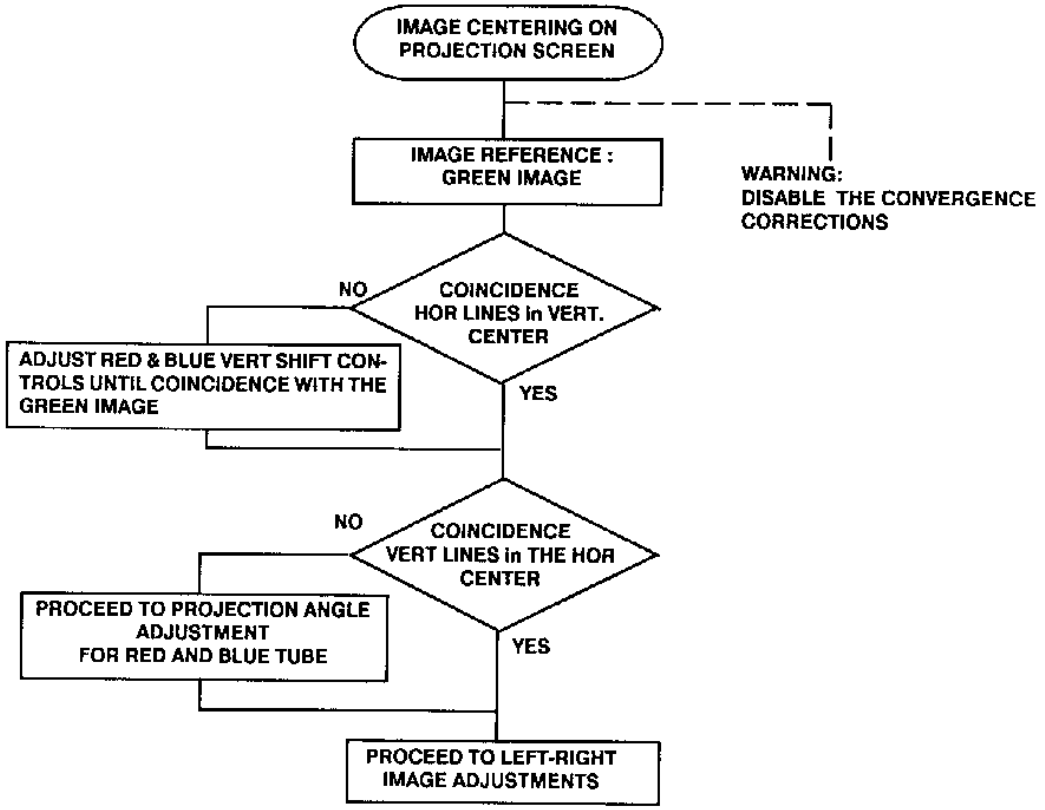


V. Raster centering on CRT screen.

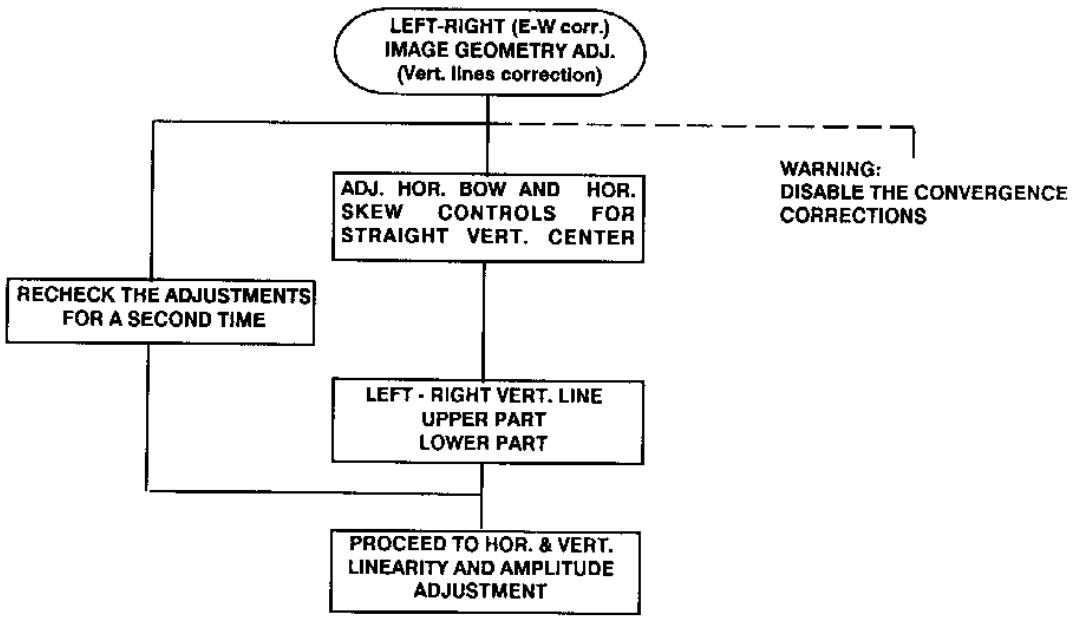


ADJUSTMENT FLOWCHARTS

VI. Image centering on projection screen

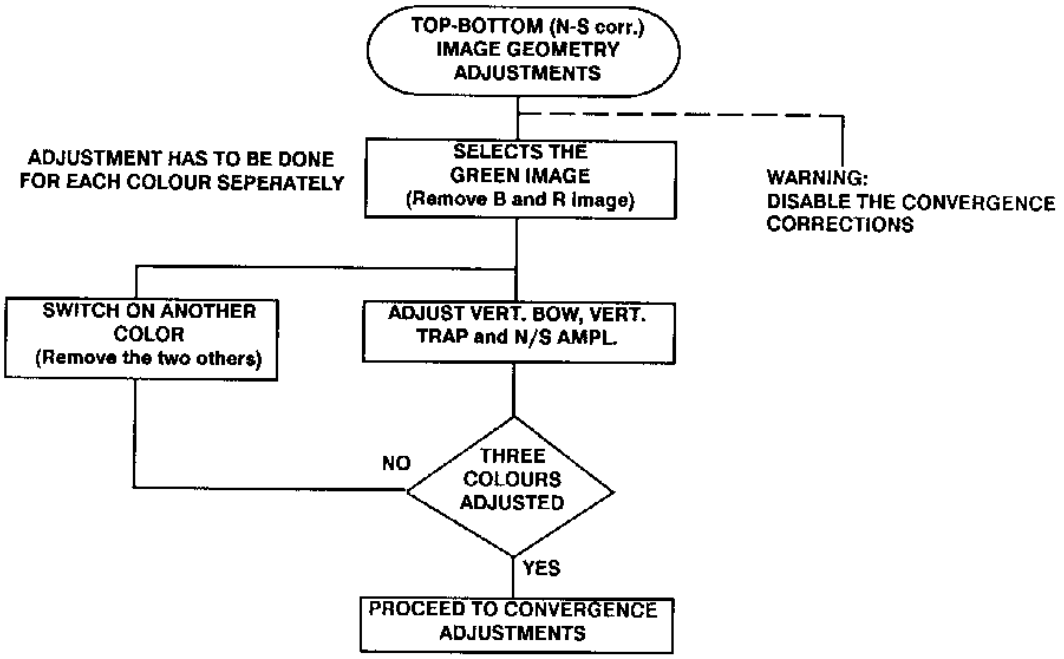


VII. Left-right adjustment

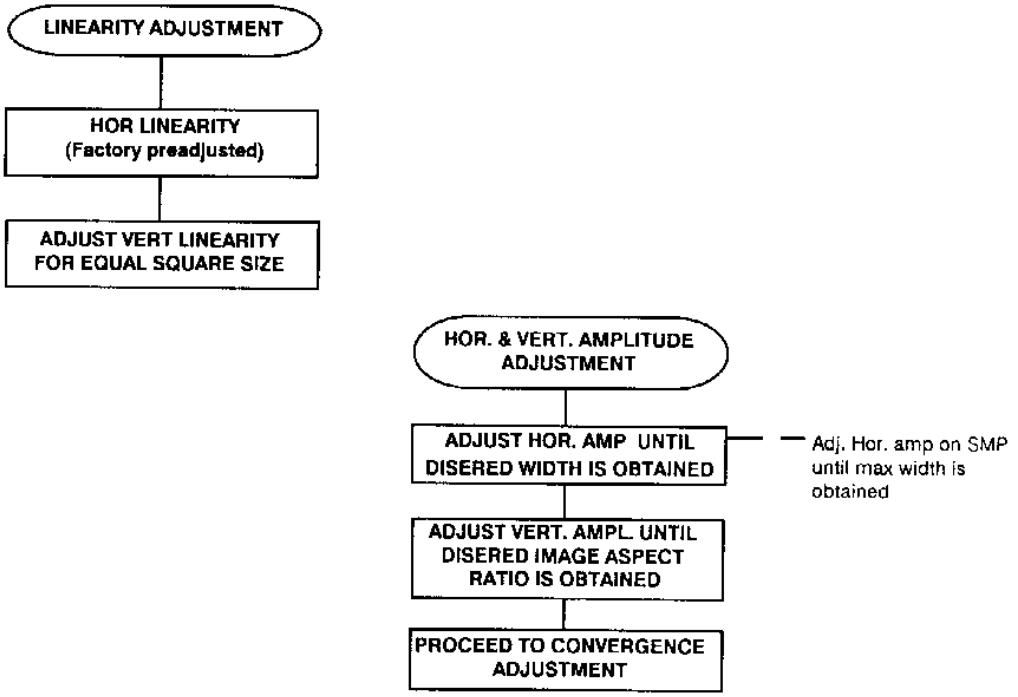


ADJUSTMENT FLOWCHARTS

VIII. Top-bottom adjustments

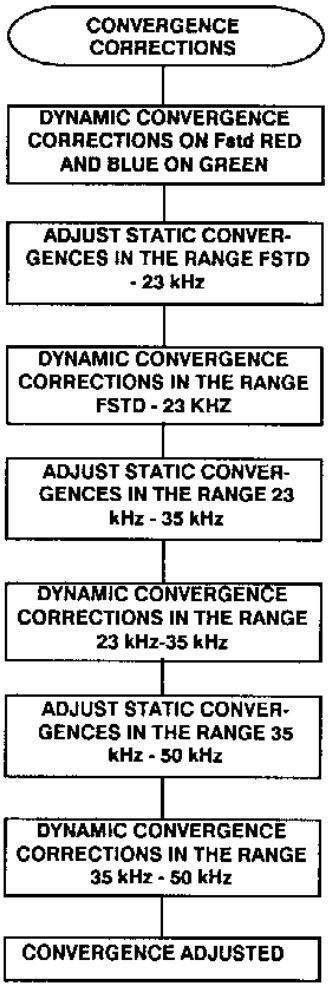


IX. Linearity and amplitude adjustment

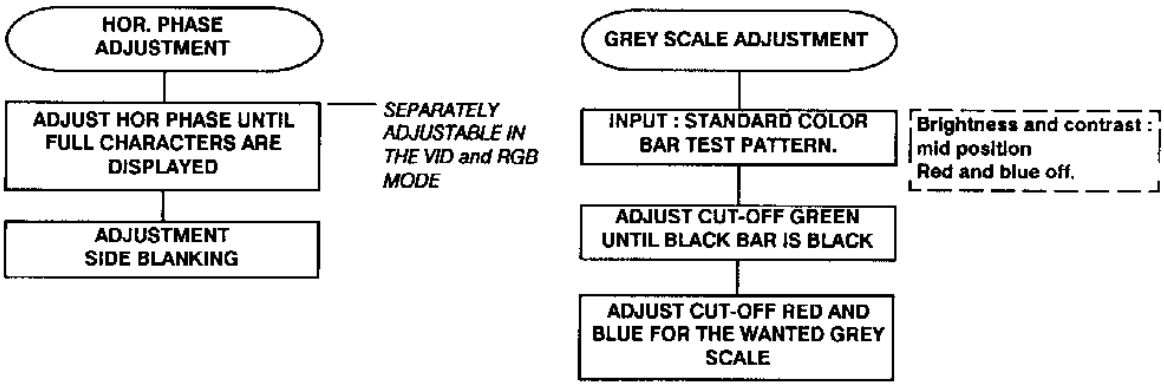


ADJUSTMENT FLOWCHARTS

X. Convergence corrections



XI. Phase, blanking and grey scale adjustment



SPECIFICATIONS

I. Video

Input selector switch : position VID

Input : 2 x BNC connectors (looped through)
75 ohm termination switch
500 mVpp to 2 Vpp ±3dB

II. Super Video

Input selector switch : position S-VID

Input : 2 x 4 pins mini DIN connector (looped through)
Pin configuration DIN connector:
pin 1 : ground (earth) luma signal
pin 2 : ground (earth) chroma signal
pin 3 : luma (Y) signal 1 Vpp ±3dB
pin 4 : chroma (C) signal 300 mVpp ±3dB
Both input signals can be 75 ohm terminated by two switches on the S-Video input module.

III. RGB(S) analog

Input selector switch : position RGsB or RGBS

RGsB : for RGB signals with sync on Green
or
RGBS : for RGB signals with separate sync.

Input : 4 BNC connectors
Red : 0.7 Vpp ±3dB
Blue : 0.7 Vpp ±3dB
Green : 0.7 Vpp ±3dB or 1 Vpp ±3dB If sync on green
Sync :(separate) : 4 Vpp neg. ±3dB or 1Vpp ±3dB
All inputs can be 75 ohm terminated by means of a switch on the RGB analog input module.

IV. Video color standards

PAL -SECAM- NTSC 3.58 - NTSC 4.43

Automatic color system selection

V. Bandwidth RGB signals

30 MHz

VI. Deflection

Vertical	37 to 140 Hz	frequency,
	450 us	retrace time.
Horizontal	15 to 50 kHz	frequency,
	4.7 us	retrace time (for projector with order number 90 00610),
	3.3 us	retrace time (for projector with order number 90 00619).

SPECIFICATIONS

VII. High voltage

Stabilized EHT : 34.7 kV

VIII. Power requirements

- 220-240V/110V AC internal switchable
- frequency independence between 40-100 Hz
- power comsumption : 280 W

IX. Display

Projection tubes :
- High definition liquid cooled 7" CRT's (5.5 " phosphor area)
- colors red, green and blue

Lenses :
- standard: USPL HD 6C (F1.03 hybrid lenses) .
- optional: TAC3 lenses (5lp/mm).
  Ultra high resolution glass lenses for precise magnification (14,22,27,36 x).

Image format : 3 x 4 ratio

Image dimensions :
min : 1.00 m x 0.75 m (3.28Ft x 2.46Ft)
max : 6.00 m x 4.50 m (19.68Ft x 14.76Ft)

Throw distance : see table in §Installation guidelines (installation manual).

Max light output : at 10 % peak white : 600 lumen (TAC3 lenses).

Screen applications : flat

Convergence : calibration using 9 independent zones.

X. Mechanical characteristics

Dimensions : see drawing on §Unpacking (installation manual).

XI. Mounting

Table standard or ceiling; front or rear projection possibility.

Adaptation ceiling-table : incorporated switches
Adaptation front-rear : incorporated switches

XII. Safety

IEC950
FCC

SPECIFICATIONS

XIII. Environment

The projector is designed to be used within the following operating range.

Max. operating range
Temperature : 0°-40°C
Humidity : 0 - 90% non condensing
Altitude : 0 - 3000m (0 - 10000 Ft)

Storage
Temperature : -30° to 65°C

XIV. Weight

net	46 kg (101,2 lbs.)
shipping	57 kg (125,4 lbs.)

OPTIONS

Flight Case for the BARCODATA 650.

This ruggedized and easily transportable flight case enables to pack the BARCODATA 650 projector in a safe manner and avoids damage through careless handling or heavy shocks.

(BARCO Order number : 98 27190)

Projection table for the BARCODATA 650.

This sturdy, height adaptable projection table provides a stable stand for the BARCODATA 650, and it adapts the projector perfectly to the local requirements.

(BARCO Order number : 98 27200)

Suspension system for the BARCODATA 650.

This suspension system enables to mount the BARCODATA 650 projector to the ceiling, and to adapt it perfectly to the local mounting requirements. The suspension system is specifically developed for rooms with a lowered ceiling, but can be used in other rooms as well by omitting the upper plate and the four screwed rods.

(BARCO Order number : 98 25550)

Interfaces.

All kinds of interfaces are available :

- RGB analog 120 MHz interface	(98 26570 - 220V / 98 26579 - 110V).
- RGB TTL 3-way splitter	(98 25900 - 220V / 98 25909 - 110V).
- RGB-S or VIDEO 3-way splitter	(98 25890 - 220V / 98 25899 - 110V).
- Universal RGB TTL interface	(98 26110 - 220V / 98 26119 - 110V).
- Universal RGB analog interface	(98 26100 - 220V / 98 26109 - 110V).
- Universal TTL to analog interface	(98 26020 - 220V / 98 26029 - 110V).
- RGB analog interface system 2	(98 26610 - 220V / 98 26619 - 110V).
- HDTV 3-level sync interface	(98 27430 - 220V / 98 27439 - 110V).

Optional source selector

The Remote Controlled Video and Data Source Selector RCVDS 650 makes it possible to connect up to ten sources to a BARCODATA 650 and to adjust all picture setting via an Infrared remote control.

The RCVDS 650 also provides individual remote control of :
- Horizontal amplitude (width) : variable aspect ratio + underscan amount.
- Horizontal phase (centering) : allows perfect picture positioning.

(BARCO Order number : 98 27700 - 220 V / 98 27709 - 110 V)

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