BARCO GRAPHICS 400

90 00190

90 00199

Operating instructions
Installation manual

BARCO Electronic n.v.

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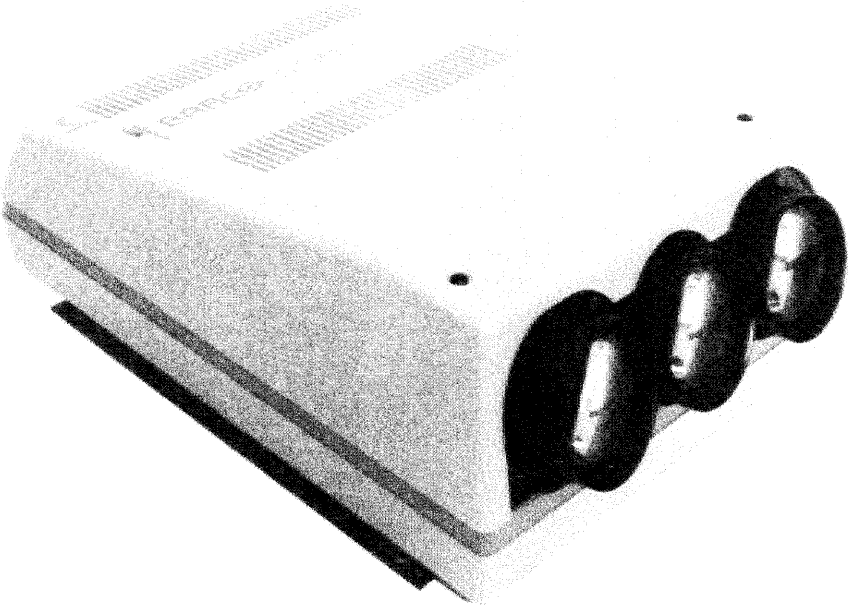
BARCO
ELECTRONIC



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Installation manual

DATE :
27/02/89

ART. NR. :
59 75762

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BARCO
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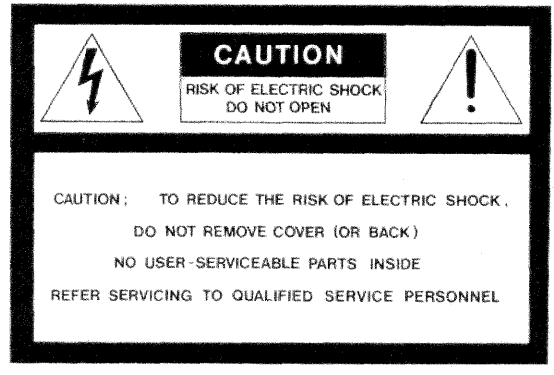
BARCO GRAPHICS 400

INSTALLATION GUIDELINES

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

WARNING !



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

Read carefully all the warnings, safety and operating instructions on page 9, 10, 11 and 12 before starting the installation

Attention !

BARCOGRAPHICS 400 - 90 00190

* The voltage selector for this model is set for a supply-circuit of 220V ac only. Before operating this model on a supply-circuit of 110V ac, the instructions on the section " Adaptation Mains (Power) Input 110Vac-220Vac in this manual must be strictly followed. Refer the modification to qualified service personnel.

BARCOGRAPHICS 400 - 90 00199

* The voltage selector for this model is set for a supply-circuit of 110V ac only. Before operating this model on a supply-circuit of 220V ac, the instructions in the section "Adaptation Mains (Power) input 110Vac-220Vac" in this manual must be strictly followed. Refer the modification to qualified service personnel.

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SECTION I

SPECIFICATIONS

I. SPECIFICATIONS

I. RGB TTL CIRCUIT

Input selector switch : position RGB TTL

Input : D9 connector
Red : pin 1
Green : pin 2
Blue : pin 3
Seperate sync drive pulses or composite sync
75 Ohm termination switches on board level

II. RGB(S) ANALOG CIRCUIT

Input selector switch : position *RGsB* or *RGBS*

RGsB : for sync on Green or

RGBS : for separate sync

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

III. DEFLECTION CIRCUITS

VERTICAL DEFLECTION

Frequency : from 50 Hz to 100Hz

Retrace time : 450 us

HORIZONTAL DEFLECTION

Frequency : from 15 kHz to 72 kHz

Retrace time : 2.5 us

IV. HIGH VOLTAGE

Stabilised EHT : 34.7 kV

V. POWER REQUIREMENTS

- 220V AC (- 10 % + 15 %) can be internally switched for 110V AC (- 10 % + 15 %)
- frequency independence between 40-100 Hz
- rated consumption : 300 W

I. SPECIFICATIONS

VI. DISPLAY

Projection tubes: - 5.5" high resolution rectangular projection tubes
- liquid cooled system
- colours R, G and B

Lenses: high resolution F 1.2 glass lenses (22x) with single focus adjustment.

Picture format : 3 x 4 ratio

Picture dimensions (standard version) :
min. : 2.00 m x 1.50 m (6.56Ft x 4.92Ft)
max. : 2.4 m x 1.80 m (7.87Ft x 5.91Ft)

Throw distance : (see table)

Max. light output : At 20 % peak white : 300 lumens,

Screen application : flat, parabolic or cylindrical screen

Geometric distortion : ± 1 % in circle equal to picture height ± 1.5 % outside

Convergence : calibration using 9 independent zones

VII. MECHANICAL CHARACTERISTICS

See diagram on page 6

VIII. MOUNTING

Table standard and ceiling mounted; front or rear projection possibility for both mountings.

Adaptation ceiling-table : incorporated switches

Adaptation front-rear : incorporated switches

IX. CROSS HATCH PATTERN GENERATOR

Vertical frequency : 50 Hz

Horizontal frequency choice :
15.6 kHz, 31.2 kHz, 41.6 kHz, 62.5 kHz

I. SPECIFICATIONS

X. SAFETY

The unit meets most relevant international standards.

X-radiation : DHHS (1)
Safety : IEC 950 (2)
Interference suppression : FCC (3)

XI. ENVIRONMENT

The projector has to be used within the following mentioned specification range for safety. However, results of tests may change this mentioned specifications.

Max. operating range

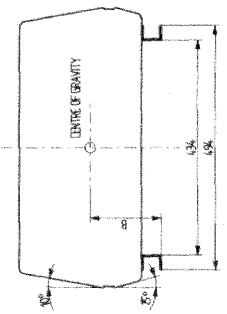
Temperature : 0° - 40° C
Humidity : 0 - 90 % non condensing
Altitude : 0 - 3,000 m (0 - 10,000 ft)

Storage

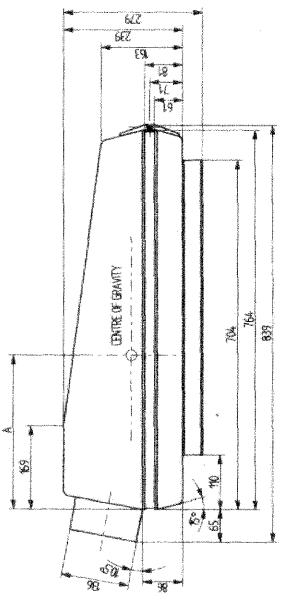
Temperature : - 30° to 65° C

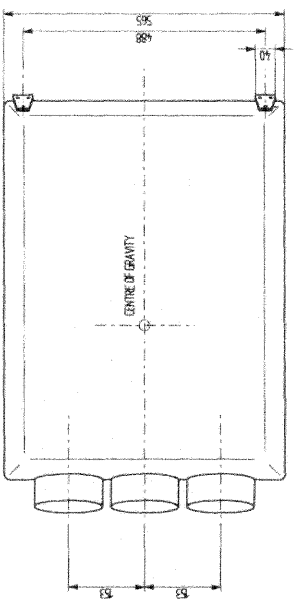
(1) U.S. Department of Healt and Human Services (2) International Electrotechnical Commission (Publication 950) (3) Federal Communications Commission (Part 15)

I. SPECIFICATIONS



Name	Type of lens	A (mm)	B (mm)
BS600	NORITA	290	140
BV600	TAC 3	345	143
BS6000	HD6	310	146





SECTION II

INSTALLATION

I. WARNING

WARNING

Read carefully all the warnings, safety and operating instructions before the equipment is operated.
The safety and operating instructions should be retained for future reference.
All warnings on the equipment and in the operating instructions should be adhered to.
All instructions for operating and use should be followed.

WHAT YOU SHOULD KNOW TO PROTECT YOURSELF.

Never touch the power plug with wet hands.

Always pull out by the power plug and never by the cord.

Only let a *BARCO* authorised qualified technician repair the *BARCO* projector. An unauthorized person might touch the internal parts and receive a severe electric shock.

Never allow someone to put anything, into the *BARCO* projector.

1. X-RADIATION

All colour television and projection tubes emit some X-rays. This chassis has been designed for minimal X-radiation. See service manual for critical components.

2. HIGH VOLTAGE

This projector chassis contains high voltages, 34.7 kV on the picture tube. To avoid danger to life, always use this set with closed cover.
WARNING : This high voltage can kill you.

3. CRT HANDLING

The picture tube encloses a high vacuum and care must be taken not to bump or scratch the picture tube as this may cause the tube to implode, resulting in personal injury and property damage.
Caution : The picture tubes in this projector contain a liquid coolant (Ethylene glycol), that may leak in case of glass breakage. Ethylene glycol is mildly toxic. Cleanup spilled liquid immediately. Do not ingest liquid and avoid contact with eyes and skin. Always use suitable protective gloves.

4. MAINS (POWER) CONNECTION

THIS APPARATUS MUST BE EARTHED (GROUNDED)

This projector should be operated only from the type of power source indicated on the voltage marking of the selector, which is visible on the cover of the projector.
If you are not sure of the type of electrical power supplied to the room where the projector is to be used, consult your electrician or the local power company.

Do not overload wall outlets and extension cords as this can result in fire or electric shock.

I. WARNING

Use the mains (power) lead delivered with the *BARCO* projector.

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

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured 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 by the letter E or by the safety earth symbol or coloured green and yellow.

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

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

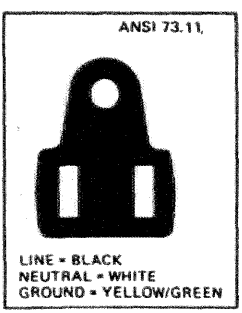
The wires of the means lead (power cord) are coloured in accordance with the following code :

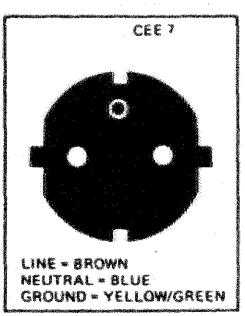
Green/yellow : earth (ground)
Blue : neutral
Brown : live

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





I. WARNING

5. AIR GAPS

Never cover the ventilation air gaps on the cover. Otherwise internal heat will be built up.

6. MOUNTING

Do not use attachments not recommended by BARCO as they may result in the risk of fire, electric shock, or injury to persons.

Do not place this projector on an unstable cart, stand, or table. The projector may fall, causing injury to persons, and serious damage to the projector.

II. CAUTIONS

1. Magnetic interference

Do not install apparatus which produce magnetic fields near the projector. Such field can disturb the synchronisation of the signal processing in the projector.

2. Lens

Never touch lens with fingers. Clean only when absolutely necessary. Moisten soft facial tissue with non-abrasive window cleaner and rub very gently the surface clean.

3. Power cord protection

Power-supply cord should be routed so that they are not likely to be walked on or pinched by items placed upon or against them.

4. Nonuse periods

The power cord of the projector should be unplugged from the outlet when left unused for a long period of time.

5. Damage Requiring service

The projector should be serviced by BARCO authorised service personnel only when :
- the power supply cord or the plug has been damaged.
- objects have fallen or liquid has been spilled into the projector.
- the projector has been exposed to rain.
- the projector does not appear to operate normally.
- the projector has been dropped, or the enclosure damaged.

6. Servicing

Do not attempt to service this projector yourself as removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified Barco personnel or to Barco authorised technicians.

When replacementparts are required, be sure that the service technician certifies in witing that he has used replacement parts specified by the manufacturer that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.

Upon completion of any service or repairs to the projector, ask the service technician to perform routine safety checks to determine that the projector is in bodily injury and property damage.

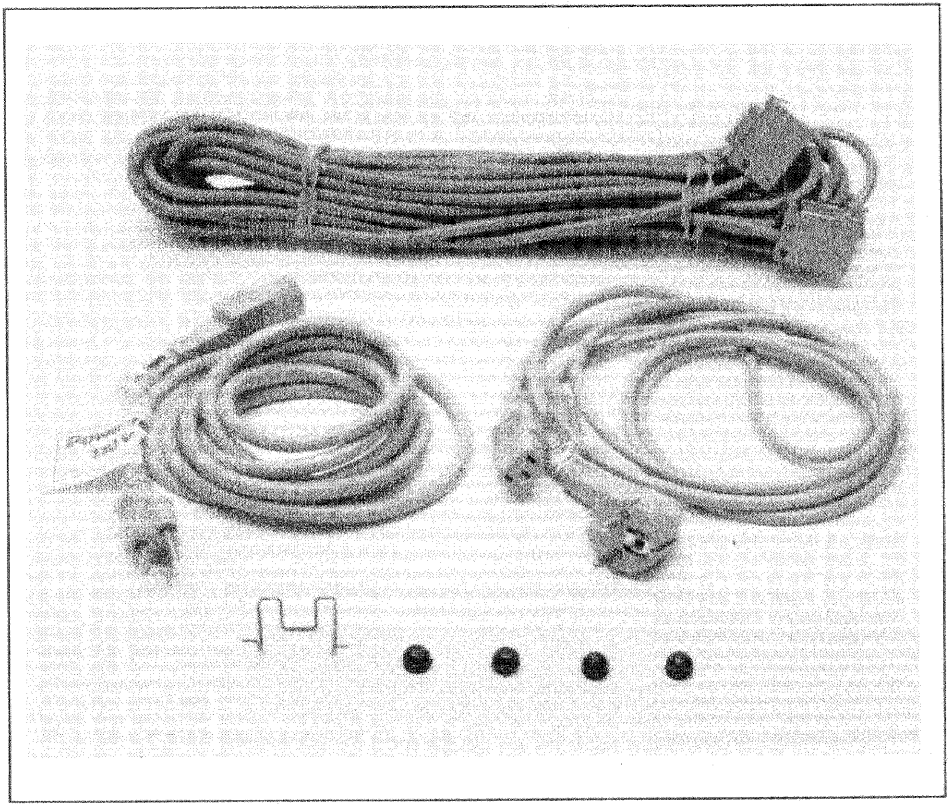
7. Precautions

Do not install the projection system near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or humidity.

As a general rule, darken the room to the point where there is just sufficient light to read or write comfortably.

It is recommended that the original packing is retained and used when shipping to another location.

III. PROJECTOR ACCESSORIES



IV. SCREEN SIZE

The projector leaves the factory as a front ceiling mounted projector, adjusted for a screen size of 2.10 m x 1.57 m (6.89 Ft x 5.15 Ft).

This ***BARCO*** projector, equipped with glass lenses (22x), can be readjusted for other screen sizes :

min screen size : 2.00 m x 1.50 m (6.56 Ft x 4.92 Ft)

max screen size : 2.40 m x 1.80 m (7.97 Ft x 5.90 Ft)

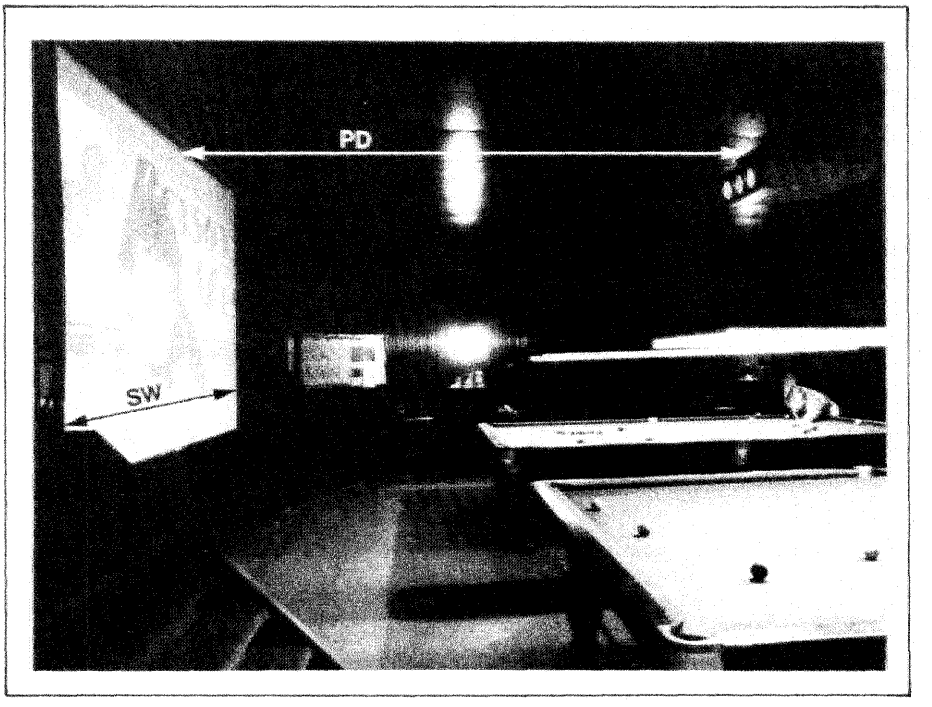
This ***BARCO*** projector can also operate in other configurations as i.e. rear projection, table standing. For changing the configuration, a qualified service representative or ***BARCO*** factory authorized service center should be contacted for advice or technical assistance.

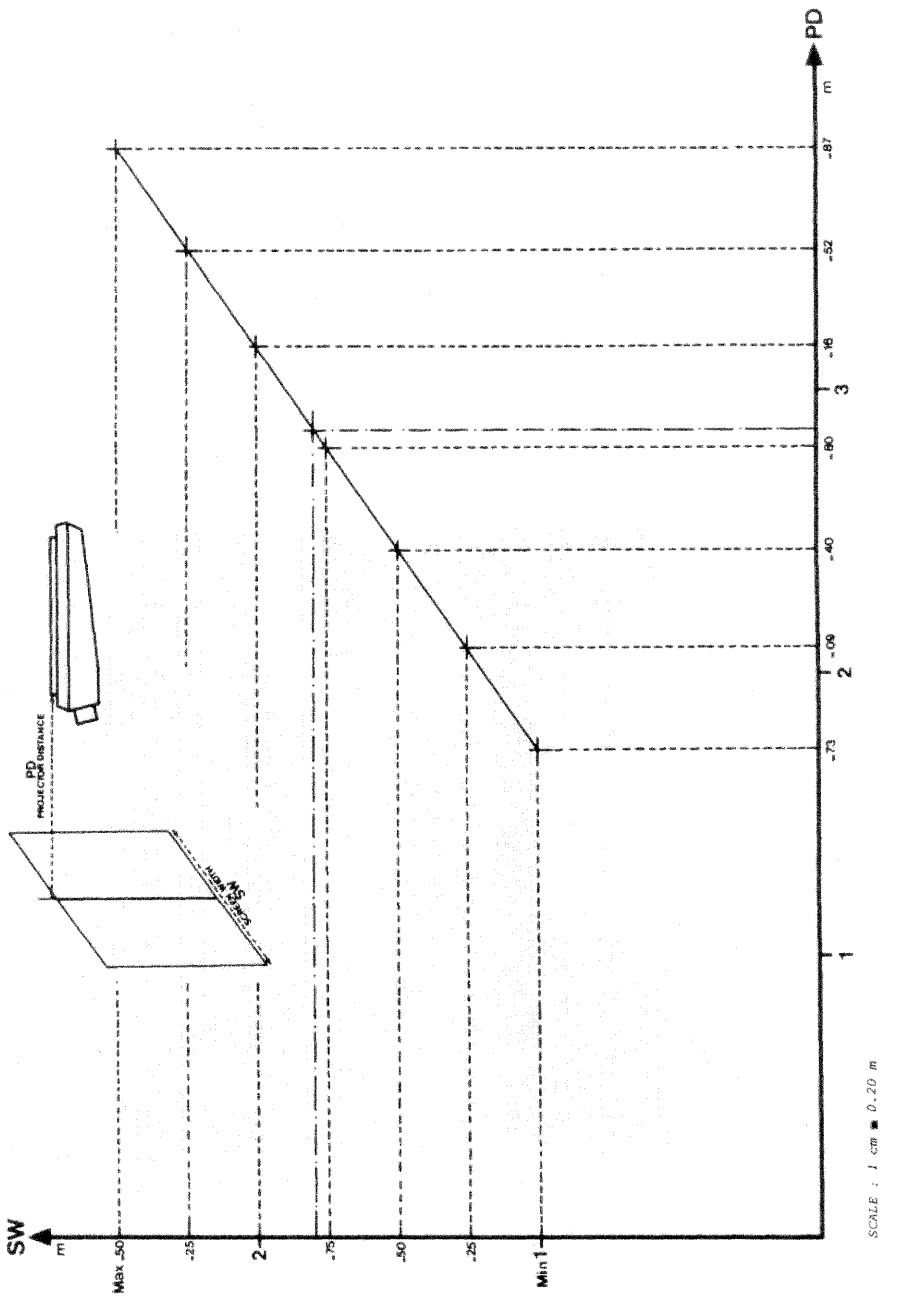
V. POSITION OF THE PROJECTOR

The diagrams on next pages indicate :

The projector/screen distance (PD) in function of the screen width (SW)

PD : projector distance to screen distance = distance screen - bracket projector.




PD
m
.87
.52
.18
3
.80
.40
.09
2
.73
1
SW
m
Max .50
.25
2
.75
.50
.25
Min 1
PD
PROJECTOR DISTANCE
SCALE : 1 cm = 0.20 m

VI. INSTALLATION DIRECTIONS

1. C A U T I O N

To ensure top performance, keep the following in mind during installation and use.

2. Location

Do not install the projection system in a location near heat sources such as radiators or airducts, 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 location is not excessive (see environment specifications).

3. Illumination

The screen should not be exposed to illumination directly from the front. Windows that face the screen should be covered by opaque drapery while the set is being viewed. It is desirable to install the projector system in a room where walls and floor are of non-reflecting material.
As a general rule, darken the room to the point where there is just sufficient light to read or write comfortably. Spot lightning is desirable for illuminating small areas so that interference with the screen is minimized.

4. WARNING

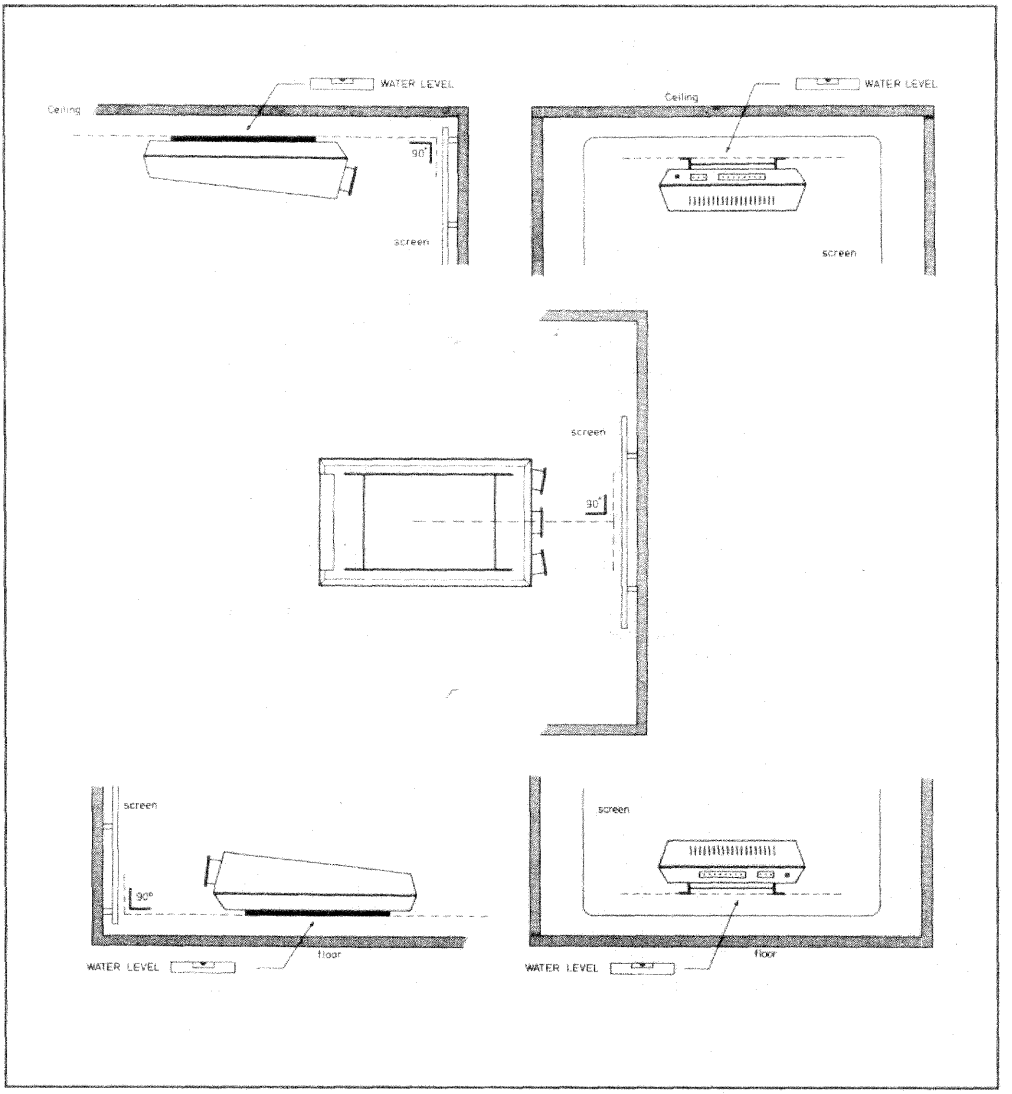
In order to avoid any convergence faults, be sure that (see on next page) :

1) the projector is always installed level (therefore use a water-level).

2) the projector axis is perpendicular on the screen surface

Two fans and air gaps prevent internal heat built- up. Always let air space around the projector in order to obtain enough ventilation air current.

VI. INSTALLATION DIRECTIONS

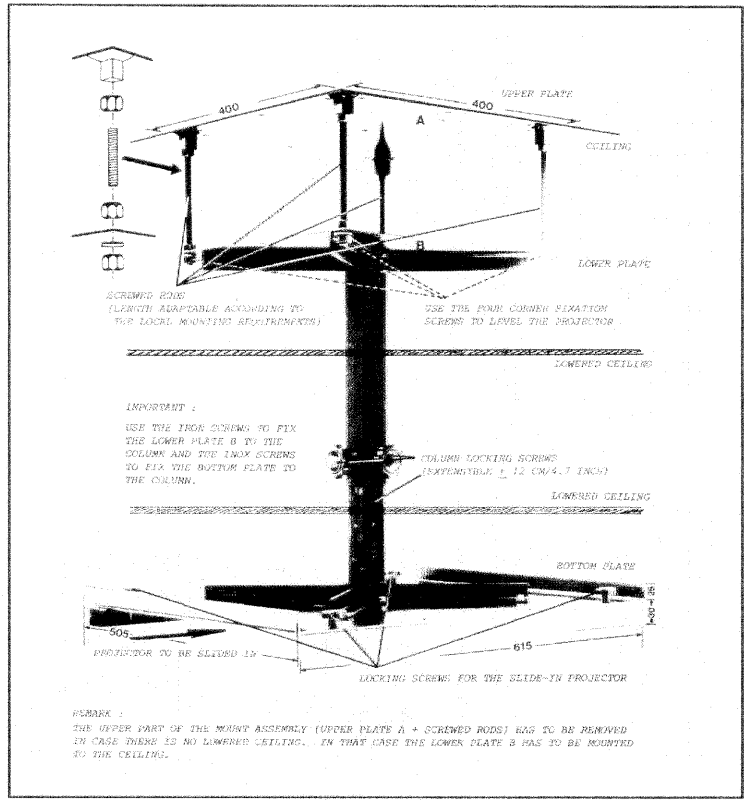


VII. INSTALLATION ACCESSORIES

BARCO CEILING SUPPORT
(art.nr 98 25550)

The ceiling mounting support, which is available in kit, must be used to attach the projector on the ceiling. The mount must be carefully installed and the attachment to the particular ceiling material must be tested adequately for safety. See mounting instructions for ceiling mounting support.

The ceiling should be capable of supporting a weight of at least 200 kg (440lb). If it cannot, the ceiling must be reinforced. Improper installation may result in serious personal injury.



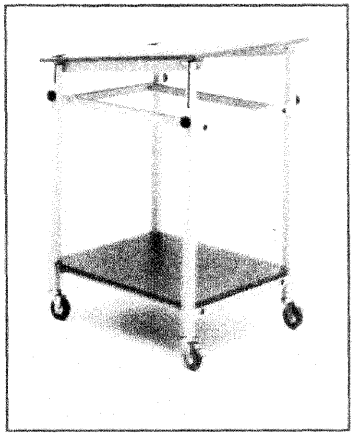
VII. INSTALLATION ACCESSORIES

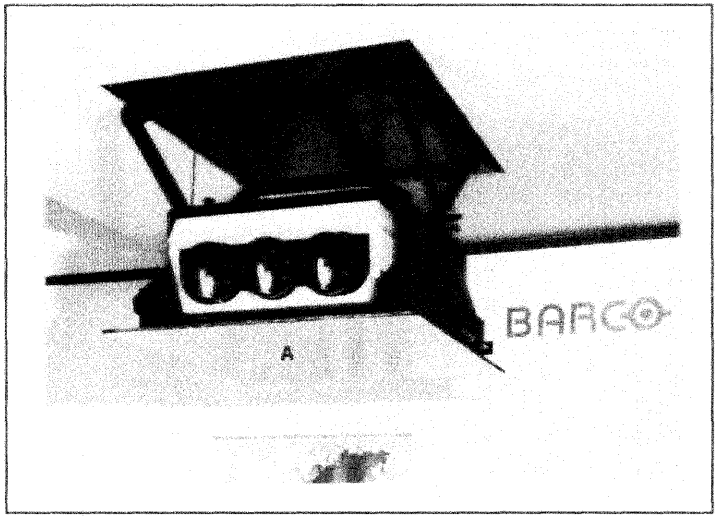
BARCO PROJECTION TABLE
(art. nr. 98 25410)

This projection table is specially designed for the BARCO projector ans allows a correct positioning of the projector with regard to the screen.

BARCO PROJECTOR ELEVATOR SYSTEM
(art. nr. 98 26430)

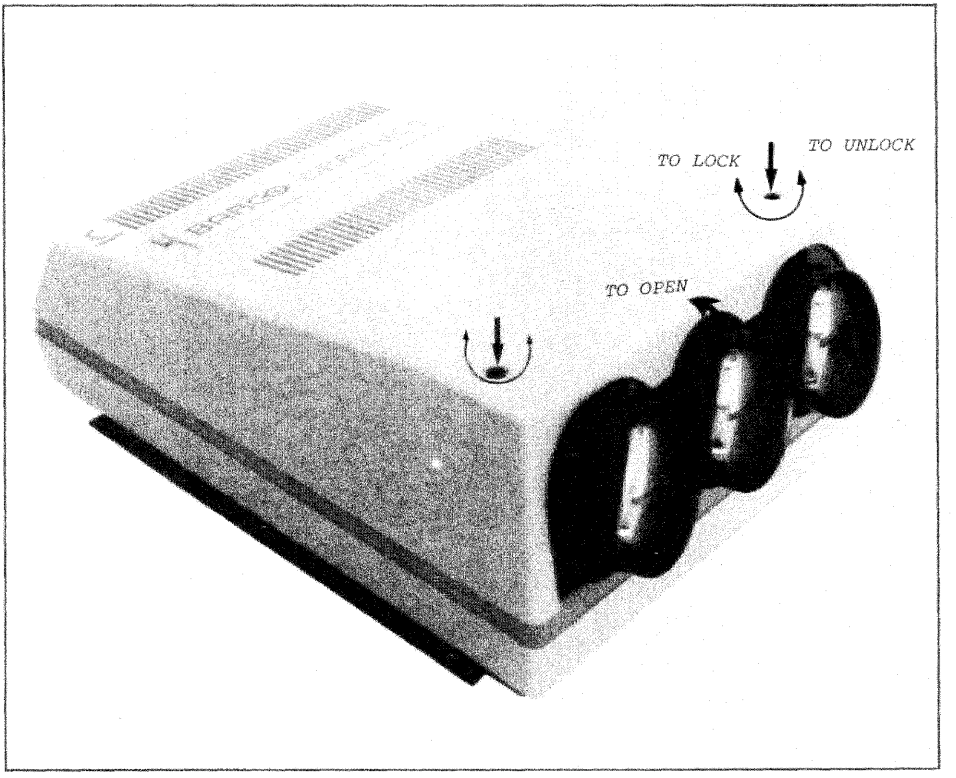
The elevator system is developed as a sinkable support lift for the projector in order to house the projector in the space between the ceiling and the lowered ceiling.



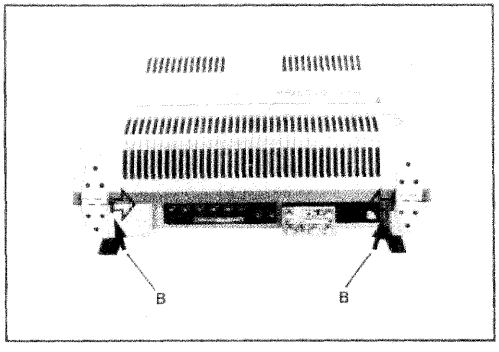


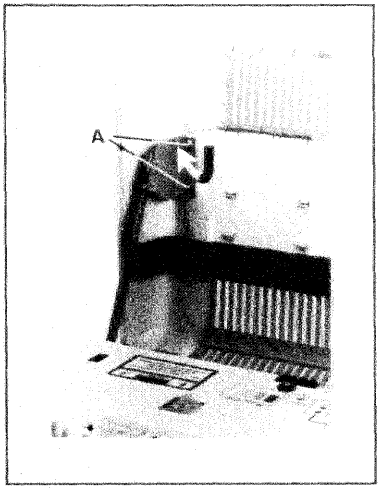
VIII. TOP COVER REMOVAL

Opening the top cover is necessary for the alignment of the projector set.
Unlock the top cover by turning both fixation screws anti-clockwise a quarter of a turn.
Open the projector by lifting up the top cover. Two incorporated supports, left and right, keep the top cover opened.



VIII. TOP COVER REMOVAL





Note : The top cover can be removed by loosening the screws A and pulling out the two hinge- joints B of the hinges.

Attention : *When loosing the screws A support the top cover so that it does not flip over. Otherwise the hinges will be damaged*

IX. PROTECTION COVER REMOVAL

The upper side of the chassis is covered by a protective cover.

WARNING :

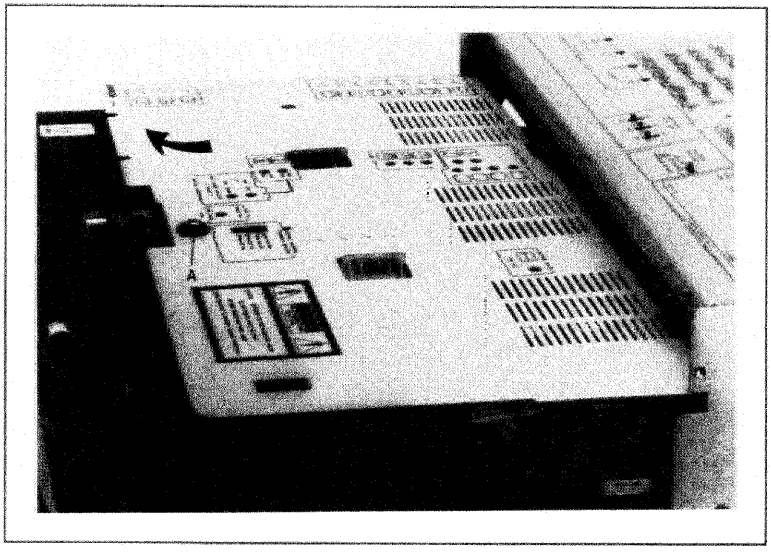
Do not remove the protective cover for projector adjustment. All the controls can be adjusted through the provided holes in the protective cover. Use a non-metalic screwdriver.

Exception :
for power adaptation, RGB signal adjustment and manual frequency adjustment, the cover has to be removed.

Proceed as follow :

- remove the fixation screw A .
- Lift up the protection cover.

Reinstall the protection cover always after Power adaptation, RGB signal adjustment or after manuel frequency adjustment.



SECTION III

OPERATING INSTRUCTIONS

I. MAINS (POWER) CONNECTION

WARNING

THIS APPARATUS MUST BE EARTHED (GROUNDED)

1. PREPARATION

Power Cord : the power line cord is supplied with the projector (See : Projector accessories).

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

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured 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 coloured green and yellow.

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

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

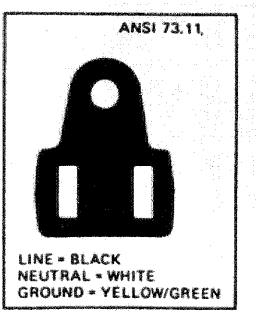
The wires of the delivered mains lead (power cord) are coloured in accordance with the following code :

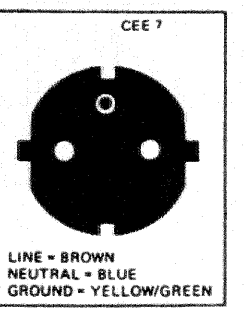
Green and Yellow : Earth (ground)
Blue : Neutral
Brown : Live

B. Power cord with ANSI 73.11 plug :

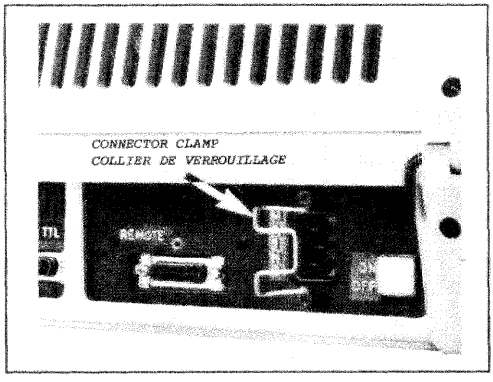
The wires of the delivered power cord are colored in accordance with the following code :

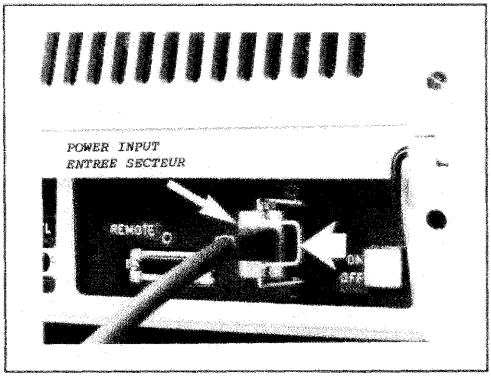
Green/yellow : ground
White : neutral
Black : live





2. POWER (MAINS) CORD CONNECTION





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

ATTENTION :

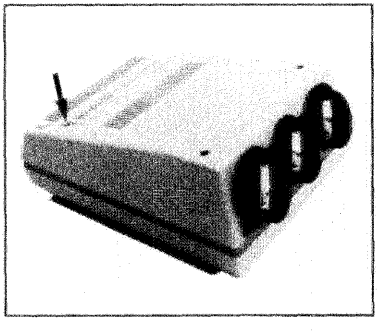
Before plugging the female power connector in the male connector on the projector, **first** put the connector clamp in the clamp holder.

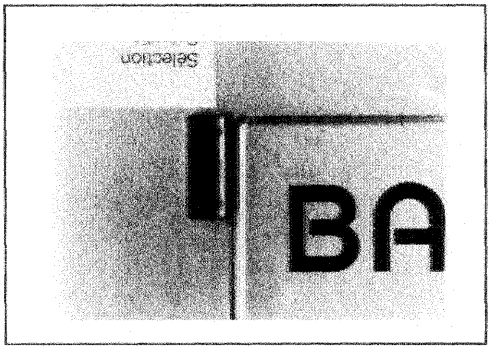
A. Power check :

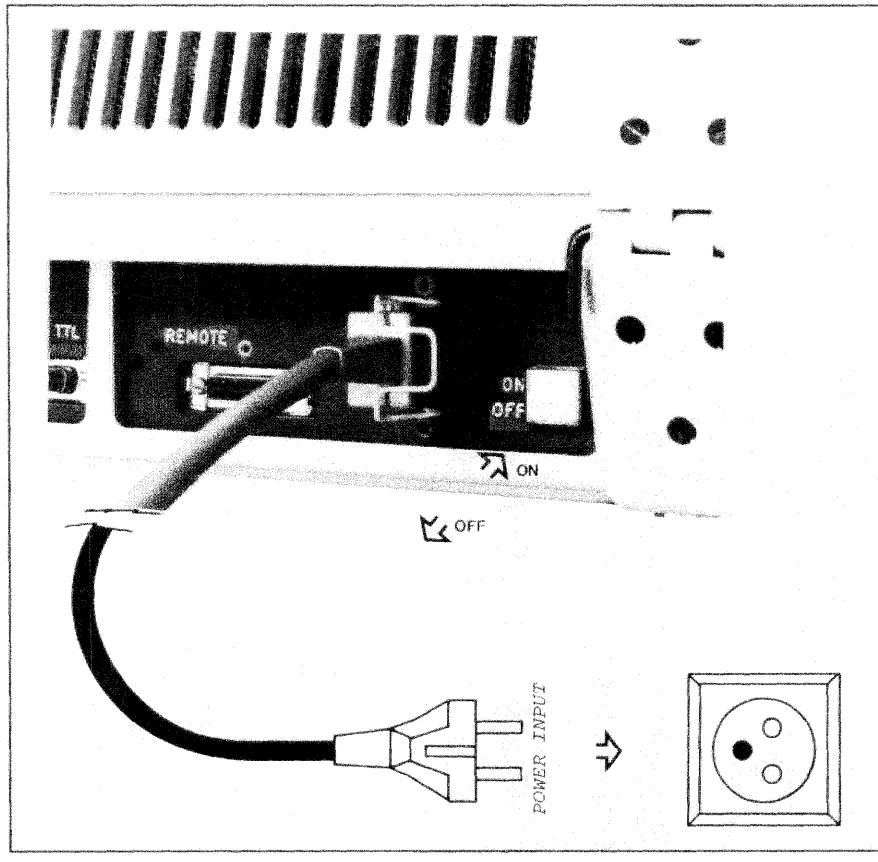
WARNING :

Check by looking through the little window on the top cover if the indicated power voltage corresponds with this of the AC outlet in the room.

If the indication is different from the used power source, see Adaptation Mains (Power) input.







B. Power cord connection

With the projector switched off, attach the line cord **first** to the projector and **second** to the power source.

3. 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.

II. MAINS (POWER) INPUT ADAPTATION

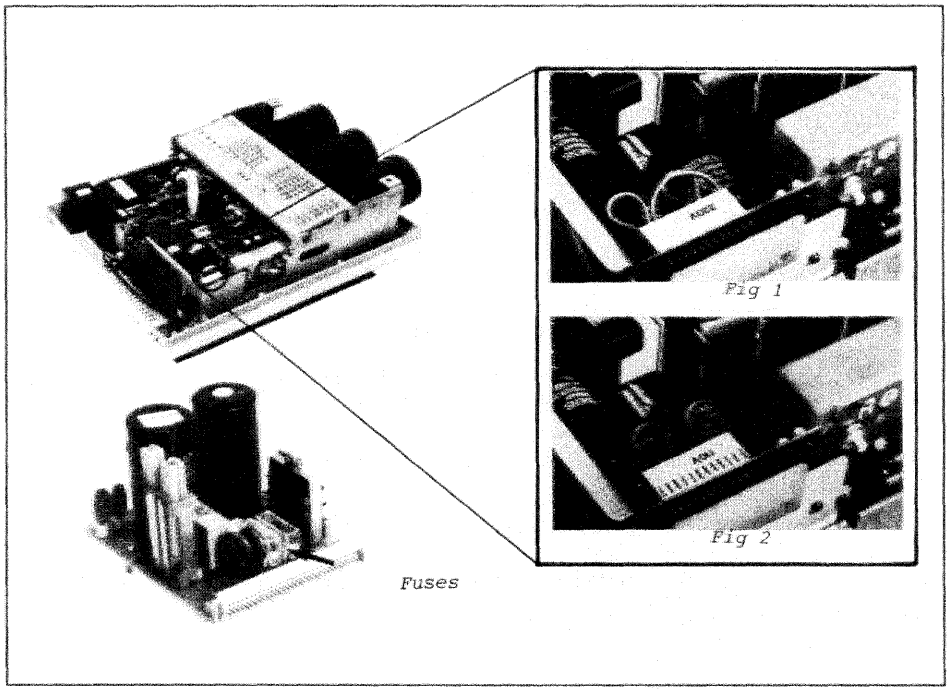
Attention :

The BARCOGRAPHICS 400 - 90 00190 leaves the factory to operate on a mains (power) input of 220V ac.
The BARCOGRAPHICS 400 - 90 00199 leaves the factory to operate on a mains (power) input of 110V ac.

Adaptation of the projector for 110V AC or 220V AC operation.

Procedure :

1. Switch off the projector and unplug the power plug from the AC outlet.
2. Lift up the top cover
3. Remove the protection cover to access the POWER INPUT BOARD
4. Unscrew the fixation screw of the power input board and pull out this board.
5. Pull out the "POWER SELECTOR PLUG" and re-insert it as illustrated in the fig. 1 and 2, depending of the AC outlet in the room.
6. Pull out the fuses and place the correct fuses in the sockets.
7. Re-insert the power input board and secure it with the fixation screw.
8. Put back the protection cover.
9. Reconnect the power cord with the AC outlet and switch on the projector.



II. MAINS (POWER) INPUT ADAPTATION

Fuses

Warning

For continued protection against fire hazard :

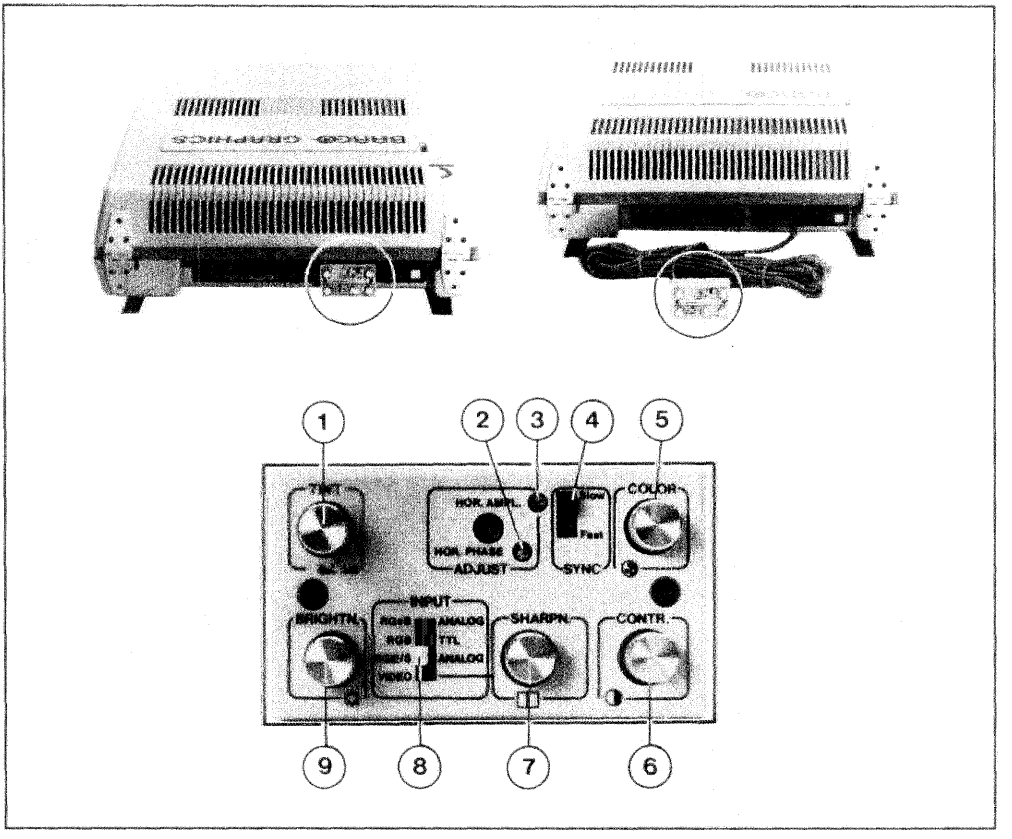
- replace with the same type of fuse
- refer replacement to qualified service personnel

F1,F2 ;	BARCO ord. n°
for 220 Vac (2X) T3.15A/250V	31 4103
for 110 Vac (2X) T5A/250V	31 4104

III. PROJECTOR CONTROLS

Projector controls

All projector controls are located on the Control/Switch box 79 15519, plugged into the 15 pin connector (remote input) on the projector or connected to the remote input by means of the remote cable.



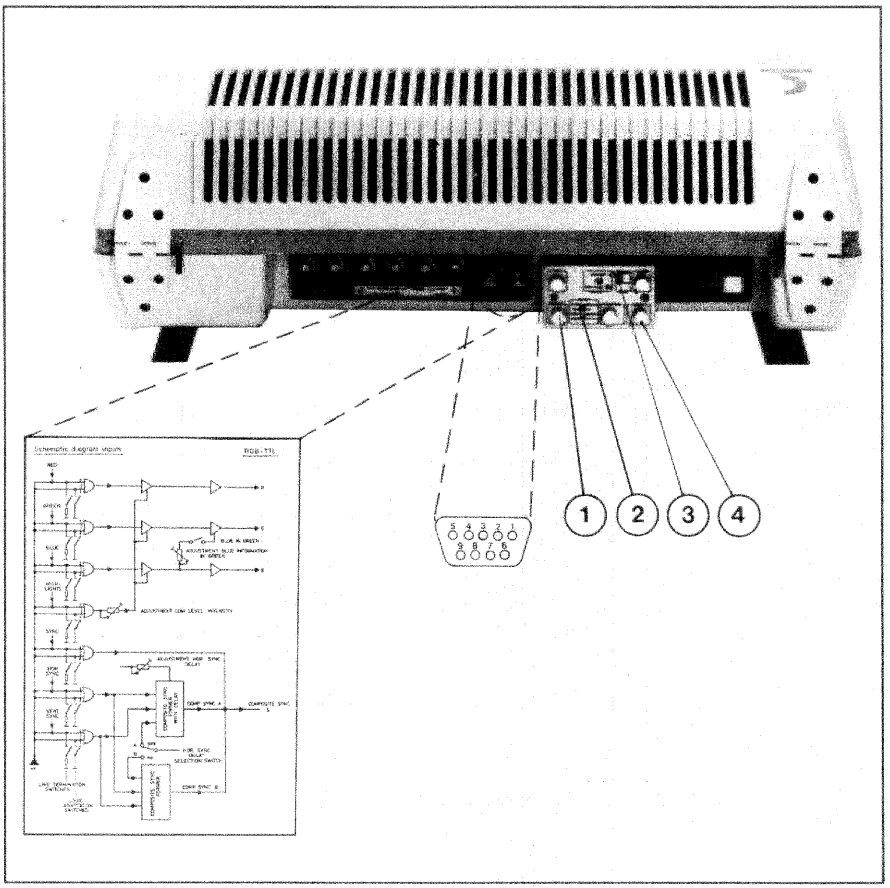
<2> Hor. phase
<3> Hor. amplitude
<4> Sync speed selection
<6> Contrast control
<8> Input selection projector
<9> Brightness control

Controls <1>, <5>, <7> have no function in the *BARCOGRAPHICS 400*.

<1> Tint control
<5> Colour saturation control
<7> Sharpness control

IV. CONNECTING EXTERNAL EQUIPMENT

1. INPUT SIGNAL : RGB TTL This signal has to be connected to the RGB TTL input connector



A. PIN CONFIGURATION D9 CONNECTOR

Inputs : Pin configuration D-connector

1. RED
2. GREEN
3. BLUE
4. ⊥
5. ⊥
6. SYNC COMPOSITE
7. HIGHLIGHTS
8. HORIZONTAL SYNC
9. VERTICAL SYNC

B.FUCTIONS OF CONTROLS :

SWITCHES

<2> CHOICE OF THE RGB TTL MODE :

Putting the INPUT SELECTING switch in the RGB TTL position, enables the RGB TTL inputs.
Attach the R-G-B and SYNC TTL signals, using coaxial cables with a D9 connector.

<3> CHOICE OF THE SYNCRO SPEED :

Always the position SLOW

CONTROLS

<4> Contrast control
<1> Brightness control

B. FUNCTIONS OF SWITCHES ON THE RGB TTL BOARD :

ATTENTION : The switches are provided on the RGB TTL board.

WARNING : when the position of the switches has to be changed :

- FIRST switch off the projector and SECOND unplug the power plug from the power source.
- Change the position of the switches with a small screwdriver (2mm)

EXPLANATION OF THE INPUT POSSIBILITIES AND SWITCHES

1. RGB and sync TTL input

a. RGB and composite SYNC TTL input :

Pin configuration D9 connector

Red (pin 1)	Blue (pin 3)
Green (pin 2)	Composite sync (pin 6)

Switches A1 to A4 :
allow an adaptation of the TTL input with regard to the computer output polarity (pos. or neg.)

Switching B1 to B4 :
allow line termination for the respective signal input.

b. RGB and HOR. & VERT. SYNC TTL input :

Pin configuration D9 connector

Red (pin 1)	Vert. sync (pin 9)
Green (pin 2)	Hor. sync (pin 8)
Blue (pin 3)	

Switches A1, A3 and A4 :
allow an adaptation of the colour signals TTL input with regard to the computer output polarity (pos. or neg.)

Switches A5-A6:
Allow an adaptation of the respective HOR. & VERT. SYNC TTL inputs with regard to the computer output polarity (pos. or neg.)

Switches B1,B3 and B4 :
allow line termination for the respective colour signal.

Switches B6-B7 :
allow line termination for the respective sync signals.

2. Highlights TTL input signal (pin 7)

Switch A7 :
allows an adaptation of the highlights TTL input with regard to the computer output polarity.

Highlights info :
Computer signal, highlight info, applied to the highlights input, commands the ***BARCO*** projector to display the respective characters in a higher intensity (HL, intensity level is adjustable with the potentiometer 'H/L intensity adj.')

Switch B5 :
allows line termination for the Highlights info signal.

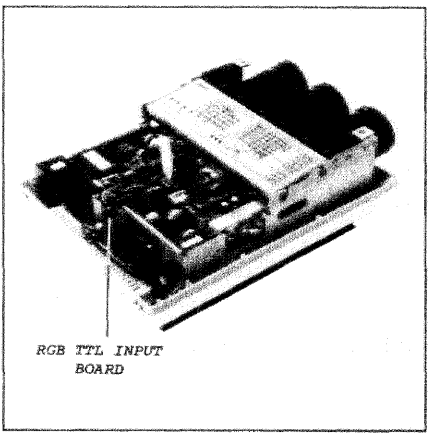
3. Additional functions on the board

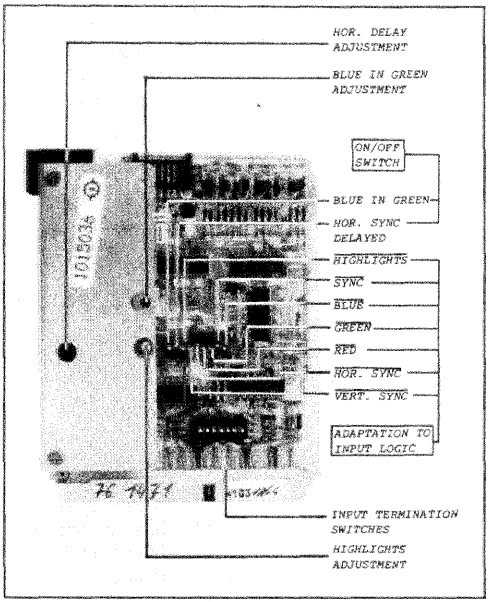
Switch A8 : Hor. sync. delays YES or NO

When the applied hor. & vert. pulses are derived from the drive circuits of the applied source, put the switch in the off (YES) position.
A logic circuit on the board will convert the applied pulses into a Hor. & Vert. sync pulse for correct synchronisation of the projector.
The position of the hor. sync pulse is adjustable with the potentiometer 'Hor. delay time'.

Switch A9 : Blue in Green : YES or NO

Display of characters in uniform Blue is in most cases very difficult to read. The legibility of these alphanumeric characters can be improved by adding on the screen some green to the blue.





Blue in Green mode : put the switch 'Blue in Green' in the on position.
The blue colour will be changed in cyanic giving a better character visibility (proportion Blue in Green is adjustable).

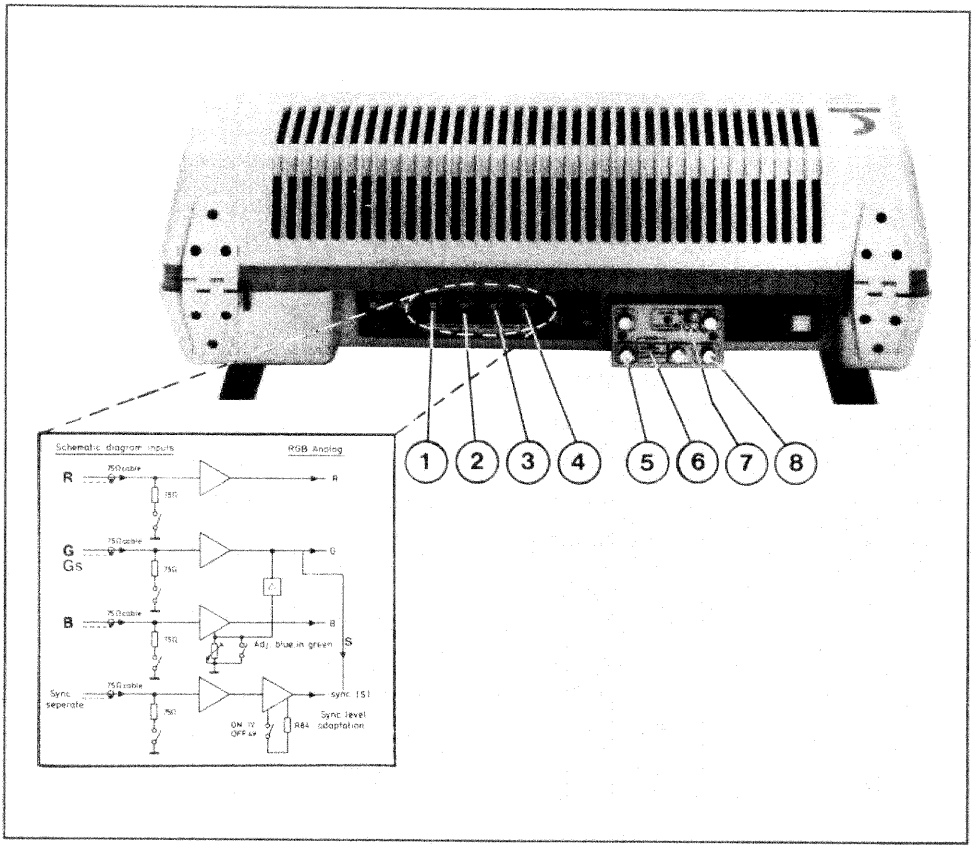
Important :For displaying graphics however, this 'blue in Green' function could falsify the colour reproduction. In this case put the 'Blue in Green switch' in the OFF position.

When the switches are in the correct position :

Plug the power plug in to the wall outlet and switch on the projector.

IV. CONNECTING EXTERNAL EQUIPMENT

2. INPUT SIGNAL : RGB ANALOG



A. LOCATION OF SIGNAL INPUTS :

RGB/S Analog Inputs :

<1> Separate sync (BNC)
<2> BLUE signal (BNC)
<3> RED signal (BNC)
<4> GREEN signal (BNC) or GREEN/SYNC signal (BNC)

Attach the R G B and Sep. Sync signals using coaxial cables with a BNC connector.

B. FUNCTION OF CONTROLS :

SWITCHES

<6> CHOICE OF THE RGBS or RGsB MODE

Putting the INPUT SELECTING switch in the :

RGB/S position : enables the R, G, B and separate sync inputs on the projector.

RGsB position : enables the R, G (with sync on GREEN) and B inputs on the projector

<7> CHOICE OF THE SYNCHRO SPEED

Always the position SLOW

CONTROLS :

<8> Contrast control
<5> Brightness control

C. FUNCTIONS OF SWITCHES ON THE RGB ANALOG BOARD.

ATTENTION : The switches are provided on the RGB Analog board.

WARNING : when the position of the switches has to change:
- ***FIRST switch off the projector and SECOND unplug the power plug from the AC wall outlet.***
- ***open the top cover (see top cover removal)***
- ***remove the yellow protection cover (see protection cover removal)***
- ***take off the fixation cap by screwing out the fixation screw.***
- ***Unplug the signal cables from the RGB TTL and the amplifier board.***
- ***pull out the RGB Analog 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 a loop-through connection, using T-BNC connectors on the respective inputs, the termination switch 75 Ohm must be put in the 75 Ohm position if the set is the last unit in the string.

2. Sync level adaptation switch :

The separate 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 putting the switch in the 1V position.

3. Blue in Green switch :

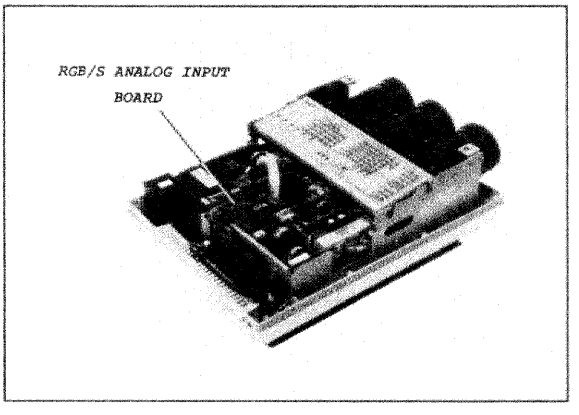
Display of characters in uniform Blue is in most cases very difficult to read. The legibility of these alphanumeric characters can be improved by adding on the screen some green to the blue.

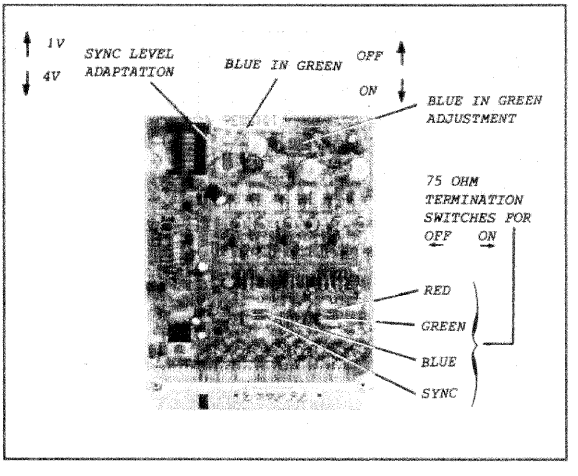
Blue in Green mode : put the switch 'Blue in Green' in the ON position.
The blue colour will be changed in cyanic giving a better character visibility (proportion Blue in Green is adjustable).

Important :For displaying graphics however, this 'blue in Green' function could falsify the colour 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 board.
- Reconnect the signal cables from the RGB TTL and the amplifier board.
- Put the fixation cap on its place and secure with the fixation screw.
- Put always the yellow protection back and secure with the fixation screw.
- Close the top cover.
- Plug in the power plug to the AC outlet.
- Switch on the projector.





SECTION IV

INSTALLATION ADJUSTMENTS

I. INTRODUCTION

After the projector is correctly installed and all electrical connections are made, proceed to the electrical adjustments of the projector.

This projector is factory preset as ceiling front projector.

If the projector is used in another configuration, put, BEFORE plugging in the plug to the wall outlet , the respective scan reverse switches in the right position (see next page).

Important note :

Picture geometry and convergence adjustments have to be adjusted at standard line (15625 Hz) and frame frequency (50 Hz) unless otherwise specified.

II. PROJECTOR ADAPTATION

The **BARCO** projector has reversal capability for ceiling, floor and rear screen applications. Therefore, switches are provided on the motherboard of the projector

WARNING :
Scan inversion has to be done always with the projector switched off and the power cord unplugged.

A: *horizontal scan inversion* :

three identical switches, one for each colour, are used. When changing the horizontal scan, always change the three switches in the same way. See position of the switches (tabel on next page) for the corresponding mounting position.

B: *vertical scan inversion* :
one switch for the three colours is used. See position of the switch (tabel on next page) for the corresponding mounting position.

Procedure :

- FIRST switch OFF the projector and SECOND, pull the plug out off the AC outlet.
- open the top cover. (see top cover removal, first part)
- remove the yellow protection cover (see protection cover removal)

For horizontal scan inversion :
- turn out the three fixation scews of the metal protection plate on the EHT board and remove the plate.
- switch over the three switches by pushing the white buttons backwards.
- re-install the metal fixation plate and secure with the three screws.

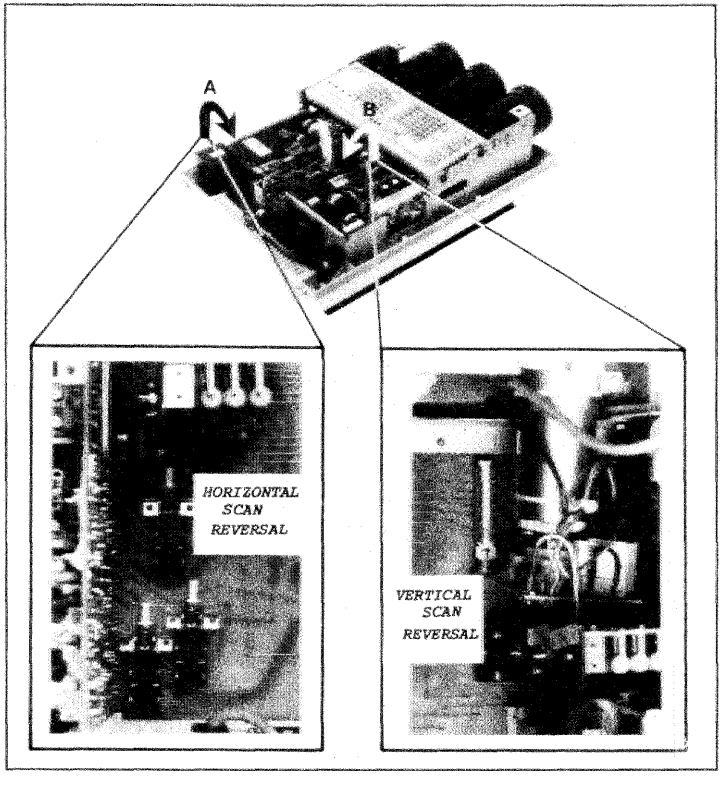
For vertical scan inversion :
- push the push-button forwards.

After scan inversion, reinstall always the yellow protection cover.
Close the top cover. Plug in the plug in the wall outlet and switch ON the projector

NOTE :

Switching over from floor to ceiling or vice versa requires a complete readjustment of picture geometry and convergence (see "Installation adjustment of the *BARCO* projector").

II. PROJECTOR ADAPTATION



POSITIONS OF THE SWITCHES :

Switch	Ceiling Front	Ceiling Rear	Floor Front	Floor Rear
A	▂	▟	▟	▂
B	▂	▂	▟	▟

pressed ▂

not pressed ▟

III. PREPARATION FOR ADJUSTMENT

Preparation :

1. Connect the projector to the power line using a corresponding power cord.

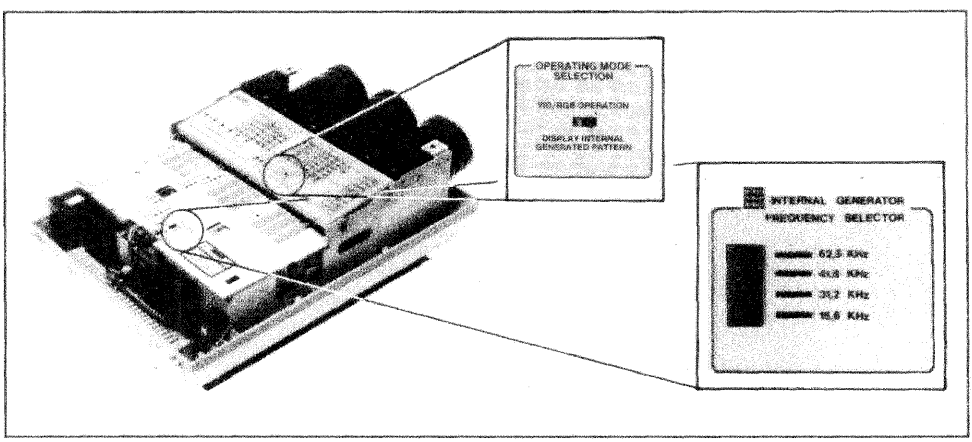
> *Attention :*
>
> ***Before switching ON the projector, always check if the factory power voltage preset of the projector corresponds with the power voltage in the room.***

2. Select the INTERNALLY generated grid test pattern. Proceed as follows :

- open the top cover of the projector
- put the switch '*# PATTERN/VIDEO RGB GENERATOR* ' switch in the '*# PATTERN* ' position.

Important : the displayed grid test pattern can be generated in four different hor. scan frequencies. The desired hor. scan frequency can be selected with the provided switch on the generator board. The vertical frequency is for each hor. scan frequency 50 Hz.

Remark : Other external test pattern generators can be used, among which the ***BARCO*** multi freq. cross hatch pattern generator.
These external generators have to be considered as input source for the projector.



IV. PICTURE SHARPNESS

Picture focus adjustment :

Picture focus adjustment for the projection system consists of two separate adjustments for each colour.

Important :

To obtain the sharpest possible picture, the projection system consists of two focus adjustments :
-optical focus
-electrical focus

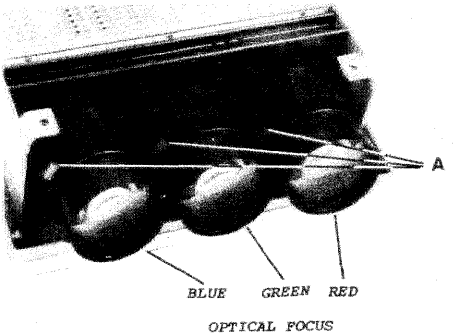
Remark :

Remove the two other colour pictures by covering the corresponding lens with the lens-cap or by putting the corresponding colour picture switch in the OFF position.

1. OPTICAL FOCUS ADJUSTMENT

This Barcographics 400 is equipped with glass lenses.
The optical focussing has to be done in the following order :

- loosen nut A on each lens unit
- rotate the lens of Green, Red and Blue separately for the sharpest picture on the screen.
- secure the exact position of each lens by tightening lens locking nut A.



OPTICAL FOCUS

IV. PICTURE SHARPNESS

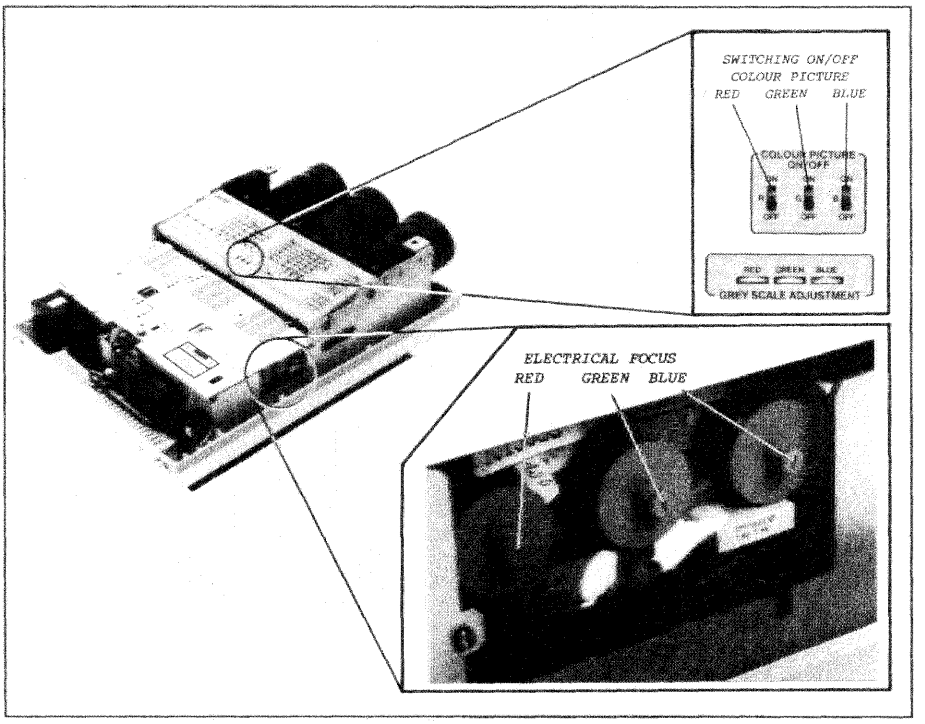
2.ELECTRICAL FOCUSSING ADJUSTMENT

Important :

Electrical focus adjustment has to be done with a reduced contrast and brightness level (e.g. contrast and brightness controls in their medium position).

Adjust separately the focus control for Red (red coloured button), Green (green coloured button) and Blue (blue coloured button) for the sharpest picture on the screen. Do it by hand or with a small non-metalic screwdriver. Be aware not to touch anything else than the coloured buttons, the other parts are under a high voltage.

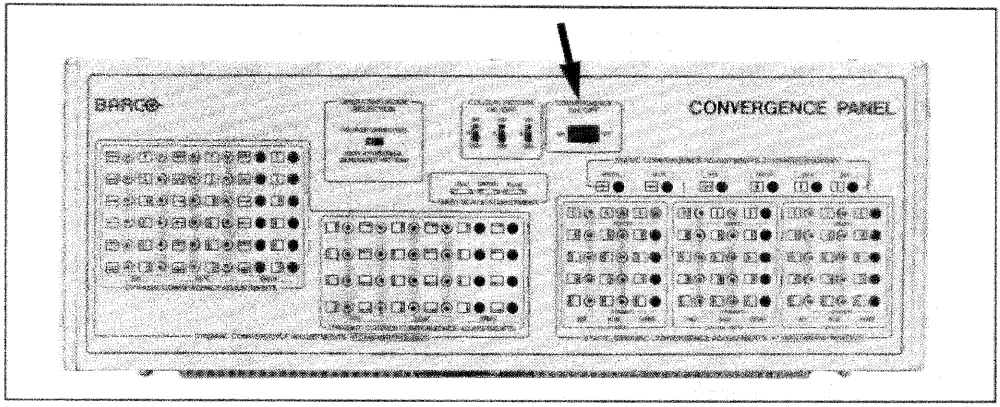
> ***WARNING :***
>
> ***Do not try to adjust the focus controls with a metalic screwdriver. Use the coloured protective buttons for picture adjustment.***
>
> ***When the plastic cover, covering the focus board is damaged, switch off the projector and unplug the plug from the wall outlet. Call an authorised technicien to replace the damaged cover.***



V. PICTURE CENTERING

1. PREPARATION :

Disable the convergence corrections by putting the convergence ON/OFF switch in the OFF position.



2. Picture centering :

This procedure consists of two parts :

- picture centering on the CRT face , CRT over- and underscan.
- lateral lens adjustment, for picture centering on the screen.

V. PICTURE CENTERING

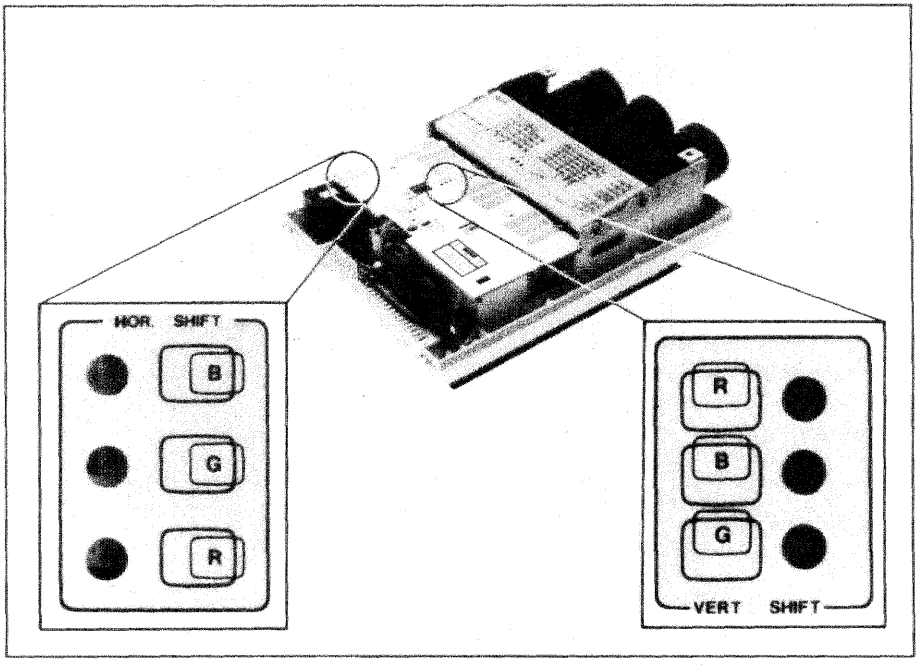
A. ON CRT SCREEN SURFACE

Positioning of the picture display in the center of the CRT screen surface for each tube :

- adjust brightness and contrast at a low level, using the brightness and contrast controls on the control switch box.

- while looking into the respective lenses, adjust the potentiometers *HOR. SHIFT* and *VERT. SHIFT*, corresponding with each picture tube for the center position of the displayed picture with regard to the screen surface.

Attention : For product safety, use a non metalic screwdriver to adjust these shifts.



B. ON PROJECTION SCREEN

- adjust brightness and contrast control for picture display on the screen.
- proceed to the following adjustments.

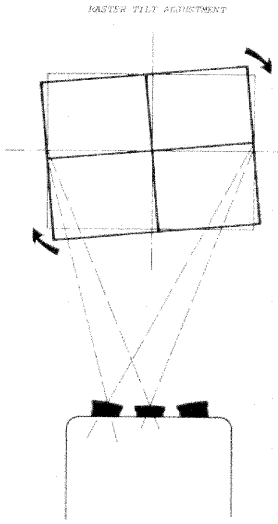
Important : In order to accomplish the following adjustments, first proceed to a quick picture sharpness adjustment (see PICTURE SHARPNESS ADJUSTMENT)

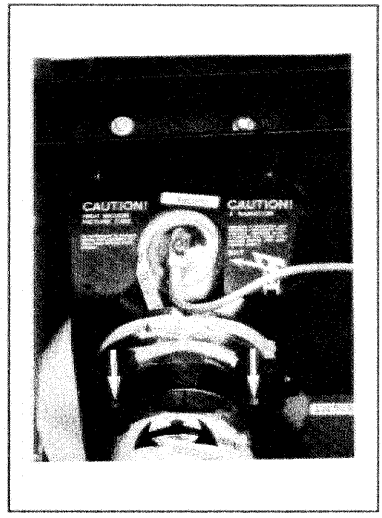
a. Raster tilt correction

Important :

Make sure that there is no raster tilting of one on the projected pictures in order to be able to converge the picture correctly.
Check on the projection screen if the horizontal line of the three colour pictures runs parallel in the vertical center.
In case of non-parallelism of one of them, proceed to the following adjustment.

WARNING : High voltage is fed to the picture tube and the CRT sockets. Avoid touching any part of the picture tube or the CRT sockets. This voltage can kill you.





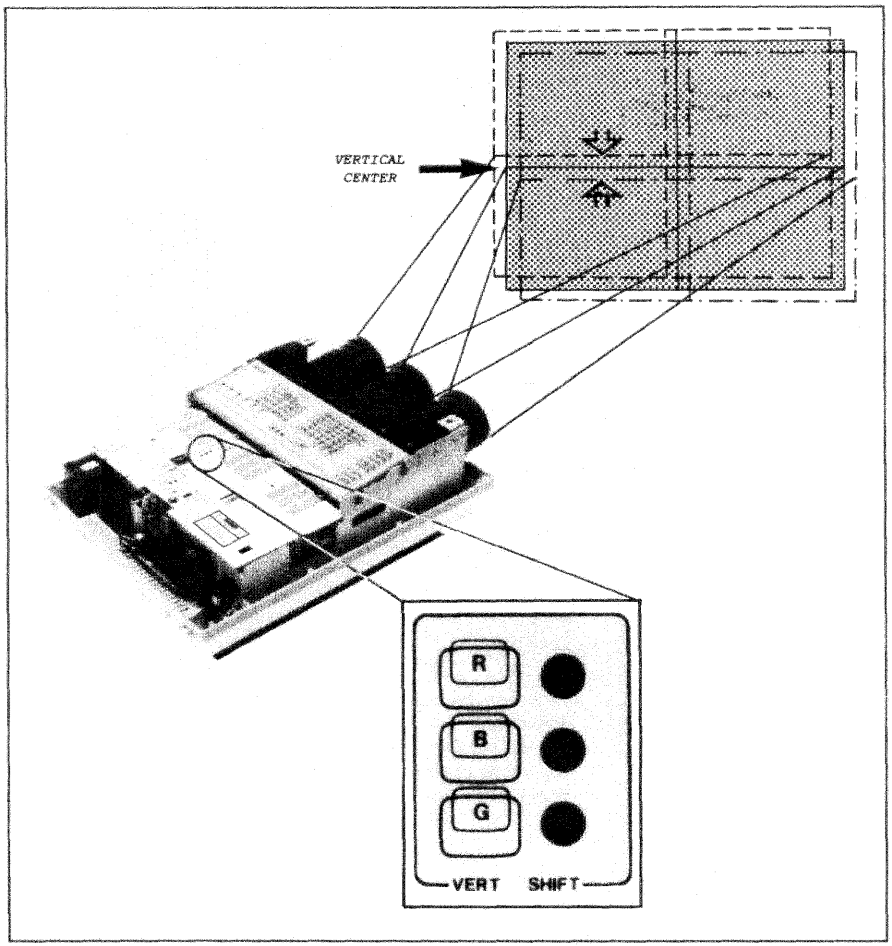
- loosen the two nuts on the deflection housing (see fig.) of the respective colour picture tube.
- rotate deflection yoke until parallelism of the horizontal lines with the other grid patterns is obtained in the vertical center.
- tighten the nuts

b. Static convergence in the vertical center

Horizontal line in the vertical center of the Red and/or Blue picture do not coincide with these of the Green picture.

This error has to be eliminated by readjusting the respective Red and/or Blue *VERT. SHIFT* potentiometer until coincidence is obtained.

Always use a non metalic screwdriver to adjust the vert. shifts.



c. Static convergence in the horizontal center

LATERAL PROJECTION ANGLE ADJUSTMENT FOR THE RED AND BLUE PICTURE PROJECTION SYSTEM.

After picture sharpness adjustment proceed to the lateral projection angle adjustment **BEFORE** adjusting *PICTURE GEOMETRY* and *CONVERGENCES*.

GENERAL RULE

When the screen size is different with regard to the factory preadjusted size, re-adjustment of the lateral projection angle for the *RED* and *BLUE* picture is obligatory

NEGLECTING THE MENTIONED ADJUSTMENT

RESULTS IN de-alignment of the picture on the CRT surfaces and also a too big driving power for the convergence circuits, causing convergence non-stability as function of temperature.

ADJUSTMENT PROCEDURE

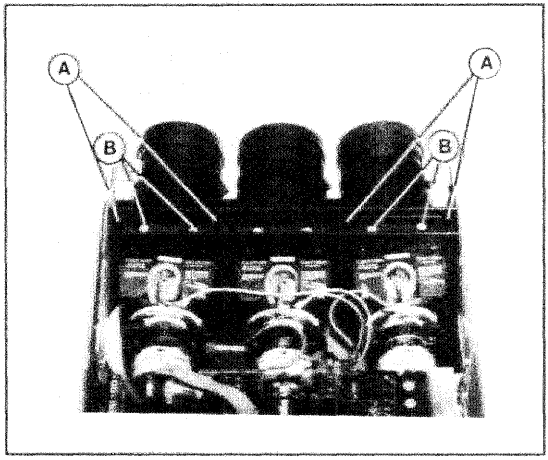
The adjustment consists of coincidence of the vertical line in the horizontal center of the *RED* and *BLUE* picture with this of the *GREEN* picture.

V. PICTURE CENTERING

Proceed as follows :

WARNING : Only use the provided holes to loose the screws A and B.
The picture tubes are fed with a high voltage (34.7 kV)

- lift up the top cover (see : Top cover removal, first part)
- loosen the two hexagon screws A, upper fixation latch, and screws B, lower fixation latch, fastening the cooling house of the RED and BLUE picture tube.
- the two outside "lens picture tube" unit can be moved slightly in a horizontal plane.
- proceed to this correction until the vertical center line of the RED and BLUE displayed picture coincides with this of the GREEN picture



- secure the right position of the "Lens picture tube" units by fastening the respective screws.

Example : The wanted screen width is bigger than the factory pre-adjusted one.

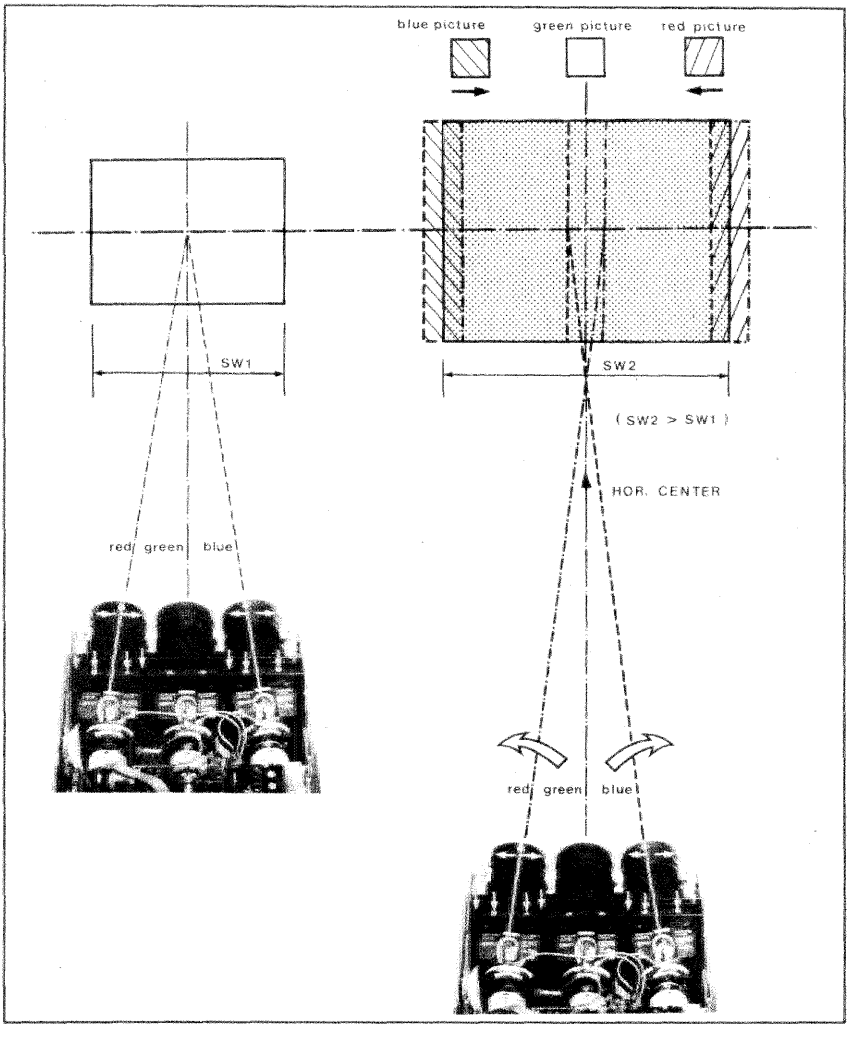
Adjustment to be done :

Move the *RED* and *BLUE 'LENS-CRT UNIT'* to the outside until on the screen the vertical center line for both pictures coincides with this of the *GREEN* picture.

V. PICTURE CENTERING

Attention :

DO NOT USE THE RESPECTIVE HOR. SHIFT CONTROLS to adjust picture coincidence in the horizontal center.



VI. PICTURE GEOMETRY CORRECTIONS

1. EAST-WEST CORRECTIONS

Adjustment procedure for the vertical lines on the left and right side of the picture.

Always use a non metalic screwdriver.

ATTENTION :

For this adjustment, the convergence corrections have to be disabled. Set convergence switch in the position 'OFF'.

These adjustments have to be done only on one colour picture, e.g. *GREEN PICTURE*, because the other colour pictures are automatically corrected in the same way. Remove the *RED* and *BLUE* picture by covering the corresponding lenses with the lens cap or by putting the corresponding colour picture switch in the *OFF* position.

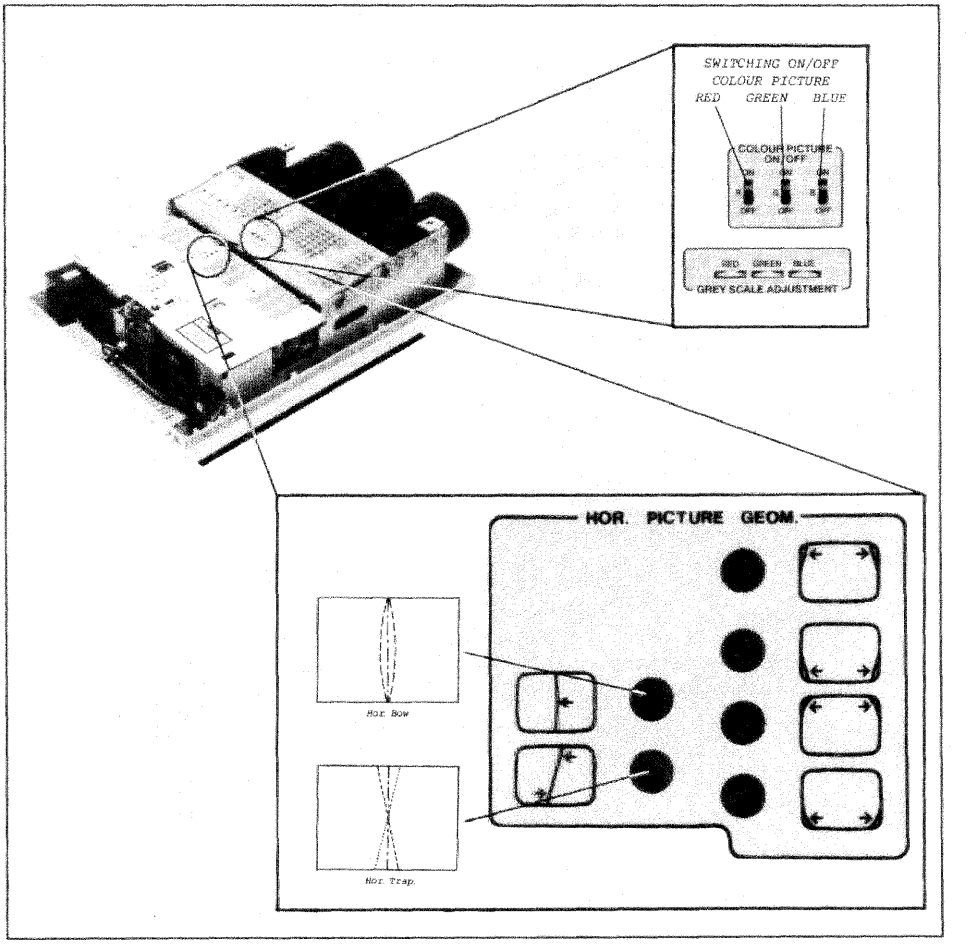
VI. PICTURE GEOMETRY CORRECTIONS

ADJUSTMENT PROCEDURE :

a. FIRST ADJUSTMENT :

VERTICAL CENTRE LINE CORRECTIONS

Adjust the *HOR. BOW* and the *HOR. SKEW* control for a vertical straight line in the middle of the projected picture.



b. SECOND ADJUSTMENT :

LEFT-RIGHT VERTICAL LINE CORRECTIONS

a) Upper part of the picture

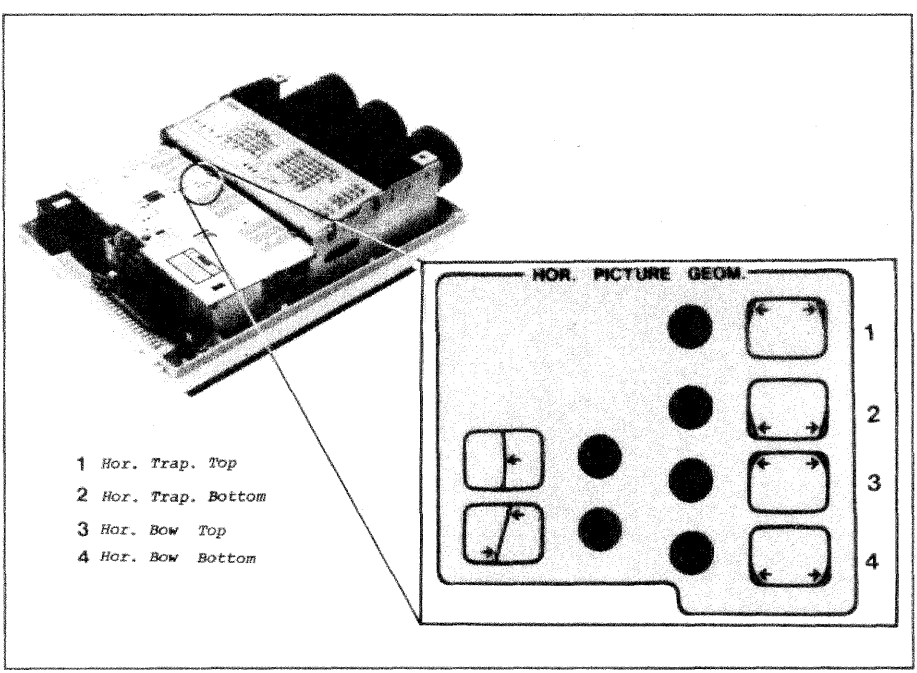
- adjust the *HOR. TRAP* distortion and *HOR. BOW* controls, controlling the upper part of the picture, until the vertical lines at the left and right side of the projected picture are straight.

b) Lower part of the picture

- Adjust the *HOR. TRAP* distortion and *HOR. BOW* controls, controlling the lower part of the picture, until the vertical lines at the left and right side of the projectred picture are straight.

IMPORTANT :
In order to obtain a perfect correction in the respective area, an alternating adjustment between *HOR. TRAP* and *HOR. BOW* will be necessary in most cases.

Readjustment of the horizontal amplitude could be necessary



VI. PICTURE GEOMETRY CORRECTIONS

2. NORTH-SOUTH CORRECTIONS

Adjustment procedure for the horizontal lines at the top and bottom of the picture. Vert. bow, north/south amplitude and trapezium distortion.

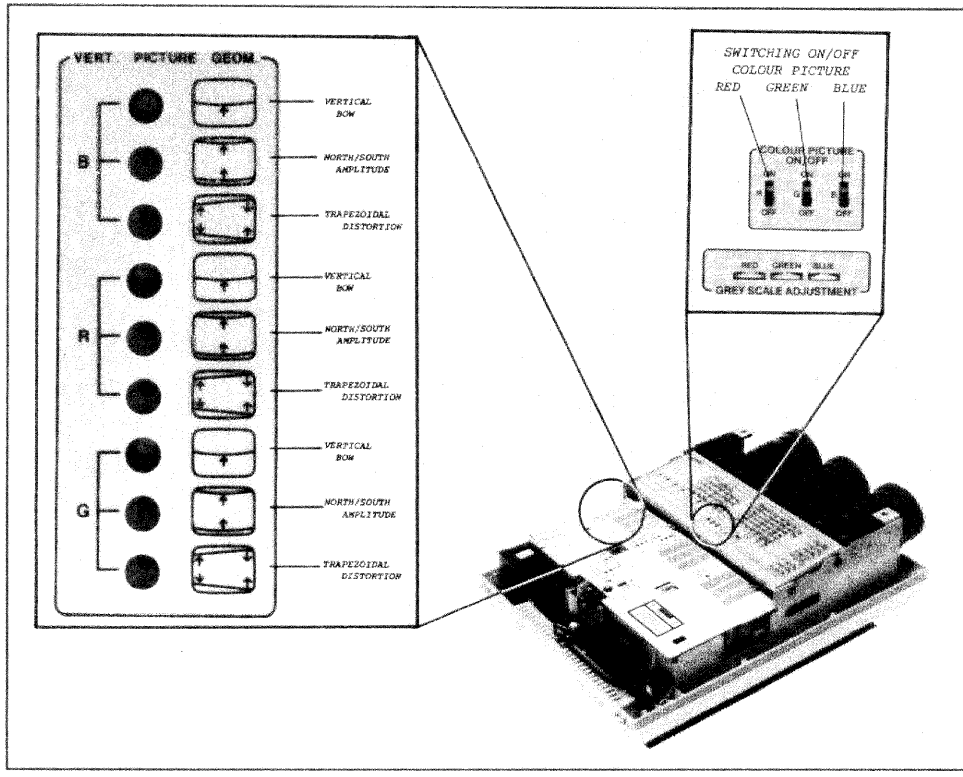
ATTENTION :

For this adjustment, the convergence corrections have to be disabled. Set convergence switch in the off position.

These adjustments have to be done separately for each colour picture. Start always first with the vertical bow and proceed than with an alternating adjustment of the n/s amplitude and the trap. distortion.

Remove the other two pictures by covering the corresponding lenses with the lens cap or by putting the corresponding colour picture switch in the OFF position.

All non coïncidences of the *RED* and *BLUE GRID TEST PATTERN* to the *GREEN GRID PATTERN* have to be corrected later with the controls on the convergence panel.



VI. PICTURE GEOMETRY CORRECTIONS

3. HORIZONTAL PICTURE WIDTH

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

The coils T100, T90 and T80, respective for RED, GREEN and BLUE, allow to correct eventual picture width differences.

Proceed as follows :

- Turn the core of each coil fully inside the coil.
- Measure the picture width of each colour picture.
- The colour picture with the smallest width will be taken as reference. (Do not touch the corresponding coil)
- Adjust the two other coils in order to obtain the same picture width.

IMPORTANT :

One of the three coils must have a core fully turned in.

VI. PICTURE GEOMETRY CORRECTIONS

4. LINEARITY/AMPLITUDE ADJUSTMENTS

These adjustments have to be done only on one colour picture, e.g. Green picture, because the other colour pictures are automatically corrected in the same way (switch off the Blue and Red picture by putting the respective colour picture switch in the OFF position).

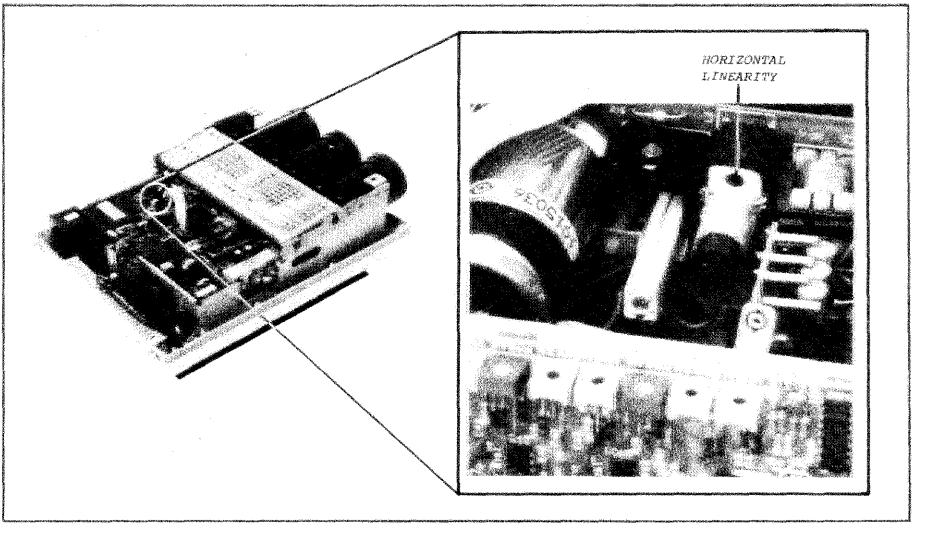
a. Horizontal linearity

The *HORIZONTAL LINEARITY* is factory preadjusted. 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.
Never touch any electronical part.

Proceed as follow :

- Open the top cover (see § Top cover removal)
- Take off the protection cover (see § protection cover removal).
- Switch on the crosshatch generator on the convergence panel.
- Adjust the horizontal linearity control for horizontal equal size of the crosshatch squares on the projection screen.
- Always reinstall the protection cover after alignment.
- Close the top cover.



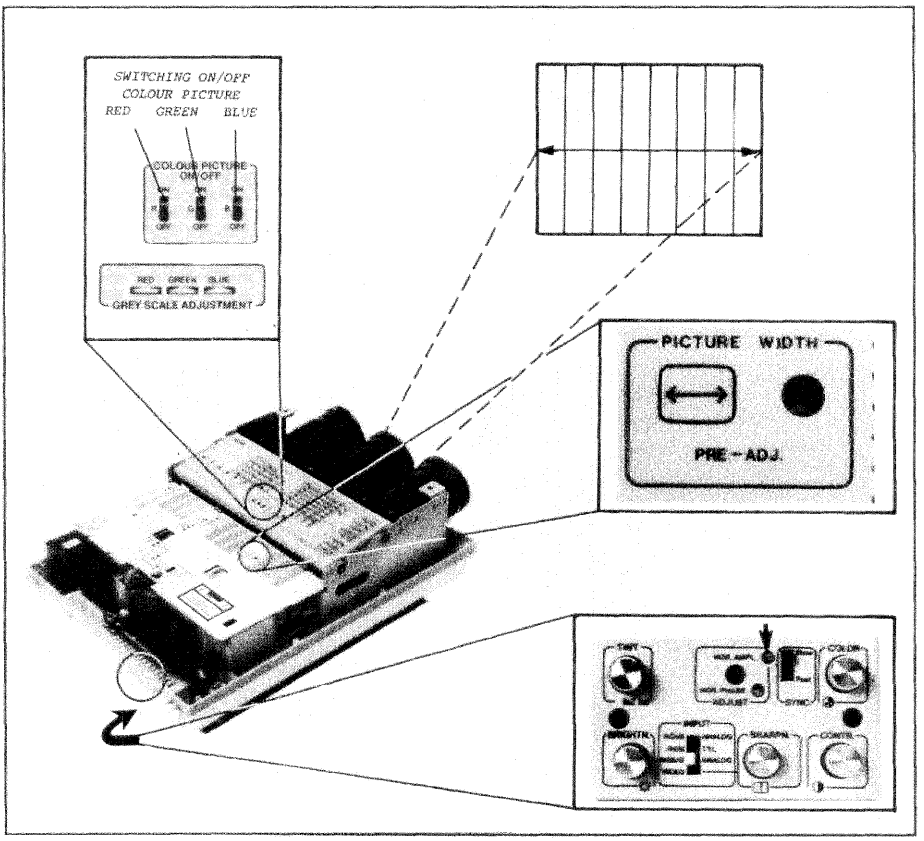
b. Horizontal amplitude

Two controls allow picture width adjustment :

* Picture width control on *SM POWER SUPPLY.*
  This control is factory preadjusted. When readjustment is necessary (e.g. after service), proceed as follows :
- Feed a video signal via the RCVDS 400 S-Quad to the projector.
- Look up in the diagrams (see §Screen width) the corresponding screen width with the projector/screen distance used in this configuration.
-Adjust 'picture width control' on the SM power supply in order to obtain this corresponding screen width.

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

* Horizontal amplitude control on the control switch box or on the respective input modules of the *RCVDS 4OO S-QUAD.*
  This control adjusts the hor. amplitude for RGB signals. Adjust this control until the desired width is obtained . The maximum attainable width will be the same as the one preset with the control on the SM power supply.



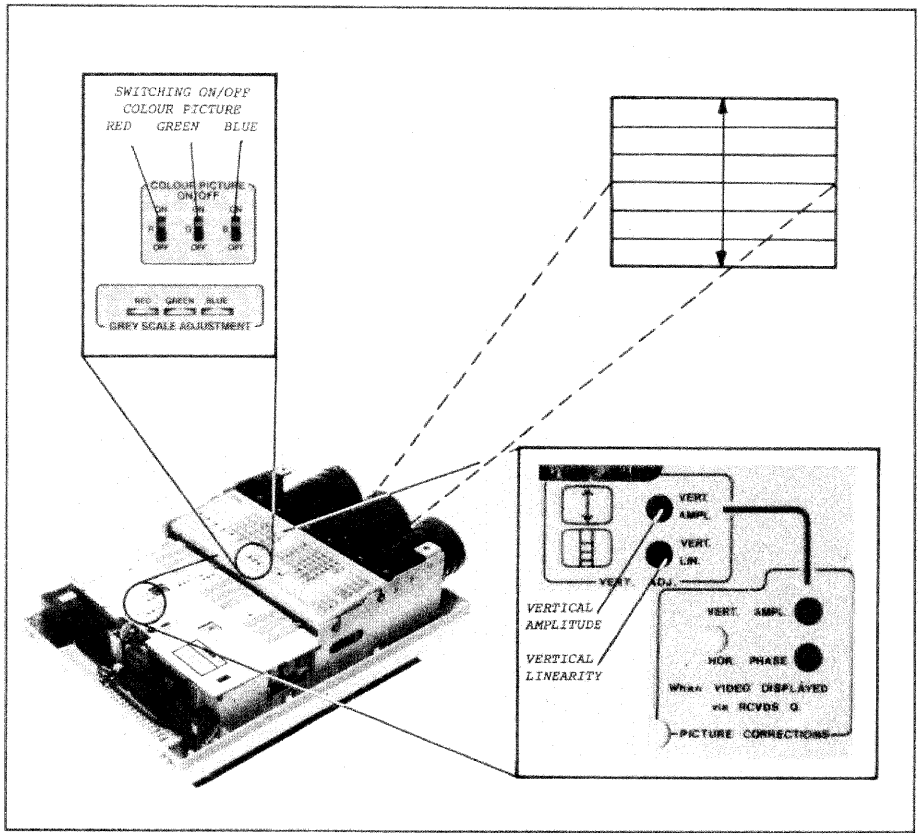
c. Vertical linearity

Adjust vertical linearity control for vertical equal size of crosshatch squares on the projected screen.

d. Vertical amplitude

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

Note : Adjust always first the horizontal amplitude.



VI. PICTURE GEOMETRY CORRECTIONS

e. Vertical amplitude correction for video playback via RCVDS 400 S-QUAD.

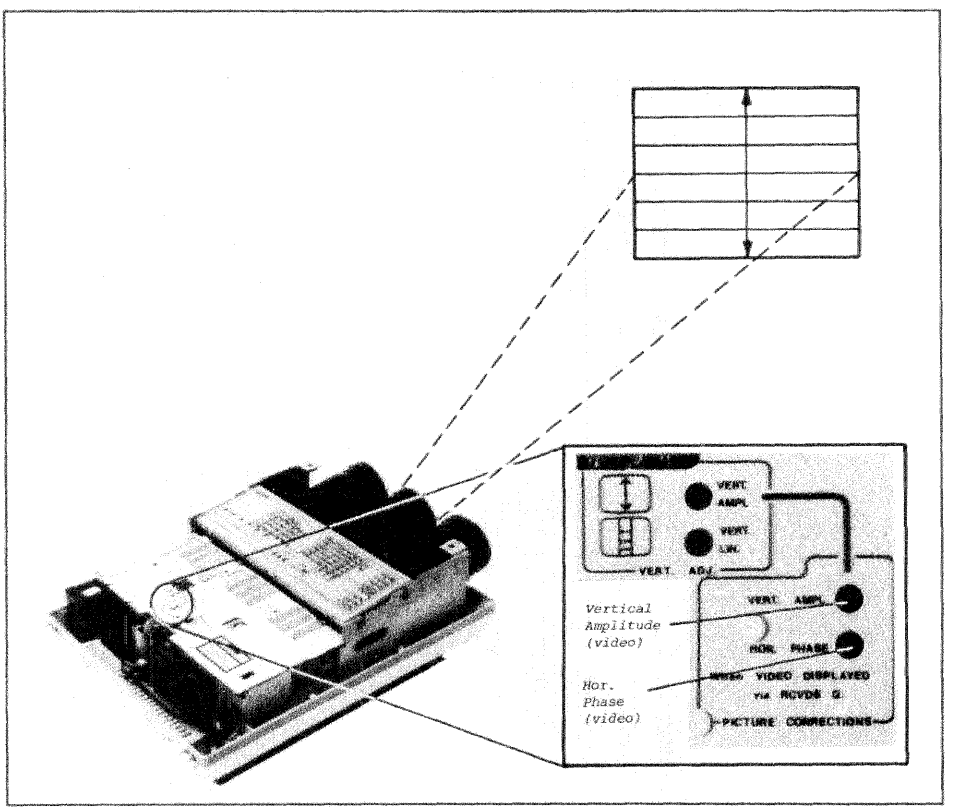
When vidoe signals are applied, after convertion into RGB analog signals, using the ***RCVDS 400 S-QUAD*** as an interface , to the ***BARCOGRAPHICS 400***, it can be necessary to correct the picture ratio and the hor. video phase.

Picture ratio 4 by 3 :

Adjust *VERT AMP* ((video) until correct picture ratio width-height 4 by 3 is obtained.

Hor. phase (video) adjustment :

Adj. *HOR PHASE* (video) until full characters are displayed on the projected picture.

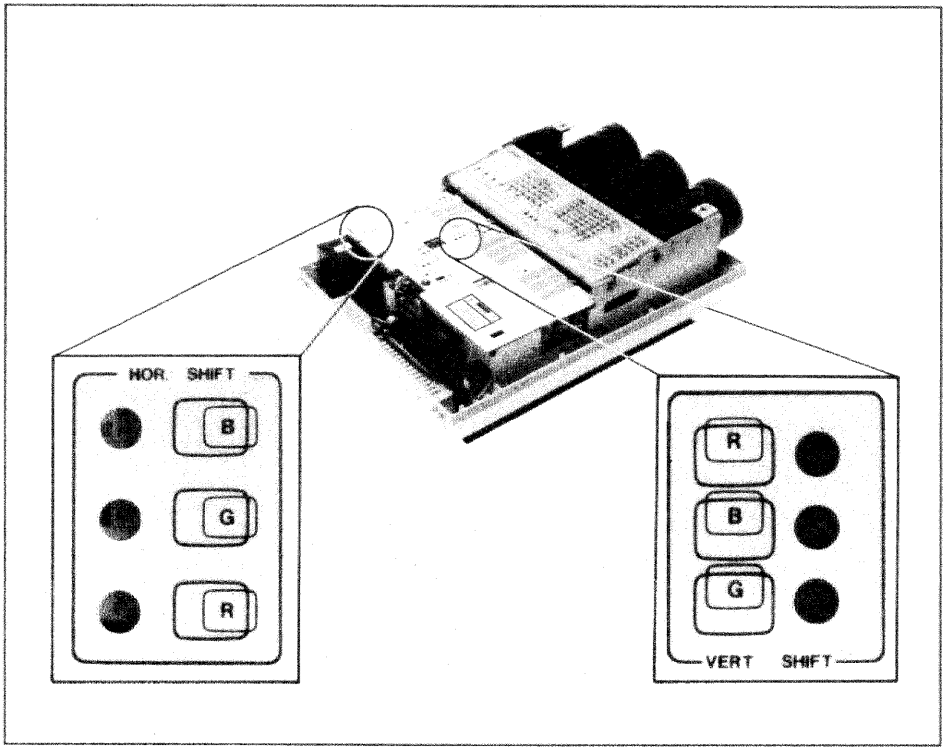


VI. PICTURE GEOMETRY CORRECTIONS

A. STATIC CONVERGENCE ADJUSTMENT

When enabling the convergence corrections (convergence switch in the position 'ON'), eventual mislanding in the center of the crosshatch pattern of *GREEN*, with respect to the landing with disabled convergence module, has to be corrected with the *HOR.* and *VERT. SHIFT* controls of Green.

Futher, converge the Red and Blue grid pattern, using the respective *SHIFT* controls, for coincidence with Green picture in *THE MIDDLE OF THE SCREEN.*



B. DYNAMIC CONVERGENCE ADJUSTMENTS

BEFORE STARTING THE CONVERGENCE ADJUSTMENT, LET WARM UP THE PROJECTOR FOR AT LEAST 15 MINUTES.

1. INTRODUCTION

Convergence adjustments consist of superimposing the *RED* and *BLUE* projected picture on the *GREEN* picture.

Location of convergence controls :

Lift up the top cover of the projector : the convergence board, with the convergence controls is located behind the lenses.

ATTENTION :

Before proceeding to any convergence adjustments, the projector has to operate in the standard frequency mode,unless otherwise specified.

2. PREPARATION :

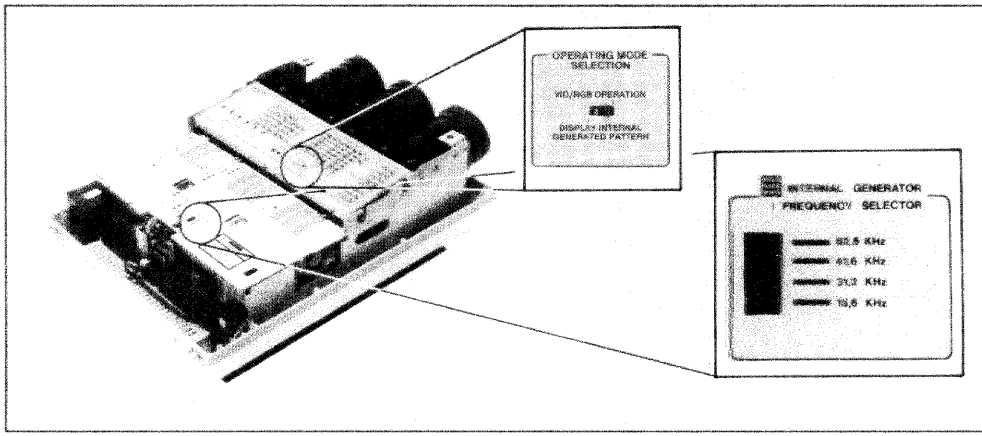
- displaying the internal generator cross hatch test pattern :

Put the switch ' *# PATTERN/VIDEO RGB OPERATION*' on the convergence module in the position ' *# PATTERN*'

- changing the horizontal frequency :

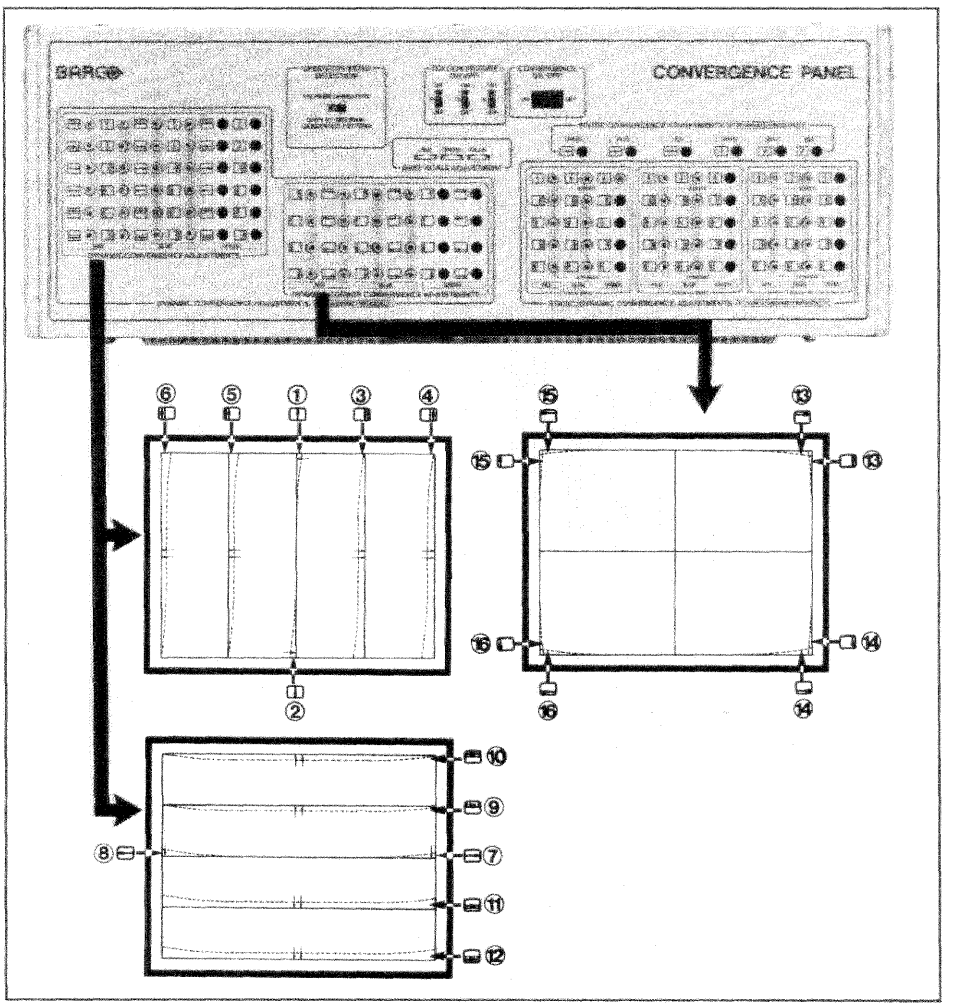
Use a non-metalic screwdriver to switch over the horizontal frequency.
The frequency possibilities are indicated on the yellow protection cover.

- to switch OFF a colour picture, put the corresponding colour picture switch in the OFF position.



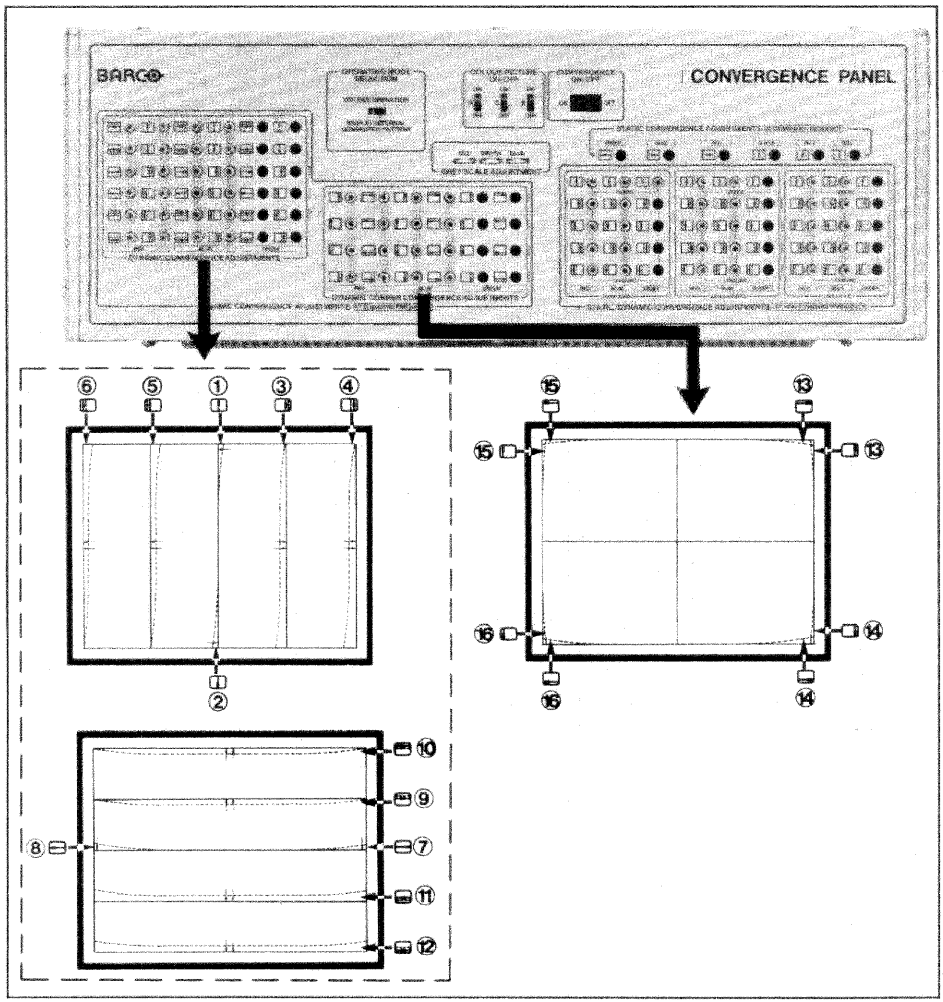
3. Superposing RED GRID PATTERN ON GREEN pattern

- switch OFF *BLUE* colour picture.
- adjust in the respective area the convergence controls for *RED* picture in the following order :



4. Superposing BLUE grid pattern on GREEN pattern

- switch ON *BLUE* picture and switch OFF *RED* picture.
- adjust the convergence controls for *BLUE* picture in the same order as for *RED*.



C. DYNAMIC AND STATIC CONVERGENCE ADJUSTMENTS AT NON-STANDARD FREQUENCIES.

IMPORTANT :

Before starting the convergence adjustments at non-standard frequencies, a correct adjustment of the convergences at standard frequency is required.

To obtain correct convergences for the Barcographics 400 over the whole range, the convergence adjustment have to be done at three different frequencies ranges :

a. first : range 15 kHz - 32 kHz

b. second : range 32 kHz - 42 kHz

c. third : range 42 kHz - 64 kHz

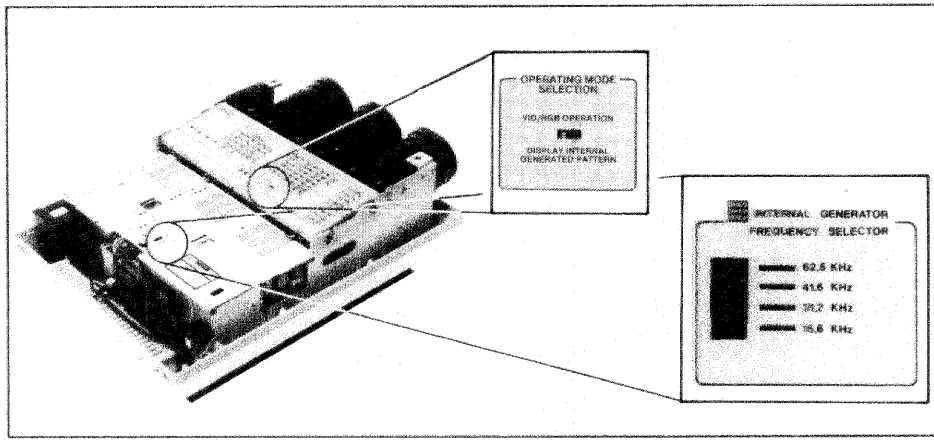
IMPORTANT :

For correct convergence setting, the applied line frequency has to be in the near of th highest frequency in the mentioned ranges.

Preparation before adjustment :

- Put the switch '*# PATTERN/VIDEO RGB OPERATION*' on the convergence panel in the position '*#PATTERN*'. An internal grid pattern will be displayed.

- A line frequency within each range can be chosen with the frequency selector on the generator board. For product safety, use a non-metalic screwdriver to switch over.



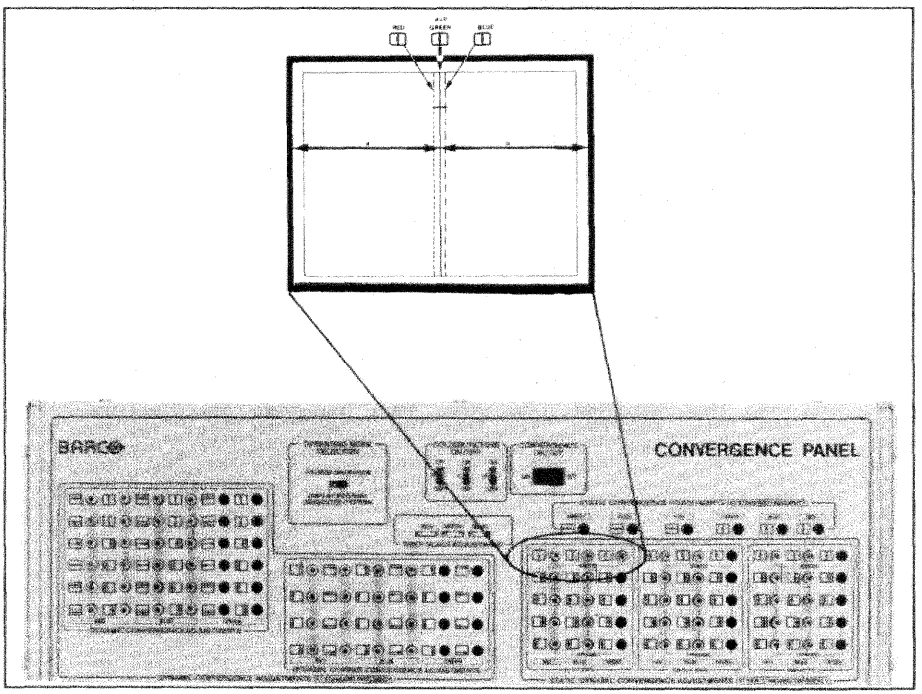
Remark :
Other external test pattern generators can be used.
These external generators have to be considered as input source for the projector.

1. DYNAMIC AND STATIC CONVERGENCE ADJUSTMENTS WITHIN FREQUENCY RANGE Fstd-32 kHz.

It is recommended to use a line frequency in the near of 32 kHz in order to obtain optimal convergence setting. When using the internal grid pattern, put the frequency selector on the generator board in the 31.2 kHz position.

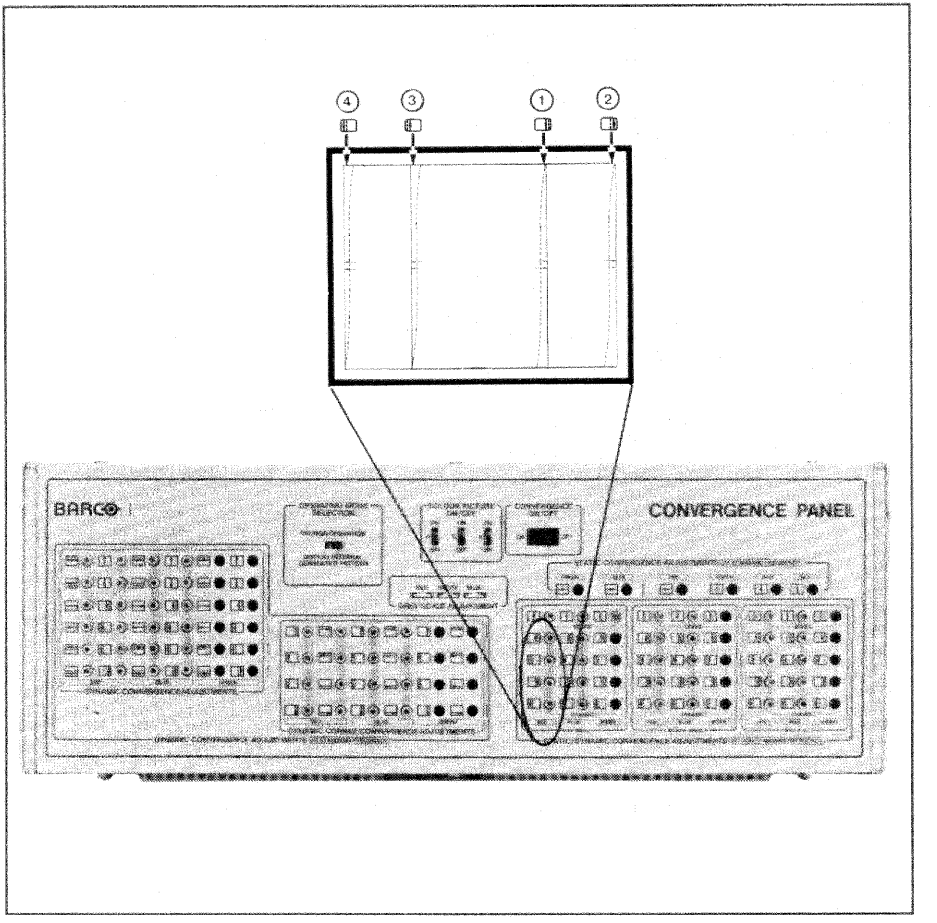
a. Static convergence

- switch OFF BLUE AND RED picture
- adjust the green static control until the vertical centre line of the green grid pattern is situated in the middle of the screen (a = b)
- switch ON BLUE AND RED picture
- adjust the horizontal static control for RED and BLUE for coincidence of the vertical lines in the horizontal centre.



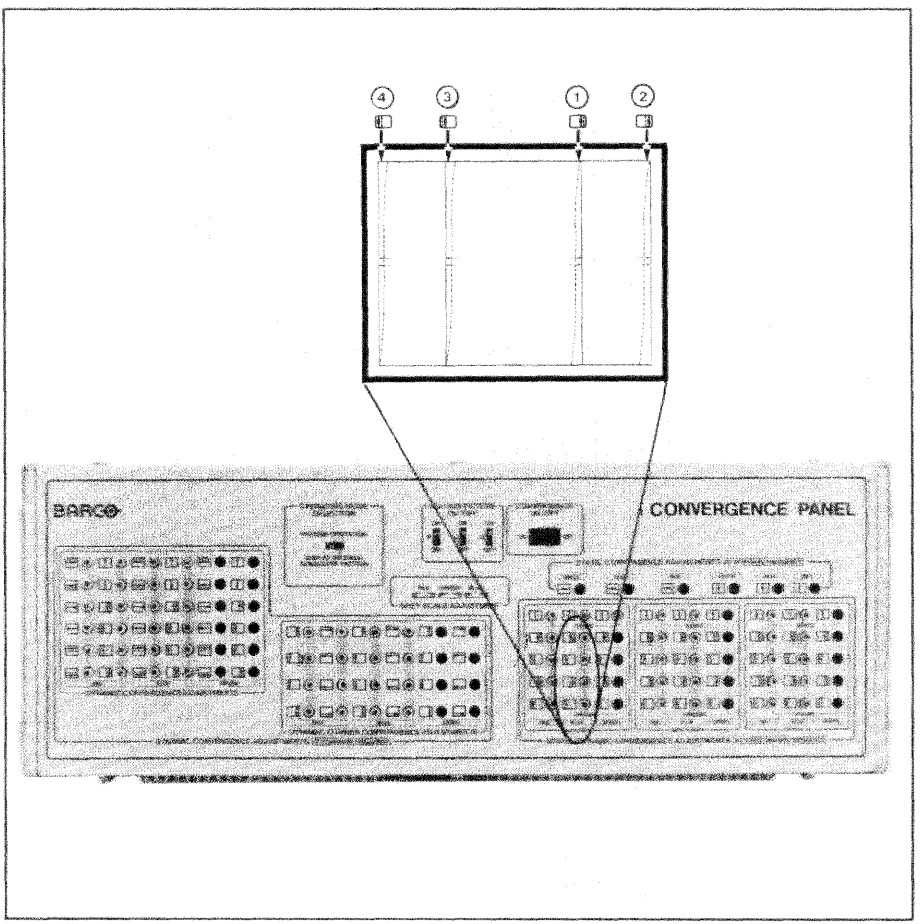
b. Dynamic convergences for RED picture.

- switch off the BLUE colour picture
- adjust in the respective area the convergence controls for the RED picture in the following order :



c. Dynamic convergences for BLUE picture.

- switch on the blue colour picture.
- switch off the RED colour picture
- adjust in the respective area the convergence controls for the BLUE picture in the following order :

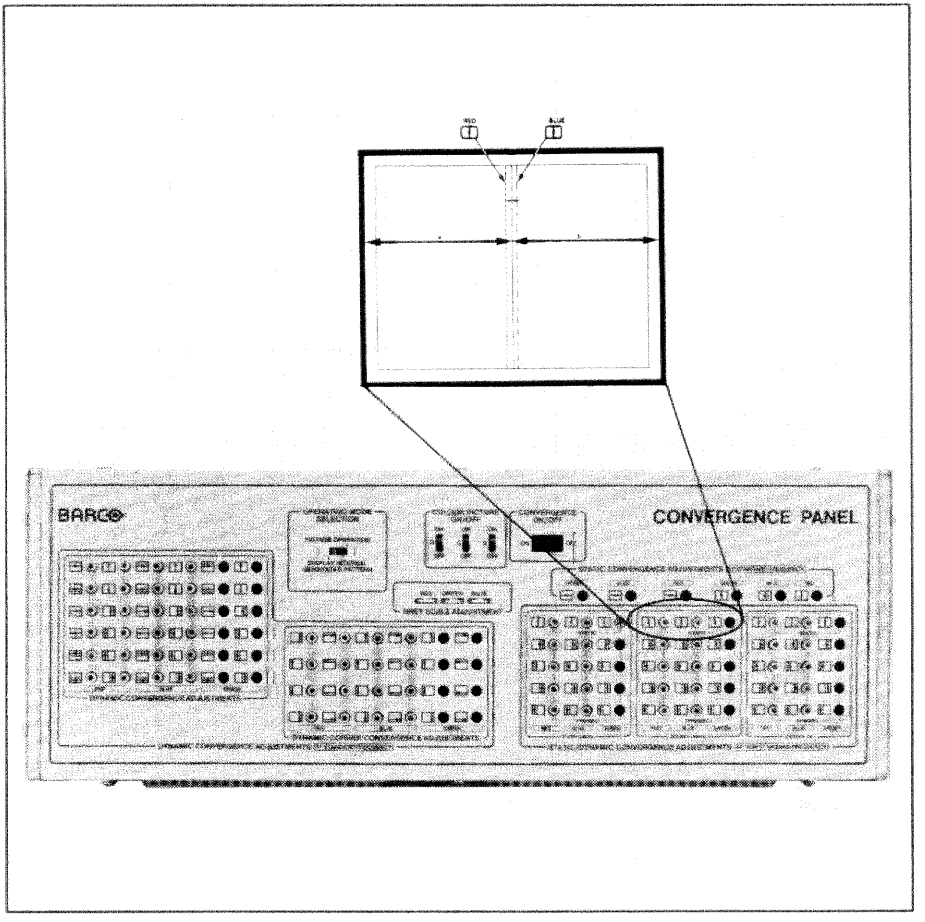


2. DYNAMIC AND STATIC CONVERGENCE ADJUSTMENT IN THE FREQUENCY RANGE 32 kHz to 42 kHz.

It is recommended to use a line frequency near 42 kHz in order to obtain optimal convergence setting.
When using the internal grid pattern, put the frequency selector on the generator board in the 41.6 kHz position.

a. Static convergence.

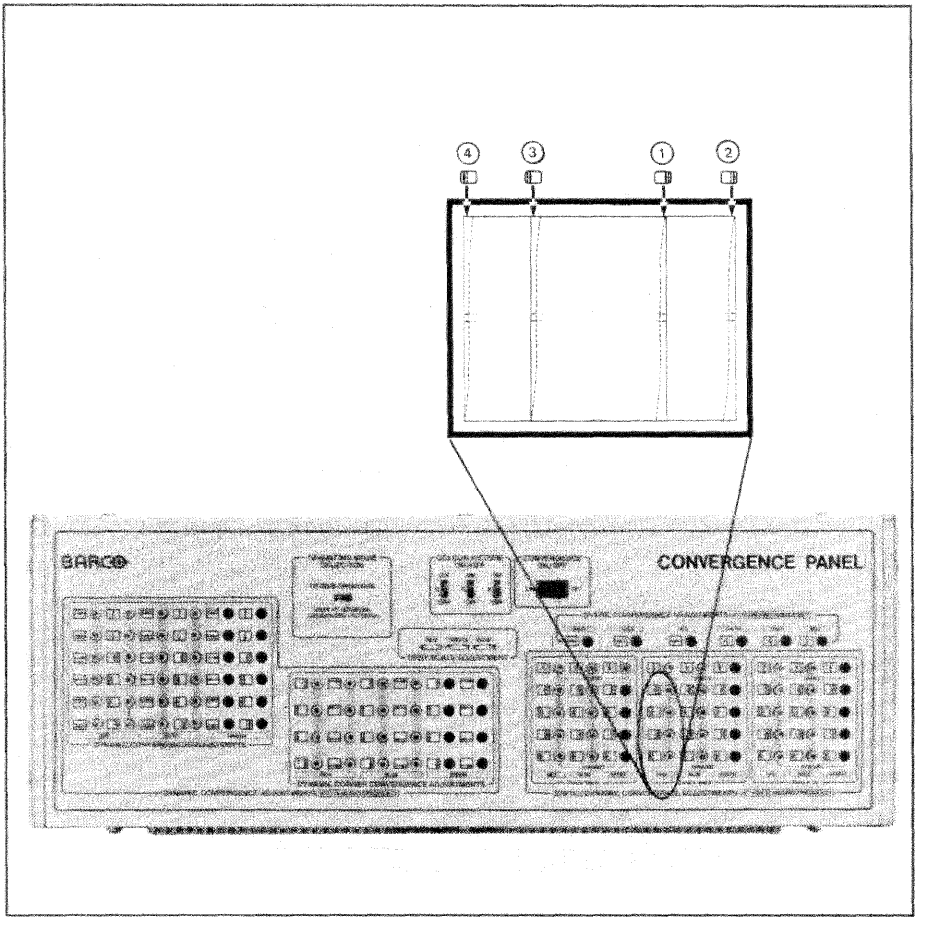
- adjust the horizontal static controls for RED and BLUE for coincidence of the vertical lines in the horizontal centre.



b. Dynamic convergences for RED picture.

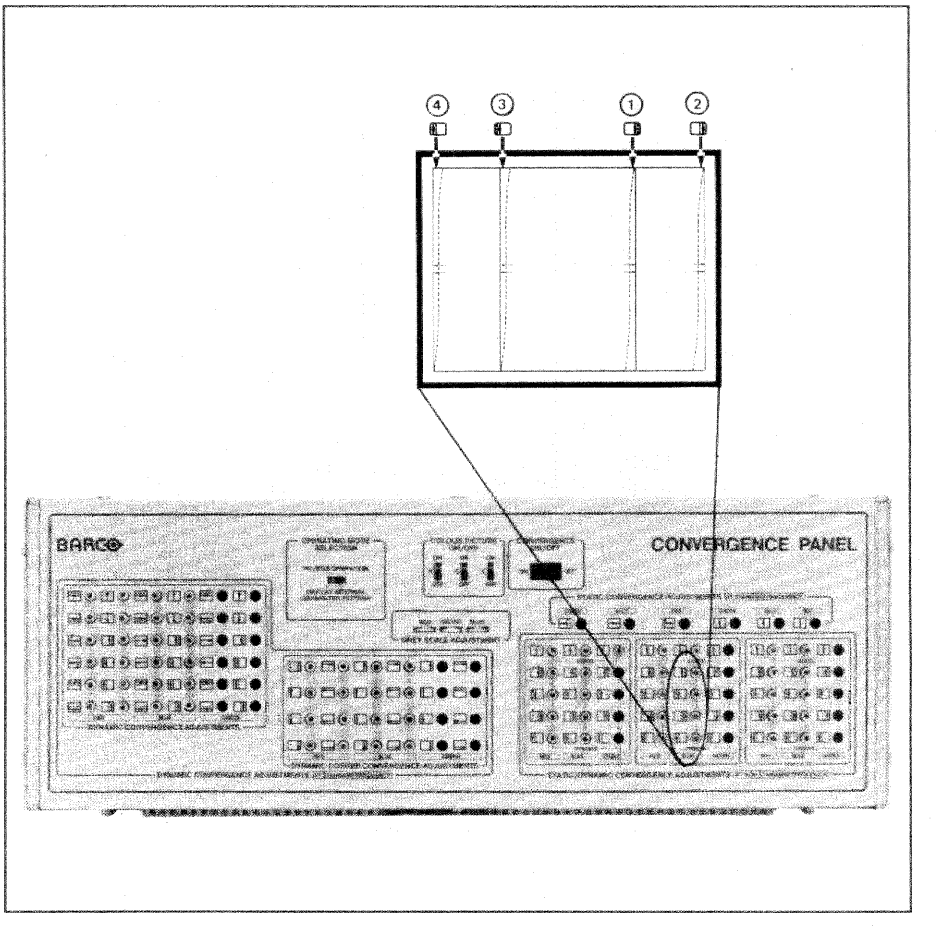
- switch off the BLUE colour picture

- adjust in the respective area the convergence controls for the RED picture in the following order :



c. Dynamic convergences for BLUE picture.

- switch on the blue colour picture.
- switch off the RED colour picture
- adjust in the respective area the convergence controls for the RED picture in the following order :

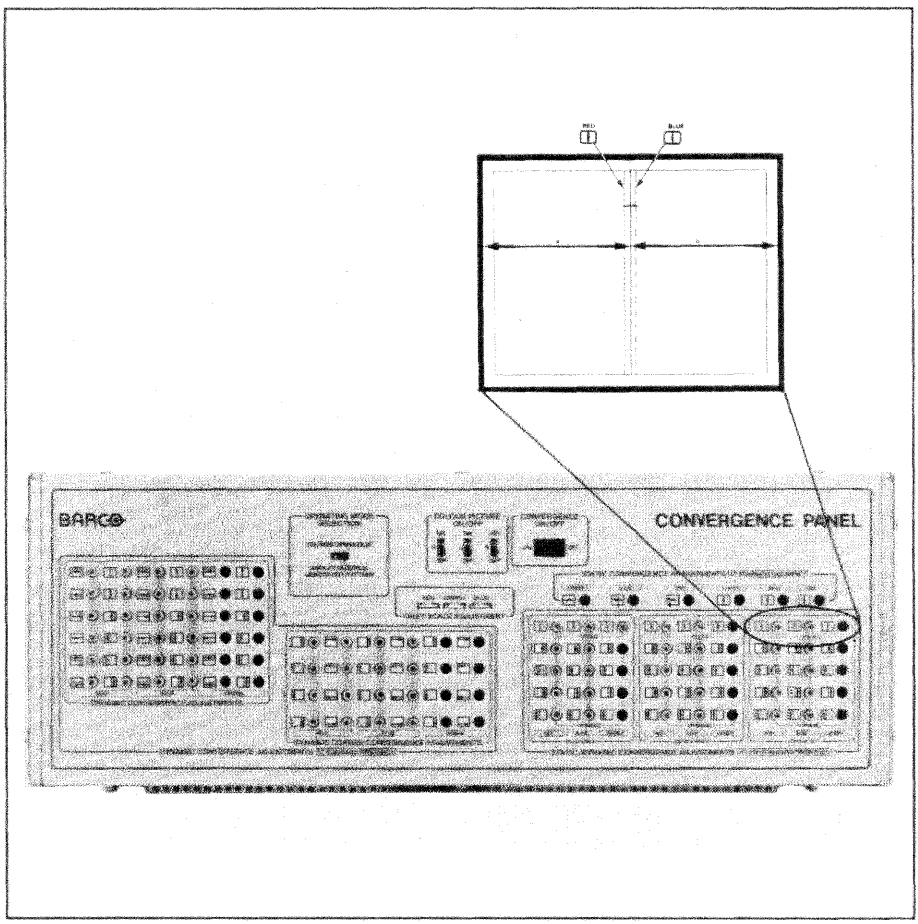


3. DYNAMIC AND STATIC CONVERGENCE ADJUSTMENT IN THE FREQUENCY RANGE 42kHz to 64 kHz.

It is recommended to use a line frequency near 64 kHz in order to obtain optimal convergence setting.
When using the internal grid pattern, put the frequency selector on the generator board in the 62.5 kHz position.

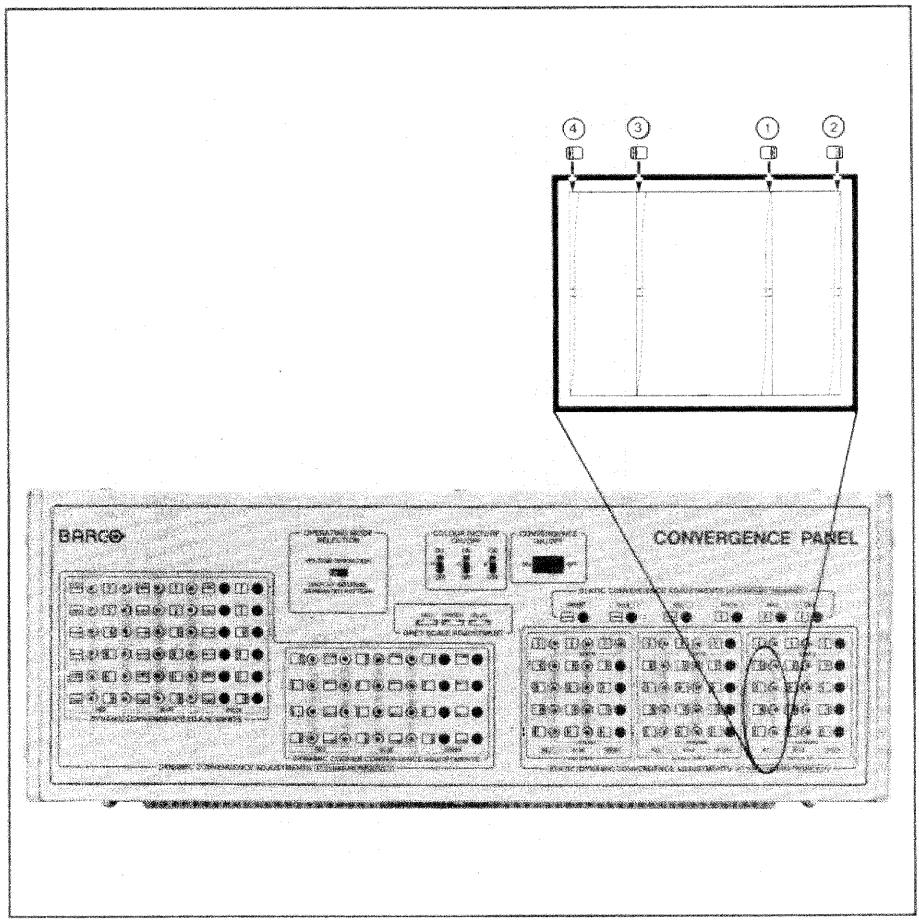
a. Static convergence.

- adjust the horizontal static controls for RED and BLUE for coincidence of the vertical lines in the horizontal centre.



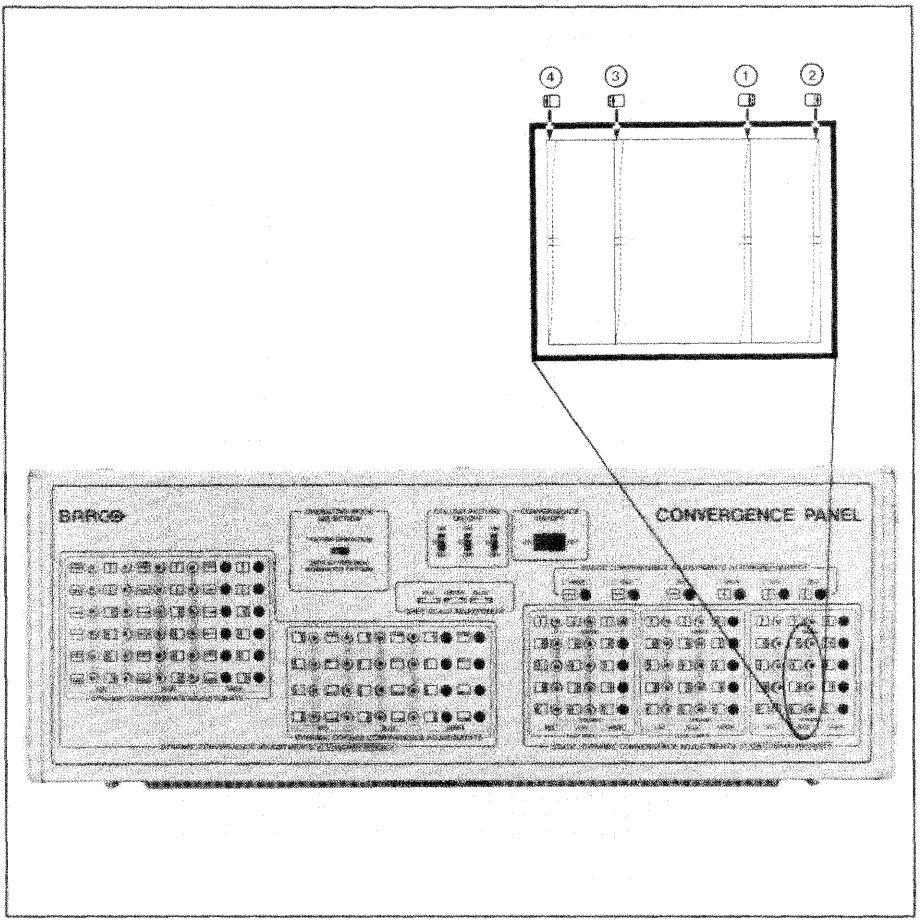
b. Dynamic convergences for RED picture.

- switch off the BLUE colour picture
- adjust in the respective area the convergence controls for the RED picture in the following order :



c. Dynamic convergences for BLUE picture.

- switch on the blue colour picture.
- switch off the RED colour picture
- adjust in the respective area the convergence controls for the RED picture in the following order :

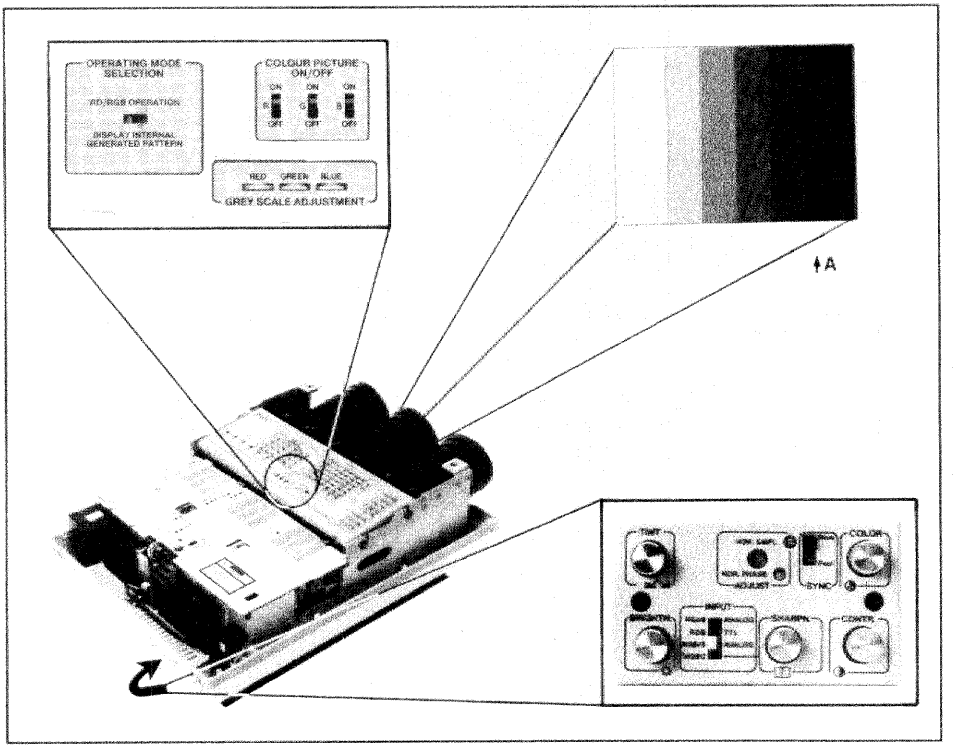


VIII. GREY SCALE ADJUSTMENT

- Place the switch '*# PATTERN/VIDEO RGB OPERATION*' in the position '*VIDEO RGB OPERATION*'.
- Feed in a standard colour bar test pattern signal to the *RGB* input of the projector, e.g. from a test pattern generator.
- Switch the input selector *RGB/VIDEO* on the control module in the *RGB* position to select the *RGB* input on the projector.
- Turn the brightness and contrast control in their mid-position.
- Switch OFF the Blue and the Red gun (G2 switches).

Adjust the *GREY SCALE GREEN* control until the response of the black bar of the test pattern is black.
Important : The first green bar (A) must be distinguishable from the black bar.

- switch ON the Red and Blue picture (respective colour picture switch). Adjust now the GREY SCALE controls of the Red and Blue picture for a correct grey scale tracking in the bright parts of the picture.

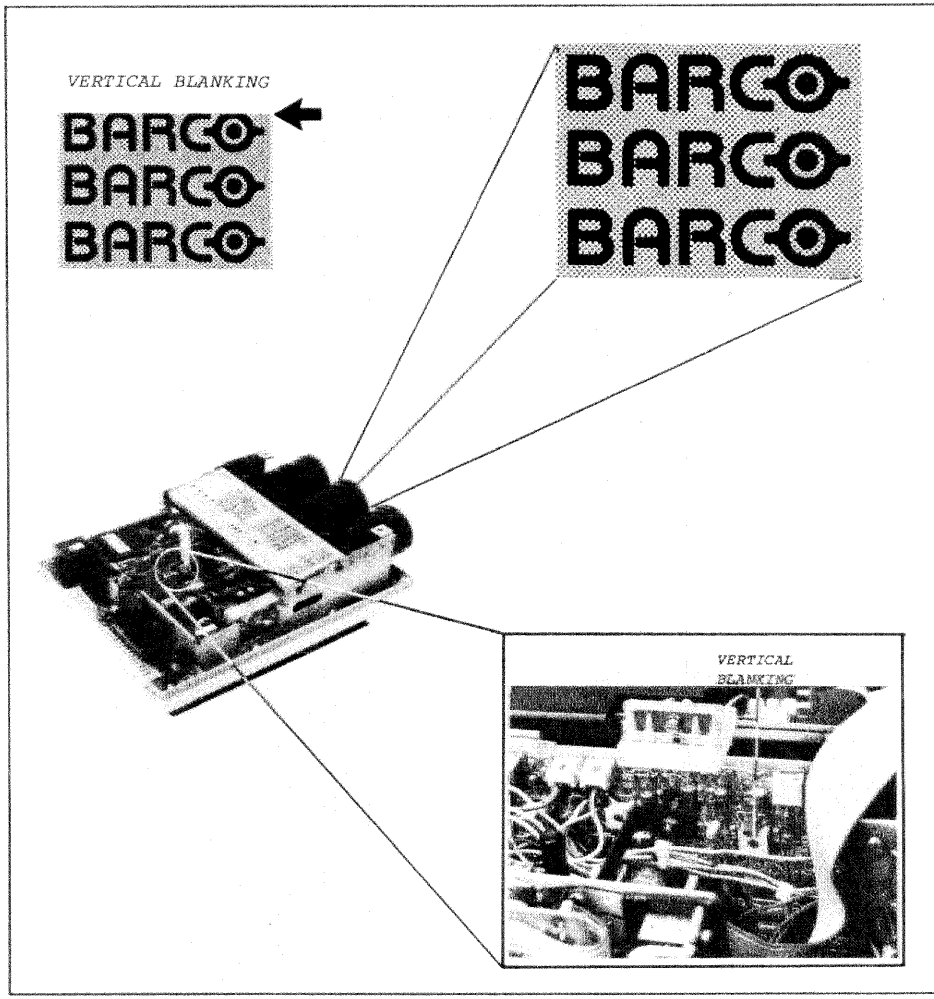


IX. HORIZONTAL PHASE

This hor. phase is adjustable with the potentiometer on the control switch box. Adjust 'Hor. phase' for full character display at the left side of the projected picture.

X. VERTICAL BLANKING

When the display of the upper character line of a page is blanked, readjust P18 until full character display is obtained.



XI. MANUAL FREQUENCY ADJUSTMENT

INTRODUCTION :

When a technical intervention is required, conventional frequency adjustment on the projector can be enabled. Switching between the two modes happens by means of the 'autolocking switch', located on the 'autolocking adaptor' board.

Acces to manual frequency adjustment :

Procedure :

- Open the top cover (see top cover removal)
- Remove the yellow protection cover (see protection cover removal)
- Follow the functional discription and the alignment

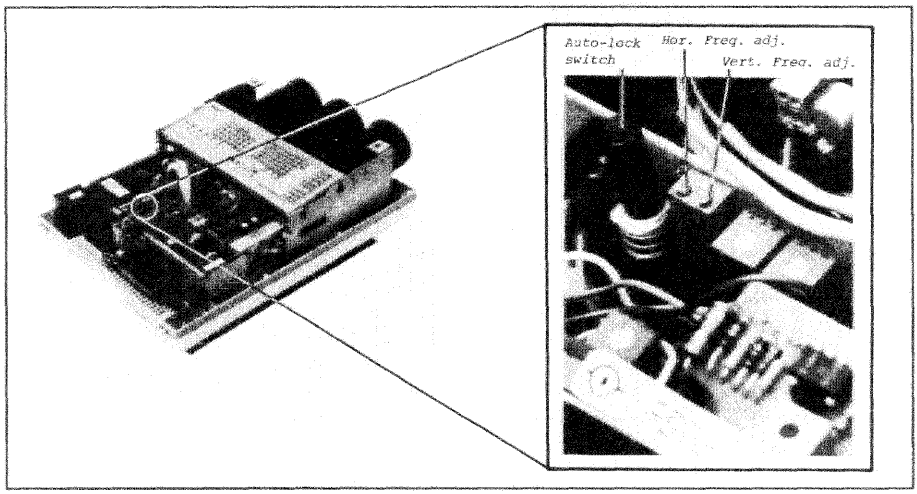
WARNING : Use only a non-metalic screwdriver.
Do not touch any electronical part.

FUNCTIONAL DESCRIPTION :

a) Switch 'AUTOLOCKING' pressed (normal operation mode)

The autolocking circuit adjusts the horizontal and vertical scanning frequencies of the projector to the frequency of the input signal.
As long as the projector is not synchronised on the input frequency, the picture on the CRT's will be blanked.
A visual control of synchronisation is build-in on the AUTOLOCKING board :

LED lights up : no synchronisation



b) Switch 'AUTOLOCKING' not pressed (only used when the autolocking circuit fails)

In this mode, the autolocking and autoblanking of the picture are disabled. Conventional frequency adjustment on the AUTOLOCKING ADAPTER board is then enabled.

ATTENTION :

Only after a technical intervention on the '*SYNC + VERT. DEFLECTION*' board or if misalignment is assessed, the following factory alignment procedure has to be applied.

Attention : refer to a qualified techniciens for the alignment.

ALIGNMENT :

For adjusting *P Hor.* and *P Vert.* on the *AUTOLOCKING* board, be sure that the *AUTOLOCKING SWITCH* is pressed.

a) Horizontal adjustment

1. Remove the *LINK*, in order to disable the autoblanking in case of non-sychronisation.

2. Line frequency of the input signal = 15625 Hz

- short-circuit capacitor C8 on the *VERT. + SYNC* board.
- adjust potentiometer P8 on the *VERT. + SYNC* board to get a minimum horizontal beat of the picture.

3. Line frequency of the input signal = 720000 Hz

- keep capacitor C8 short-circuited.
- adjust potentiometer P1 on the *AUTOLOCKING* board to get a minimum horizontal beat of the picture.

4. Remove the short-circuit on C8, re-install the *LINK* and verify horizontal locking in the range 15625 Hz to 72000 Hz.

b) Vertical adjustment

1. Verify horizontal locking first and perform horizontal adjustment if necessary.

2. Remove the *LINK* to disable the *AUTOBLANKING* while not synchronised.

3. Frame frequency of the input signal = 50 Hz

- short-circuit capacitor C15 on the *VERT. + SYNC* board.
- adjust potentiometer P2 on the *VERT. + SYNC* baord to get a slowly rolling up picture.
  (ceiling mounted projector)

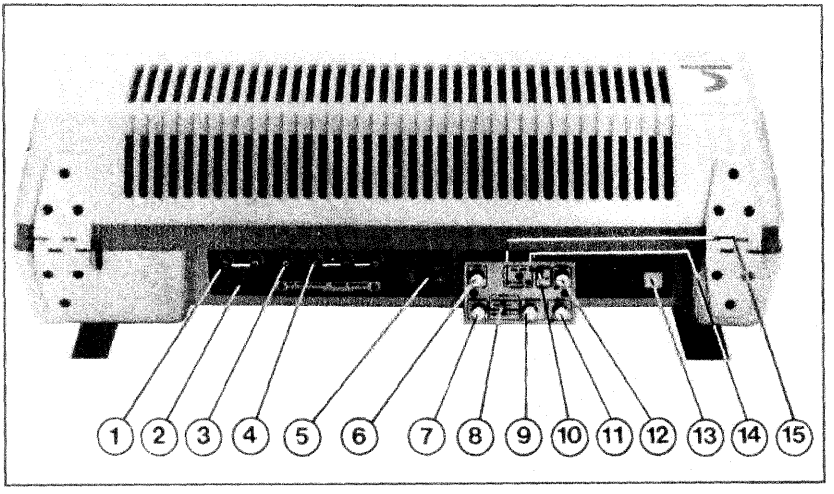
4. Frame frequency of the input signal = 100 Hz

- keep capacitor C15 short-circuited.
-adjust potentiometer P2 on the *AUTOLOCKING* board to get a slowly rolling up of the picture.
  (ceiling mounted projector)

5. Remove the short-circuit on C15, re-install the *LINK* and verify vertical locking in the range of 50 Hz to 100 Hz.

SECTION V

OPERATION



1. SWITCHING ON-OFF THE PROJECTOR

Press the power switch <13> to bring the projector into operation. The built-in pilot lamp will light. To switch *OFF*, press the power switch again.

2. SELECT THE DESIRED INPUT AS FOLLOWS

a) RGsB : For a signal source connected to the RGB+S, RGB/S analog input <3>, <4>

- switch <8> in the RGsB position for RGB signals with sync on green
- switch <8> in the RGB+S position for RGB signals with separate sync
- switch <10> in the *SLOW* position

b) RGB TTL : For a signal source connected to the RGB TTL inputs <5>

- switch <8> in the RGB TTL position
- switch <10> in the *SLOW* position

3. TURN ON THE CONNECTED EQUIPMENT

The picture will be projected on the screen.

4. ADJUST THE PICTURE TO YOUR PREFERENCE

Important :

Playback RGB signals : picture is controlled only by the Brightness and Contrast control.

BRIGHTNESS <7> AND CONTRAST <11> CONTROLS :

Correct brightness and contrast settings are important for good colour reproduction.

Brightness <7> : adjust brightness control so that the darkest parts of the picture appear as black.

Contrast <11> : adjust contrast from the lowest setting to the desired level according to your pre- ference and room lighting conditions.

(Note : don't overdrive into "smearing").

5.HORIZONTAL AMPLITUDE <14>

Adjust the hor. ampl. with potentiometer <14> until the width of the projected picture corresponds with the desired screen width.

6. HORIZONTAL PHASE <15>

Adjust the hor. phase with potentiometer <15> for full charcter display at the left side of the projected picture.

SECTION VI

ADJUSTMENT FLOW CHARTS

PROJECTOR INSTALLATION

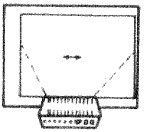
PROJECTOR CONNECTIONS
POWER LINE
EXTERNAL SOURCES

PICTURE SHARPNESS ADJUSTMENT

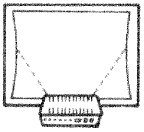
PICTURE CENTERING ON CRT SURFACE (BLUE-GREEN-RED)

PICTURE CENTER CORRECTION ON PROJECTION SCREEN (BLUE-RED)

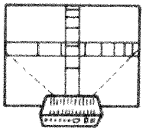
WARNING
These adjustments have to be executed in accordance with the installation guidelines.

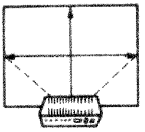


LEFT-RIGHT (E-W corrections)
PICTURE ADJUSTMENTS
(vert. lines left-right)

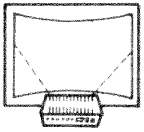


HOR. & VERT. LINEARITY
AND
AMPLITUDE ADJUSTMENTS

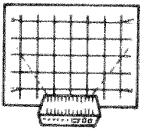




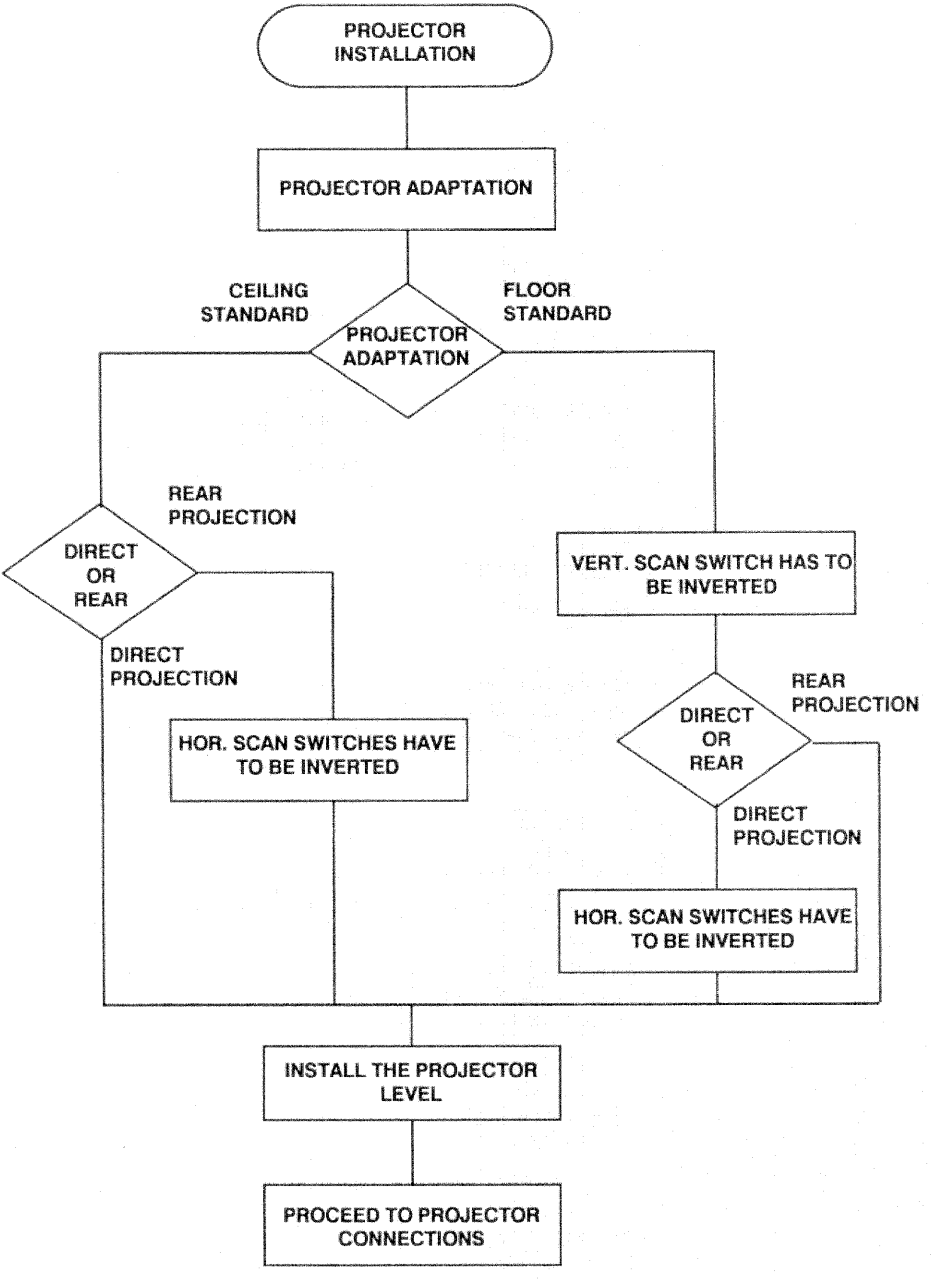
TOP-BOTTON (N-S corrections)
PICTURE GEOMETRY ADJUST.
(hor. lines top-bottom)

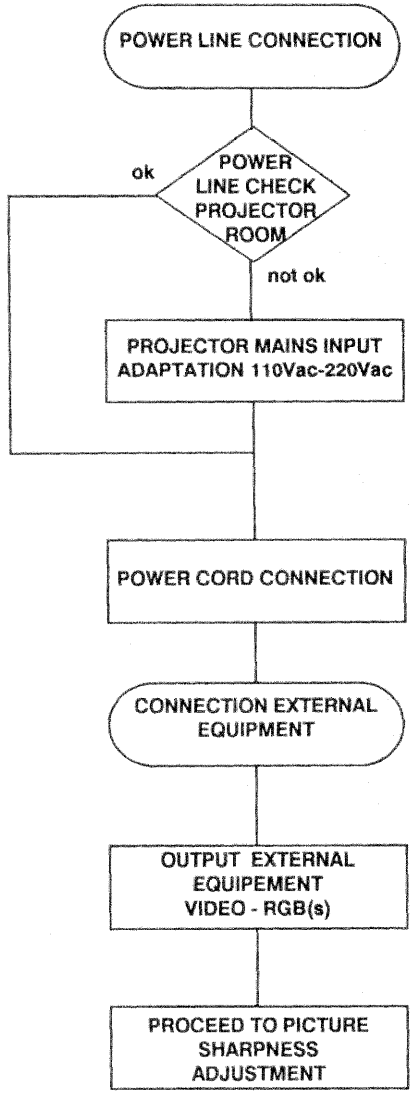


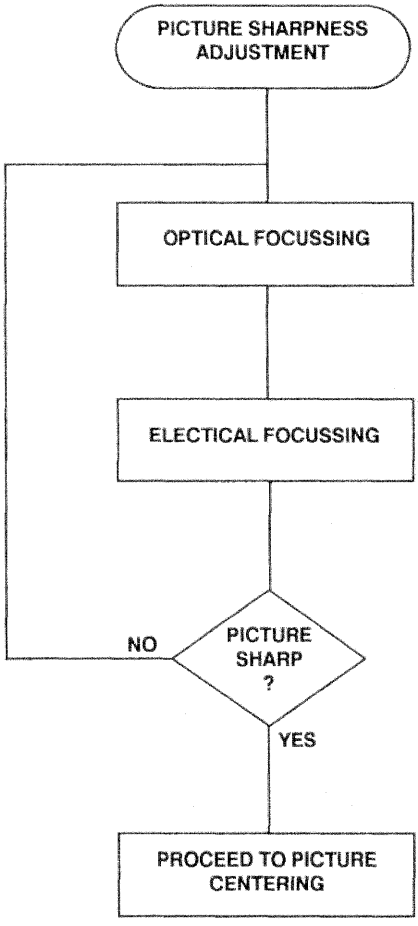
CONVERGENCE ADJUSTMENTS



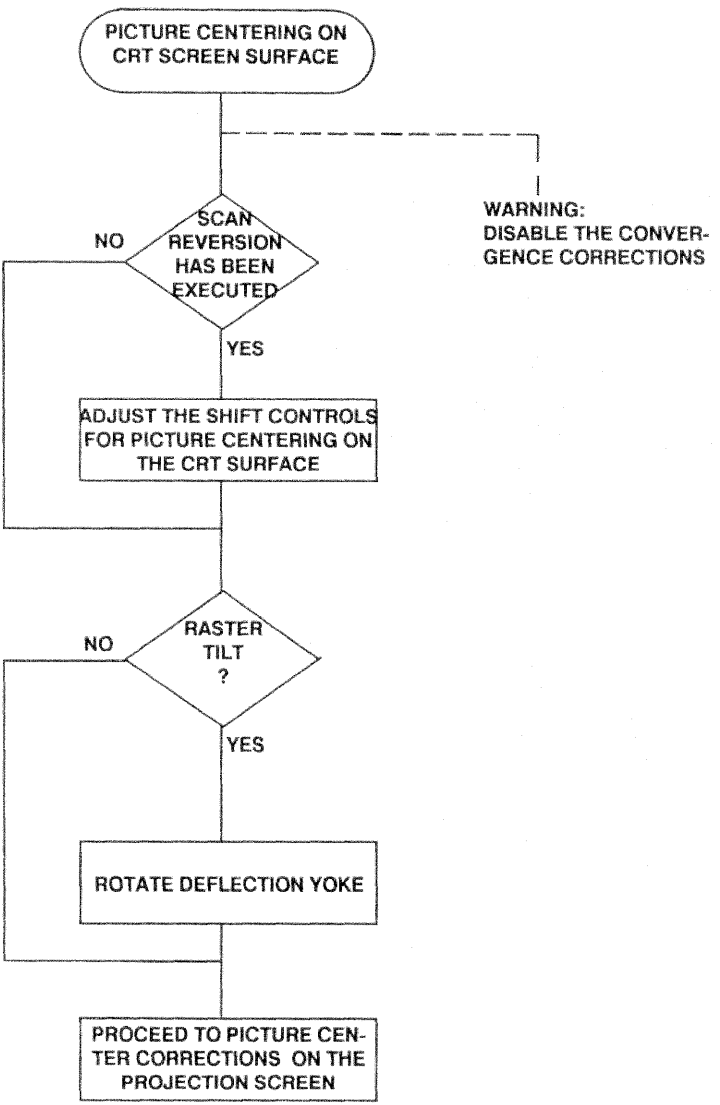
PHASE, BLANKING & GREY SCALE ADJUSTMENT


PROJECTOR INSTALLATION
PROJECTOR ADAPTATION
CEILING STANDARD
PROJECTOR ADAPTATION
FLOOR STANDARD
REAR PROJECTION
DIRECT OR REAR
DIRECT PROJECTION
HOR. SCAN SWITCHES HAVE TO BE INVERTED
VERT. SCAN SWITCH HAS TO BE INVERTED
REAR PROJECTION
DIRECT OR REAR
DIRECT PROJECTION
HOR. SCAN SWITCHES HAVE TO BE INVERTED
INSTALL THE PROJECTOR LEVEL
PROCEED TO PROJECTOR CONNECTIONS

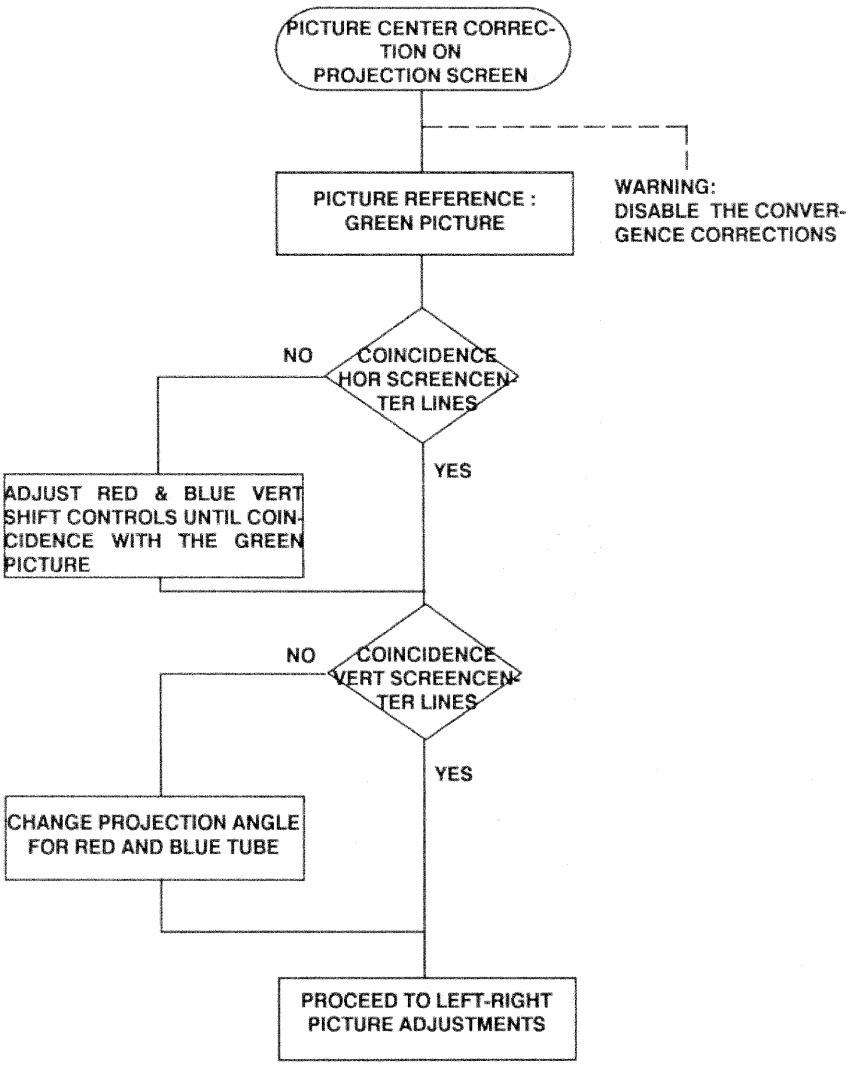

POWER LINE CONNECTION
ok
POWER LINE CHECK PROJECTOR ROOM
not ok
PROJECTOR MAINS INPUT ADAPTATION 110Vac-220Vac
POWER CORD CONNECTION
CONNECTION EXTERNAL EQUIPMENT
OUTPUT EXTERNAL EQUIPEMENT VIDEO - RGB(s)
PROCEED TO PICTURE SHARPNESS ADJUSTMENT


PICTURE SHARPNESS ADJUSTMENT
OPTICAL FOCUSSING
ELECTICAL FOCUSSING
PICTURE SHARP ?
NO
YES
PROCEED TO PICTURE CENTERING

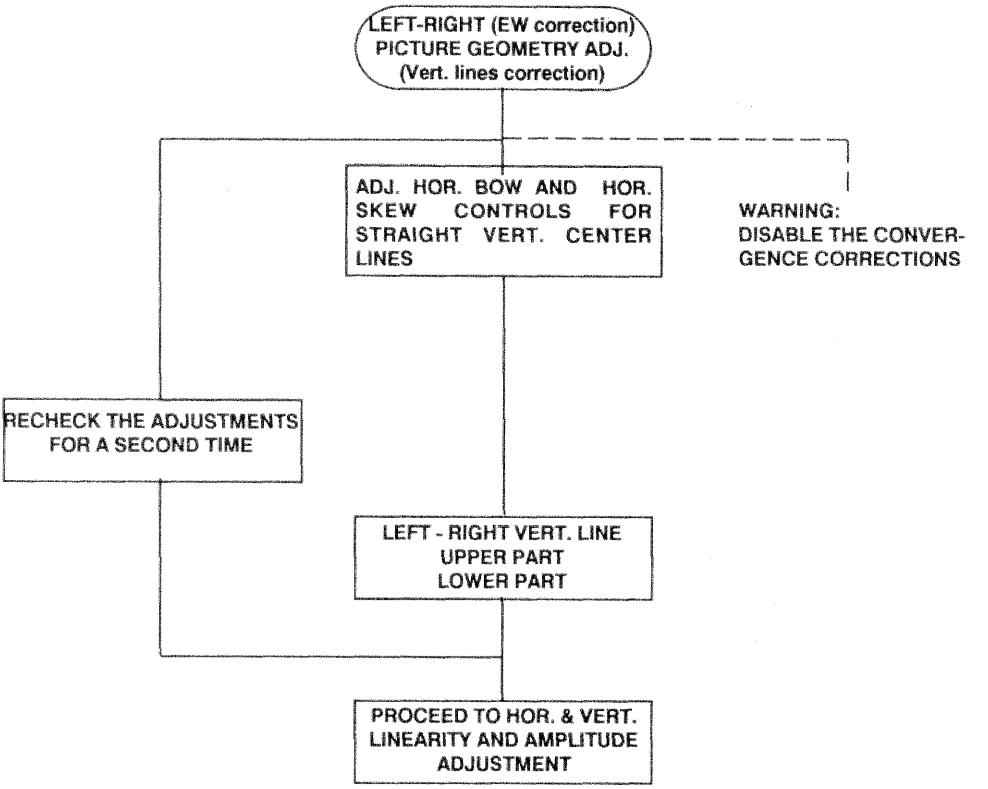
V. PICTURE CENTERING ON CRT SCREEN



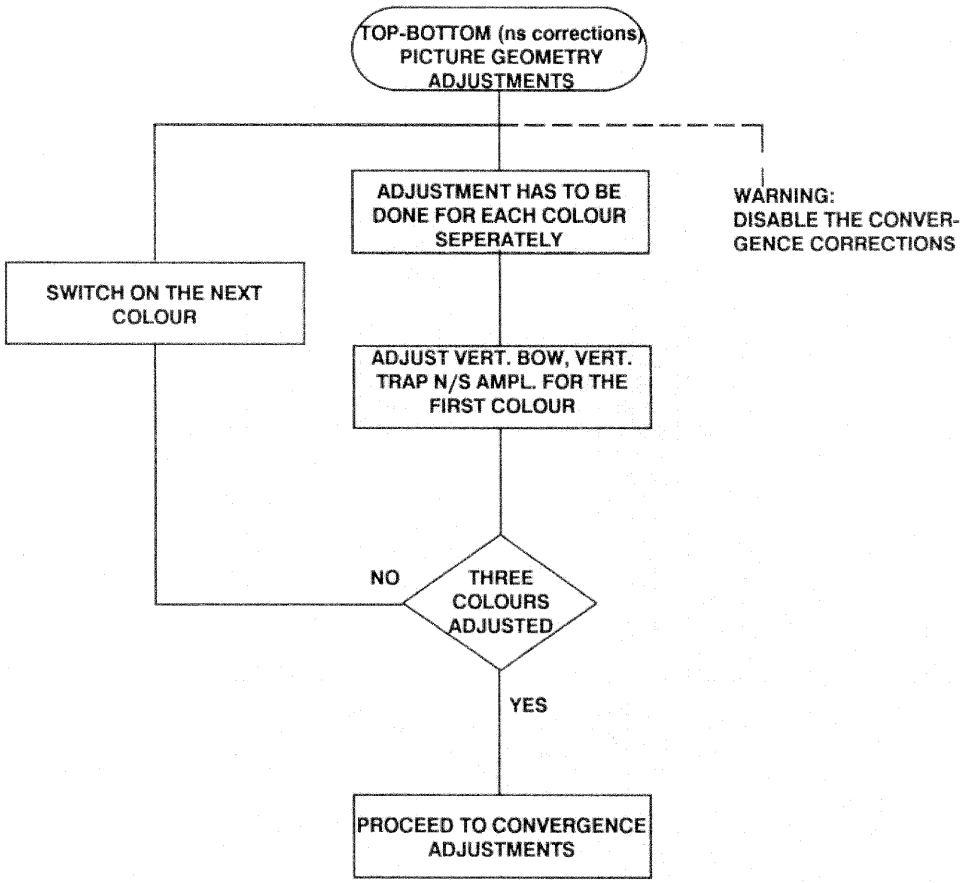
VI. PICTURE CENTERING ON PROJECTION SCREEN



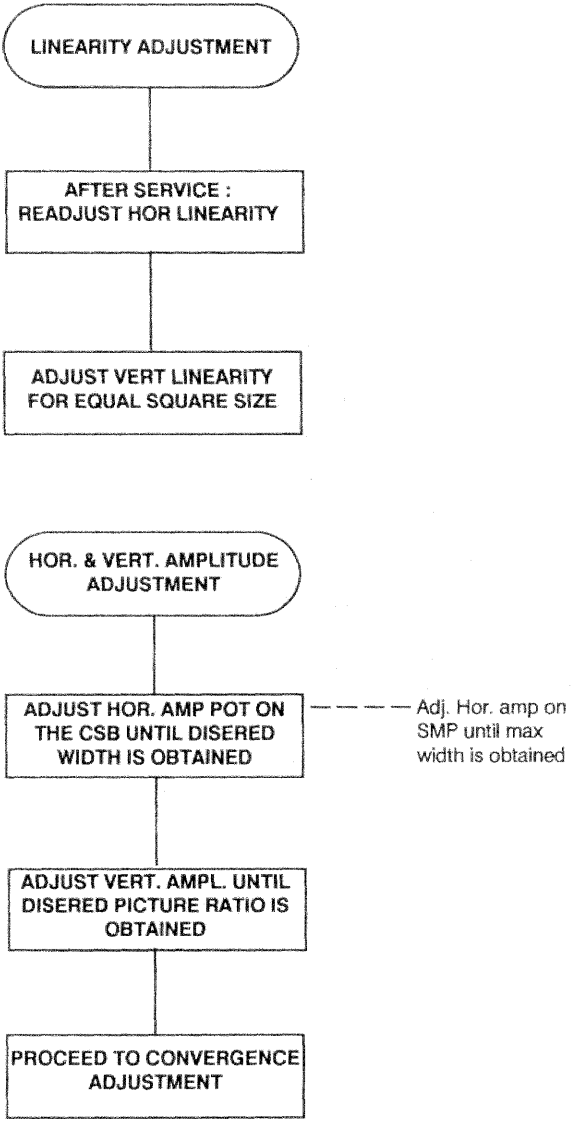
VII. LEFT-RIGHT ADJUSTMENT

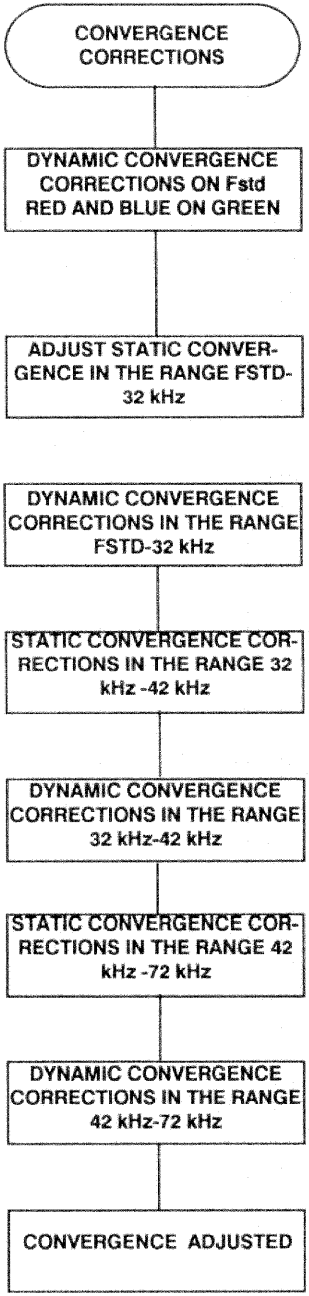


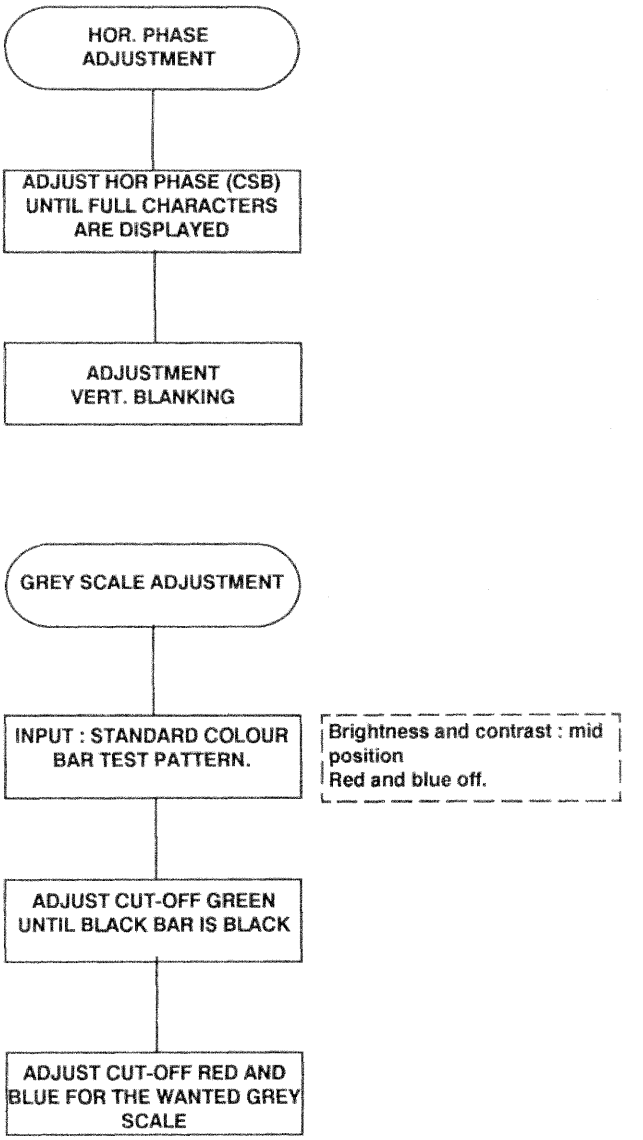
VIII. TOP-BOTTOM (NORD-SOUTH) ADJUSTMENTS



IX. LINEARITY AND AMPLITUDE ADJUSTMENT




CONVERGENCE CORRECTIONS
DYNAMIC CONVERGENCE CORRECTIONS ON Fstd RED AND BLUE ON GREEN
ADJUST STATIC CONVERGENCE IN THE RANGE FSTD-32 kHz
DYNAMIC CONVERGENCE CORRECTIONS IN THE RANGE FSTD-32 kHz
STATIC CONVERGENCE CORRECTIONS IN THE RANGE 32 kHz -42 kHz
DYNAMIC CONVERGENCE CORRECTIONS IN THE RANGE 32 kHz-42 kHz
STATIC CONVERGENCE CORRECTIONS IN THE RANGE 42 kHz -72 kHz
DYNAMIC CONVERGENCE CORRECTIONS IN THE RANGE 42 kHz-72 kHz
CONVERGENCE ADJUSTED


HOR. PHASE ADJUSTMENT
ADJUST HOR PHASE (CSB) UNTIL FULL CHARACTERS ARE DISPLAYED
ADJUSTMENT VERT. BLANKING
GREY SCALE ADJUSTMENT
INPUT : STANDARD COLOUR BAR TEST PATTERN.
Brightness and contrast : mid position
Red and blue off.
ADJUST CUT-OFF GREEN UNTIL BLACK BAR IS BLACK
ADJUST CUT-OFF RED AND BLUE FOR THE WANTED GREY SCALE

SECTION VII

PERIPHERAL EQUIPMENT

I. USE OF THE RCVDS 400 Q

1. Video display on the *BARCOGRAPHICS 400*.

When the display of a video source is required on the ***BARCOGRAPHICS 400***, the ***RCVDS 400 QUAD*** has to be used as intergace. The ***RCVDS 400 QUAD*** is designed in such a way that the video signal is converted in RGB analog signals looped through with the RGB output of the ***RCVDS 400 QUAD***, which can be processed by the ***BARCOGRAPHICS 400***.

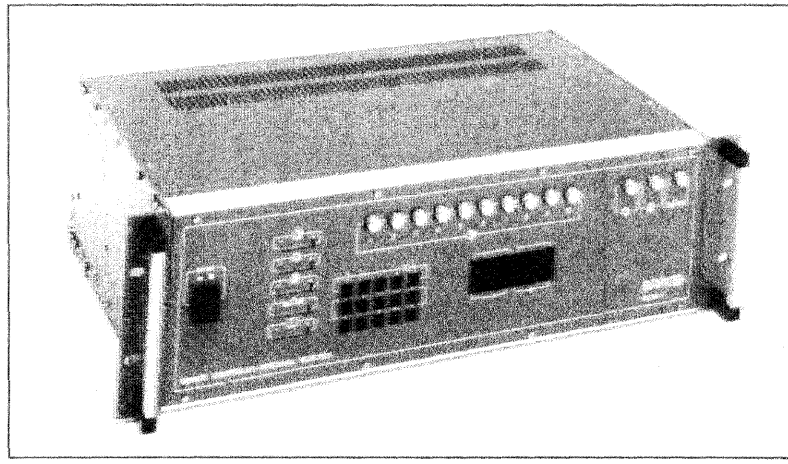
Connection and use : refer to the operating instructions of the ***RCVDS 400 QUAD***.

IMPORTANT :

In order to display a picture with ratio 3 x 4, a vertical amplitude correction is provided an the *'AUTOLOCKING ADAPTE'* board (see vertical amplitude correction for video playback via RCVDS QUAD)

2. Connection of different sources to the *BARCOGRAPHICS 400*.

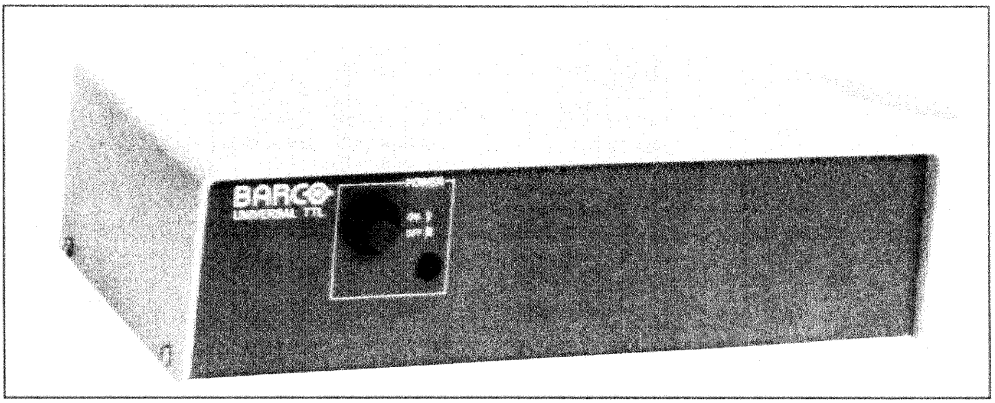
When different sources have to be connected to the ***BARCOGRAPHICS 400***, the ***RCVDS 400 QUAD***, as interface, allows a connection of maximum 10 different sources, as well in RGB TTL, RGB analog as well in video. These input modules are separately selectable to display the corresponding input source on the screen.



II. THE USE OF INTERFACES

1. Universal TTL interface

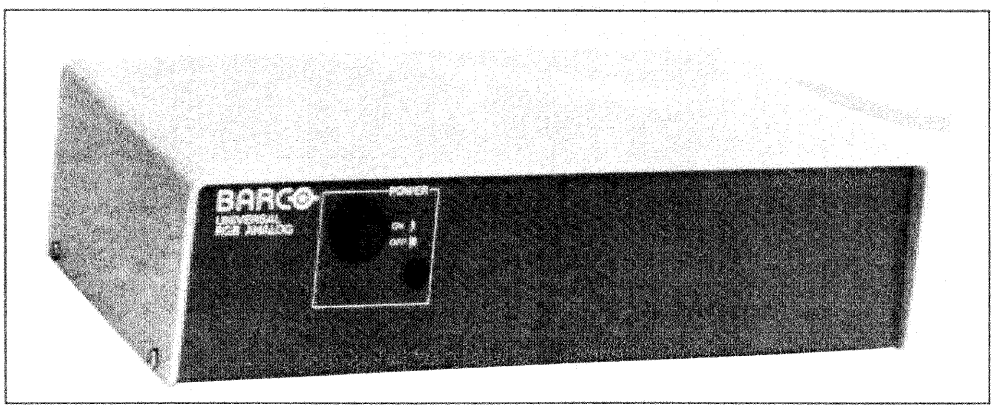
A TTL interface has to be used when distance between source (without line drive outputs) and the projector is greater than 60 cm, or when buffering of the signal is required.

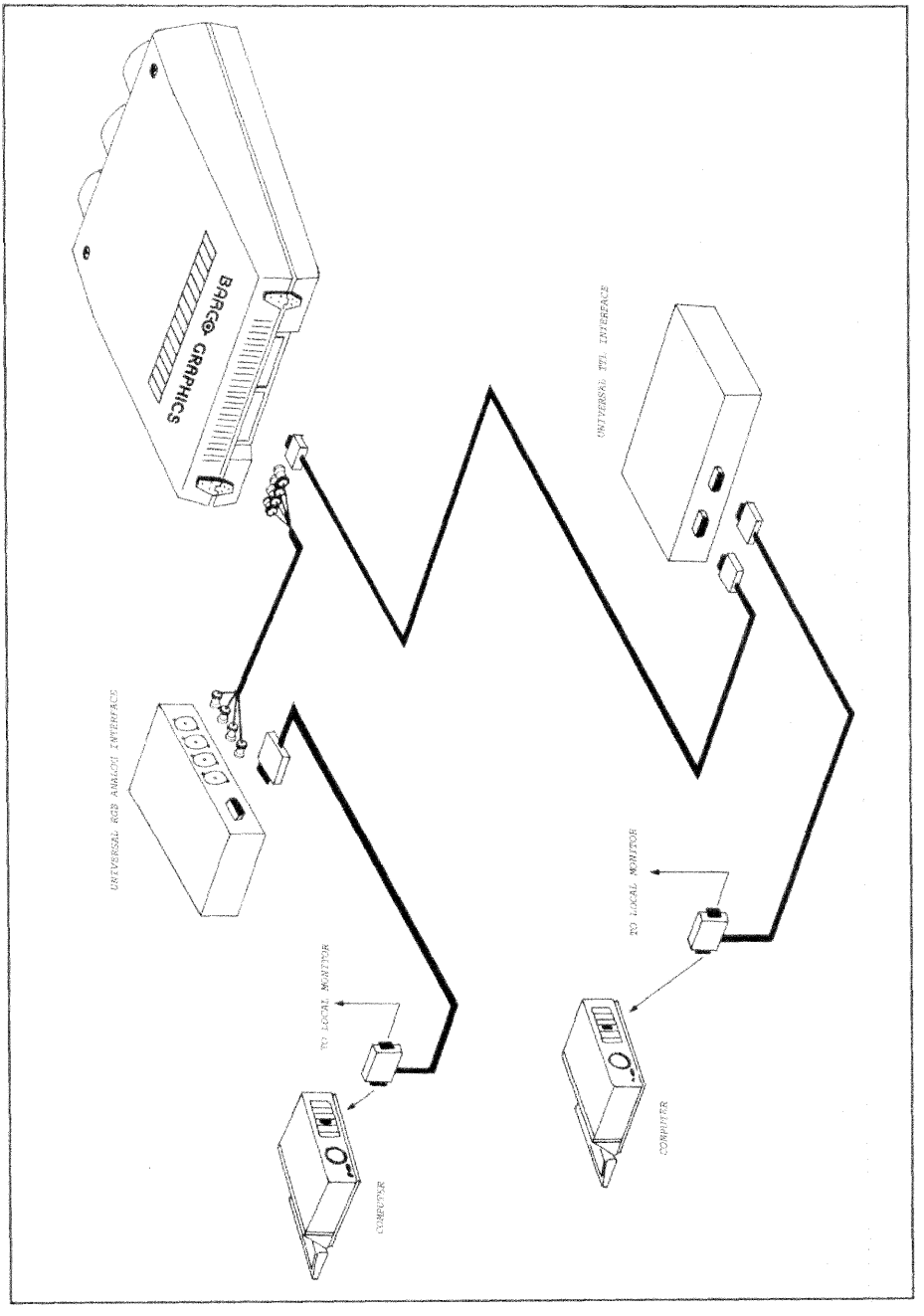


2. RGB 120 MHz analog interface

A RGB analog interface has to be used when :
- the output signal level is too low to drive the projector inputs.
- signal adaptation is required.

Specifications :
- seperate horizontal and vertical sync input.
- all inputs ca be terminated externally
- all inputs are loop-through
- gain is externally adjustable
- blue in green is externally adjustable
- externally adjustable cable compensation
- RGB signals can be inverted externally
- automatic sync polarity detection




BARCO GRAPHICS
UNIVERSAL TTL INTERFACE
UNIVERSAL RGB ANALOG INTERFACE
TO LOCAL MONITOR
TO LOCAL MONITOR
COMPUTER
COMPUTER