

BARCO

BARCO PROJECTION SYSTEMS



R9001330

OWNER'S MANUAL

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WARNINGS
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Safety instructions
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On installation
Installation

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Prescription de sécurité

Remarque sur la Sécurité

Les projecteurs sont fabriqués conformément aux exigences des normes de sécurité internationales IEC950, UL 1950 et CSA C22.2 No. 950. Ces normes de sécurité sont imposées aux équipements de la technologie informatique incluant les équipements électriques.

Ces normes de sécurité imposent des exigences importantes sur l'emploi des composantes, des matériaux et de l'isolation dont la sécurité est critique, afin de protéger l'utilisateur contre le risque d'une décharge électrique et d'avoir accès aux parties sous tension.

Les normes de sécurité aussi imposent des limitations concernant la hausse de la température interne et externe, les niveaux de radiation, la stabilité et la force mécanique, la construction du cadre métallique à l'intérieure et la protection contre les risques d'incendie.

Les épreuves auxquelles l'équipement a été subi assurent la sécurité totale de l'utilisateur, même lorsque l'équipement ne fonctionne pas normalement.

Instructions pour l'installation

Lire ce manuel complètement avant de mettre l'appareil en fonctionnement et le conserver pour consultation ultérieure.

L'installation et les réglages préliminaires devraient être faits par du personnel qualifié BARCO ou par des agents autorisés du service BARCO.

DONNEES POUR LE PROPRIETAIRE

Le numéro de pièce et le numéro de série sont situés à l'arrière du projecteur. Copier ces numéros dans les espaces prévus ci-dessous. Se référer à ces numéros chaque fois que vous consultez votre agent BARCO concernant cet appareil.

NUMERO DE PIECE :

NUMERO DE SERIE :

AGENT :

Notice on safety

Projectors are built in accordance with the requirements of the international safety standards IEC950, UL 1950 and CSA C22.2 No. 950, which are the safety standards of information technology equipment including electrical business equipment.

These safety standards impose important requirements on the use of safety critical components, materials and isolation, in order to protect the user or operator against the risk of electric shock and energy hazard, and having access to live parts.

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

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

Installation instructions

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

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

OWNER'S RECORD

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

PART NUMBER:

SER. NUMBER:

DEALER:



L'éclair avec une tête de flèche dans un triangle indique à l'utilisateur que les pièces à l'intérieur de l'appareil présentent un risque de chocs électriques.



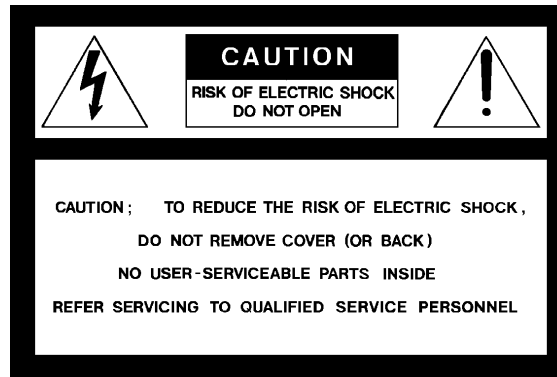
Le point d'exclamation dans un triangle indique à l'utilisateur que des instructions de fonctionnement et/ou de service sont comprises dans la documentation technique de cet équipement.

POUR EVITER DES RISQUES D'INCENDIE OU DE CHOCS ELECTRIQUES, NE PAS EXPOSER CE PROJECTEUR A LA PLUIE OU A L'HUMIDITE

Fédéral communication commission (FCC statement)

Cet équipement a été testé et trouvé conforme aux limites imposées aux appareils digitaux de classe A, selon la section 15 des règles FCC. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences lorsque l'utilisation doit se faire dans un environnement commercial. Cet équipement génère, utilise et peut

émettre de l'énergie aux fréquences radio, et s'il n'est pas installé et utilisé conformément aux instructions du manuel, il peut créer des interférences désavantageuses dans les communications radio. L'utilisation de cet équipement dans des zones résidentielles peut créer des interférences. Le cas échéant, l'utilisateur devra prendre toutes les mesures requises pour les amoindrir, à ses propres frais.



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 has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio

frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Prescription de sécurtié

Instructions pour l'utilisateur :

Si cet équipement cause des interférences de radio ou de télévision, l'utilisateur peut essayer de corriger les interférences en appliquant une ou plusieurs de les mesures suivantes :

- Ré-orienter l'antenne radio ou télévision.
- Déplacer l' équipement concernant le récepteur.
- Brancher l' appareil sur une autre prise de telle sorte que l'appareil et le récepteur se trouvent sur différents circuits électriques.
- . Fixer les connecteurs des cables a l'équipement au moyen des vis.

Remarque :

L'utilisation de câbles blindés est exigée afin d'observer les règles de la section 15 des règles FCC.

Prescriptions de securite générales.

- * Lire toutes les prescriptions de sécurité et de fonctionnement avant d'utiliser cet appareil.
- * Le manuel de prescriptions de securite et de fonctionnement doit être conservé pour consultation ultérieure.
- * Il faut respecter tous les avertissements mentionnés sur le projecteur et dans les manuels.
- * Suivre fidèlement toutes les prescriptions d'utilisation et de fonctionnement de cet équipement.

SECURITE

- * Cet équipement doit fonctionner sur une source à courant alternatif. Ce projecteur peut être branché sur un système à IT courant.
- * Cet appareil est équipé d'un connecteur à trois broches dont une mise à la terre. Le connecteur n'est adapté qu'à des prises de courant du

type avec terre. Ceci est une mesure de sécurité. Si le connecteur ne s'adapte pas dans la prise, contacter votre électricien pour remplacer la prise non valable. Ne pas compromettre le but du connecteur de terre.

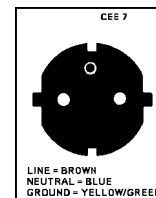
Avertissement pour les utilisateurs : CE PROJECTEUR DOIT ÊTRE MIS À LA TERRE avec le cordon secteur fourni.

(Si le cordon secteur n'est pas correct, consulter votre revendeur.)

A. Cordon d'alimentation avec connecteur CEE7

Les couleurs des fils du cordon d'alimentation sont codées comme suit :

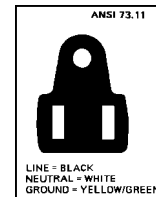
Vert et jaune :	terre
Bleu :	neutre
Brun :	sous tension (actif)



B. Cordon d'alimentation avec connecteur ANSI 73.11

Les couleurs des fils du cordon d'alimentation sont codées comme suit :

Vert/Jaune :	terre
Blanc :	neutre
Noir :	actif



- * Ne rien laisser en appui sur le cordon d'alimentation. Ne pas placer ce cordon là où des personnes risquent de marcher dessus.

Instructions to the user :

if this equipment does cause interference to radio or television reception, the user may try to correct the interference by one or more of the following measures :

- Re-orientation of the receiving antenna for the radio or television.
- Relocate the equipment with respect to the receiver.
- Plug the equipment into a different outlet so that the equipment and receiver are on different branch circuits.
- Fasten cables connectors to the equipment by mounting screws.

Note :

The use of shielded cables is required to comply within the limits of Part15 of FCC rules.

General safety instructions.

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

- * This product should be operated from an AC power source. This projector may be connected to an IT-power system.
- * 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

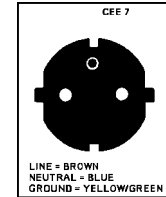
plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.

WARNING FOR THE CUSTOMERS: THIS APPARATUS MUST BE GROUNDED (EARTHED) via the supplied 3 conductor AC power cable.
(If the supplied power cable is not the correct one, consult your dealer.)

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

The colors of the mains lead are colored in accordance with the following code:

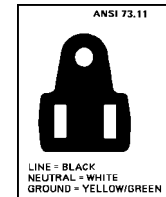
Green-and-yellow:	Earth (safety earth)
Blue:	Neutral
Brown:	Live



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



- * Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.

Prescription de sécurité

* Pour débrancher le cordon, le tirer par le connecteur, jamais par le cordon lui-même.

* Si on utilise une rallonge, vérifier que le total des courants des appareils raccordés à cette rallonge ne dépasse pas la capacité nominale du câble de rallonge. Vérifier aussi que la somme des consommations des appareils raccordés à la prise murale ne dépasse pas 15 ampères.

* Ne jamais introduire un objet quelconque dans l'appareil à travers les fentes du boîtier, car ils pourraient être en contact avec des points de tension dangereux ou court-circuiter des pièces, ce qui pourrait entraîner un risque d'incendie ou de choc électrique.

* Ne jamais répandre un liquide quelconque sur l'appareil. Si un liquide ou un objet solide tombe dans le boîtier, débrancher l'appareil et le faire vérifier par du personnel qualifié avant de reprendre l'utilisation.

* Foudre - Pour une protection supplémentaire de cet appareil vidéo lors d'un orage ou s'il n'est pas employé et laissé sans surveillance pendant de longues périodes, le débrancher de la prise murale. Ceci évite tout endommagement au projecteur par la foudre ou par des impulsions sur le secteur.

* Avant de débrancher le projecteur, réduire la chaleur de la lampe en commutant le projecteur en mode d'attente et laisser refroidir la lampe du projecteur pendant 15 minutes au moins. Puis le projecteur peut être débranché par l'interrupteur secteur.

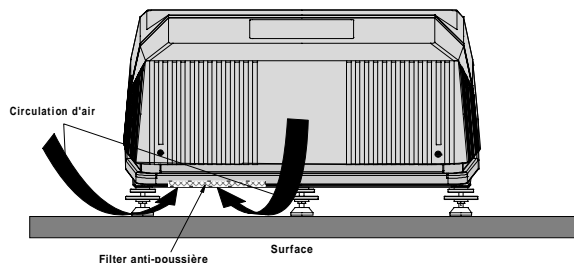
L'Installation

* Ne pas placer le projecteur sur un chariot, un support ou une table instable. Le projecteur risquerait de tomber causant des dégâts sérieux au projecteur.

* Ne pas utiliser le projecteur à proximité d'eau.

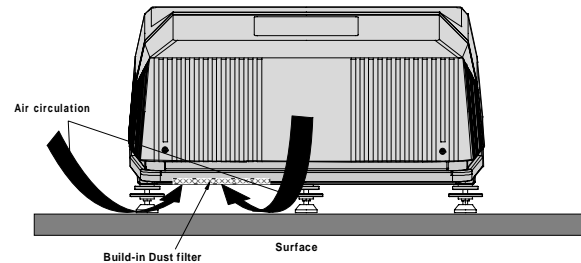
* N'utiliser que le cordon d'alimentation fourni avec votre projecteur. Bien qu'ils se ressemblent, d'autres cordons d'alimentation n'ont pas subi des tests de sécurité dans l'usine et pour cette raison ils ne peuvent pas être utilisés pour actionner le projecteur. Si vous avez besoin d'un cordon d'alimentation de remplacement, contactez votre agent.

* Les fentes et les ouvertures pourvues dans le boîtier et au dos ou



sur le fond, sont destinées à la ventilation. Pour assurer un fonctionnement fiable du projecteur et le protéger de toute surchauffe, ses ouvertures ne doivent être ni obstruées ni recouvertes. Les ouvertures ne devraient jamais être obstruées en plaçant l'appareil sur un lit, un divan, un tapis ou toute autre surface similaire. L'appareil ne devrait jamais être placé près ou au-dessus d'un radiateur ou autre source de chaleur. Ce projecteur ne doit pas être installé dans une installation encastrée ou fermée, sauf si une ventilation suffisante est assurée.

- * To disconnect the cord, pull it out by the plug. Never pull the cord itself.
 - * 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.
 - * 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.
 - * 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.
 - * To reduce the lamp heat of the projector, switch the projector **first** to stand-by and let the projector lamp cool down for at least 15 minutes. Then the projector may be switched off with the power switch.
- * Use only the power cord supplied with your projector. While appearing to be similar, other power cords have not been safety tested at the factory and may not be used to power the projector. For a replacement power cord, contact your dealer.
- * Slots and openings in the cabinet and the sides are provided for



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

On Installation

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

Prescription de sécurité

* Laisser suffisamment d'espace autour du projecteur et ne pas obstruer la circulation de l'air. Ne pas mettre des feuilles libres ou d'autres objets plus près de 11 cm du projecteur.

Entretien et Réparation

Ne pas essayer de réparer le projecteur vous-même, puisque ouvrir le boîtier ou l'enlèvement des blindages peuvent vous exposer à une puissance électrique dangereuse et au risque d'une décharge électrique.

Contactez le service technique qualifié dans les cas suivants :

- Si le cordon secteur ou la prise de courant est endommagé ou effiloché.
- Si on a répandu du liquide dans le projecteur.
- Si l'appareil a été exposé à la pluie ou à de l'eau.
- Si l'appareil ne fonctionne pas normalement, bien que les instructions soient correctement suivies. Ne régler que les commandes décrites dans les instructions de fonctionnement, car un mauvais réglage d'autres commandes peut entraîner des dégâts et souvent nécessiter un travail important par un technicien qualifié pour remettre l'appareil en conditions de fonctionnement normal.
- Si l'appareil est tombé ou si le boîtier est endommagé.
- Si l'appareil présente des changements nets de performance, indiquant un besoin de réparation.

Pièces de rechange - Lorsqu'on a besoin des pièces de rechange, veiller à ce que le technicien de service utilise des pièces d'origine BARCO ou des pièces équivalentes autorisées qui ont les mêmes caractéristiques que la pièce d'origine BARCO. Un remplacement par des pièces de rechange non autorisées peut nuire à la performance et la fiabilité, entraîner incendies, chocs électriques ou d'autres dangers. L'utilisation de pièces de rechange non autorisées peut annuler la garantie.

Vérification de sécurité - Lorsqu'un service ou une réparation sur ce projecteur est terminé, demander au technicien de service de faire les vérifications de sécurité pour s'assurer que le projecteur est en bon état de fonctionnement.

Le projecteur emploie une lampe halogène à vapeurs métalliques. Remplacer la lampe par une lampe de projection quelconque peut causer la surchauffe ou une qualité de l'image inacceptable. N'utiliser que des lampes de projection indiquées par BARCO ou un agent autorisé de BARCO ou un service.

Nettoyage

Débrancher l'appareil de la prise avant tout nettoyage. Ne pas utiliser des détergents liquides ou des aérosols. Utiliser un chiffon humide pour le nettoyage.

Pour garder au boîtier son aspect neuf, le nettoyer régulièrement avec un chiffon doux. Des tâches tenaces peuvent être enlevées avec un chiffon humidifié par une solution de détergent doux. Ne jamais utiliser des solvants forts, tels que du 'thinner' ou du benzène, ni des produits de nettoyage abrasifs, car ils pourraient endommager le boîtier.

* Do not block the projector cooling fans or free air movement under and around the projector. Loose papers or other objects may not be nearer to the projector than 4" on any side.

On Servicing

Do not attempt to service this projector yourself, as opening or removing covers may expose you to dangerous voltage potential and risk of electric shock! Refer all projector service to a qualified BARCO service center.

Call for service in the following conditions :

- When the power cord or plug is damaged or frayed.
- If liquid has been spilled into the projector.
- If the product has been exposed to rain or water.
- 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;
- If the product has been dropped or the cabinet has been damaged;
- If the product exhibits 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.

The projector uses a metal halide projection lamp. Replacing the projection lamp with any other projection lamp can cause overheating or unacceptable image quality. Use only the projection lamps specified by BARCO, or an authorized BARCO dealer or service center.

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 benzene, or abrasive cleaners, since these will damage the cabinet.

Prescription de sécurité

Pour garantir les meilleures performance et définition, les objectifs de projection sont spécialement traités avec un revêtement anti-reflets. En conséquence : éviter de toucher les objectifs. Pour enlever la poussière de l'objectif, utiliser un chiffon sec et doux. Ne pas utiliser de chiffon humide, de solution détergente ou de diluant. Respecter la méthode de nettoyage des objectifs indiquée dans l'annexe D au manuel d'utilisateur.

Ré-emballage

Conserver l'emballage et les produits d'emballage d'origine, ils seront d'un précieux secours s'il avère utile d'expédier le projecteur. Pour une protection maximale, ré-emballer l'appareil de la même manière qu'à l'usine.

Eclairage

Pour garantir la meilleure qualité possible de l'image projetée, il est essentiel que l'éclairage ambiant incident sur l'écran soit réduit au strict minimum.

Lors de l'installation du projecteur et de l'écran, il faut veiller à éviter toute exposition directe de l'écran à la lumière ambiante. Eviter tout éclairage perturbateur sur l'écran par des rayons du soleil ou des éclairages fluorescents.

L'utilisation d'un éclairage ambiant contrôlable, tel qu'un spot incandescent ou un variateur de lumière est recommandée pour obtenir un éclairage correct de la pièce. Dans la mesure du possible veiller à ce que les parois et le sol de la pièce dans laquelle le projecteur doit être installé soient non-réfléchissants et de couleur foncée. Des surfaces brillantes réfléchissent et diffusent la lumière ambiante et par conséquent réduisent le contraste de l'image sur l'écran.

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. Follow the lens cleaning procedure on Appendix D in the Owners Manual.

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 fluorescent lighting fixtures.

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

UNPACKING

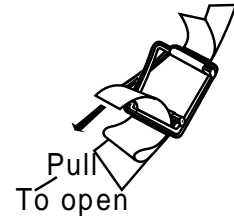
DIMENSIONS

BATTERY INSTALLATION ON THE RCU

Unpacking & Dimensions

Unpacking

To open the banding, pull on the clip as shown in the first drawing.



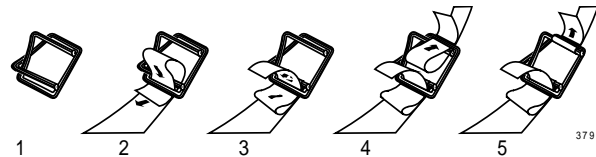
Take the projector out of its shipping carton and place it on a table.

For transportation, the projector is mounted on a wooden board with 3 bolts. Use a 13 mm wrench to remove these bolts.

When using the projector as a table mounted configuration, always mount the 3 supporting feet (see drawing below). These feet are mounted on the same wooden board. Each foot contains one metal part and two plastic parts. To remove the feet, first turn out both plastic parts. To remove the metal parts from the board, remove the retaining bolts. Save these bolts because these bolts must be used to mount the feet to the projector. Mount first the metal parts with the removed bolts and turn in then both plastic parts to finish the assembly.

Warning : To prevent overheating of the projector as table mounted, always remove the wooden board and turn in the 3 supporting feet to allow air circulation via the built-in dust filter at the bottom.

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.

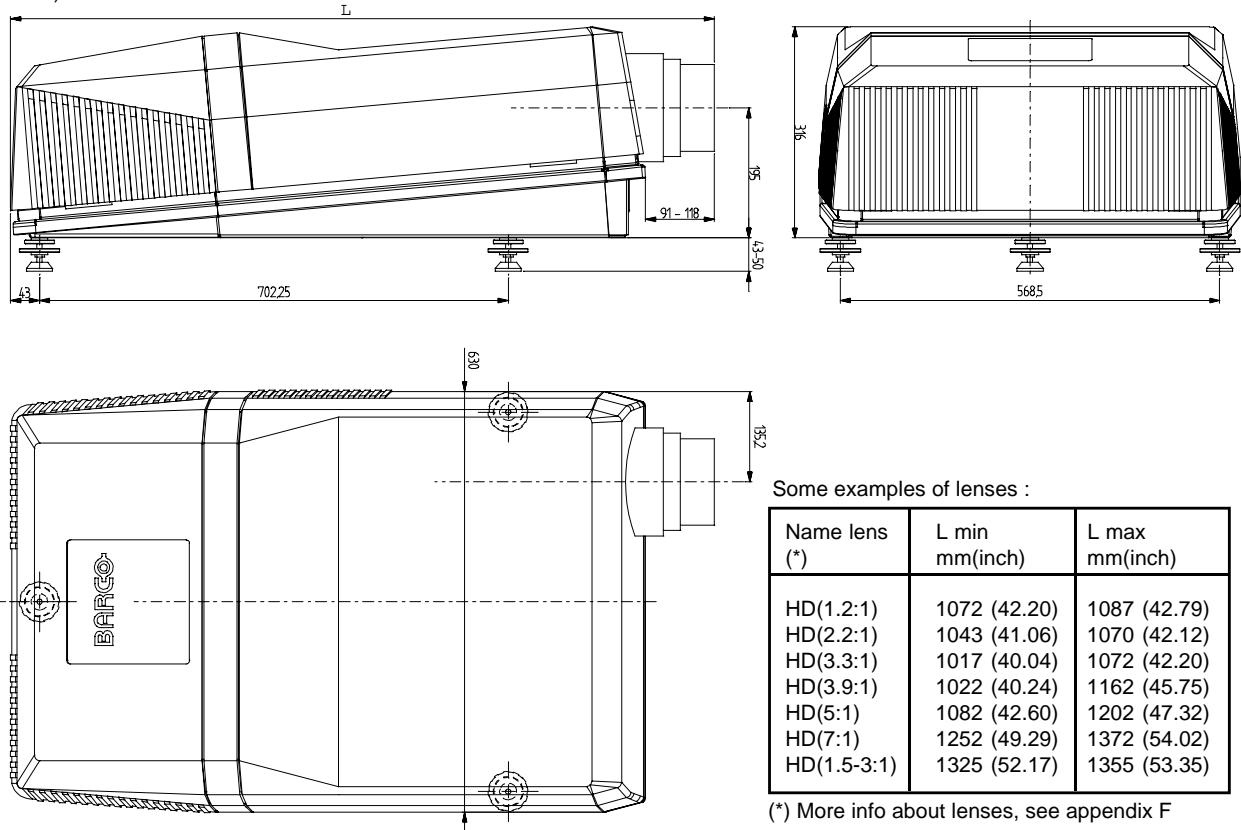


Contents of the shipped box :

- 1 BARCOGRAPHICS 8100
- 1 remote control unit RCU + 9V battery
- 1 power cable with outlet plug type CEE7 or ANSI 73.11.
- 1 owner's manual
- 3 supporting feet

Projector dimensions

(units : mm)



Battery installation in the RCU.

A battery (not yet installed to save the battery life time) is delivered inside the plastic bag with the power cord. To install the battery, remove the battery cover on the backside of the remote control by pushing the indicated handle a little to the bottom of the RCU. Lift up the top side of the cover at the same time (fig. 1).

Insert the new 9 V battery (type E-block or equivalent) in the lower compartment and connect the battery to the contact plate.

Insert the battery into the lower compartment and put the cover back.

Note : projector address has to be programmed on the RCU before using the RCU (see chapter 'Controlling').

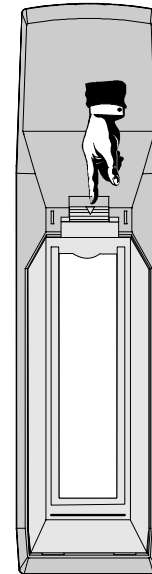
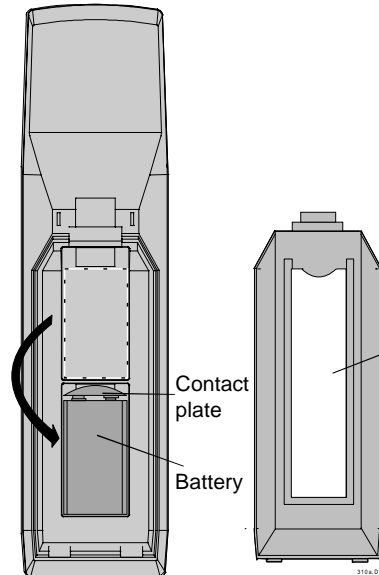


fig.1



Insert here the 'Insert card RCU' which you can cut out on the last page of this manual.

fig.2

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

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.

Max. ambient temperature : 40°C.

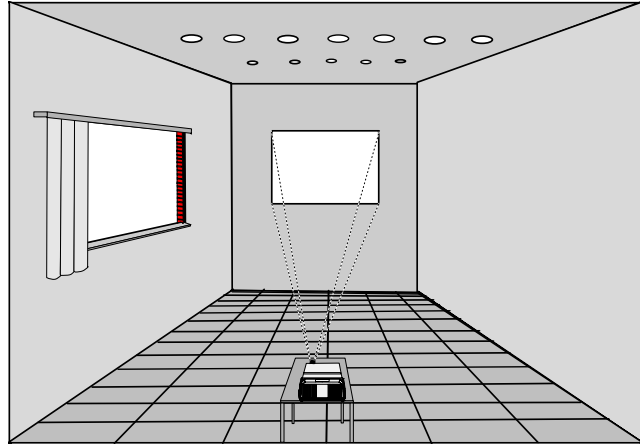
* *Environment*

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 less contrast between the darkest and lightest parts of the image. With bigger screens, the 'wash out' becomes more important. As a general rule, darken the room to the point where there is just sufficient light to read or write comfortably. Spot lighting is desirable for illuminating small areas so that interference with the screen is minimal.



** Which screen type?*

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

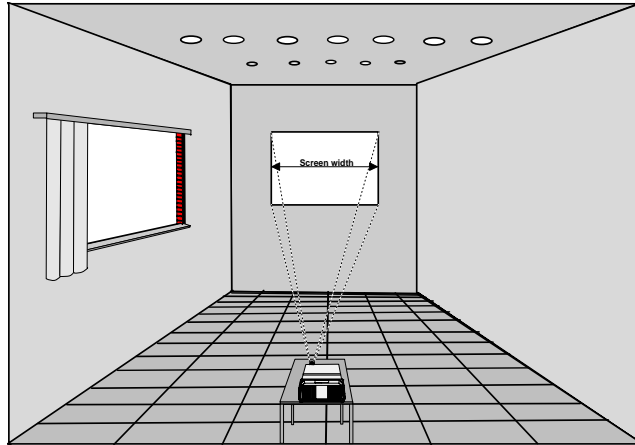
Screens are rated by how much light they reflect (or transmit in the case of rear projection systems) given a determined amount of light projected toward them. The 'GAIN' of a screen is the term used. Front and rear screens are both rated in terms of gain. The gain of screens range from a white matte screen with a gain of 1 (x1) to a brushed aluminized screen with a gain of 10 (x10) or 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 BARCOGRAPHICS 8200 is designed for projecting an image size (video) from 1.00m (3.3ft) to 15.00m (49.2ft) with a aspect ratio of 4 to 3.



* Where to install the projector?

Definitions of the Abbreviation on drawings

B = Distance between ceiling and top of the screen or between floor and bottom of the screen.

A = Correction value, distance between bottom side of projector and middle of the lens. Value to be subtracted from B to obtain the correct installation position. (A value is a constant value for all screen widths and type of lenses, A = 195 mm.)

CD = Total distance between projector and ceiling or projector and floor.

SW = Screen width.

SH = Screen height (image height).

PD = Projector Distance, distance between screen and projector.

Inputs and computer video format input compatibility :

Some examples :

VIDEO and S-VIDEO

COMPONENT VIDEO

RGB ANALOG with STANDARD SYNC (SYNC ON GREEN or SEPARATE SYNC)

RGB ANALOG with TRI-LEVEL SYNC (SYNC ON GREEN or SEPARATE SYNC)

VGA : 640 x 480 pixels

MAC : 640 x 480 pixels

Super VGA : 800 x 600 pixels

XGA : 1024 x 768 pixels

up to 1280 x 1024 pixels

Sources with pixel clock < 135 MHz

Lens type selection.

a) determine the required screen width.

b) determine the approximate position of the projector in the projection room with regard to the screen and measure the projector-screen distance (PD).

c) refer to the lens diagrams to find the best corresponding PD with regard to the measured projector-screen distance for the required screen width.

The lens type is determined (lens name is indicated on top of the page).

Start the installation procedure for the projector as described in the manual.

Ceiling mounting of the BARCOGRAPHICS 8200

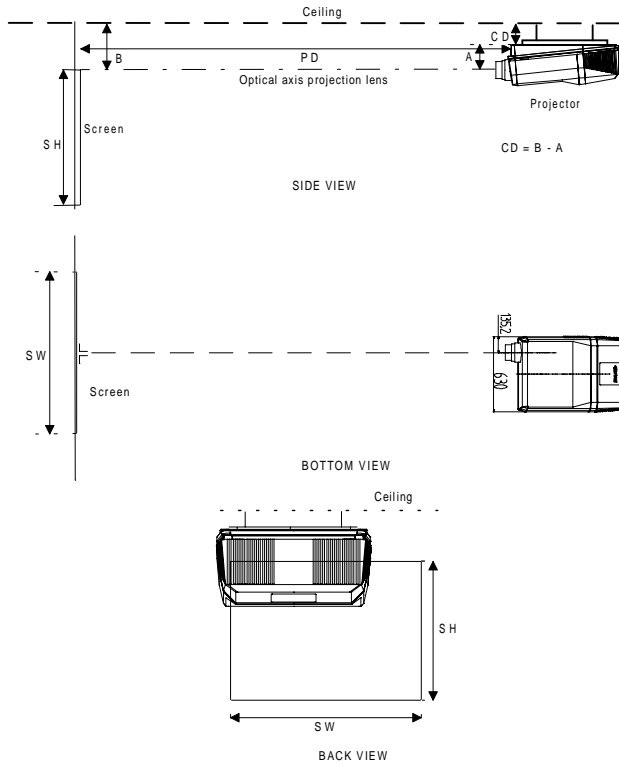
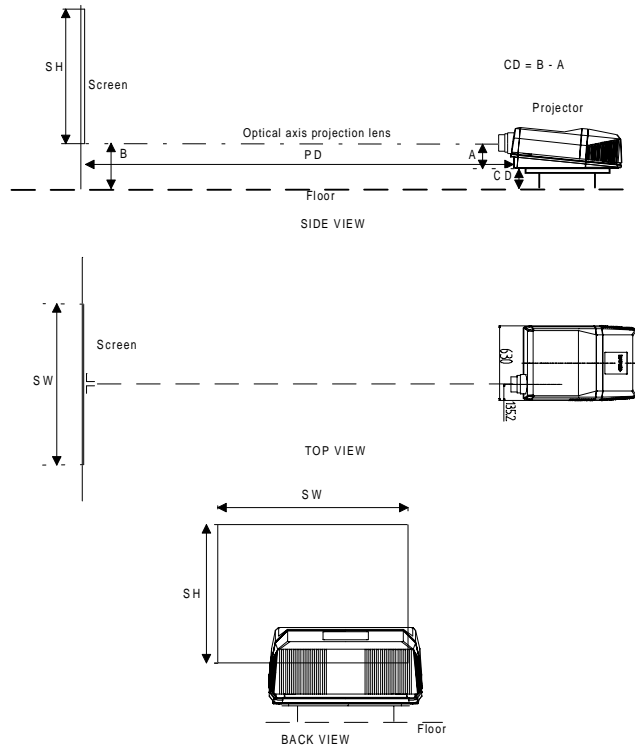


Table mounting of the BARCOGRAPHICS 8200



Installation Guidelines

** How to install a projection lens?*

The BARCOGRAPHICS 8200 is supplied without any lens.

The following lenses are available as an option :

HD(1.2:1)
HD(2.2:1)
HD(3.3:1)
HD(4.0:1)
HD(5:1)
HD(7:1)
HD(1.5-3:1)
HD(3.0-5.3:1)
WHD(3.5:1)

How to install the lens by the BARCOGRAPHICS 8200?

Remove the foam rubber in the opening of the lens holder.

- Take the new lens out of its shipping carton and remove the lens covers.
- Turn the lens into the lens holder by turning clockwise.
- Focus the lens (see appendix C) and secure the correct position with the fastener ring by turning this ring clockwise.

** How to install the projector?*

Ceiling mount or table mount?

To install the BARCOGRAPHICS 8200, it is recommended that the BARCO mounting kits which are specially designed for this function be used at all times.

BARCO ceiling support.

Order number : R9829620 or R9829621

Always use the BARCO ceiling support to attach your BARCOGRAPHICS 8200 to the ceiling.

The installation instruction for this support is enclosed in the packet of the set. You can order these instructions also from BARCO.

BARCO projection table.

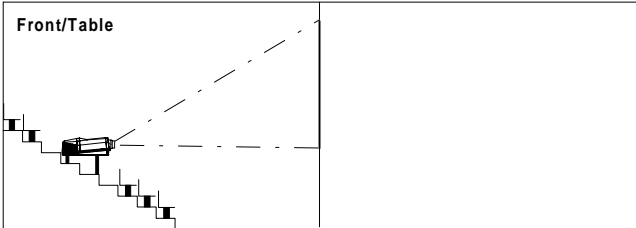
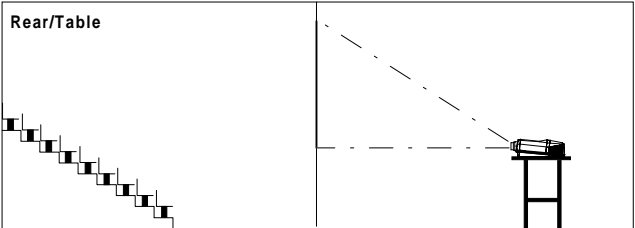
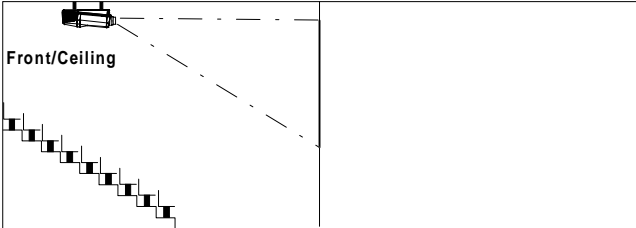
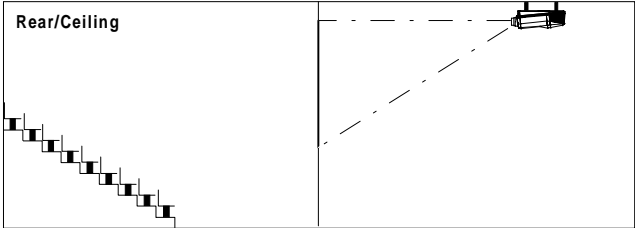
BARCO's projection table provides adjustable height and offers a stable surface for the projector
Order number R9827740.

INSTALLATION SET UP

Projector configuration

Installation Set Up

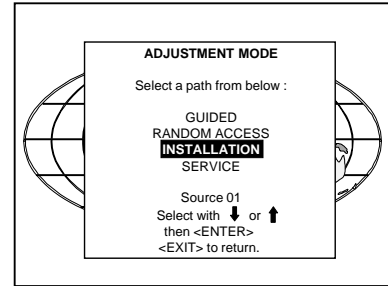
The BARCOGRAPHICS 8200 can be installed to project images in four different configurations : front/table, front/ceiling, rear/table and rear/ceiling.



To change the Configuration, enter the adjustment mode by pushing **ADJUST** or **ENTER**.

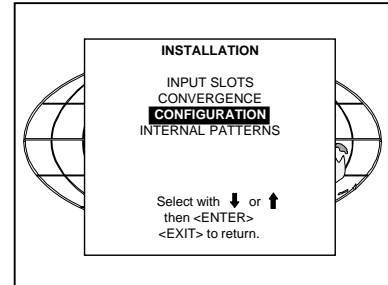
Highlight Installation by pushing the control disk up or down and press **ENTER** to select. The installation menu will be displayed.

ENTER displays the Installation menu.
EXIT returns to operational mode.



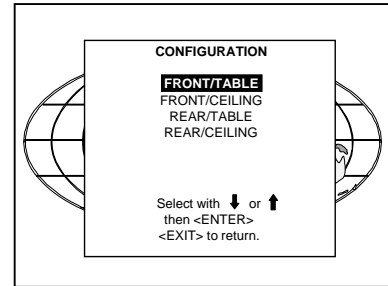
Highlight Configuration by pushing the control disk up or down and press **ENTER** to select. The configuration menu will be displayed.

ENTER displays the Configuration menu.
EXIT returns to the path selection menu.
ADJUST returns to operational mode.



The actual selected configuration will be highlighted.
Push the control disk up or down to select the corresponding configuration with regard to the projector environment. Press **ENTER** to confirm your selection.

ENTER to confirm the selection.
EXIT returns to the installation menu.
ADJUST returns to operational mode.



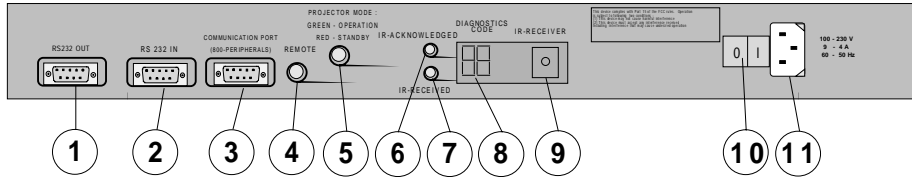
LOCATION AND FUNCTION OF CONTROLS

Front panel terminology

Local keypad

Remote control

Front panel terminology



- 1 **RS232 IN** : to allow communication with external computer, e.g. IBM PC or compatible, Macintosh ...
- 2 **RS232 OUT** : used to connect to next projector, RS232IN plug (communication link for PC or MAC to the next projector).
- 3 **Communication port** : allows communication with the 800 peripherals.
- 4 **Remote** : remote input for wired remote control.
- 5 **Projector mode indication** : indicates the status of the projector.

no lighting up : power switch is not pressed.
red lighting up : power switch is pressed, projector in stand by mode.
green lighting up : projector in operational mode.
- 6 **IR-Acknowledged** : IR signals are recognized.
- 7 **IR-Received** : IR signals are received but not recognized by the projector.
- 8 **Diagnostics code** : a) source number
b) error code : a two digits error code is displayed when something goes wrong inside the projector.
- 9 **IR receiver** : receiver for control signals transmitted from the RCU.
- 10 **Power switch** : '1' = on, '0' = off
- 11 **Power input** : autoranging from 100 to 230 Vac.

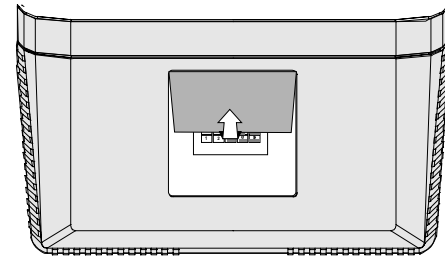
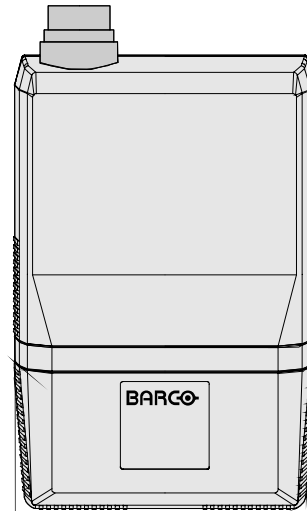
Control Panel Terminology

a. Local keypad

Getting access

The keypad is located behind a door, screened with the name of the projector.

To open the door, push once on the indicated side of the door and turn it to the front side of the projector.



b. Remote control

This remote control includes a battery powered infrared (IR) transmitter that allows the user to control the projector remotely.

This remote control is used for source selection, control, adaptation and set up. It includes automatic storing of :

- picture controls (Brightness, Sharpness...)
- settings

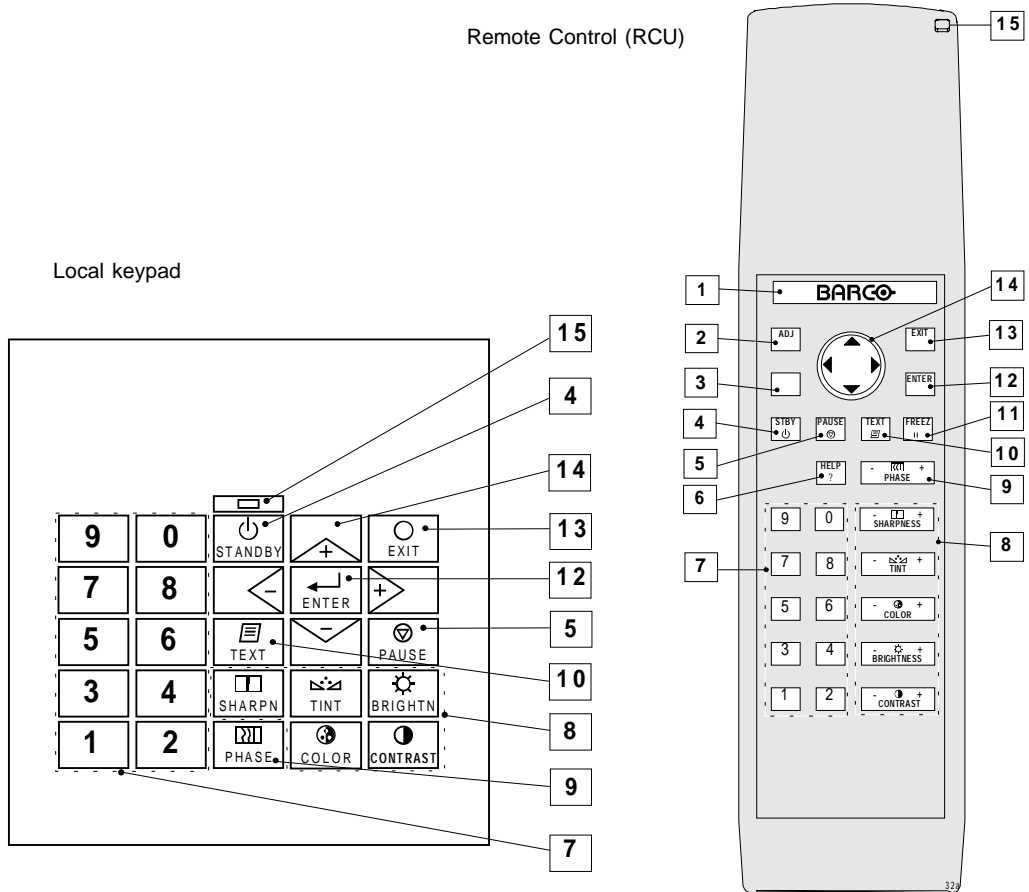
Other functions of the remote control are :

- switching between standby and operational mode.
- switching to "pause" (blanked picture, full power for immediate restarting)
- direct access to all connected sources.
- variable adjustment speed : when pushing continuously on the control stick or the picture keys, the adjustment will be executed in an accelerated fashion.

Location and Functions of Control

Remote Control (RCU)

Local keypad



POWER CONNECTION

Power Connection

Power (mains) cord connection

Use the supplied power cord to connect your projector to the wall outlet. Plug the female power connector into the male connector at the front of the projector.

The power input is auto-ranging from 100 to 240 VAC.
This projector may be connected to an IT-power system.

Fuses

Warning

For continued protection against fire hazard :

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

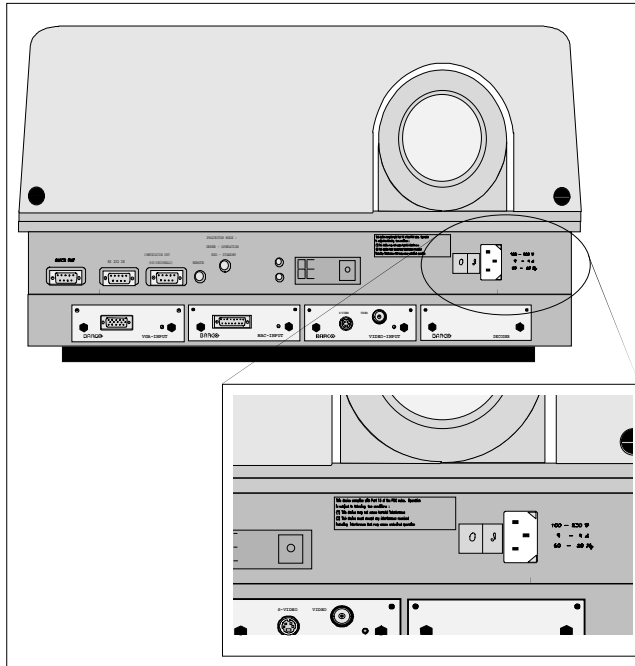
Fuse type : T12.5 AH/250V

Switching on

Use the power switch to switch on.

When '0' is visible, the projector is switched off.

When '1' is visible, the projector is switched on.

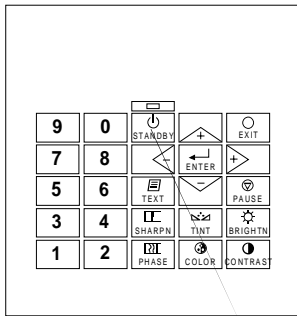


100-240Vac
10-4.5A

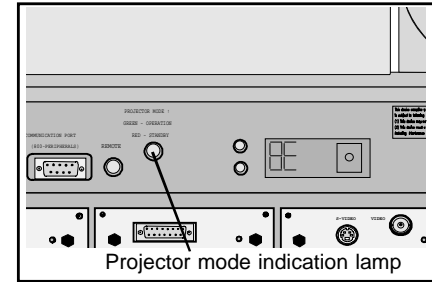
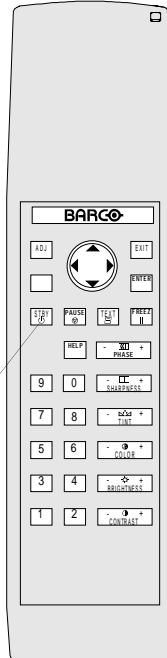
When switching on with the power switch, the projector starts in the stand by mode. The projector mode indication lamp is red.

To start image projection :

- a. press the 'Stand by' button on the local keypad or on the remote control. The projector mode indication lamp will be green.



Stand by button



- b. press a digit button to select an input source. The projector mode indication lamp will be green.

Power Connection

When the total run time of the lamp is 970 hours or more, the following message will be displayed for 1 minute. This message will be repeated every 30 minutes. Press EXIT to remove the message before the minute is over.

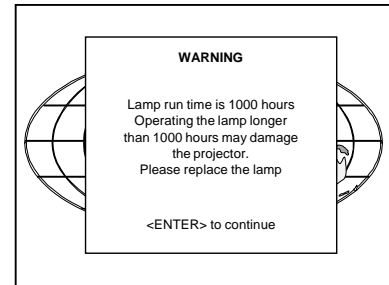
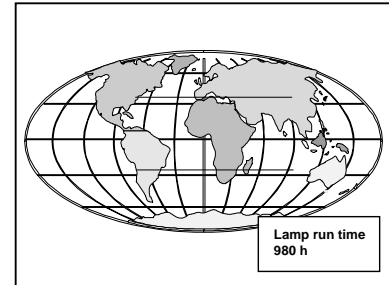
When the total run time of the lamp is 1000 hours or more, the following message, with the exact run time is displayed on the screen.

Lamp run time is 1000 hours. Operating the lamp longer than 1000 hours may damage the projector. Please replace the lamp.

When OK (ENTER) is pressed to go on, the warning will be repeated every 30 min.

The total lifetime of the lamp for a safe operation is 1000 hours max. (normal power mode). Do not use it longer. Replace always with a same type of lamp. Call a BARCO authorized service technician for lamp replacement.

Warning : Using a lamp for more than 1000 hours is dangerous, the lamp could explode.



Switching to stand-by.

When the projector is running and you want to go to stand-by, press the stand-by key.

Caution : Before powering down the projector, switch the projector to stand-by and let the projector lamp cool down until the fans stop blowing (or for at least 15 minutes).

Switching off

To switch off:

- press first **STANDBY** key and let cool down until the fans stop blowing (or at least 15 min).
- switch off the projector with the power switch.

INPUT MODULE CONNECTIONS

Module insertion into the projector.

Video/S-Video input module

RGB analog input module

Component input module

RGB3S/RG3sB input module

Peripheral equipment connection

Connecting a computer

Connecting a RCVDS05

Connecting a VS05

Connecting an IR Remote Receiver 800

Connections

Input connections.

The projector has modular input facilities. The input slots can be filled up with the following modules :

Video, S-video (PAL, SECAM, NTSC) input
order no. R9827900
RGBS/RGsB analog input
order no. : R9827910
RGB3S/RG3sB input
order no. : R9827920
Component Video input
order no. : R9827930

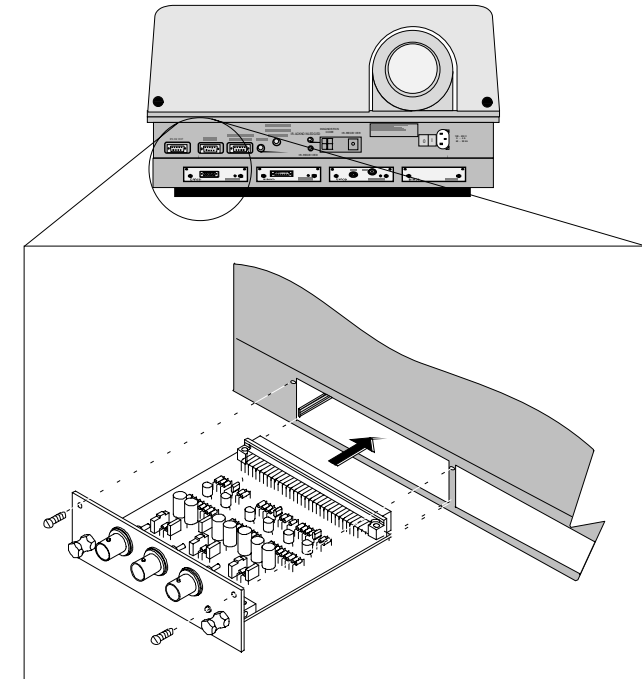
The sequence of insertion has no importance, except when using a RCVDS or VS05. It is even perfectly possible to insert several input modules of one type.

Note : When using a RCVDS05 or VS05, the input configuration of the projector must be as follows:

- Slot 1 : video input module
- Slot 2 : RGB analog input module
- Slot 3 : Component input module

Input module insertion into the projector :

- Power down the projector and disconnect the power cord from the wall outlet.
- Remove the dummy plate covering the chosen input slot by turning out both screws.
- Slide the input module in the free slot. Insure the module is seated correctly in the guide grooves.
- Press on both handles of the input module until the module plug seats in the connector of the projector.
- Secure the input module by tightening both retaining screws.
- Reconnect the power cord to the wall outlet and switch on the projector.



The new installed module can be selected with the digit buttons on the RCU or the local keypad.

Video/S-video input module

To the Video input :

Composite video signals from a VCR, OFF air signal decoder, etc...
1 x BNC 1.0Vpp \pm 3 dB

To the S-Video input :

Separate Y-luma/C-chroma signals for higher quality playback of Super VHS-signals.

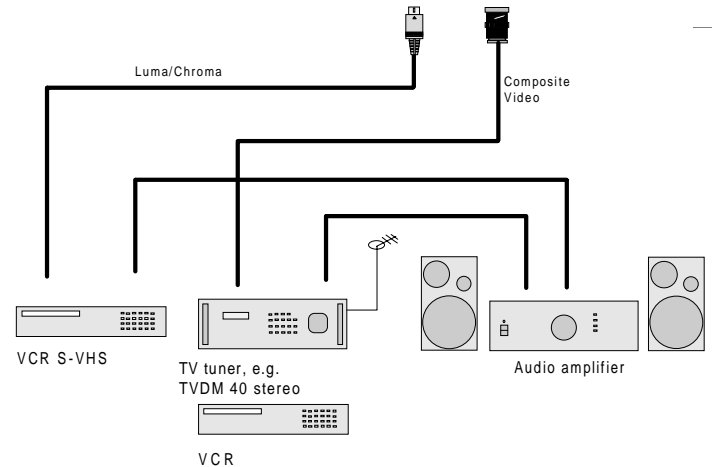
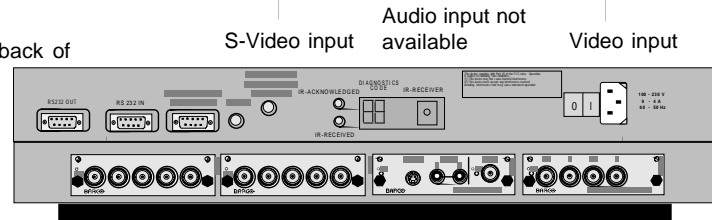
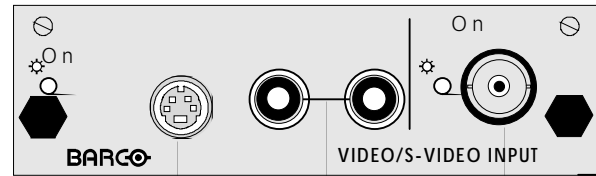
1 x 4 pins plug (mini DIN)

pin configuration :

- 1 ground luminance
- 2 ground chrominance
- 3 luminance 1.0 Vpp \pm 3 dB
- 4 chrominance 282 mVpp \pm 3 dB

Input selection :

Key in the corresponding slot number on the RCU or the local keypad. Depending on the priority setting in the Input slots menu, Video or S-Video will be displayed. If the wrong source type is displayed, start up the adjustment mode and select Installation. Select the Input Slots menu. Highlight the corresponding slot number with the control disk and press **ENTER** to change the priority setting. To start up the Adjustment menu, press **ADJUST** or **ENTER**.

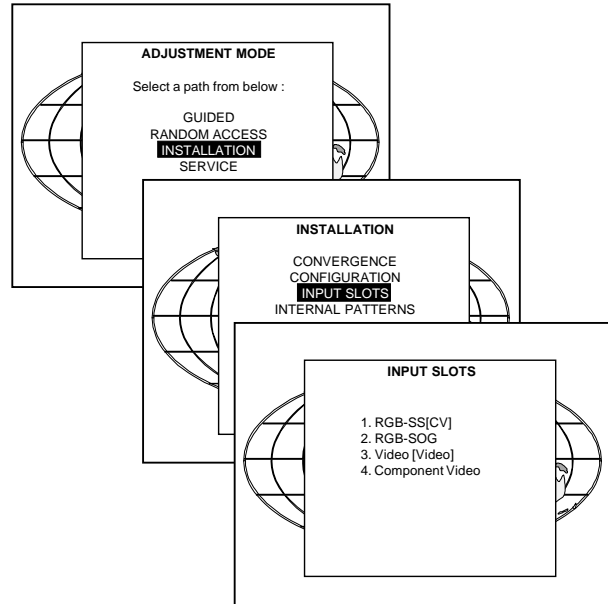


Connections

Push the Control disk up or down to highlight Installation and press **ENTER** to display the Installation menu.
EXIT returns to operational mode.

Use the control disk to select Input Slots by pushing it up or down and press **ENTER**. The internal system will scan the inputs and displays the result in the Input Slots menu.

Push the control disk up or down to select the corresponding (video or S-video) input slot number.
To change the priority between Video and S-Video, press **ENTER** key to toggle.



Straps on module level.

Floating or non-floating input.

Video input :

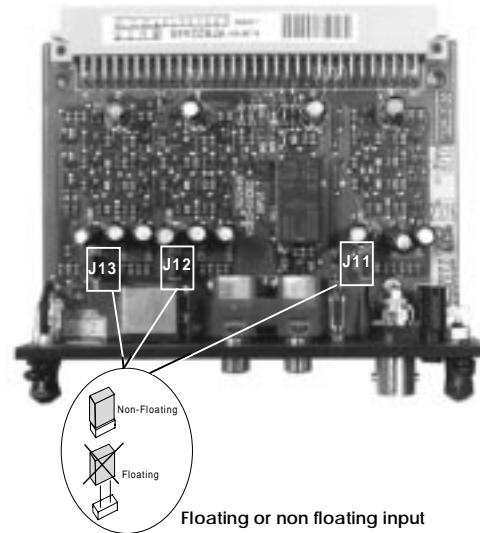
J11 : strap "yes" : non floating strap "no" : floating

S-Video input :

J12 : strap "yes" : non floating strap "no" : floating

J13 : strap "yes" : non floating strap "no" : floating

Factory preset : strap on, input non floating.



Connections

RGB analog input module.

RGB analog input terminals with separate Horizontal and Vertical sync inputs(RGB-HV), with Composite sync input(RGB-S) or with Sync signals on green(RGSB).

Always use an interface when a computer and local monitor have to be connected to the projector. Interfaces to be applied :

Universal analog interface.

Order number : R9826100.

RGB 120 MHz analog interface.

Order number : R9826570.

VGA interface

Order number 120V : R9828079.

Order number 230V : R9828070

MAC interface

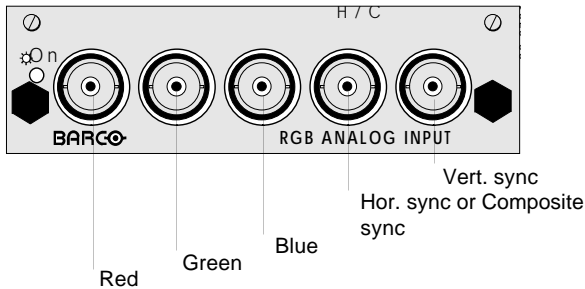
Order number 120V : R9828059

Order number 230V : R9828050

MAGIK interface

Order number 120V : R9828129

Order number 230V : R9828120



RGBS/RGSB analog : 5 x BNC

Red : 0.7 Vpp ± 3 dB

Blue : 0.7 Vpp ± 3 dB

Green : 0.7 Vpp ± 3 dB

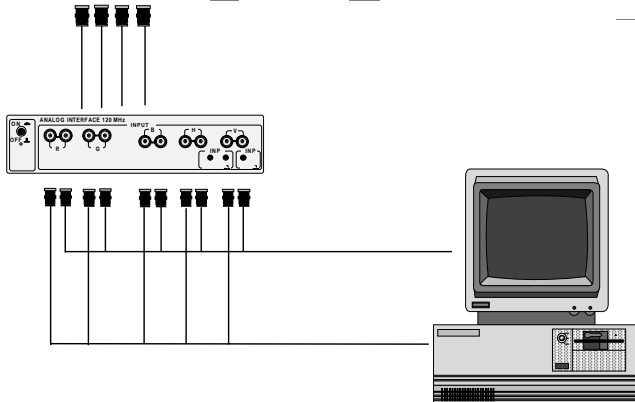
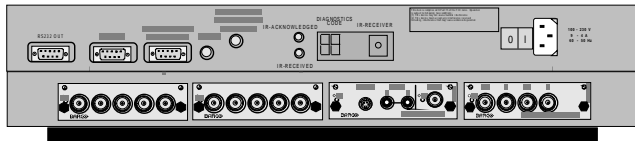
1 Vpp ± 3 dB if sync on green

Vert. sync : 1 Vpp to 4 Vpp ± 3 dB

Hor. sync / Composite sync :

1 Vpp to 4 Vpp ± 3 dB

All input signals are always 75 ohm terminated, even in the "not selected" mode.



RGB input selection :

Key in the corresponding slot number on the RCU or the local keypad.

Straps on module level :

Floating or non-floating input.

Red :	J3 :	strap "yes" :	non floating	strap "no" :	floating
Green :	J4 :	strap "yes" :	non floating	strap "no" :	floating
Blue :	J5 :	strap "yes" :	non floating	strap "no" :	floating
H/C :	J6 :	strap "yes" :	non floating	strap "no" :	floating
V :	J7 :	strap "yes" :	non floating	strap "no" :	floating

Factory preset : strap "yes", non floating input

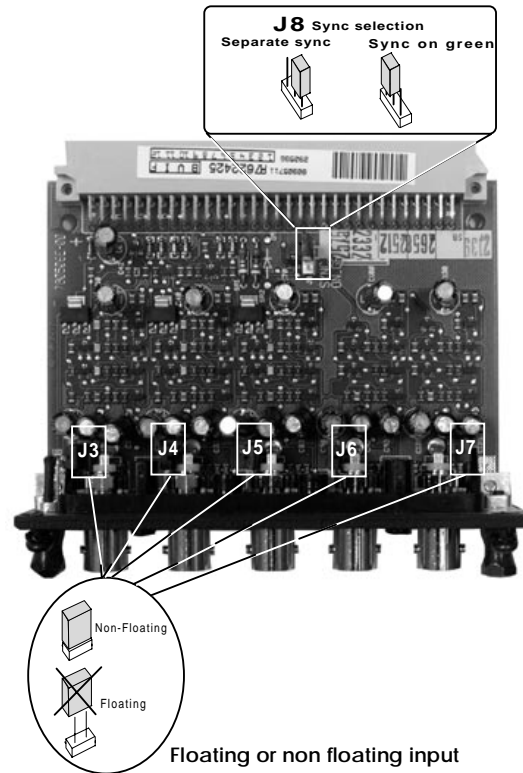
Sync selection : strap on module level.

J8 : see drawing

Factory preset : separate sync.

Sync selection on the Input Slots menu.

The horizontal sync input can be set as separate sync input or as separate sync + video input. To change this setting, press **ADJUST** or **ENTER** key to start up the Adjustment mode..



Connections

Push the control disk up or down to select *Installation* and press **ENTER**.

Use the control disk to select Input Slots by pushing up or down and press **ENTER**. The internal system will scan the inputs and displays the result in the Input Slots menu.

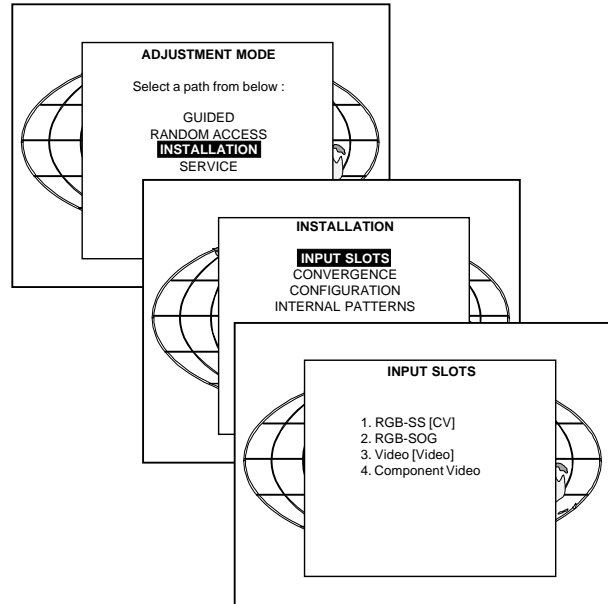
Push the control disk up or down to select the corresponding RGB input slot. To change the sync priority for Sync separate, press **ENTER** key to toggle between CV and CS or HS&VS.

Possible indication :

RGB-SS [CV] = separate sync is composite video signal on H/C input.

RGB-SS [CS or HS&VS] = separate sync is composite sync or horizontal and vertical sync.

RGB-SOG = sync on green.



Component input module.

Connect your component signals (Y-luma, R-Y and B-Y), e.g. a professional VCR to the Component input module.

Component video : 4 x BNC

R-Y : 0.7 Vpp ± 3 dB

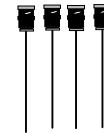
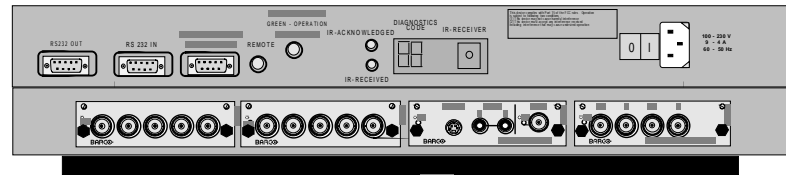
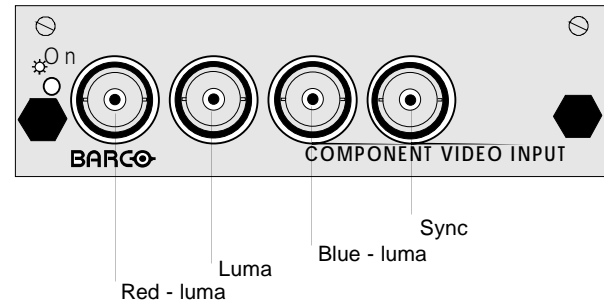
B-Y : 0.7 Vpp ± 3 dB

Y : 0.7 Vpp ± 3 dB

1 Vpp ± 3 dB if Tri-level sync on green

Composite sync : 1 Vpp to 4 Vpp ± 3 dB

All input signals are always 75 ohm terminated, even the module is "not selected".



Professional VCR

Connections

Component input selection :

Key in the corresponding slot number on the RCU or the local keypad.

Indication on the input slot menu :

Component Video-SS = Component video with separate sync

Component Video-SOY = Component video with sync on Y

Component Video-3LSS = Component video with 3 level separate sync

Component Video-3LSOY = Component video with 3 level sync on Y

Straps on module level :

Floating or non-floating input.

R-Y : J3 : strap "yes" : non floating strap "no" : floating

Y : J4 : strap "yes" : non floating strap "no" : floating

B-Y : J5 : strap "yes" : non floating strap "no" : floating

S : J6 : strap "yes" : non floating strap "no" : floating

Factory preset : strap "yes", non floating input

Sync selection.

J8 :

strap "no" : separate sync

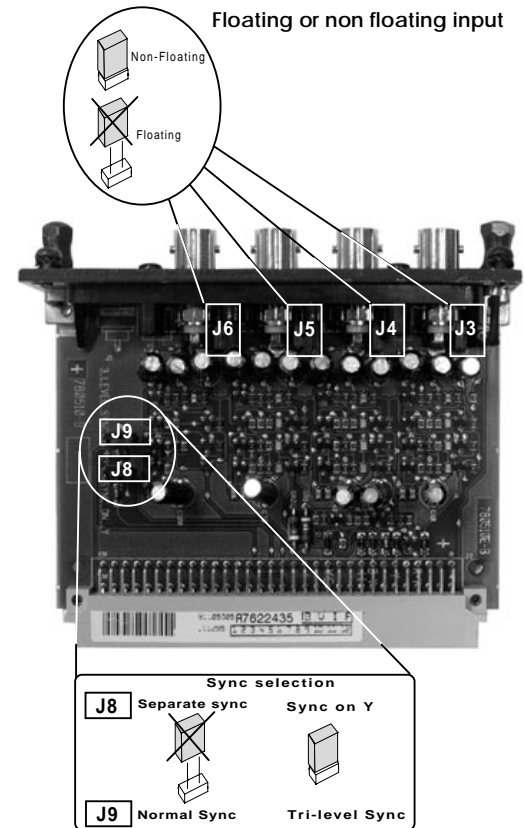
strap "yes" : sync on Y.

J9 :

strap "yes" : Tri-level sync

strap "no" : normal sync.

Factory preset : separate sync and normal sync.



RGB3S/RG3sB input module.

Connect your RGB signals with Tri-level sync, e.g. a professional VCR to the RGB 3 level sync input module.

RGB3S/RG3sB analog : 5 x BNC

Red : 0.7 Vpp ± 3 dB

Blue : 0.7 Vpp ± 3 dB

Green : 0.7 Vpp ± 3 dB

1 Vpp ± 3 dB if Tri-level sync on green

Vert. Tri-level sync : 1 Vpp to 4 Vpp ± 3 dB

Hor. Tri-level sync / Composite Tri-level sync:

1 Vpp to 4 Vpp ± 3 dB

All input signals are always 75 ohm terminated, even in the "not selected" mode.

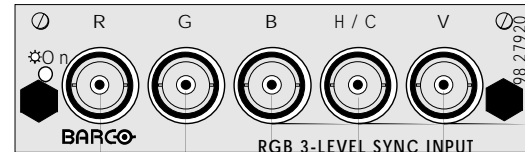
Input selection :

Key in the corresponding slot number on the RCU or the local keypad.

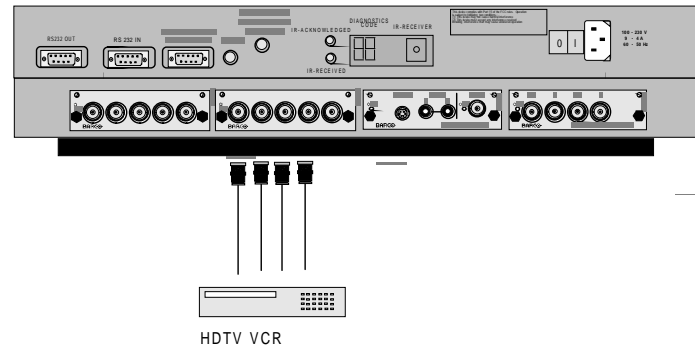
Indication on the input slot menu :

RGB3L-SS = RGB with separate Tri level sync.

RGB3L-SOG = RGB with Tri level sync on green.



Red
Green
Blue
Vert. 3 level sync
Hor. or composite 3 level sync



Connections

Straps on module level :

Floating or non-floating input.

Red : J3 : strap "yes" : non floating strap "no" : floating

Green : J4 : strap "yes" : non floating strap "no" : floating

Blue : J5 : strap "yes" : non floating strap "no" : floating

H/C : J6 : strap "yes" : non floating strap "no" : floating

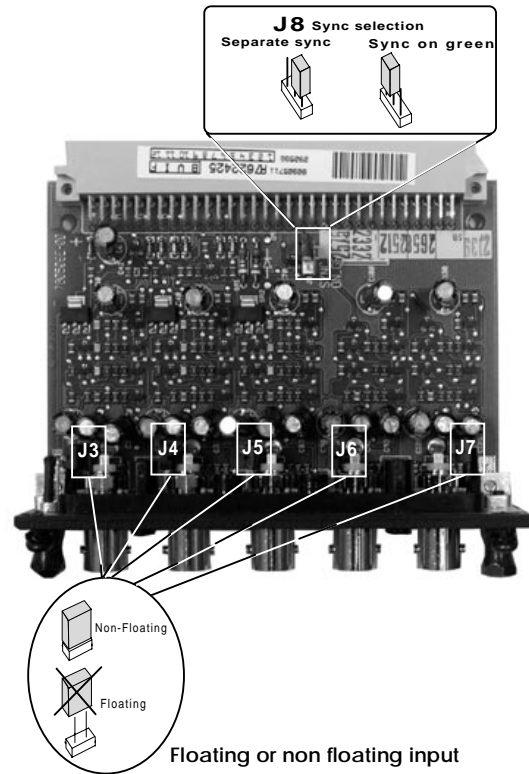
V : J7 : strap "yes" : non floating strap "no" : floating

Factory preset : strap "yes", non floating input

Sync selection.

J8 : separate sync or sync on green.

Factory preset : separate sync.



Connecting a computer, e.g. IBM PC (or compatible), Apple Macintosh to the RS 232 input of the projector.

The projector has a RS232 port that allows it to communicate with a computer.

Applications : remote control and data communications.

a) remote control :

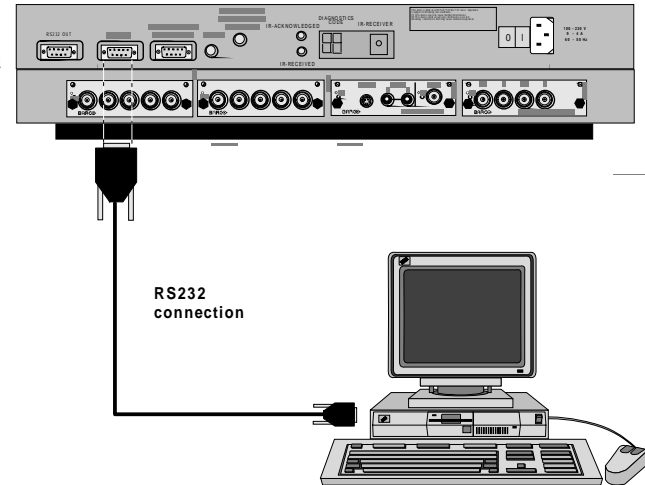
- easy adjustment of projector via IBM PC (or compatible) or MAC connection.
- allow storage of multiple projector configurations and set ups.
- wide range of control possibilities.
- address range from 0 to 255.

b) data communications :

- sending data to the projector or copying the data from the projector to a hard memory device.

Set up of the baud rate for communication with a computer.

See 'Change Baudrate PC' in chapter 'Service mode'.



Connections

Connecting a RCVDS 05 to the projector.

- Up to 10 or 20 inputs(video) with the RCVDS 05 and 90 inputs when RCVDS's are linked via the expansion module.
- Serial communication with the projector.
- Remote control buttons on the RCVDS to control the projector (source selection and analog settings).
- The selected source number will be displayed on a 2 digit display and the selected input module will be indicated with a LED on the rear.

For more information about the use of the RCVDS 05, consult the owner's manual, order number : R5975765.

Connecting a VS05 to the projector.

The VS05 can switch up to 5 Composite Video sources, 3 Super Video sources and 1 RGB analog or component video source to the projector. In addition, the audio signal proper to the source, can be switched to an audio amplifier.
Order number : R9827890

For more information about the use of the VS05, consult the VS05 owner's manual, BARCO order number : R5975245.

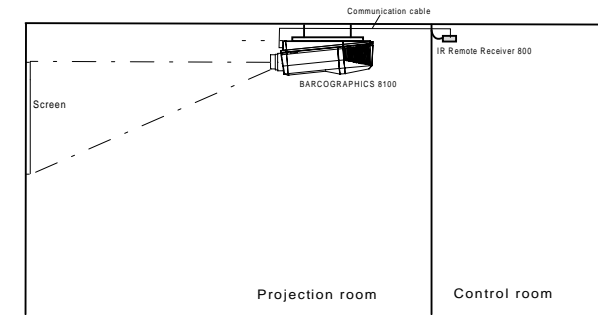
Connecting an IR Remote Receiver 800 to the projector.

This infrared red receiver unit makes it possible to control the projector from another room.

There is a communication line cable between the IR receiver and the projector or the RCVDS. The control information from the RCU can now be sent to the IR Remote Receiver 800.

The IR Remote Receiver 800 displays the selected source on a 7-segment display.

Order number : R9827515.



CONTROLLING

How to use the RCU.

Projector address

How to display a projector address.

How to program an address into the RCU.

Picture controls with direct access.

Controlling

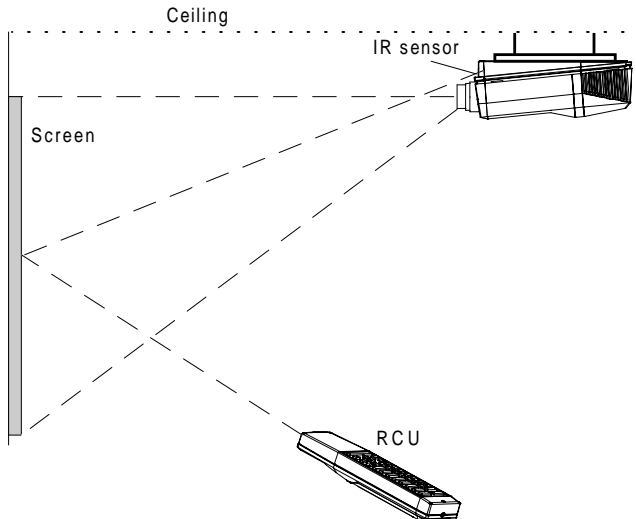
The BARCOGRAPHICS 8200 can be controlled with

- the RCU
- the hardwired RCU (cable is not included)
- the local keypad.

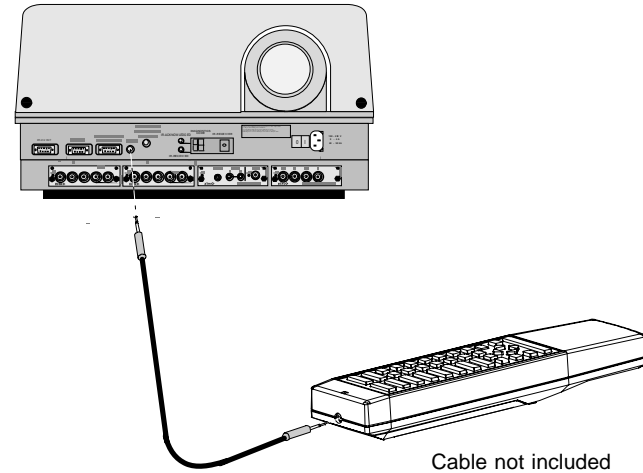
Controlling the projector with the RCU and the hardwired RCU is equal.

How to use the RCU?

a) Point the front of the RCU to the reflective screen surface.

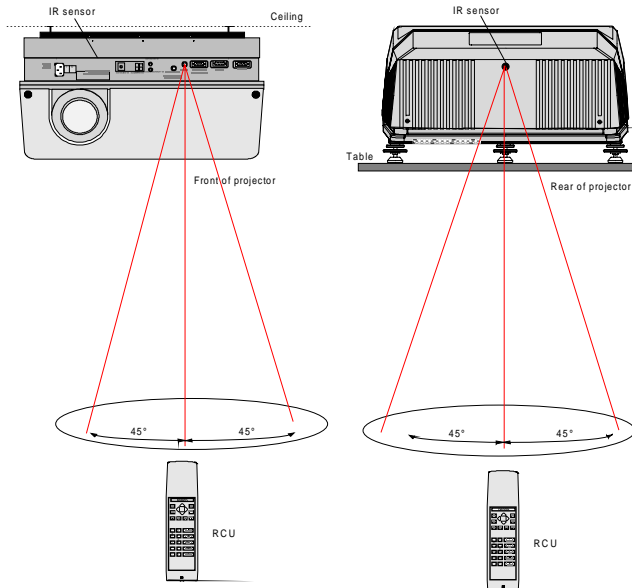


b) RCU used in a hardwired configuration.



Plug one end of the remote cable in the connector on the bottom of the RCU and the second side in the connector in the front panel of the BARCOGRAPHICS 8200 labelled 'REMOTE'.

c) Point the front of the RCU directly at one of the IR sensors of the projector.



When using the wireless remote control, make sure you are within the effective operating distance (30m, 100ft in a straight line). The remote control unit will not function properly if strong light strikes the sensor window or if there are obstacles between the remote control unit and the projector IR sensor.

Projector address

a. Software set up of the projector address.

See 'Change projector address' in chapter 'Service mode'.

Every projector requires an individual address between 0 and 255 which can be set in the Service mode.

Only projectors with addresses between 0 and 9 can be controlled with the RCU.

b. How to control the projector or projectors.

The projector's address may be set to any value between 0 and 255. When the address is set, the projector can be controlled now :

- RCU for addresses between 0 and 9.
- computer, e.g. IBM PC (or compatible), Apple MAC, etc. for addresses between 0 and 255.

Note : a projector will respond to a RCU set to an address of '0' regardless of what address is set in the projector itself.

c. Using the RCU.

Before using the RCU, it is necessary to enter the projector address into the RCU (only when that address is between 1 and 9). The projector with the corresponding address will listen to that specific RCU.

When address 0, 'zero address' is programmed into the RCU, every projector, without exception will listen to the commands given by this RCU.

How to display a projector address?

Press the **ADDRESS** key (recessed key on the RCU) with a pencil. The projector's address will be displayed in a 'Text box'. This text box disappears after a few seconds. To continue using the RCU, it is necessary to enter the same address with the digit buttons (address between 0 and 9). For example : if the Address key displays projector address 003, then press "3" digit button on the RCU to set the RCU's address to match the projector's address.

How to program an address into the RCU?

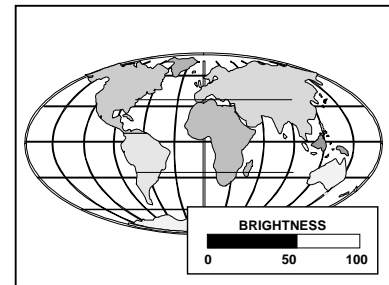
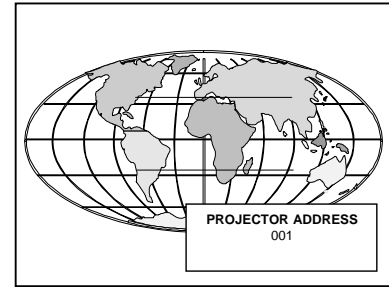
Press the **ADDRESS** key (recessed key on the RCU) with a pencil and enter the address with the digit buttons. That address can be any digit between 0 and 9. When programming '0', zero address, the RCU will control any projector regardless of the projector's address. This feature allows multiple projectors with different addresses to be controlled by a single RCU.

Picture controls with direct access.

When an image control is pressed, a text box with a bar scale, icon and function name of the control, e.g. 'brightness...' appears on the screen (only if text is ON). See example screen. The length of the bar scale and the value of the numeric indication indicate the current memorized setting for this source. The bar scale changes as the + or - buttons of the control on the RCU are pressed or the + or - buttons on the local keypad.

Brightness Control

A correct '*brightness*' setting is important for good image reproduction.
Use the + button for a higher brightness.
Use the - button for a lower brightness.



Contrast Control

A correct 'contrast' setting is important for good image reproduction. Adjust the contrast to the level you prefer, according to room lighting conditions.
Use the + button for a higher contrast.
Use the - button for lower contrast.

Color Saturation

Color saturation is only active for Video and S-Video. Adjust the color intensity of the picture.
Use the + button for richer colors.
Use the - button for lighter colors.

Tint Control

Tint is only active for Video and S-Video when using the NTSC 4.43 or NTSC 3.58 system.
Use the + button
Use the - button.

Sharpness Control.

Use the + button for a sharper picture.
Use the - button for a softer picture.

Phase Control

Use the control stick to adjust the phase. Within the total adjustment range there are 2 or 3 areas where the phase is correctly aligned.

START UP OF THE ADJUSTMENT MODE

Start Up of the Adjustment Mode

Adjustment Mode

All source set ups, picture tunings and geometry are made while in the 'Adjustment mode'. Press the **ADJUST** or **ENTER** key to enter the 'Adjustment mode'.

You are now in the 'Adjustment mode'. The control stick (RCU) or '+' or '-' keys (local keypad) are used to make menu selections and also for adjustments. The **ENTER** and **EXIT** keys are used to move forward and backward through the menu structure. The **ADJUST** key can be used to terminate the adjustment mode while any path selection menu is displayed.

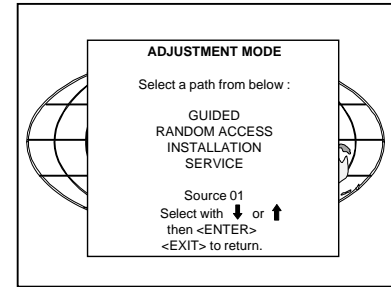
There are 4 possible paths to follow once in the Adjustment mode. They are :

Installation - Installation should be selected if a new input module is installed or a new source is connected to an existing input module. Also when the projector is relocated in a new configuration.

Guided - Guided should be selected if the user intends to perform a complete new set up. All of the necessary adjustments or set ups are made in a predetermined sequence.

Random Access - Random Access should be selected if the user is used to set up a source.

Service - Service should be selected if the user intends to change general settings such as password, language, address, etc. or some service actions as reset lamp run time, panel adjustments, etc. or get set-up information.



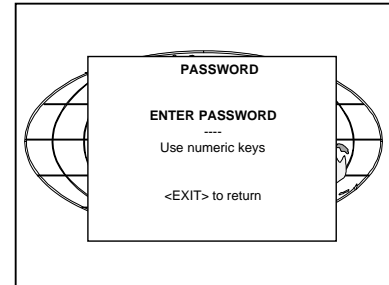
Some items in the Adjustment mode are password protected. While selecting such an item, the projector asks to enter your password (Password protection is only available when the password strap on the controller module is ON, see 'Change password' in chapter 'Service mode').

Your password contains 4 digits.

Enter the digits with the numeric keys.

Example : 2 3 1 9

The first digit position is highlighted. Enter with the numeric keys. The highlighted square jumps to the next position. Continue until all 4 digits are filled in.



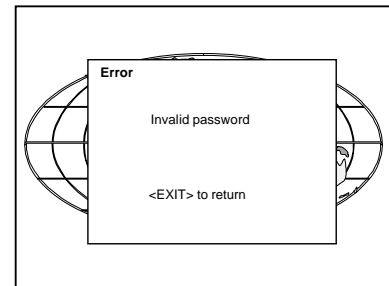
When your password is correct, you get access to the selected item.

When your password is wrong. The error message "Invalid password" is displayed on the screen. Press **ENTER** to continue and to return to the Service menu.

Factory programmed password : **0 0 0 0**

Once the password is correctly entered, all other password protected items are accessible without re-entering your password.

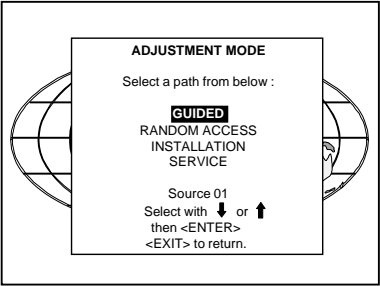
When re-entering the Adjustment mode, it will be necessary to enter your password again when selecting a password protected item.



GUIDED ADJUSTMENT MODE

Guided Adjustment Mode

The Guided Adjustment Mode is not active.



RANDOM ACCESS ADJUSTMENT MODE

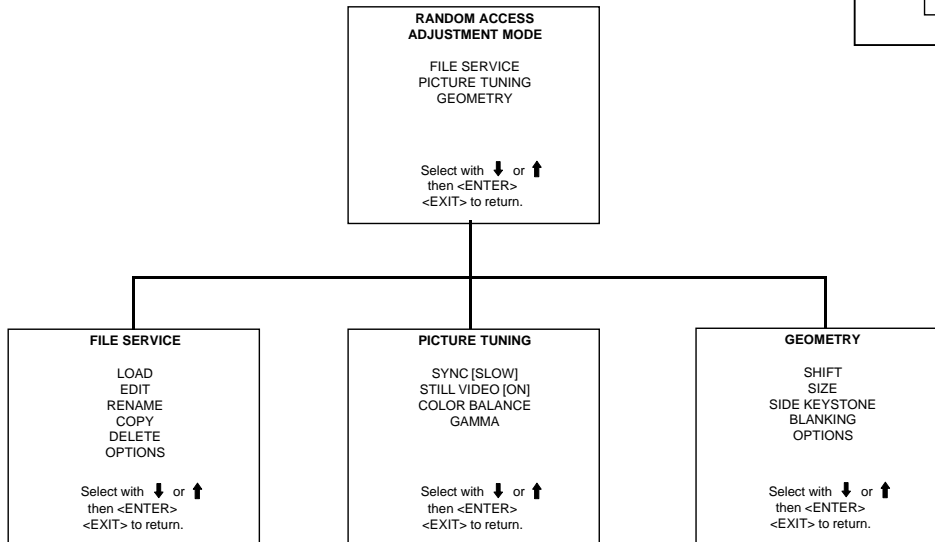
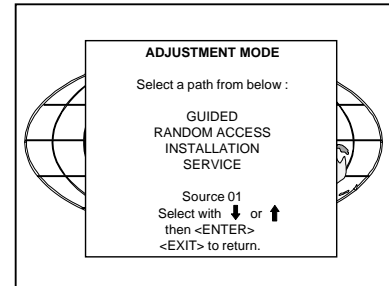
File Service

Picture Tuning

Geometry

Starting up the Random Access Adjustment Mode

Push the control disk up or down to highlight 'Random Access' and then press **ENTER**.



File service

Before using a new source, a correct file has to be installed. The projector's memory contains a list of files corresponding to the most used sources. When the new source corresponds with one of these files, the file can be loaded and saved for future use. When there is a little difference, the file can also be loaded and then edited until the source specs are reached.

File annotation :

xxxxxxx.xxx x xxxXxxxxi

i or blanc : i = interlaced, blanc = not interlaced

xxxxXxxxx : active pixel rating

x : source number

xxx : file extension, first character is C (for custom made files) or S (for standard files).

The second and third character is used for a following number (=file index)

file index for custom files : 00 to 63.

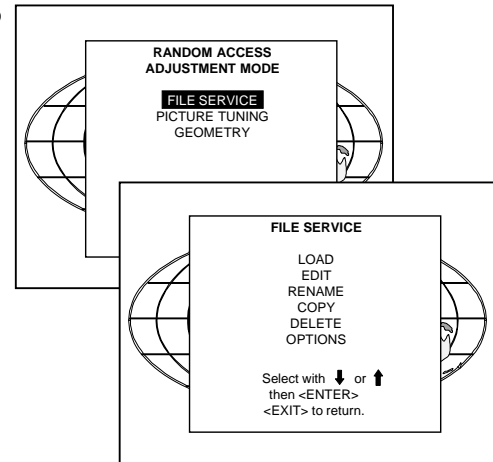
xxxxxxx : base name, 8 characters.

Highlight *File Service* by pushing the control disk up or down and press **ENTER** to select. The File service menu will be displayed.

ENTER displays the File Service menu;
EXIT returns to the Path selection menu.
ADJUST returns to operational mode.

The following file manipulations are possible :

- Load : installation of a file for a new source.
- Edit : editing a loaded file to the source specs.
- Rename : renaming a file.
- Copy : copying a file to a new file.
- Delete : deleting an existing file.
- Options : way of displaying the file annotation and sort possibilities.



Load file

Push the control disk up or down to select **LOAD** and press **ENTER** to display the Load menu.

The Load menu displays the corresponding files depending on the installed filter.

This filter can be "Fit" or "All". To change the filter, push the control disk to the right to select "filter list" (filter list will be highlighted) and press **ENTER** to toggle the annotation between brackets.

"All" : all files that can be loaded will be displayed.

"Fit" : only the best fitting files will be displayed (with a distinction of ± 2 lines and line duration distinction of ± 300 ns)

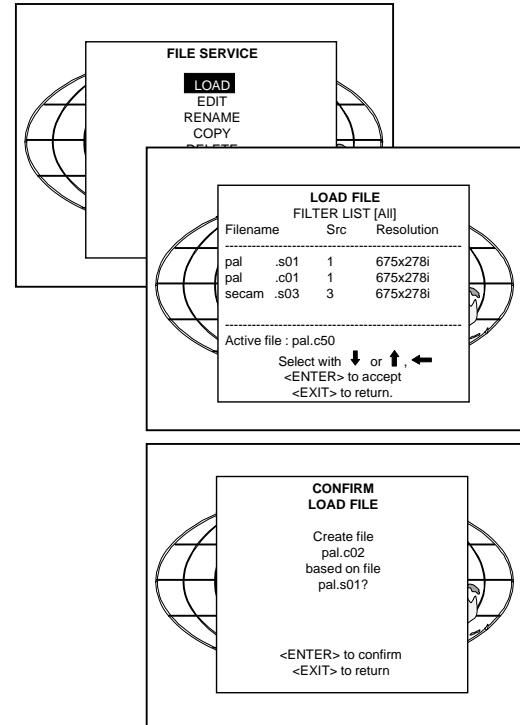
Push the control disk up or down to select the most fitting file and press **ENTER** to select.

When scrolling through the files, the image will be adapted according to the settings of the selected file (on line adaptation). When the best fitting image is displayed, press **ENTER** to select this file. A confirm Load file menu will be displayed with the new created file and the one on which the new file is based on.

Press **ENTER** to confirm your new creations or **EXIT** to return to the load file menu.

If the displayed image is not yet as it has to be, select the most corresponding file and go to the Edit menu to change the file settings.

During a load file, the actual active file is displayed next to the indication 'Active file'.



Edit file

The Edit file menu makes it possible to change the settings of the file according to the real settings of the connected source. Consult the source specification before entering the data.

To start up the EDIT menu, push the control disk up or down to select EDIT in the FILE menu and press **ENTER**.

Select the file which must be edited (mostly the active file) and press **ENTER**.

The Edit file adaptation menu will be displayed.

The file name will be displayed in the upper right corner.

The following items can be adjusted :

Total quantity horizontal pixels

Active quantity horizontal pixels

Horizontal shift in pixels

Horizontal period in μs (is automatically adapted during the installation of a file with LOAD)

Total vertical lines (is automatically adapted during the installation of a file with LOAD)

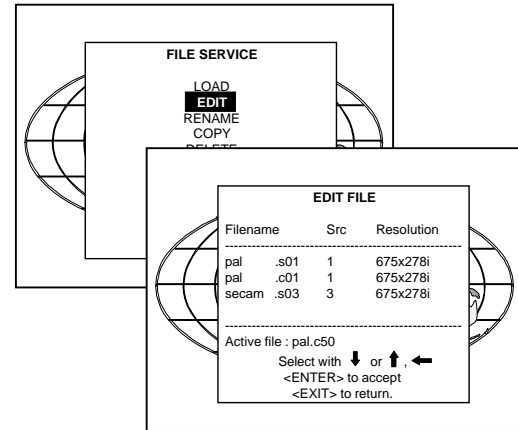
Active vertical lines

Vertical shift in lines

Interlaced : toggle on/off (is automatically set to its correct position during the installation of a file with LOAD)

All settings can individually be changed. Push the control disk up or down to select an item. The color of the selected item will change and follow one of the three methods to change the value.

- a. press **ENTER** to activate the digits and enter directly with the numeric keys on the RCU or local keypad the new value or
- b. press **ENTER** to activate the digits. Push the control disk to the right or to the left to select the changing digit. Push the control disk



Random Access Adjustment Mode

up or down to scroll to desired digit. When finished press **ENTER** to confirm.
c. counting up or down by pushing the control disk to the right or to the left.

How finding the correct values for the displayed item?

During the installation of a file with LOAD, the horizontal period, the total number of vertical lines and the interlaced mode are automatically measured and filled in in the menu table. These values will be available when starting up the EDIT procedure of an active file.

Select first "*Horizontal*" and press **ENTER** to display a full image.

If the value for "*Horizontal total pixels*" is wrong, sampling mistakes (small vertical bars in the projected image) will be seen in the image. Select "*Total*" and adjust the pixel quantity. Adjust for zero bars (hint : if the number of bars increase, adjust in the other way).

The active pixels : determine the width of the window on the screen. This value is normally given in the source specifications. If not, adjust until full image is displayed (no missing pixels).

Horizontal shift : to shift the image on the screen.

Horizontal period : already filled in with the correct value when active file.

Press **EXIT** to return to the normal Edit file menu.

Select "*Vertical*" by pushing the control disk up or down and press **ENTER**. The full image is displayed.

The "*Vertical Total lines*" are already filled when an active file is selected to be edited.

The "*Active lines*": number of horizontal lines determining the height

of the projected image. This value is normally given in the specification of the source. If not, adjust until full image height is displayed (no missing lines)

Vertical shift : shift the image up and down (push joy stick up or down) on the screen until the correct image position is obtained.

Interlaced [On] or [Off] : this selection is automatically filled when active file has to be edited. If the image is wrong due to mismeasurement, use the ENTER key to toggle between [On] and [Off]. (for interlaced images, 1 frame contains 2 fields).

Read AMDS

AMDS = automatic mode detection & synchronisation

During the installation of a file with LOAD, the system automatically measured the horizontal period, the total vertical lines and the interlaced mode.

When selecting Read AMDS, the system remeasures the above indicated items.

Options

Source number : The source number of a non-active source can be changed to any other source number. This makes it possible to create a file for future source numbers.

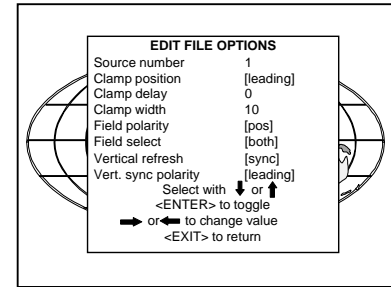
Clamp position : Clamping determines the black level of the signal. The clamp pulse can be related to the leading or the trailing edge of the sync pulse. Use the **ENTER** key to toggle between [leading] and [trailing].

Clamp delay : The time between the leading edge of the clamp pulse and the locked edge of the sync pulse. Can be any value between 0 and 127. Change the value by pushing the control disk to the left or to the right.

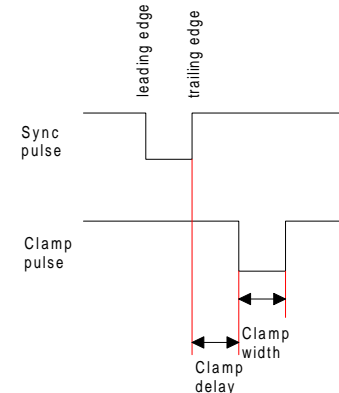
Clamp width : The width of the clamp pulse. Can be any value between 0 and 127. Change the value by pushing the control disk to the left or to the right.

Field polarity : Default [auto]
 [auto] = autodetection of the field polarity.
 The field polarity function is used for interlaced images. Both rasters of the image could be shifted in a wrong way (double lines are visible in the image). This can be corrected by forcing the field polarity to [neg] or [pos].
 Use the **ENTER** key to toggle between [auto], [pos] and [neg].

Field select : Default [both]
 The field select is only used for interlaced images. One frame of an interlaced image contains two fields, an even and an odd field. The choice exists to project [both] fields on the screen or only the [even] or [odd] field. This can be useful for 3D projection.
 Use the **ENTER** key to toggle between [both], [even] and [odd].



Example for clamp position [trailing]



Random Access Adjustment Mode

Vertical refresh [sync/async] : The way of updating the image information on the LCD panels. For moving images, the vertical refresh has to be done on a synchronous way, for still images, asynchronous vertical refresh is possible.

Vertical sync polarity : [leading] or [trailing]

The vertical refresh can be synchronised with the leading sync edge or trailing sync edge. Default on [leading].

Toggling to [trailing] is only necessary for special applications where the trailing edge of the sync signal has to be taken as a reference. Use the **ENTER** key to toggle between [leading] or [trailing]

Press **EXIT** to leave the Edit File Option menu.

Rename

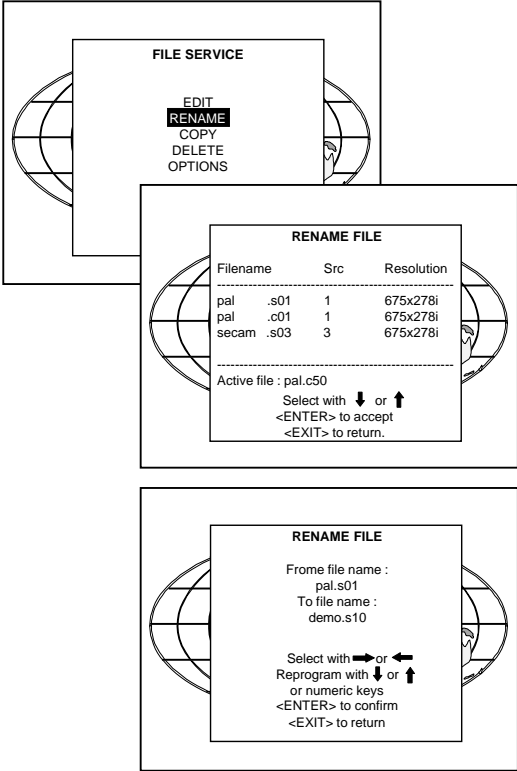
To change the name of a selected file.
Use the control disk to select RENAME and press **ENTER**. The Rename selection menu will be displayed.

Use the control disk to select a file name and press **ENTER** to select.

The Rename menu will be displayed with the selected file name already filled in in the 'From file name : ' area and in the 'To file name:' area.

Press **ENTER** to select the separate characters. Push the control disk to the right or to the left to select the desired character. Change that characters by pushing the control disk up or down. Numeric characters can be entered directly with numeric keys on the RCU. Press **ENTER** to confirm. The renamed file is entered in the list of files.

Press **EXIT** to return to the Rename menu selection. No changes are made.



Copy

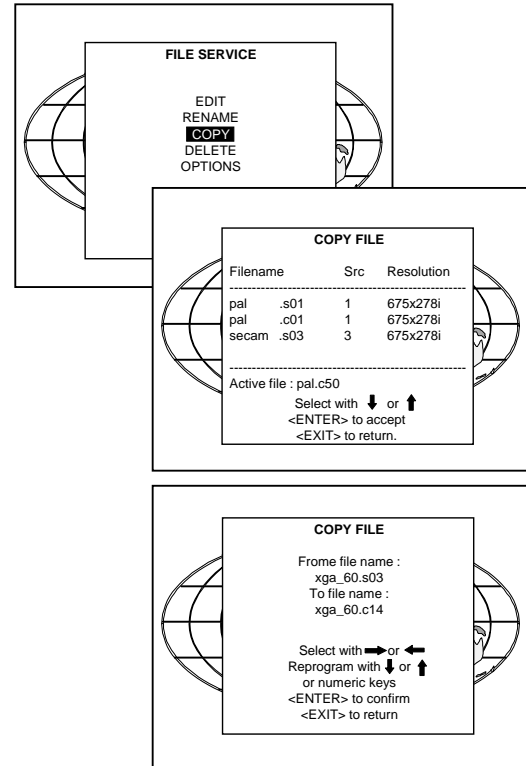
To copy a selected file into a new file.

Use the control disk to select COPY and press **ENTER**. The Copy selection menu will be displayed.

Use the control disk to select a file name and press **ENTER** to select.

The Copy menu will be displayed with the selected file name already filled in in the 'From file name : ' area and in the 'To file name : ' area.

Press **ENTER** to select the separate characters. Push the control disk to the right or to the left to select the desired character. Change that characters by pushing the control disk up or down. Numeric characters can be entered directly with numeric keys on the RCU. Press **ENTER** to confirm. The copied file is entered in the list of files. Press **EXIT** to return to the Copy selection menu. No copies are made.

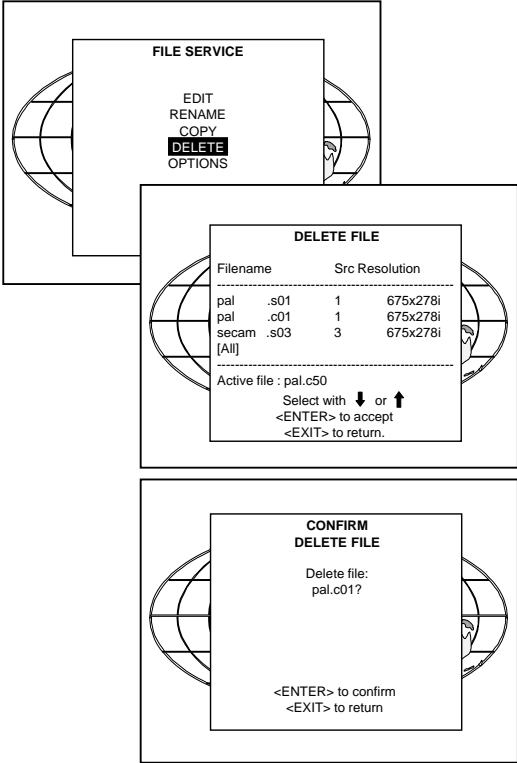


Delete

To delete a selected file out of the list of files.
Use the control disk to select DELETE and press **ENTER**. The delete selection menu will be displayed.

Push the control disk up or down to select a file and press **ENTER**.
If [All] is selected, your password has to be entered before all files will be deleted.

A confirmation menu "Delete file 'file name'?" is displayed. When you want to delete the file, press **ENTER**. If you do not want to delete the file, press **EXIT**.
Note : the active file cannot be deleted.



Random Access Adjustment Mode

File Options

Use the control disk to select **OPTIONS** and press **ENTER**. The option selection menu will be displayed.

Press **ENTER** to toggle between [name] and [index]

[name] : The files in the file list will be sorted on the file name.

[index] : The files in the file list will be sorted on the file extension.

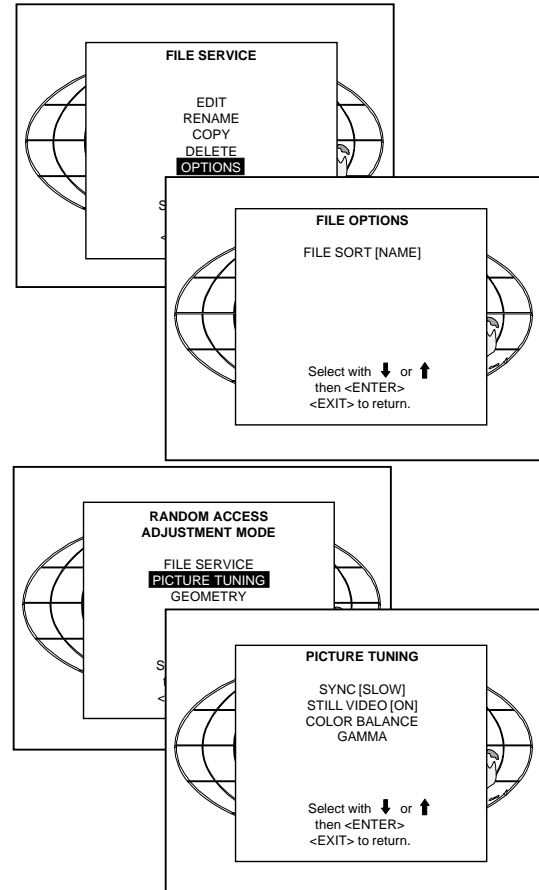
Picture Tuning

Highlight Picture Tuning by pushing the control disk up or down and press **ENTER** to select.

The Picture Tuning menu will be displayed.

The next items are available :

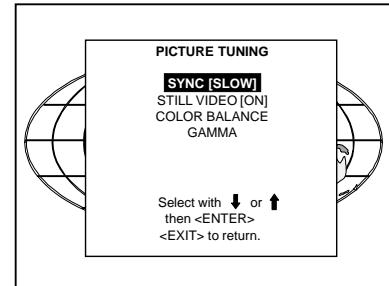
- sync slow/fast
- still video
- color balance
- gamma



Sync slow/fast

Highlight sync by pushing the control disk up or down and press **ENTER** to toggle between SLOW and FAST.

Note : Sync is normally used in the SLOW position. The FAST position is used to compensate for unsteady sync pulses from older video playback equipment.

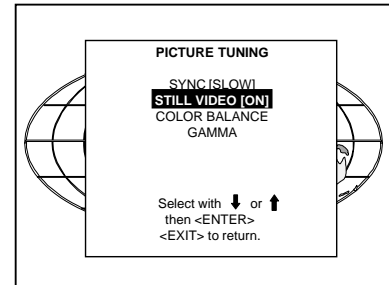


Still Video

This function is only used for stationary interlaced images.

Highlight Still Video by pushing the control disk up or down and press **ENTER** to toggle between ON and OFF.

Still Video : ON : the displayed image contains less jitter and gives a sharper image.
Still Video : OFF : for moving picture.



Random Access Adjustment Mode

Color Balance

Highlight Color Balance by pushing the control disk up or down and press **ENTER** to select the color balance selection menu.

The next choices are possible :

Fixed color balance :

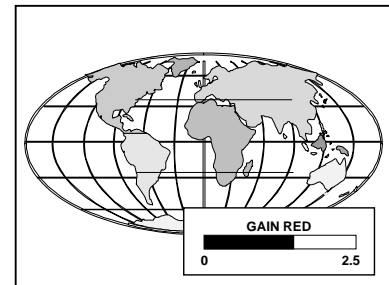
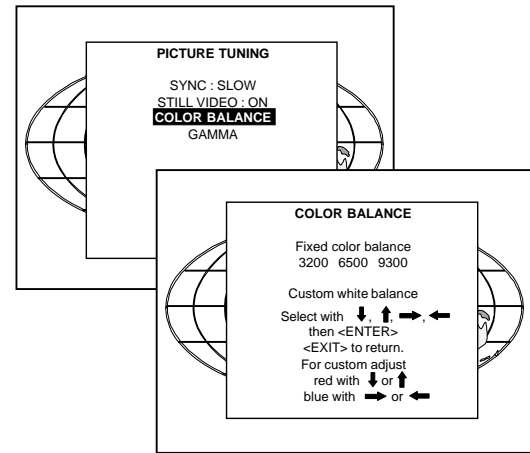
- 3200 K (reddish)
- 6500 K (white)
- 9300 K (bluish)

Custom white balance.

Push the control disk up or down to select Fixed Color Balance or Custom Color Balance.

If Fixed Color Balance is selected, use the control by pushing it to the right or to the left to select one of the 3 preprogrammed color temperatures.

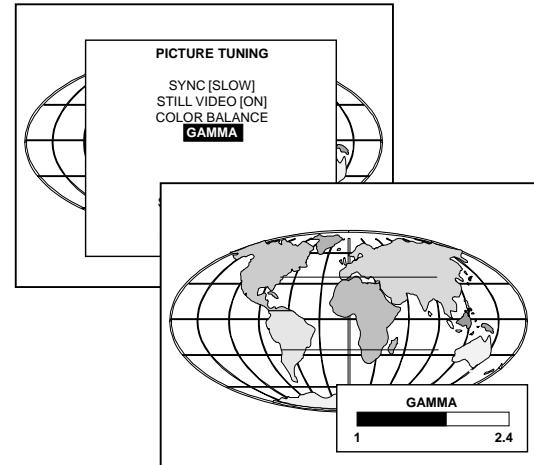
When Custom Color Balance is selected, push the control disk up or down to adjust red and push the control disk to the right or to the left to adjust blue (range 0 to 2.5) in comparison with the green color (value 1).



Gamma

With the gamma correction adjustment, it is possible to bring the details in dark image parts more to the front (lower image values) or to reduce the importance of these details (higher gamma values).

To change the gamma value, highlight Gamma by pushing the control disk up or down and press **ENTER**.



Random Access Adjustment Mode

Geometry

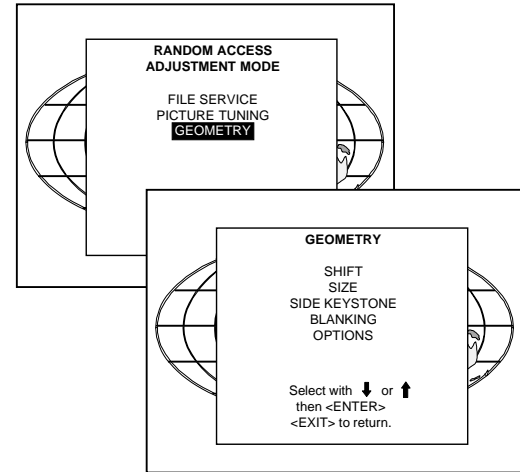
Highlight Geometry by pushing the control disk up or down and press **ENTER** to select the geometry selection menu.

The following adjustment are possible :

- horizontal and vertical image shift.
- horizontal and vertical image size
- side keystone (only necessary if the projector is mounted under a non standard projection angle).
- blanking
- options

The following ways are possible to adjust a geometry function :

- using the control disk to adjust or
- entering the value with the digit keys. Therefore, press **ENTER** to select the indicated value and enter the desired value with the digit keys. Press **ENTER** to confirm the entered value.



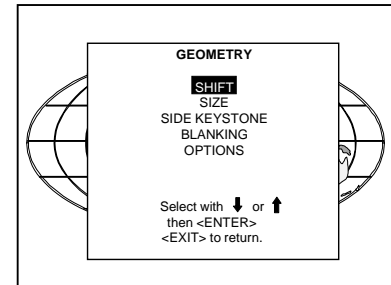
Shift

Highlight Shift by pushing the control disk up or down and press **ENTER**.

The image can be shifted in a horizontal or vertical direction. Push the control disk up or down to shift the image in a vertical direction. Push the control disk to the right or to the left to shift the image in a horizontal direction. The default value for the shift is 0.

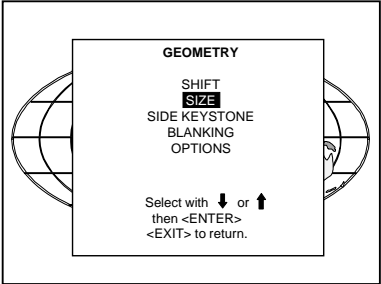
Shifting in a vertical direction : when the shift value is positive, the image is shifted upwards, when the value is negative, the image is shifted downwards.

Shifting in a horizontal direction : when the shift value is positive, the image is shifted to the right, when the value is negative, the image is shifted to the left.



Size

Highlight Size by pushing the control disk up or down and press **ENTER** to select.



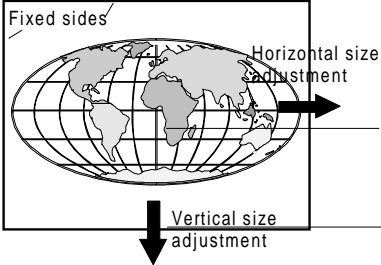
The size can be adjusted in a vertical or horizontal way.

When adjusting the vertical size,
 for table mount configuration : the upper side of the image is fixed and only the lower side can be moved to its exact position.
 for ceiling mount configuration : the lower side of the image is fixed and only the upper side can be moved to its exact position.

When adjusting the horizontal size, the left side of the image is fixed and only the right side can be moved to its exact position.

Hint : Before sizing the image, be sure that

- for table mount configuration the upper left corner is correctly positioned on the screen. Use the Shift function to position this corner.
- for ceiling mount configuration the upper left corner is correctly positioned on the screen. Use the Shift function to position this corner.



Example for table mount configuration

Side keystone

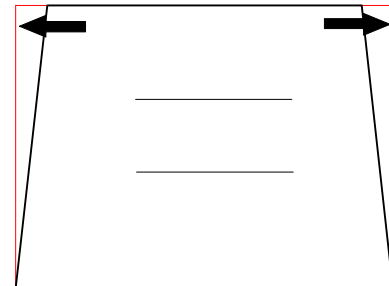
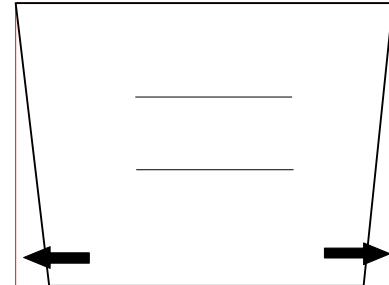
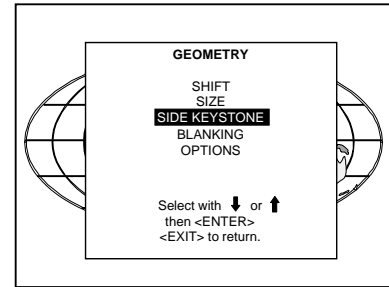
Highlight Side Keystone by pushing the control disk up or down and press **ENTER** to select.

The side keystone adjustment is used to align the image if the projector is mounted as a non standard projection angle.

Push the control disk to the right or to the left to adjust the keystone of the image.

When the upper part of the image is wider than the lower part of the image, push the control disk to the left. The number indication below the bar scale will be negative.

When the upper part of the image is smaller than the lower part of the image, push the control disk to the right. The number indication below the bar scale will be positive.



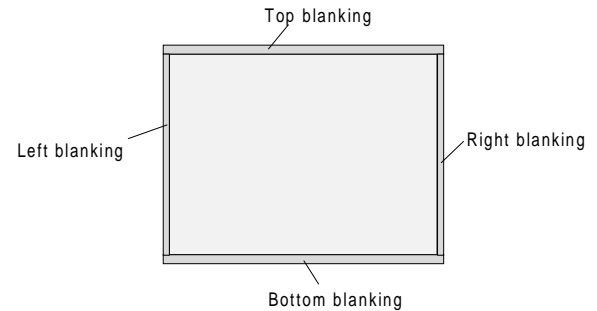
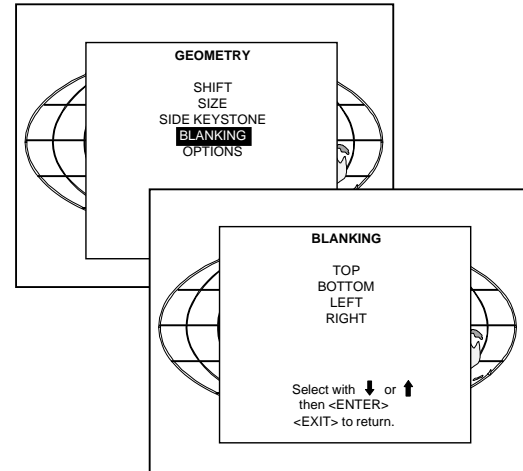
Blanking

Highlight Blanking by pushing the control disk up or down and press **ENTER** to select.

Blanking adjustments affect only the edges of the projected image and are used to frame the projected image on to the screen and to hide or black out unwanted information (or noise). A 0% on the bar scale indicates no blanking.

The following blanking corrections are possible :

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

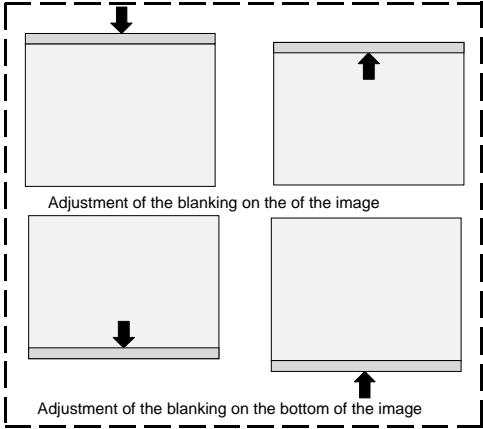


Random Access Adjustment Mode

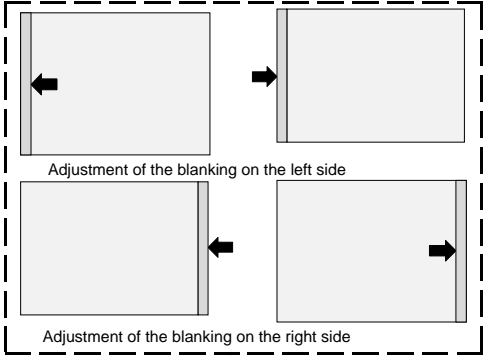
BLANKING

- TOP
- BOTTOM
- LEFT
- RIGHT

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



Correct by pushing the control disk up or down

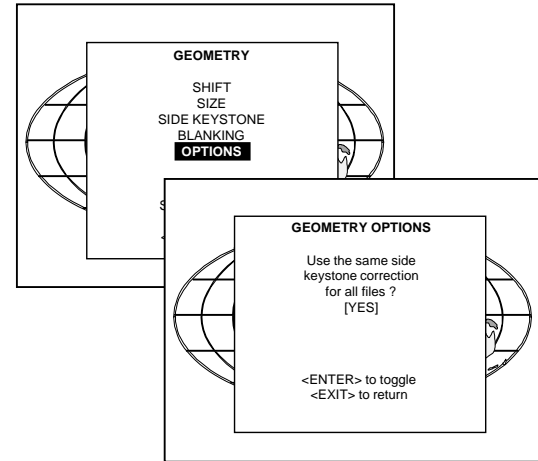


Correct by pushing the control disk to the right or to the left

Options

Highlight Options by pushing the control disk up or down and press **ENTER**. The Geometry Options menu will be displayed.
The next question will be asked by the projector :
'Use the same side keystone correction for all files ? [YES] or [NO].
[YES] : the same keystone correction will be used for all installed files.
[NO] : the keystone has to be adjusted file per file.

Push the **ENTER** key to toggle between [YES] or [NO].
Press **EXIT** to return to the Geometry menu.



INSTALLATION

Convergence

Configuration

Internal Patterns

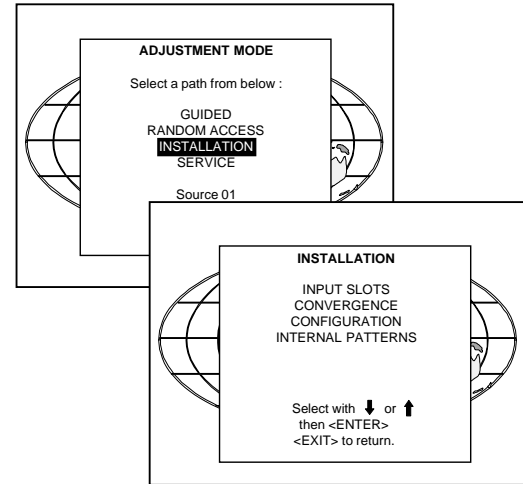
Starting up the Installation Mode

Push the control disk up or down to highlight Installation and then press **ENTER**.

ENTER continues to the Installation mode selection menu.
EXIT returns to operational mode.

The following item can be selected in the Installation mode :

- Input slots : to set up the input priority.
- Convergence : to align the red, green and blue image.
- Configuration : to set up the projector position.
- Internal Patterns

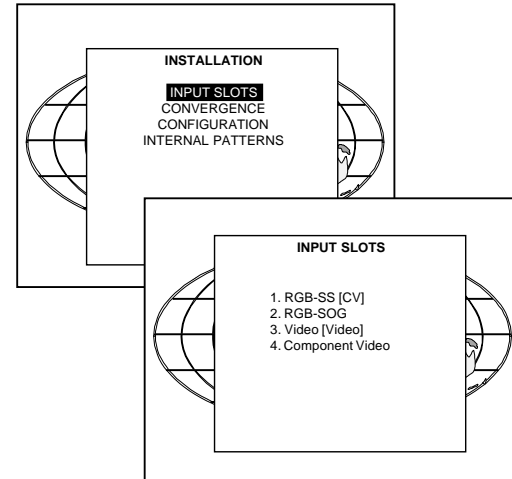


Input Slots

Highlight Input Slots by pushing the control disk up or down and press **ENTER**.

The internal system will scan the input slots and displays the result in the Input Slots menu.

Source	indication
Video or S-Video	Video[Video] Video[S-Video]
RGB analog	RGB-SS[CV] : separate sync is composite video signal on H/C input RGB-SS[CS or HS&VS] : separate sync is composite sync or horizontal and vertical sync RGB-SOG : sync on green
Component video	Component Video - SS : component video with separate sync Component Video - SOY : component video with sync on Y Component Video - 3LSS : component video with 3 level separate sync. Component Video - 3LSOY : component video with 3 level sync on Y.
RGB analog with tri-level sync	RGB3L-SS : RGB with separate Tri level sync RGB3L-SOG : RGB with Tri level sync on green



If a RCVDS (switched on) or VS05 is connected to the projector, it will be also indicated on the menu by adding *+800 peripheral*. If no 800 peripheral indication is made on the menu, there are still two possibilities :

- no RCVDS or VS05 connected or
- RCVDS is switched off.

When a 800 peripheral is connected to the projector, the input slots are not accessible with the control disk to toggle their function.

Convergence

Highlight "*Convergence*" by pushing the control disk up or down and press **ENTER** to display the convergence selection menu. Every LCD panel has 6 adjustment screws. By turning these screws you change the relative position of the panels and converge the image.

Always start with the adjustment of the green panel. When the green image is correctly focused, it will later on be used as the reference image to converge the red and blue image.

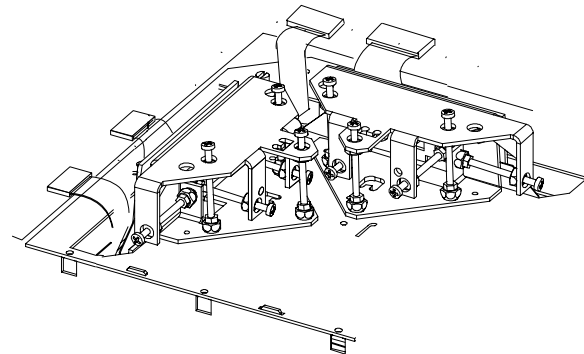
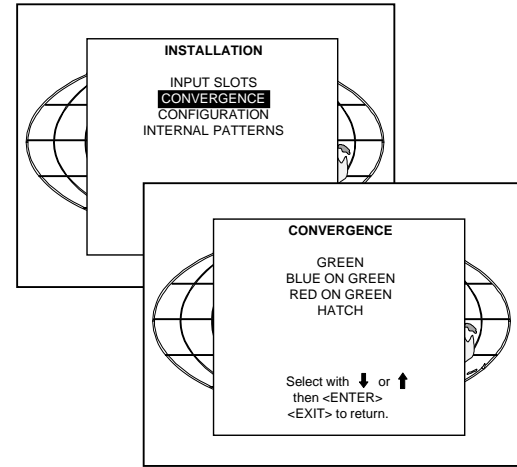
Next alignments have to be done :

You have to adjust the green panel until the indicated lines on the screen are focused (sharp lines). Continue with the red panel and adjust until the red lines coincide with the green lines. Than continue with the blue panel until the blue lines coincide with the green lines.

Follow the next procedure to adjust the LCD panels.

* Open the top cover as described in *Change password* in chapter *Service Mode*.

The three mounting parts for the LCD's (two are shown on the drawing below) are located on the black metal cover. The screws are indicated from 1 to 6 for each color.

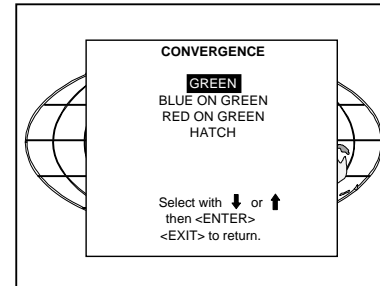


To adjust the convergence, there are test patterns provided in the convergence menu.

Use the control disk to highlight *Convergence* and press **ENTER** to display the *Convergence* menu.

Start with the Green test pattern and continue with the Red on green and finish with the Blue on green.

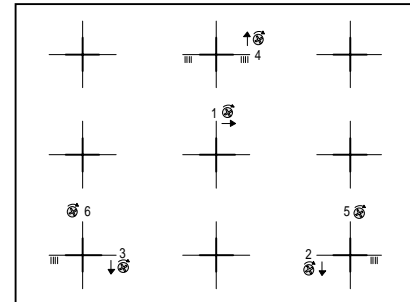
Use the control disk to select *Green* and press **ENTER** to display the green pattern.



The pattern shows lines of one pixel.

Near six lines on the displayed pattern, a screw is drawn with a number next to it (e.g. if displayed in green = corresponding with the screws and numbers on the green LCD panel).

When turning a screw in the direction marked by the arrow above the displayed screw on the screen, the line on the screen moves in the direction of the straight arrow.



Green focusing

- Adjust the projection lens until optimal focus for the lines 5 and 6 is obtained (hint : use the focusing marker lines next to the indicated points)
- Turn screw 4 for optimal focus of the corresponding green line 4 on the screen.
- Turn screw 5 for optimal focus of the corresponding green line 5 on the screen.
- Turn screw 6 for optimal focus of the corresponding green line 6 on the screen.

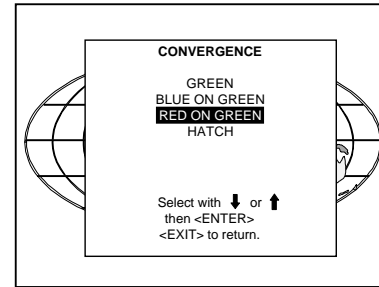
Installation

The three alignments influence each other, therefore repeat if necessary the above three steps (b,c and d).

When the green pattern is correctly focused, press **EXIT** to return to the *Convergence* menu.

Red on green convergence.

Use the control disk to highlight *Red on green* and press **ENTER** to display the Red on green test pattern.



The longest lines are the red lines. These lines must be converged with the green lines.

The drawn screws and numbers are displayed in red.

Follow next steps :

a. Adjust first screws 4, 5 and 6 to obtain an optimal focus for respective lines 4, 5 and 6.

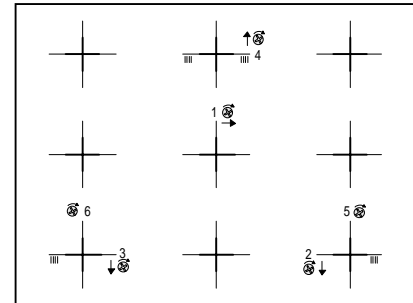
Due to interaction, it may be necessary to repeat step a several times.

Follow next steps to converge the red lines with the green lines :

b. Start with screw 2 and adjust for optimal convergence of line 2.

c. Adjust screw 3 for optimal convergence of line 3.

Due to interaction repeat above two steps (b and c) if line 2 and possibly line 3 is misaligned.



If both lines are correctly converged, continue with screw 4.
Adjust screw 4 until line 4 is correctly converged. It is possible that line 2 and 3 have to be reconverged. If so, repeat procedure for screw 2 and 3 (step b and c)

If line 2, 3 and 4 are converged, continue with line 1 (screw 1).

When line 1 is converged, check again the convergence of lines 2, 3 and 4. If necessary repeat the above procedure for the corresponding lines.

Check if lines 5 and 6 are correctly converged. If so, press **EXIT** to return to the *Test pattern* menu and continue with Blue on green.

If not yet correctly converged, check the distance between lines 5 and 6 of the red pattern and the distance between lines 5 and 6 of the green lines.

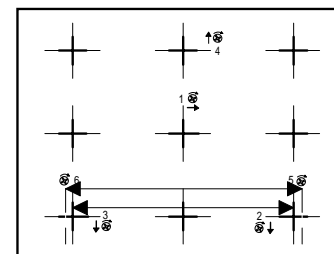
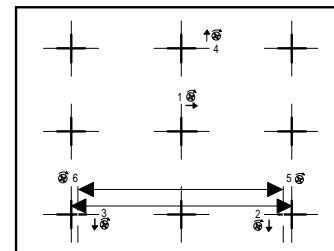
Two possibilities :

1) distance between red lines is smaller than distance between green lines.
Turn screw 5 and 6 clockwise until distance between lines 5 and 6 is the same for the red and green lines.

2) distance between red lines is greater than distance between green lines.
Turn screw 5 and 6 counter clockwise until distance between lines 5 and 6 is the same for the red and green lines.

Due to this movement the lines 1, 2, 3 and 4 may be out of convergence. Repeat the above mentioned steps for the respective lines.

If all lines are correctly converged, press **EXIT** to return to the *Test pattern* menu.



Installation

Blue on green convergence.

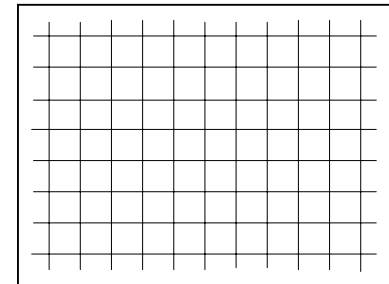
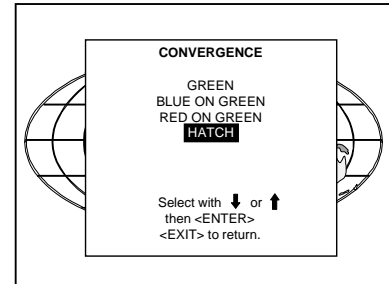
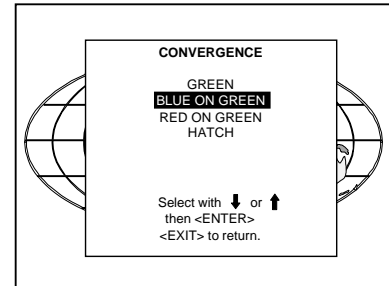
Use the control disk to highlight *Blue on green* and press **ENTER** to display the Blue on green test pattern.

Repeat the same procedure as for Red on green lines but read blue when red is indicated.

To check the result of the convergence adjustments, highlight *Hatch* and press **ENTER**. A hatch pattern will be displayed on the screen.

ENTER : displays a hatch pattern.
EXIT : returns to the installation menu.

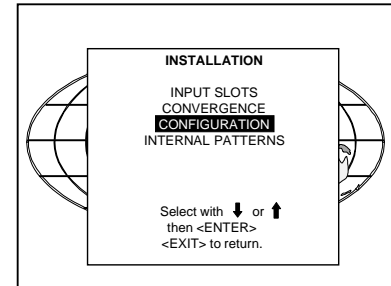
All lines must be displayed in white, if not so repeat the convergence adjustment procedure.



Configuration

Highlight "Configuration" by pushing the control disk up or down and press **ENTER** to select.

For more information, see Projector configuration in chapter Installation Set Up.



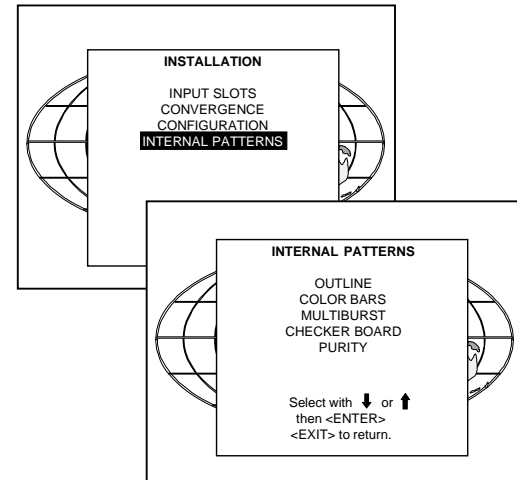
Internal Patterns

The projector is equipped with different internal patterns which can be used for measurement purposes.

Highlight "Internal Patterns" by pushing the control disk up or down and press **ENTER** to display the Internal Pattern selection menu.

The following test pattern are available :

- Outline
- Color Bars
- Multiburst
- Checker Board
- Purity



SERVICE MODE

Identification

Change Password

Change Language

Change Projector Address

Change Baudrate PC

Reset Lamp Run Time

Lamp Run Time History

Panel Adjustments

Preset Color Balance

I²C Diagnosis

Starting up the Service Mode

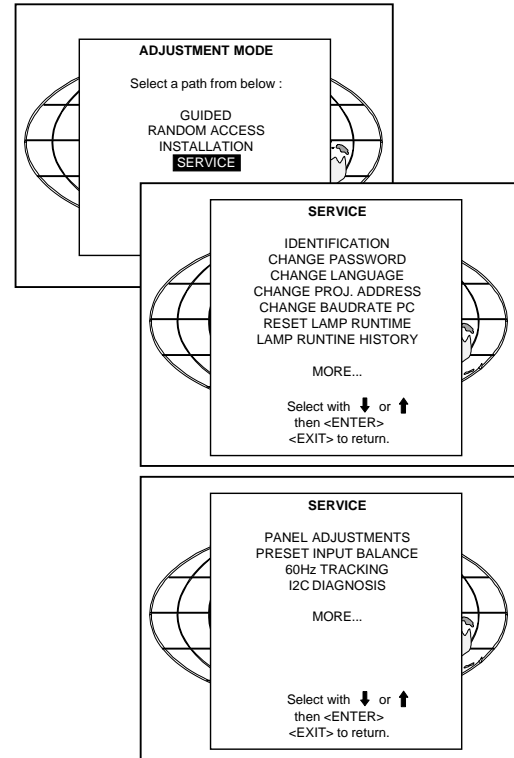
Push the control disk up or down to highlight Service and then press **ENTER**.

Some items in the Service mode are password protected (when the password function is active). Enter your password to continue. All other password protected items are now available if you stay in the adjustment mode.

The service menu is built-up in two parts which are connected together with the 'more' item.

If the disered item is not in the list of the displayed menu, select more with the control disk and push **ENTER** to display the other items in the service menu.

ENTER continues to the Service mode selection menu.
EXIT returns to operational mode.



SERVICE

IDENTIFICATION
 CHANGE PASSWORD
 CHANGE LANGUAGE
 CHANGE PROJ. ADDRESS
 CHANGE BAUDRATE PC
 RESET LAMP RUNTIME
 LAMP RUNTIME HISTORY

MORE...

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

SERVICE

PANEL ADJUSTMENTS
 PRESET INPUT BALANCE
 60Hz TRACKING
 I2C DIAGNOSIS

MORE...

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

BARCO GRAPHICS 8200

Proj. address : 001
 Soft. version : 3.0
 Config : front/
 ceiling
 Baudrate PC : 9600
 text : ON
 Serial no. : 1010200
 Run time : 100 h

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

CHANGE PASSWORD

Enter new password
 0000

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

CHANGE LANGUAGE

ENGLISH

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

CHANGE PROJ. ADDRESS

Enter new address
 001

Select with → or ←
 Reprogram with ↓ or ↑
 or numeric keys
 <ENTER> to confirm
 <EXIT> to return

CHANGE BAUDRATE PC

9600
 4800
 2400
 1200
 600
 300
 150
 75

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

RESET LAMP RUN TIME

Enter the
 serial number
 of the new lamp
 0000000

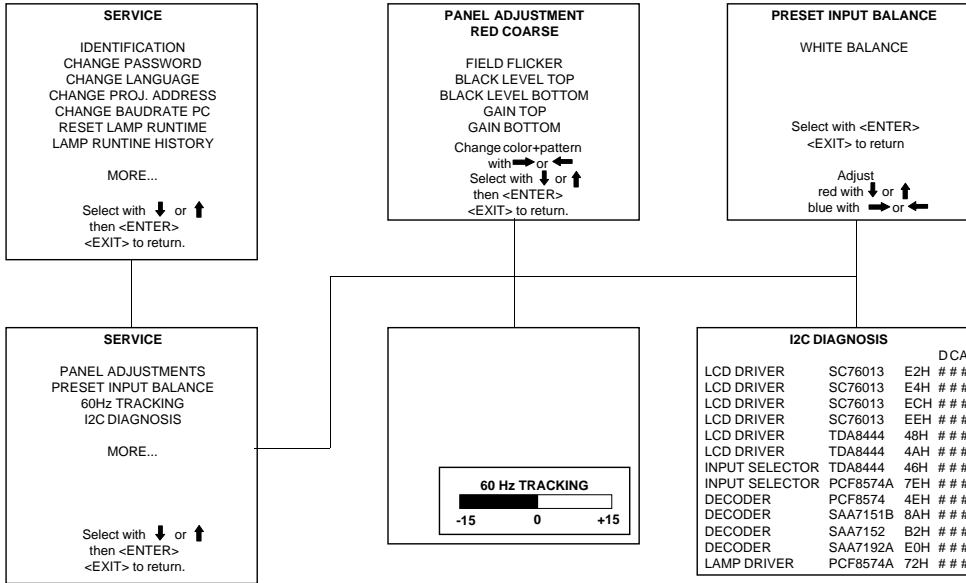
Select with → or ←
 Reprogram with ↓ or ↑
 or numeric keys
 <ENTER> to confirm
 <EXIT> to return

LAMP RUNTIME HISTORY

Serial No	Runtime
> 0111121	600 h
0110031	750 h
0110010	745 h

<EXIT> to return

Service Mode



Identification

To display the Identification screen, push the control disk up or down to highlight *Identification* and press **ENTER** to display the *Identification* screen.

The Identification screen gives an overview of :

- type of projector
- projector address
- software version
- installation configuration
- baud rate
- text ON
- projector serial number
- projector run time

- *type* of projector : BARCOGRAPHICS 8200

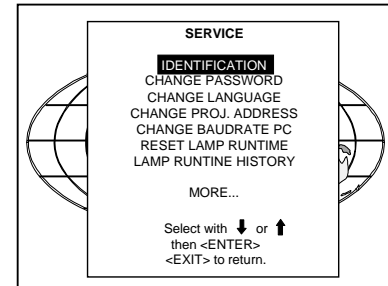
- *software version*

- *Proj. Address* : to change the address of the projector, see Change Projector Address in this chapter.

- *Installation* : possible installations :

- * Front/Ceiling
- * Front/Table
- * Rear/Ceiling
- * Rear/Table

To change the installation configuration follow the instructions in chapter Installation Set Up.



Service Mode

- *Baud rate* : transfer speed for communication with a IBM PC (or compatible) or MAC. The baud rate of the projector must be the same as the baud rate of the connected computer. When there is a difference, consult Set up of the baud rate for communication with a computer in chapter Connections.

- *Projector Run Time* : gives the total run time since the first start up. All projectors leave the factory with a run time of approximately 24 hours.

- *Projector Serial number* : indicates the fabrication number of the projector. This number can be useful when calling for technical assistance.

Change Password

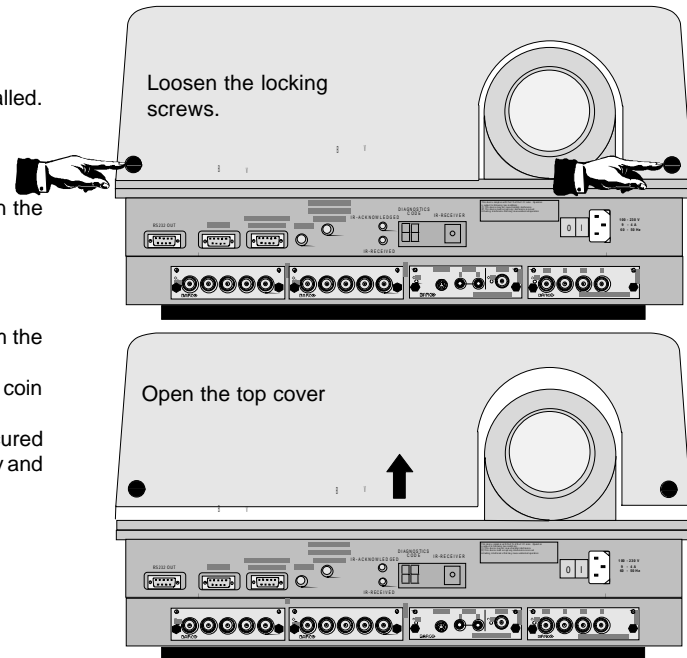
This item is password protected when the password strap is installed.

How to enable or disable the password function ?

The password function is enabled when the password strap on the controller module is installed.

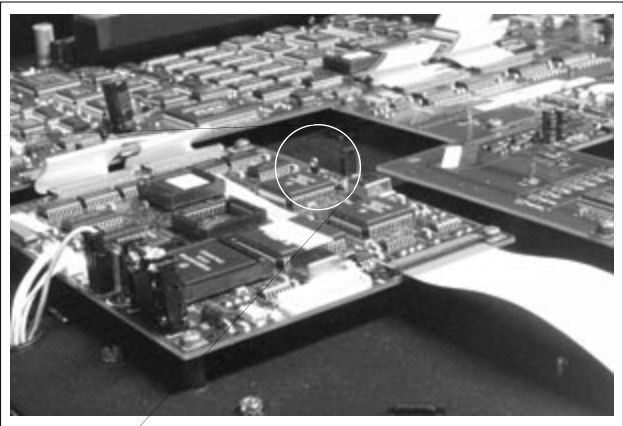
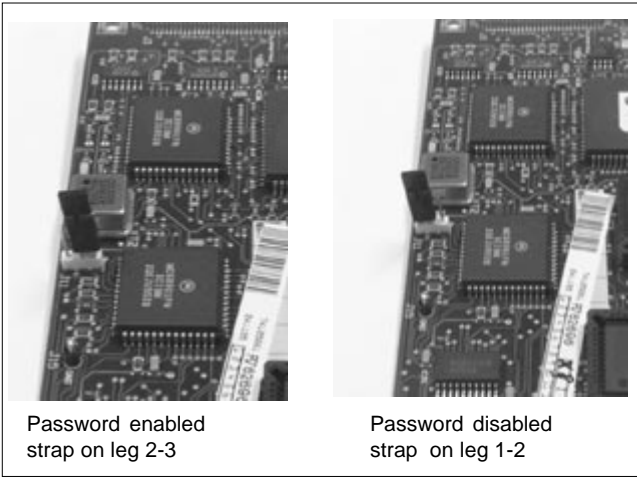
To gain access to the controller module, handle as follows :

- Power down the projector and disconnect the power cord from the wall outlet.
- Turn both lock screws of the front top cover with a screwdriver or coin counter clockwise.
- Lift up and pivot the top cover. Attention : the cover is not secured with an incorporated support. When opening, turn it over slowly and lay it down on the second part of the top cover.



Service Mode

When the strap is on leg 2-3 or no strap is mounted, the password function is enabled, when the strap is on leg 1-2, the password function is disabled.



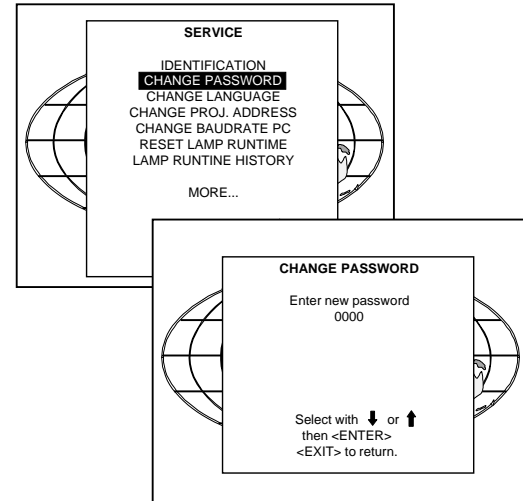
How to change the password ?

Highlight Change password by pushing the control disk up or down and press **ENTER** to display the Change Password menu.

ENTER displays the Change Password menu
EXIT returns to the adjustment selection menu.

The old password is displayed and can be changed by entering the digit with the numeric keys of the RCU or local keypad.

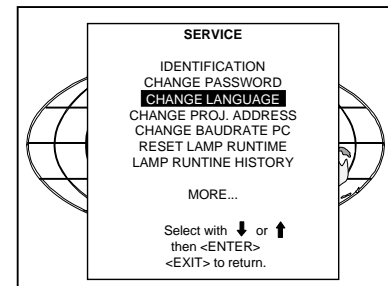
Press **ENTER** to save the new entered password.
 Press **EXIT** if no changes have to be made.



Change Language

Highlight Language by pushing the control disk up or down and press **ENTER** to select the Language Selection menu.

For the moment, only English is available.

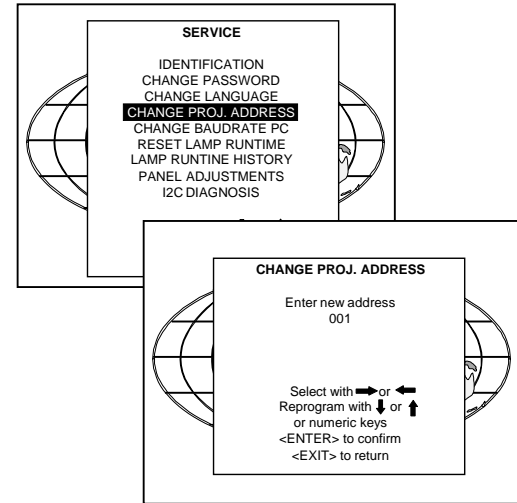


Change Projector Address

Every projector requires an individual address between 0 and 255. This address can be software installed.

To change that address, push the control disk up or down to highlight Change Proj. Address and press **ENTER**. The Change Projector Address menu will be displayed and the actual address will be filled in. The first digit is highlighted. Enter the new projector address with:

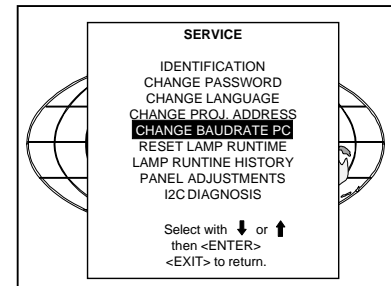
- the digit keys on the RCU or the local keypad or
- use the control disk to the right or to the left to select a digit and change the value by pushing the control disk up or down until the new value is reached. Continue with the other digits on the same way.



Change Baudrate PC

The communication speed between projector and computer, e.g. PC or MAC, has 8 possible speeds. The baud rate speed can be software set up.

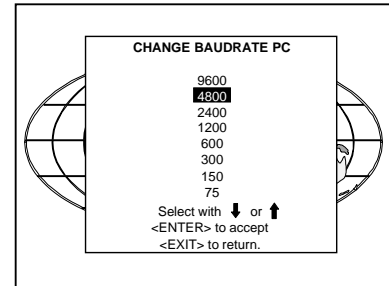
Highlight Change Baud rate PC by pushing the control disk up or down and press **ENTER** to display the Change Baudrate PC.



The following baud rates are available :

- 9600
- 4800
- 2400
- 1200
- 600
- 300
- 150
- 75

The actual baud rate will be highlighted. To change the baud rate, push the control disk up or down and press **ENTER** to accept the new baud rate setting.

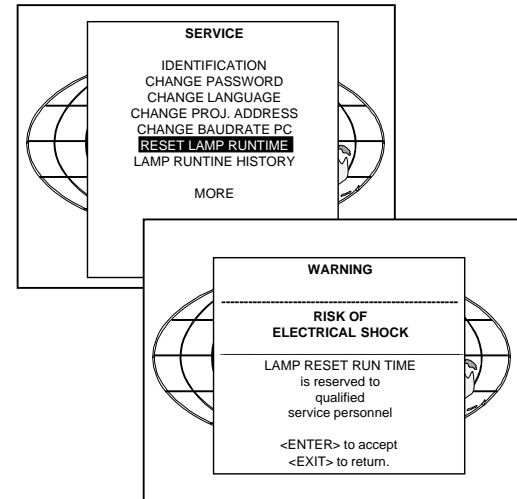


Reset Lamp Runtime

Reset lamp run time is only allowed when a new lamp is installed. Highlight Reset Lamp Run Time by pushing the control disk up or down and press **ENTER** to select.

When Reset Lamp Run Time is selected in the Service Mode selection menu, the following warning will be displayed :

Risk of electrical shock. Reset lamp run time is reserved to qualified service personnel.
If you are not qualified, press **EXIT** to cancel the reset operation.



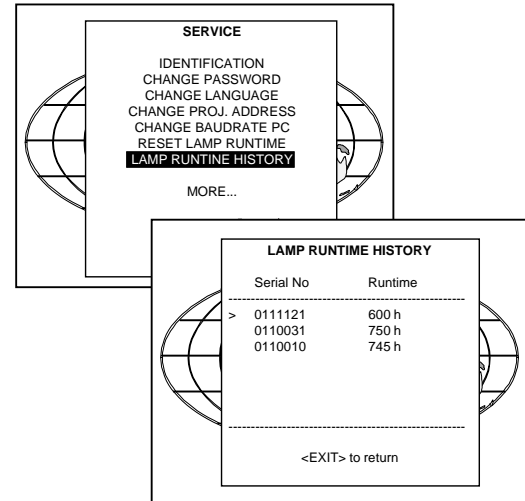
Lamp Run Time History

To get an overview of the different lamp run times, highlight Lamp Run Time History by pushing the control disk up or down and press **ENTER**.

A listing with the lamp serial number and the corresponding run time will be displayed.

The actual installed lamp will be marked.

Press **EXIT** to return to the service mode selection menu.



Panel Adjustments

Changing these settings may seriously affect the performance of the projector.

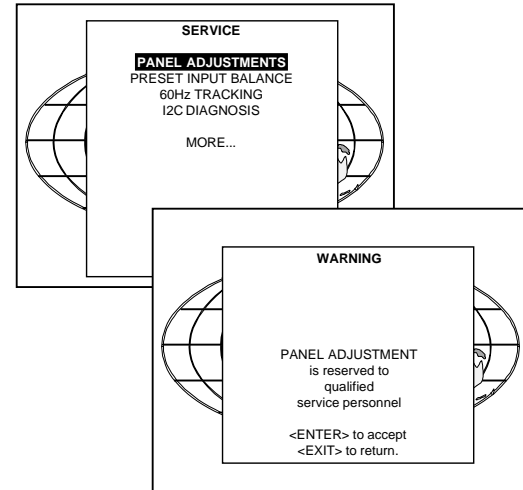
All panel adjustments are factory adjusted. If not really necessary, do not touch one of these adjustments. They are useful when a new panel is installed.

Highlight Panel Adjustments by pushing the control disk up or down and press **ENTER**

When Panel Adjustments is selected in the Service Mode selection menu, the following warning will be displayed :

Risk of electrical shock. Panel Adjustments is reserved to qualified service personnel.

If you are not qualified, press **EXIT** to cancel the panel adjustments.



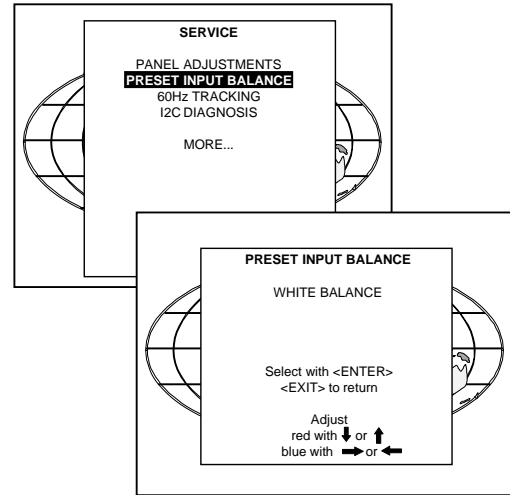
Preset Input Balance

Highlight White Balance by pushing the control disk up or down and press **ENTER** to select.

With the white balance adjustment, the gain of the red and blue channels can be adjusted in comparison with the green channel. (To adjust the gain of the complete video signal, use the contrast adjustment)

Use the control disk by pushing up or down to change Red or by pushing to the right or to the left to change Blue.

Press **EXIT** to return to the Preset Input Balance menu.



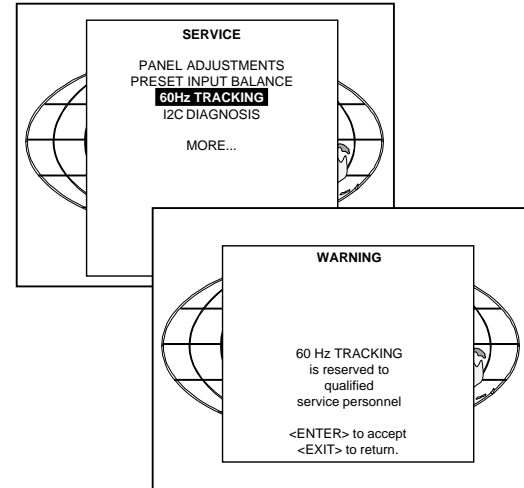
60 Hz Tracking

60 Hz tracking is used to adjust the 60 Hz by synchronous signals

Highlight *60 Hz Tracking* by pushing the control disk up or down and press **ENTER**.

When 60 Hz Tracking is selected in the Service Mode selection menu, the following warning will be displayed :

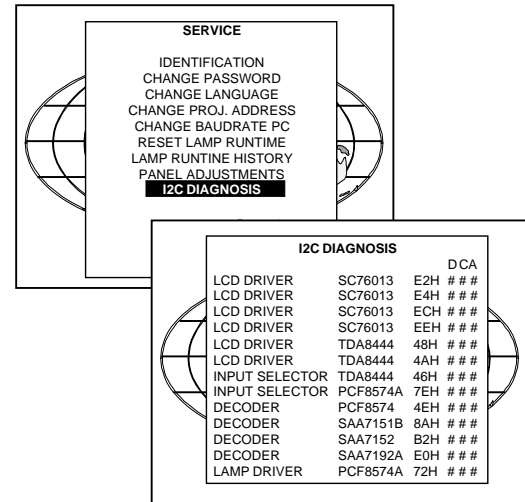
60 Hz Tracking is reserved to qualified service personnel.
If you are not qualified, press EXIT to cancel the 60 Hz Tracking.



Service Mode

I2C diagnosis.

Give an overview of the correct working of the I²C controlled IC's.
Highlight I2C diagnosis by pushing the control disk up or down and press **ENTER** to display the overview.



OPTIONAL EQUIPMENT

IR remote receiver

Hardwired RCU

RCVDS05

VS05

MAGIK interface

Adapter and communication cables

Ceiling mount kit CM100

Transport handle

Frame for dual or triple projection

Multifunctional flightcase

Mechanical shutter

Adjustable lensholder

Optional Equipment

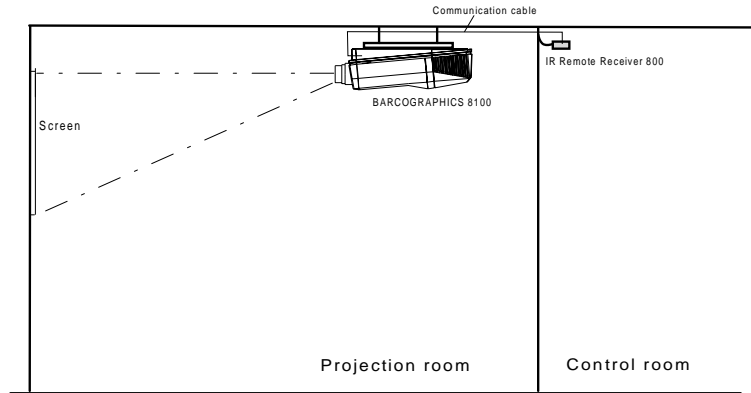
IR Receiver 800

This infra red receiver unit makes it possible to control the BARCOGRAPHICS 8200 from another room.

There is a communication line with cable between the IR receiver and the projector or the RCVDS. The control information from the RCU can now be sent to this IR receiver.

The IR receiver 800 displays the selected source on a 7-segment display.

Order number : R9827515



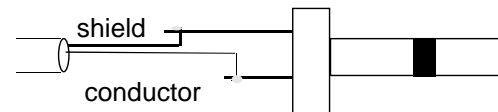
Hardwired RCU.

The control signals from the RCU can be sent to the projector via a wired connection. (How to use the hardwired RCU, see chapter Controlling)

Preparing your remote cable :

Use a shielded cable with a maximum length of 100 m and two mini-jack 3.5 mm connectors (order number : R3131991).

- Peel back the vinyl covering of the cable on both sides and twist the wire core.
- Solder a jack plug as shown in drawing above to each end of the cable.
 - shield = ground
 - conductor = data information



When the cable is ready, plug one side in the remote control and the other side in the connector on the rear of the projector labelled 'remote'.

RCVDS 800 / RCVDS 05

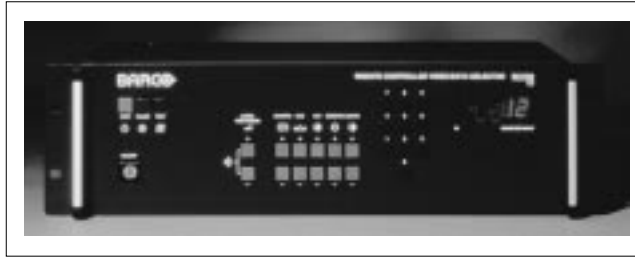
An optional RCVDS 05 source selector makes it possible to connect up to 10 (20 if video) sources to the projector. When RCVDS's are linked via the expansion module, even 90 inputs can be connected to the projector.

The selected source number will be displayed on a 2 digit display and the selected input module will be indicated with a LED on the rear.

Order number : R9828880 (230V) without input modules

RCVDS 05 R9828888 (120V) with input modules

 R9828889 (120V) without input modules



VS05

The VS05 is a versatile Video and HDTV source selector for all BARCO's digitally controlled large screen projectors. It offers the possibility to connect and switch up to 5 different Video sources, 3 different S-Video sources and 1 RGB Analog source to a BARCO projector. In addition, the audio signal proper to the source, can be switched to an audio amplifier.

Order number : R9827890



Optional Equipment

MAGIK Interface

Multifunctional Analog Graphics Interface Kit.

BARCO's MAGIK interface allows the user to connect a presentation device such as a projector or a professional monitor to any computer with analog video signal with or without maintaining the connection with its own display. The MAGIK interface buffers and amplifies any RGB analog signal with TTL or analog sync without signal loss or image degradation.

The MAGIK can be delivered together with connection cables for PC, MAC, SUN or workstation in a nice handbag case.

Order numbers MAGIK with cables and case :

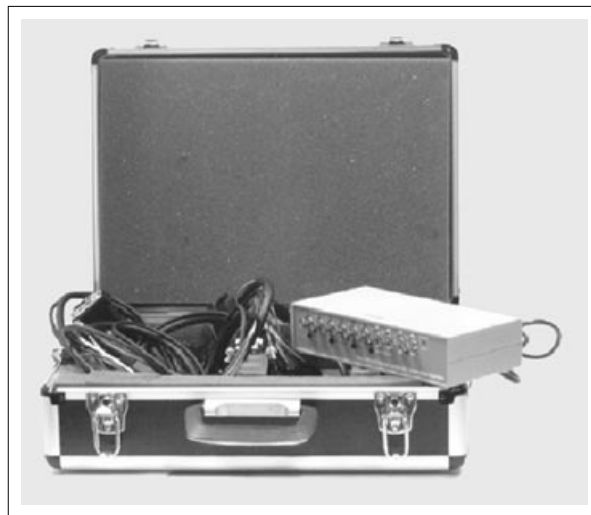
R9828120 (230V)

R9828129 (120V)

Order number MAGIK only :

R9828121 (230V)

R9828128 (120V)



Adapter and communication cables

BARCO provides several cables to connect peripheral equipment to the BARCOGRAPHICS 8200.

a. D9-D9 communication cable

- To connect an IBM PC (or compatible) to the projector.(only if the optional RS232 port is installed.)
- To connect a RCVDS 05 to the BARCOGRAPHICS 8200.
- To connect a IR receiver to the RCVDS or to the BARCOGRAPHICS 8200.
- To be used as extension cable for all other adapter cables.

Available length :5 m (16ft), order number R982770; 15 m(50ft), order

number R9827640; and 30 m (100ft), order number R9827570

b. Din Mini8-D9 adapter cable.

- To connect a Macintosh computer to the BARCOGRAPHICS 8200.
(only if the optional RS232 port is installed.)
Available length : 1 m, order number R9827640.

c. D25-D9 adapter cable

- To connect a workstation to the BARCOGRAPHICS 8200.(only if the optional RS232 port is installed.)
Available length : 1 m, order number R9827630

d. 5 BNC to 5 BNC cable

- To connect an analog source to the BNC input of the projector.
Available length : 60 cm, order number R9828260
 150 cm, order number R9828261
 5 m, order number R9828262
 15 m, order number R9828263

Ceiling Mount Kit CM100

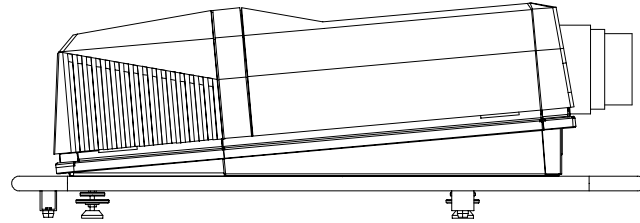
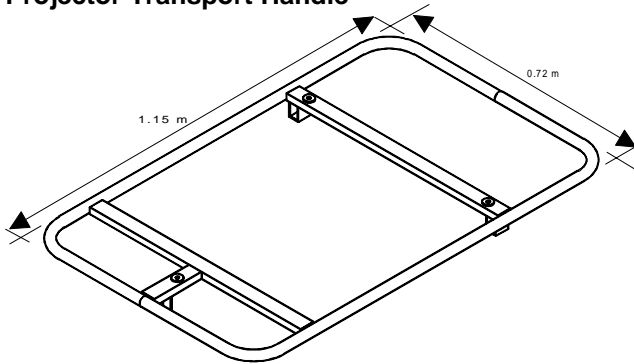
This heavy duty ceiling mount kit, together with the CM100 adapter plate enables the projector to be installed in any ceiling mount application. A heavy duty pulley facilitates installation and maintenance.

Order number CM100 : R9829620

Order number CM100 without pulley : R9829621

Optional Equipment

Projector Transport Handle



Order number : R9829170

Projector Frame for Dual or Triple Configurations

The frame is designed for use in table as well as ceiling mount configurations. The projector can be easily locked in the solid black frame via three bolts. The modular construction of the frame enables dual or triple configurations, in combination with the adjustable lensholder for convergence of the two or three images and provides a very high light output.

Projection Frame, Order number : R9829210.



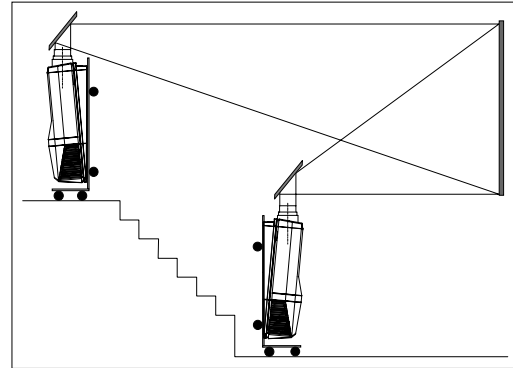
Multifunctional flight case

BARCO's multifunctional flight case is a special designed flight case for temporary installations of a BARCOGRAPHICS 8200 projector. Due to the advanced mechanical design of the flight case and the built-in mirror, it is possible to install the projector in a horizontal as well as in a vertical position - in ceiling mount or table configuration - without removing the projector out of the flight case. It is even possible to use the flight case in a dual or triple configuration.

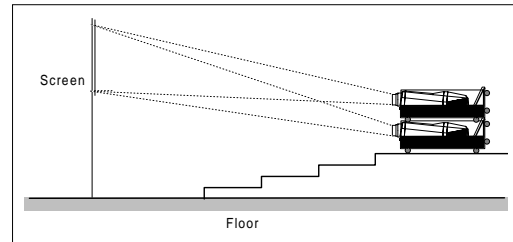
Features:

- Heavy duty black cover with aluminium corners and profiles for maximum protection and easy stackability.
- Solid handles and wheels on two sides assure maximum transportability.
- Can be installed in horizontal as well as vertical position, in single, dual or triple projector configurations.
- Built-in mirror for vertical projection in ceiling mount as well as table configuration.
- Adjustment of the projector in a quick set-up, both in single as in multiple projection configuration.
- Additional cooling system for upright vertical projection position.

Order number : R9829110



The built-in mirror makes it possible to install the projector in vertical position (in table or ceiling mount configuration).



The advanced mechanical design of the flightcase enables dual or triple projection configurations.

Optional Equipment

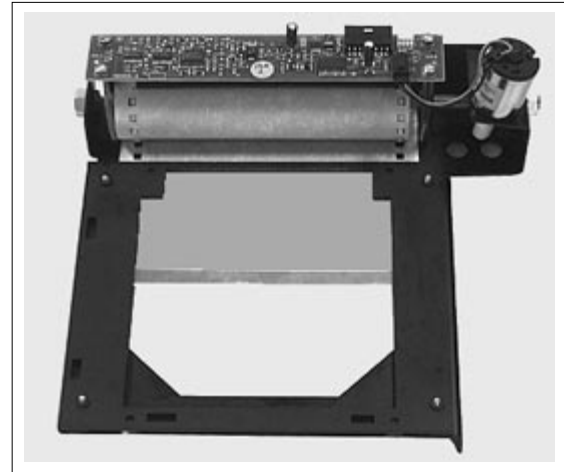
Mechanical Shutter

BARCO's mechanical shutter can be used there where the display has to be totally black when the projector is set in pause. This can be very useful when the projector is used together with a slide-projector.

Features:

- Is installed inside the projector.
- The shutter is controlled through the 'pause' button on the RCU.
- The shutter is powered through the power supply of the projector.
- The fading time is adjustable through RS232 communication.
- Reaction time less than 0.5 seconds.

Order number : R9829270



Adjustable lensholder

With BARCO's special adjustable lensholder, it is possible to shift the displayed picture of the BARCOGRAPHICS 8200 projector up or down on the screen, without moving the projector from its normal position, and without any geometric picture distortion. This system is particularly useful for use in dual or triple projector configurations, or for applications where the projector can not be installed in its standard position.

Features :

- Vertical shift of the lens possible between 20 mm (0.79") up to 6 mm (0.24") down without removing the projector cover.
- Shift of the displayed picture on the screen up till 2 meters (6.5 ft) over its standard position.

- Makes it possible to project a geometric non-distorted picture from a non-standard projection position.
- The shift of the lensholder is not determined by the lens used, but depends on the screen width.
- Can be used with all available lenses.
- Can be used in dual or triple configuration in combination with BARCO's projection frame or multifunctional flight case.

Standard source set up files.

Standard preprogrammed set up files

NAME	RESOLUTION	FVERT Hz	FHOR kHz	FPIX MHz	PTOT	PACT	LTOT	LACT
CGA	640 X 200	59,924	15,700	14,318	912	640	262	200
NTSC	675 X 240I	29,970	15,734	13,500	858	720	263	240
NTSC_2	675 X 240I	29,970	15,734	13,500	858	720	263	240
NTSC_3	675 X 240I	29,970	15,734	13,500	858	720	263	240
PAL	675 X 278I	25,000	15,625	13,500	864	720	313	278
PAL_2	675 X 278I	25,000	15,625	13,500	864	720	313	278
PAL_3	675 X 278I	25,000	15,625	13,500	864	720	313	278
SECAM	675 X 278I	25,000	15,625	13,500	864	720	313	278
SECAM_2	675 X 278I	25,000	15,625	13,500	864	720	313	278
SECAM_3	675 X 278I	25,000	15,625	13,500	864	720	313	278
EGA	640 X 350	59,702	21,851	16,257	744	640	366	350
MAC_5	512 X 342	60,158	22,259	15,670	704	512	370	342
MAC_3	512 X 384	60,147	24,480	15,667	640	512	407	384

Name : name of file, contains the settings
Resolution : image resolution, when followed by ...I means interlaced.

FVERT Hz : vertical frequency of the source

FHOR kHz : horizontal frequency of the source.

FPIX MHz : pixel frequency

PTOT : total pixels on one horizontal line

PACT : active pixels on one horizontal line

LTOT : total lines in one frame

LACT : active lines in one frame

Appendix A : Standard Source Set Up Files

NAME	RESOLUTION	FVERT Hz	FHOR kHz	FPIX MHz	PTOT	PACT	LTOT	LACT
MAC_4	560 X 384	60,147	24,480	17,234	704	560	407	384
8514-A	1024 X 384	43,479	35,522	44,900	1264	1024	409	384
VGA_TXT	720 X 400	70,087	31,469	28,322	900	720	449	400
COMPUSC4	1024 X 480	29,945	30,694	39,779	1296	1024	512	480
VGA_72V	640 X 480	72,800	37,856	31,496	832	640	520	480
VGA_GR	640 X 480	59,941	31,469	25,175	800	640	525	480
VGA75ISO	640 X 480	75,000	39,375	31,500	800	640	525	480
MAC_2	640 X 480	66,667	35,000	30,240	864	640	525	480
MAC_LC	640 X 480	66,619	34,975	31,338	896	640	525	480
MUSE	960 X 518	30,000	33,750	37,125	1100	960	563	518
HDMAC	1008 X 570	25,020	31,250	39,125	1252	1008	625	570
SVGA_56V	800 X 600	56,250	35,156	36,000	1024	800	625	600
SVGA_60V	800 X 600	60,317	37,879	40,000	1056	800	628	600
SVGA_72V	800 X 600	72,084	48,080	50,003	1040	800	667	600
XGA_70V	1024 X 768	69,705	56,182	74,610	1328	1024	806	768
XGA_60	1024 X 768	60,000	48,360	64,996	1344	1024	806	768

Appendix A : Standard Source Set Up Files

NAME	RESOLUTION	FVERT Hz	FHOR kHz	FPIX MHz	PTOT	PACT	LTOT	LACT
XGA_75	1024 X 768	75,781	61,080	86,000	1408	1024	806	768
XGA75_GS	1024 X 768	74,534	59,701	79,284	1328	1024	801	768
XGA_72	1024 X 768	71,955	58,140	80,000	1376	1024	808	768
SUP_MAC	1024 X 768	60,000	48,780	63,999	1312	1024	813	768
XGA_70	1024 X 768	70,000	57,050	78,044	1368	1024	815	768
MAC_POR	640 X 870	74,996	68,846	57,280	832	640	918	870
INTER_GR	1184 X 886	67,170	61,796	92,941	1504	1184	920	886
EWS_50	280 X 1024	50,000	52,350	87,948	1680	1280	1047	1024
EWS_60	280 X 1024	60,000	63,900	107,352	1680	1280	1064	1024
EWS_60V	280 X 1024	60,282	63,657	110,000	1728	1280	1056	1024
EWS_72	280 X 1024	72,000	76,968	130,076	1690	1280	1069	1024
EWS_75	1280 X 1024	75,025	79,976	135,000	1688	1280	1066	1024
SG_60_1	1280 X 1024	60,000	63,900	107,352	1680	1280	1064	1024
SG_60_2	1024 X 768	60,000	48,780	64,390	1320	1024	812	768
SG_60_3	960 X 680	60,000	43,200	54,432	1260	960	720	680
ED	735 X 480	59,940	31,470	27,000	910	735	525	480

Appendix A : Standard Source Set Up Files

NAME	RESOLUTION	FVERT Hz	FHOR kHz	FPIX MHz	PTOT	PACT	LTOT	LACT
PC98_1	640 X 400	56,416	24,823	21,050	848	640	440	400
PC98_2	1120 X 375I	79,987	32,835	47,840	1457	1120	411	375
PC98_3	1120 X 750	60,000	50,000	78,569	1571	1120	833	750
MAC_6	832 X 624	74,550	49,722	57,280	1152	832	667	624
MAC_7	1024 X 768	74,910	60,150	80,000	1330	1024	803	768
PAM500	640 X 400	60,000	26,400	22,810	864	840	440	400
PAM800	1120 X 375I	89,872	36,443	50,000	1372	1120	406	375
FMTO_2	640 X 400	55,370	24,370	21,060	864	640	440	400
FMR	640 X 400I	84,700	36,440	28,570	784	640	431	400
SUNXGA60	1024 X 768	59,984	48,287	64,125	1328	1024	805	768
SUNXGA70	1024 X 768	70,041	56,596	74,250	1312	1024	808	768
SUNXGA77	1024 X 768	77,069	62,040	84,375	1360	1024	805	768
SUNNEWS67	1280 X 1024	67,189	71,691	117,000	1632	1280	1067	1024
SUNNEWS76	1280 X 1024	76,107	81,130	135,000	1664	1280	1066	1024
S1152_66	1152 X 900	66,004	61,846	94,500	1528	1152	937	900
S1152_76	1152 X 900	76,637	71,809	108,000	1504	1152	937	900

Battery replacement in the RCU.

Remove the battery cover on the backside of the remote control by pushing the indicated handle a little to the bottom of the RCU. Lift up the top side of the cover at the same time. (fig. 1)

Remove the battery from the compartment and disconnect the contact plate. (fig. 2)
Connect a new 9 V battery (E-block type, e.g. type 6F22S or equivalent) to the contact plate.
Insert the battery back into the compartment.
Put the cover back.

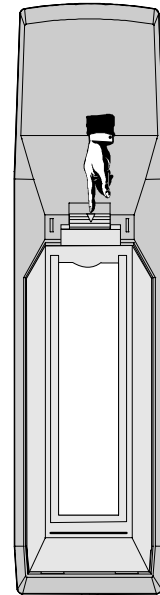
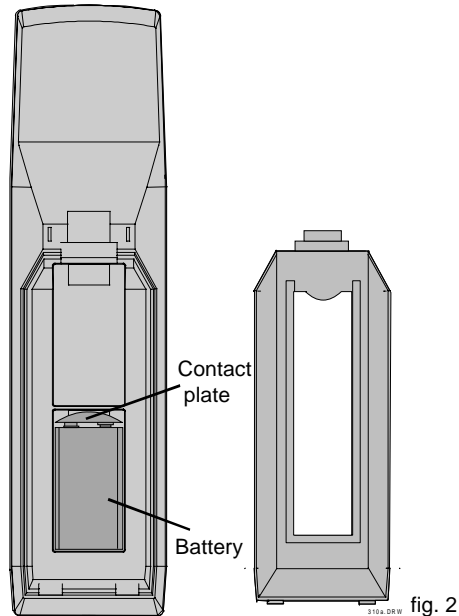


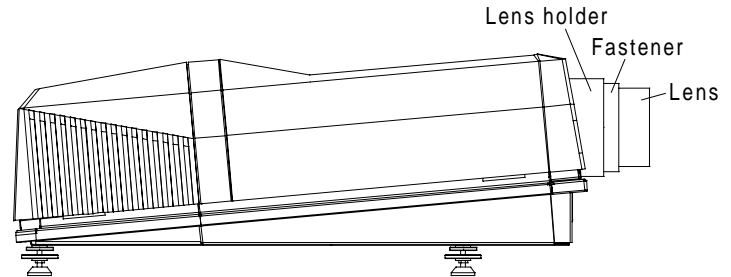
fig. 1

Focusing the lens

Loosen the fastener ring of the lens by turning counter clockwise.

Focus the image by turning the lens barrel to the left or the right. Attention : Do not turn out the lens too far, otherwise it will fall out of the lens holder.

When the image is focused, secure the correct position of the lens with the fastener ring by turning this ring clockwise.



Lens Cleaning Procedure

Cleaning procedure for HD(1.5-3:1) lens and HD(3-5.3:1) lens.

To minimize the possibility of damaging the optical coating or scratching exposed lens surface, we have developed recommendations for cleaning the lens. **FIRST**, we recommend you try to remove any material from the lens by blowing it off with clean, dry deionized air. **DO NOT** use any liquid to clean the lenses.

A Toraysee™ cloth is included with the lens kit.

Proceed as follows :

1. Always wipe lenses with a CLEAN Toraysee™ cloth.
2. Always wipe lenses in a single direction. Do not wipe back and forth across the lens surface as this tends to grind dirt into the coating.
3. Do not leave cleaning cloth in either an open room or lab coat pocket, as doing so can contaminate the cloth.
4. If smears occur when cleaning lenses, replace the cloth. Smears are the first indication of a dirty cloth.
5. Do not use fabric softener when washing the cleaning cloth or softener sheets when drying the cloth.
6. Do not use liquid cleaners on the cloth as doing so will contaminate the cloth.

Order number for a new Toraysee™ cloth : R379058.

Other lenses can also be cleaned safely with this Toraysee™ cloth.

Cleaning procedure for the other HD lens

To minimize the possibility of damaging the optical coating or scratching exposed lens surfaces, we have developed recommendations for cleaning lenses. **FIRST**, we recommend you try to remove any material from the lens by blowing it off with deionized air or **lightly** brushing it with a soft, camel's hair brush.

Plastic lens with multilayer coatings & all glass lens elements.

1. **DO NOT** spray any type of fluid directly on the lens surface.
2. **DO NOT** use any dry material to clean the surface (dry rag, tissue, etc.)
3. Use a commercial liquid window cleaner. **DO NOT use an aerosol.** Other cleaning agents, such as laboratory-grade acetone or a 70-30 mixture of ethyl ether and ethyl alcohol may also be used. If you are not sure of the cleaning agent, experiment with a small area of the lens first.
4. Use a soft cotton cloth (cotton diapers laundered several times to remove sizing) or any soft facial tissue (Charmin, Softweve, etc.).
5. When using window cleaner, **moisten the cloth or tissue** and lightly wipe the surface. Then lightly dry with a new tissue.
6. When using acetone or ethyl ether mixture, proceed as follows : Fold the cloth or tissue several times to form a pad. Soak the folded end of the pad in the acetone. Starting at the diameter opposite you, immediately wipe the coated lens, with very little pressure, toward you in a straight line and off the lens. Do not stop with the tissue on

Appendix D : Lens Cleaning Procedure

the lens. Wipe at a speed that is equal to the evaporation rate. This is very important to prevent streaking and spotting. Start your wiping at one side of the lens and, with successive wipes, move to the other side. Turn the pad over for each wipe, then inside out. Do not make more than one wipe per clean area of pad. Be careful of the painted edge, since acetone will soften it.

Source numbers 90 - 99

These source numbers do not correspond to physical inputs. They can only be used when the projector is equipped with a RCVDS 05 or VS05. An additional adjustment file can be created for these source numbers. This file can contain different settings. The relationship between sources 0 - 9 and 90 - 99 is shown in the diagram below.

source input 1	source number 1 source number 91	file A file A'
source input 2	source number 2 source number 92	file B file B'
source input 3	source number 3 source number 93	file C file C'
	• •	
source input 9	source number 9 source number 99	file I file I'

Follow the steps below to create a second file for sources 0 to 9 :

1. Select the source between 0 and 9.
2. Select the corresponding source number between 90 and 99 with the digit keys on the RCU.
3. Enter the adjustment mode and load a corresponding file. Edit this file if necessary.
4. Save the file and exit the adjustment mode.

Lenses

This APPENDIX gives an overview of the tables and formulas for the available lenses for the BARCOGRAPHICS 8200.

The next lenses are available :

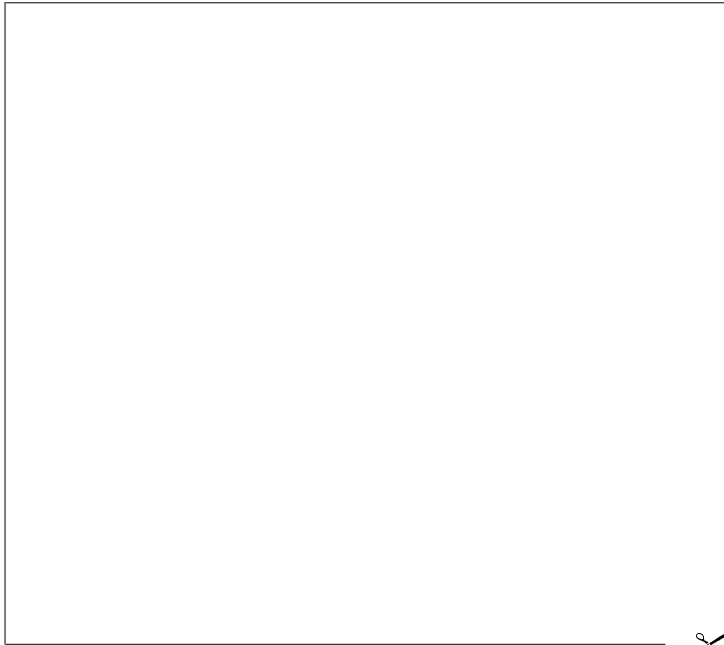
Name	length lens mm (inch)	diam. lens mm (inch)	weight kg (lbs)	order number
HD(1.2:1)	253 (9.96)	189 (7.44)	8.7 (19.2)	R9829200
HD(2.2:1)	235 (9.25)	137 (5.39)	7.5 (16.5)	R9829060
HD(3.3:1)	149 (5.87)	152 (5.98)	4.3 (9.5)	R9829075
HD(4.0:1)	165 (6.50)	152 (5.98)	3.5 (7.7)	R9829145
HD(5:1)	238 (9.37)	164 (6.46)	5.1 (11.2)	R9829180
HD(7:1)	373 (14.68)	196 (7.72)	12.0 (26.4)	R9829090
HD(1.5-3:1)	460 (18.11)	260 (10.24)	13.0 (28.7)	R9829150
HD(3-5.3:1)	578(22.8)	225(8.9)	15.0(33.1)	R9829190
HD(0.9:1)*	366(14.4)	216(8.5)	10.0(22.0)	R9829550

* ON-AXIS lens, requires an on-axis projector or a retrofitted kit off-> on-axis (order nr. R808459K)

Appendix F : Lenses

Lens formulas to calculate the projector distance.

HD(1.2:1)	Metric	$PD=1.264 \times SW + 0.126 + (0.018/SW)$		
	Inch	$PD= 1.264 \times SW + 4.961 + (27.90/SW)$		
HD(2.2:1)	Metric	$PD=2.0566 \times SW + 0.16 + (0.029/SW)$		
	Inch	$PD=2.0566 \times SW + 6.299 + (44.95/SW)$		
HD(3.3:1)	Metric	$PD=3.33 \times SW + 0.386 + (0.046/SW)$		
	Inch	$PD=3.33 \times SW + 15.19 + (71.30/SW)$		
HD(4.0:1)	Metric	$PD=4.02 \times SW + 0.50 + (0.06/SW)$		
	Inch	$PD=4.02 \times SW + 19.69 + (93/SW)$		
HD(5:1)	Metric	$PD=5 \times SW + 0.747 + (0.070/SW)$		
	Inch	$PD=5 \times SW + 29.41 + (108.5/SW)$		
HD(7:1)	Metric	$PD=6.911 \times SW + 1.414 + (0.096/SW)$		
	Inch	$PD=6.911 \times SW + 56.06 + (148.8/SW)$		
HD(1.5-3:1)	Metric	$PD_{min}=1.49 \times SW + 0.123$ $PD_{max}=2.983 \times SW + 0.145$		
	Inch	$PD_{min}=1.49 \times SW + 4.84$ $PD_{max}=2.983 \times SW + 5.71$		
HD(3-5.3:1)	Metric	$PD_{min}=3.126 \times SW - 1.08 \pm 0.2$ $PD_{max}=5.345 \times SW \pm 0.2$		
	Inch	$PD_{min}=3.126 \times SW - 42.52 \pm 8$ $PD_{max}=5.345 \times SW \pm 8$		
HD(0.9:1)*	Metric	$PD=0.83 \times SW + 0.20$	recommended screen width range	$1.2 \text{ m} < SW < 3.20\text{m}$
	Inch	$PD=0.83 \times SW + 7.874$		$47 \text{ inch} < SW < 126 \text{ inch}$



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