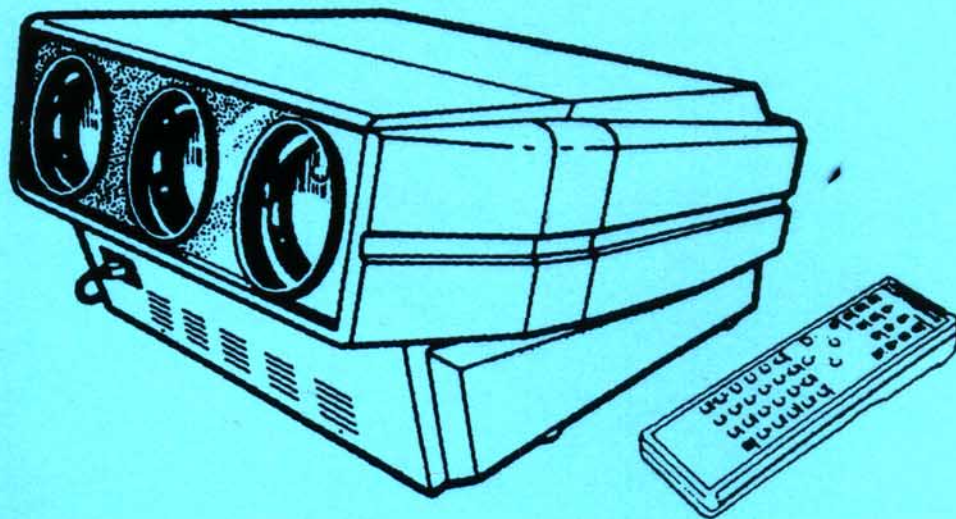^{TM} **MARQUEE**

Training Manual

ELECTROHOME
Projection Systems
Global Leadership in Visual Communications

The Marquee line of projectors is the 4th generation of CRT projectors to be developed by Electrohome. The Marquee design evolved from the ECP projectors that preceded it.

The ECP
The ECP was introduced in 1987 as the 3000, the first 3 lens CRT projector made by Electrohome. It has evolved into the 25/35/4500 which is still available today. Some of the main features of this product line are:

> 7 inch CRT,s
> Electrostatic focus
> Maximum scan rate 80 - 90 KHz
> First projector with ACON
> Maximum resolution 1600 x 1200

For low cost applications the ECP is still worth considering.

The Marquee series
The Marquee 8000 and 9000 were introduction in January 1993 and became an overnight success. The 8000 in particular was unequalled at the time for price/performance. Some of the main features were:

> 8000 Magneticaly focussed 8 inch CRT's
> 9000 Magneticaly focussed 9 inch liquid coupled CRT's
> Scan rate from 15.75 KHz to 130 KHz
> Maximum resolution 2500 x 2000
> No internal potentiometers
> Significantly less convergence drift than the ECP

8110, 8500, 8500LC, 9500LC
The new range of Marquee products were introduced in June 1995 at Infocom. A number of major design improvements were introduced:

> 8110, 8500 Uses 8 inch CRT's with air coupled lenses.
> 8500LC uses 8 inch CRT's with liquid coupled lenses
> 9500LC uses 9 inch CRT's with liquid coupled lenses
> Astigmatism coils on 8500, 8500LC and 9500LC

New features on the 8110, 8500, 8500LC, 9500LC

Electronic Stigmators
This is now standard on the 8500/9500. The new coils greatly improve the sharpness of the corners.

Contrast Modulation
Contrast modulation allows adjustment of the contrast over 6 zones of the screen. The center to edge drop off can be typically adjusted to less than 2%. The feature is intended to correct the red/blue contrast at the edges of the screen and is very useful for pictures where two or more screens are edge matched.

Multiple Languages
Five languages, English, German, French, Italian and Spanish, are available in memory to translate the status bars and help screens. Standard feature on the 8500/9500.

High voltage at 34.9 KV
The new models have increased beam current reulting in higher light output. 8500 is 225 lumens, 8500LC is 835 lumens and 9500LC is 935 lumens.

Streaking problem reduced
A new low impedance splitter plus low impedance HV power supply reduce the horizontal streaking significantly.

Grey scale tracking
The grey scaletracks contrast much more accurately than before.

Focus Improvement
Improvements have been made to the focus coils and the dynamic focus has been optimised.

Gamma Correction
Gamma correction has been optimised on the blue channel to improve video performance. We believe the video performance has been significantly improved.

Future Developments

Several features were not available at the product release time and are being prepared for the next release of software in version 3.2.

ACONII
This is the stacking feature for aligning two Marquees onto the same screen using the ACON automatic convergence feature.

Real time clock and programmable events
Implementation of a real time clock will provide date and time. In addition multiple events can be programmed to occur at various times.

Horizontal linearity
In addition to Vertical S and C linearity controls that presently exist on the Marquee ne w Horisontal S and C controls will be available.

Summary of New Product Features

Marquee 8110 Plus
- 8 inch Panasonic magnetically focussed CRT's
- 15 - 110 Khz
- Standard air coupled lens
- Improved focus (new focus coils and improved dynamic focus)
- Gamma correction
- More brightness - 225 lumens (new HVPS and more beam current)
- Improved grey scale tracking

Marquee 8500
- 8 inch Panasonic magnetically focussed CRT's
- 15 - 130 Khz
- Standard air coupled lens
- Electronic stigmators
- Contrast modulation, colour correction
- multi-language
- Improved focus (new focus coils and improved dynamic focus)
- Gamma correction
- More brightness - 225 lumens (new HVPS and more beam current)
- Improved grey scale tracking

Marquee 8500LC
- 8 inch Panasonic magnetically focussed CRT's
- 15 - 130 Khz
- Liquid coupled HD10L lens
- Electronic stigmators
- Contrast modulation, colour correction
- multi-language
- Improved focus (new focus coils and improved dynamic focus)
- Gamma correction
- More brightness - 225 lumens (new HVPS and more beam current)
- Improved grey scale tracking

Marquee 9500LC
- 9 inch Panasonic magnetically focussed CRT's
- 15 - 130 Khz
- Liquid coupled HD10L lens
- Electronic stigmators
- Contrast modulation, colour correction
- multi-language
- Improved focus (new focus coils and improved dynamic focus)
- Gamma correction
- More brightness - 225 lumens (new HVPS and more beam current)
- Improved grey scale tracking

CONTROL METHODS

There are five methods of controlling the projector:-

- Using the built in keypad in the front section of the projector
- Using the IR sensor at the front of the projector
- Using the external IR input port at the back of the projector
- Controlling the projector via the input signal switcher
- Using the RS232 port

Built in Keypad and IR Sensor

The built in Keypad is mounted inside the front cover of the projector and is directly connected to the projector with a short cable. The keypad can also be detached from its cable and used to operate the built in IR sensor.

As long as the projector is plugged in to the 110/220 V supply the wired keypad or the IR sensor will be active.

In order to convert the keypad over to IR operation a jumper has to be moved and four AA batteries loaded into the rear battery compartment.

External IR Port

At the rear of the projector there is an input for a wired keypad or an external sensor. These are useful in situations where IR control is needed but the normal IR signal path will not work. This is useful when:
- The distance to the screen is large
- In some rear screen applications
- When controlling multiple projectors with one remote

Switcher Control

Basic operations on the projector can be controlled via the switcher which is controlled via an RS232 link.

RS232 Control

An RS232 port on the rear panel allows external controllers to remotely control the projector. The command set is available from Electrohome and the major controller manufacturers have them built into the software libraries.

Simple Commands

Power Press and hold for 2 or 3 seconds until the projector turns on Repeat this to turn off.

\#   Test patterns enabled. There are 5 test patterns to choose from.

*   Status screen - Gives the projectors current settings three pages which are accessed one at a time when the * button is pressed.

EXIT   Used to exit a menu, or screen display e.g. the setup screens.

STDBY   Used to keep the projector in a standby mode by disabling the video signals to the CRT's.. The key has to be held for 3 seconds. EXIT returns the screen display.

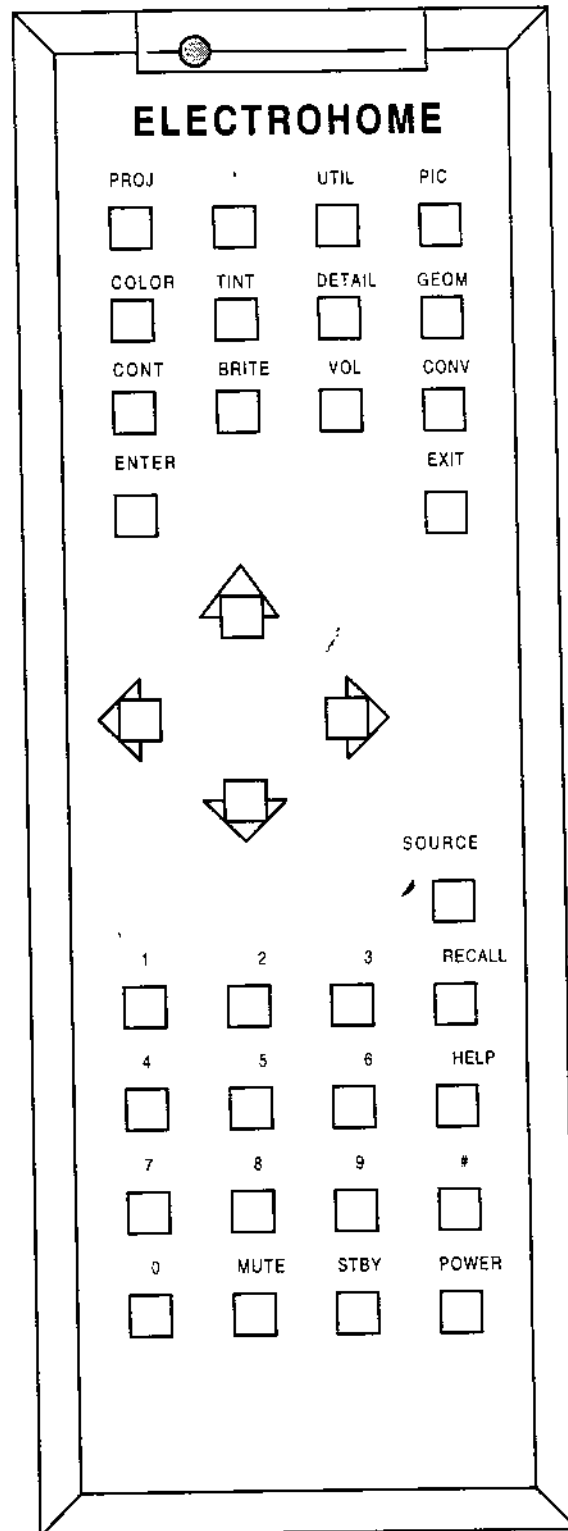CONT Used to increase or reduce the video level the display.

BRITE Increases or reduces the background brightness.

COLOR Used with video decoders to control
TINT,   the picture.
DETAIL

VOL,   Used with audio signals to control the volume.

MUTE Mute must be held for 3 seconds.

HELP By pressing a key and then HELP a help screen describing the function is displayed.

ELECTROHOME

PROJ	'	UTIL	PIC
COLOR	TINT	DETAIL	GEOM
CONT	BRITE	VOL	CONV
ENTER			EXIT

SOURCE

| 1 | 2 | 3 | RECALL |
4	5	6	HELP
7	8	9	\#
0	MUTE	STBY	POWER

TYPES OF COMMANDS

The commands on the projector can be divided into simple direct commands and menu commands for less frequently used or more complex operations.

Side Bars

Simple up down adjustments make use of slide bar window menus shown here. The UP and DOWN arrows are highlighted to show that these are the active control keys.

```
  ⇧          Contrast
 ┌──┐
 │50│    ━━━━━━━━━┓
 └──┘    0      50      100
  ⇩
```
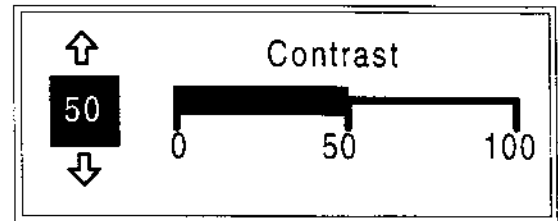
Menus

The four menu keys bring up a list of menu selections. Items can be picked by pressing the item number or by moving the highlighted bar, with the arrow keys, to the required item and pressing the ENTER key.

```
┌────── Title ──────┐
│                   │
│  Menu info here   │
│                   │
└───────────────────┘
```
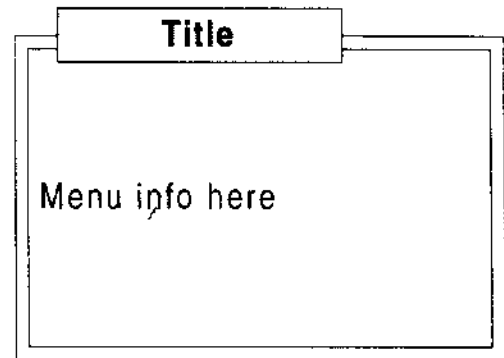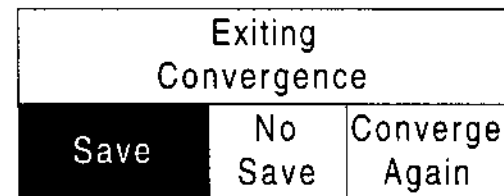
Selection Boxes

These are used for parameters requiring data entry such as source and recall memories as shown. The arrow keys are used to move between fields. The bottom of the screen provides instructions to save the information.

```
┌── Copy Setup ──┐
│ From:  S12      │
│ To:    R56      │
│                 │
│ Press (ENTER) to copy │
└─────────────────┘
```
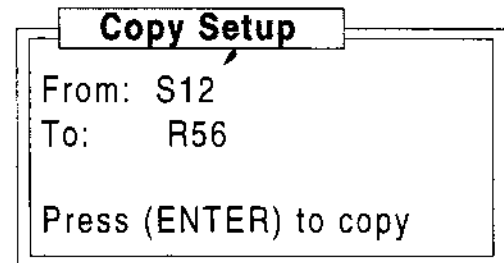
Confirmation Boxes

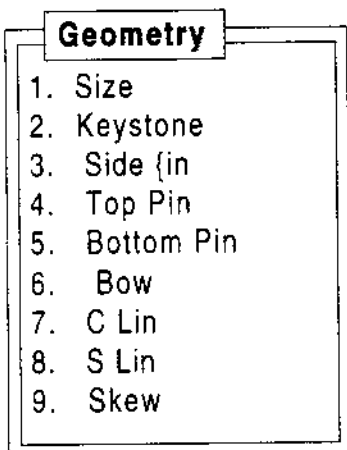These are used to confirm a set of changes such as when the convergence is readjusted. ENTER is used to confirm or not confirm the changes, and the left/right arrow keys are used to move between the different selections.

```
┌──────────────────────────┐
│        Exiting           │
│      Convergence         │
├────────┬──────┬──────────┤
│        │  No  │ Converge │
│  Save  │ Save │  Again   │
└────────┴──────┴──────────┘
```

PICTURE MENU

Picture
1. Phase
2. Size
3. White Balance
4. Focus
5. Sync: Fast
6. Blanking
7. Auto Clamp: Off
8. Retrace: Long
9. Decoder

White Balance
1. 3200 K (Reddish)
2. 6500 K (White)
3. 9500 K (Bluish)
4. User Settings
5. Customise white

Blanking
1. Top
2. Bottom
3. Left
4. Right

Decoder
1. Video Standard
2. Signal Routing

Routing
1. Auto Detect
2. As Composite
3. As S Video
4. As RGB

Video Std
1. Autodetct
2. NTSC 3.58
3. NTSC 4.43
4. PAL
5. SECAM

GEOMETRY MENU

Geometry
1. Size
2. Keystone
3. Side {in
4. Top Pin
5. Bottom Pin
6. Bow
7. C Lin
8. S Lin
9. Skew

UTILITIES

Utilities

1. Source Setup
2. Channel List
3. Recall memories
4. Input memories
5. Preferences
6. Remote Control Options
7. -
8. -
9. Service

Source Setup

1. Copy Setup
2. ASI with Save
3. Current Setup: Unlocked
4. ASR: OFF
5. Clear Current Setup
6. Select Internal Frequency

Preferences

1. Auto Power Up: ON
2. Screen Messages: ON
3. Blanking Time: AUTO
4. Channel Select: 2 Digits
5. Language: English

Remote Options

1. Keypad
2. Communications Setup

Keypad Options

1. IR Sensor: A
2. Remote Jack: OFF

Communications

1. Projector: 000
2: Baud Rate: 9600

CONVERGENCE

Connvergence

1. Guided
2. Interpolated
3. Random Access
4. ACON
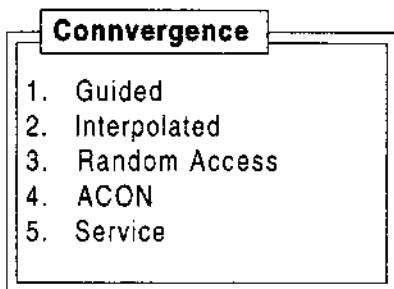5. Service

SETUP MEMORY

Memory parameters
The status key * shows the setup that is stored for a single source selection. There is enough memory to save over 80 of these setups.

Memory Identification
* Input or Recall
* Switcher and Slot Number
  or Recall Number

Memory Status
* Locked or Unlocked
* Last used

Signal Frequencies
* Horizontal Frequency
* Vertical Frequency

Picture Parameters
Phase   * Focus
* Size   * Sync
* White Balance * Blanking

Primary Display Parameters
* Color   * Contrast
* Tint   * Brightness
* Detail   * Volume

Geometry Parameters
* Size   * Bow
* Keystone   * Linearity
* Pincushion * Skew

Convergence Parameters
* Convergence settings at all 45 zones

Control Settings
* ASR On/Off (input memories only)
* Video Format (decoder only)
* Signal Type Override
* Volume (audio)

Setup, Input and Recall Memories
A setup memory is defined as either an input or a recall memory. An input is associated with a particular input selection and a recall can be used regardless of the input selected.

Memory is allocated as required by the user until the is no more setup memory left (at 80 setups). The Source Setup menu provides ways to copy or delete setups.

About recall memories
When an input or recall memory is selected this becomes the current display setup that the projector is using.

Also when one input has several different signals with different frequencies, recall setups can be used to save each set of display parameters. This can be "recalled" to get a fast smooth setup for the display.

Memory lock

The Source Setup menu also provides a way to lock a memory setup so that any changes made by the user are only temporary.

BASIC SERVICE FUNCTIONS

All electronic adjustments are made from the remote control.

Some of the basic operations are:

Setting the colors

Each CRT can be directly turned off and on by pressing the COLOR key followed by a number.

1	RED
2	GREEN
3	BLUE
4	RED & GREEN
5	BLUE & GREEN
6	BLUE & RED
7	ALL OFF
8	RED, BLUE & GREEN

Resetting the Convergence
The convergence values of Red and Blue can be zeroed when in convergence mode by pressing:
0 Resets the static and dynamic convergence
1 Resets the static convergence
2 Resets the dynamic convergence

Service Password
Entering the service menus from either Convergence or the Utility Menus requires a password.

The factory password is: **0901**

UTILITIES SERVICE MENU
Once the password has been entered the following menu will be displayed.

1. RGB Color Temperature Setup
2. RGB Focus Adjustment
3. Red/Blue Vertical Size
4. Projector Initialization
5. Status Page Message
6. Diagnostics
7. Stigmator Adjustment
8. Delete a Setup Memory

RGB COLOR TEMPERATURE

Color temperature has 3 preset values for color temperatures of 3500, 6500, 9500 degrees Kelvin. These are global values and will be the same for all setups.

The user setup is a user defined color temperature that is unique for this setup.

The last entry is used to adjust the color correction and to set the center to side contrast.

Note: The first three items are set up at the factory with calibrated test equipment and should never be adjusted.

Adjustment Method

For best results do not exceed 50% on the CONTRAST control because the Blue CRT will saturate and the bright areas of the picture will not have sufficient blue color.

To adjust the color temperature select Adjust User Setting (#4). Display a gray scale test pattern (either the internal gray scale or preferably one from each source connected).

Note: Room lighting should be at presentation levels.

Display only the Red color by pressing ENTER and adjust the G2 control so that the second dimmest bar is just visible. Press ENTER and repeat for Green and Blue.

Press ENTER to display the three colors and adjust the Red drive so that the brightest bar has enough Red in it. Press TINT to cycle through the colors, and repeat for Green and Blue.

This will get the picture close to the final setup but further small adjustments will be needed using the white field test pattern and the customers own images. For best results a color temperature meter should be used.

RGB FOCUS

RGB Focus is used to adjust the magnetic focus coils. The Focus control in the PIC menu is not precise enough to be used for this and should always be set at 50%.

There are 5 focus zones, an overall center focus which effects the whole screen (Static focus) and 4 more zones - one on each side that adjust the side (Dynamic) focus. Static focus is unique to each setup but Dynamic focus is a global setting and will effect all the set ups.

Note the focus adjustments effect the size of the picture and will make errors in the convergence. For this reason it is best to do this adjustment before making final convergence adjustments.

Before adjusting the RGB focus:

- Set the CONTRAST to 75%
- Set the FOCUS to 50%
- SET the BRITE to 50%
- Input a test pattern at 70kHz or more horizontal rate

Press 2 to enter RGB focus, press # to select the cross hatch test pattern, and use the up and down arrows to adjust the Red static focus. Press ENTER to change between the three colors.

After Blue static focus the Red focus is displayed again with the box in the top middle section of the screen. Adjust the focus looking at the top of the screen. Press ENTER to adjust the other sides. Repeat for the Green and Blue colors.

Press the # key until the external pattern is displayed. Select a pattern with a lot of detail such as a text pattern. Repeat all of the adjustments for static and dynamic focus.

Note if one corner appears soft it may be necessary to adjust two of the sides to optimize the corner.

3.RED BLUE VERTICAL SIZE
This adjustment is used to set the heights of Red and Blue to match the height of the Green display measured at the center of the screen. The up down arrows control the Red size and the side arrows control the Blue size.

4. PROJECTOR INITIALIZATION
This dialog box allows the setups to be removed. Three choices are available:
1. Remove all Recall Memories
2. Remove all Memories
3. Remove Everything

5. PROJECTOR STATUS PAGE MESSAGE
This dialog box is used to enter a one line message that appears in the status screen when the * key is pressed.

6. STIGMATORS
This is where the stigmators are adjusted. Stigmators control the spot size and shape on the CRT face and have a direct effect on the focus that can be achieved. Stigmators are adjusted before the RGB focus. To adjust the stigmators:
1. Set CONTRAST = 100, FOCUS = 100, BRITE = 50.
2. Enter the Stigmator adjust routine and use the arrow keys to adjust each zone in turn . (There are 9 for each color).
Exit and reset CONTRAST and FOCUS to 50.

7. DIAGNOSTICS

This brings up some useful information which can be used for diagnostics. The following information is given:

1. Internal hardware
2. ROM revisions
3. Last 20 keystrokes
4. Number of hour on the CRT's

8. DELETE A SETUP MEMORY

This is used to remove individual setups.

9. CONVERGENCE SERVICE MENU

The convergence service menu is used for adjusting the Green convergence which controls the position of the Red and Blue images.

Green convergence is used to correct minor errors in the geometry which cannot be fully corrected in the GEOM menu, to edge match multiple screen displays and to correct non linearities in the display.

There are two convergence modes - Interpolated which is used when large amounts of correction are required, and Random which is used for small touch up work.

Note: If the Red and Blue crosshatch was previously converged prior to the Green Convergence adjustment they will move with the Green convergence minimizing additional dynamic convergence adjustment of Red and Blue.

INTERPOLATED CONVERGENCE

This is a guided Green convergence which steps through each zone of convergence just as in normal interpolated convergence. The arrow keys adjust lines between the box and the center of the screen which speeds up the adjustment process. ENTER steps to the next zone of convergence. Exit brings up the prompt Save, Cancel or Continue. Pressing EXIT or ENTER over the highlighted area will save cancel or exit.

Interpolated convergence is useful when large changes need to be made such as when correcting sideways keystone or if the Horizontal linearity is to be corrected.

Each time a zone is adjusted, it will interpolate between the zone and a previously adjusted zone. This results in smoother convergence variation and faster convergence.

2.RANDOM ACCESS

As with random access in the normal converge the ENTER key toggles between Move and Converge which is displayed in the center of the screen while in move the arrow keys will move the box to the position desired on the image. Once the position is selected by pressing the ENTER key the arrow keys now move the grid within the box.

Random convergence is useful for touch up or removing distortions in one section of the screen.

OVERVIEW

The difficult part of an installation is in knowing where to start because there are so many different adjustments that can be performed.

The check list below is a detailed list from start to finish that will help guide you through the installation process. There is a copy of this list also at the end of this chapter which you may photocopy for your installations.

Also remember to set the ASR feature off to avoid a conflict when doing setups.

CHECK LIST

1. Throw distance calculation
2. Reverse the scans of mounting configuration
3. Center the green raster
4. Optically focus green
5. Phase and size adjustments for image
6. Geometry
7. Green Convergence Corrections
8. Center Red raster
9. Toe in RED CRT (over lap RED image on GREEN image)
10. Optical Focus for RED
11. Center BLUE raster
12. Toe in BLUE CRT (over lap BLUE image on GREEN image)
13. Optical Focus for BLUE
14. Stigmator adjustments
15. RGB Focus
16. Converge
17. Color Balance
18. Copying Setups
19. Make the Channel Entries
20. Projector Numbering

The Golden Rule

The most important part of a good set up is to have the raster centered in the CRT and to have the crosshatch centered on the screen with no sideways skew and no tilt. The rest of it will follow from there.
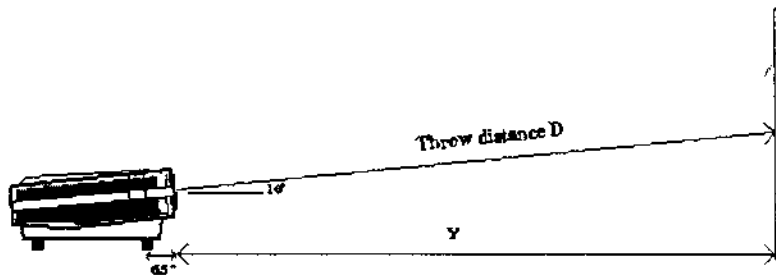
THROW DISTANCE

The throw distance for the Marquee is as follows:

Marquee Model	Throw distance formula 1
8000, 8110, 8500	D = 1.22 x W + 10 inches
8500LC HD10L	D = 1.82 x W + 3.3 inches
9000, 9500 HD10	D = 1.25 x W + 6 inches
9000, 9500 HD10L	D = 1.54 x W + 3.3 inches
9000, 9500 GT17	D = 1.49 x W + 4.8 inches
9000, 9500 GT26	D = 154. x W + 0.5 inches

Where D is the throw distance and W is the width of the screen in inches.

Note that the angle of the projector can be varied between ± 15^0.

You can calculate the distance Y using the formula:

Which in this case is:

$$Y = D \text{ x Cos (Angle)}$$
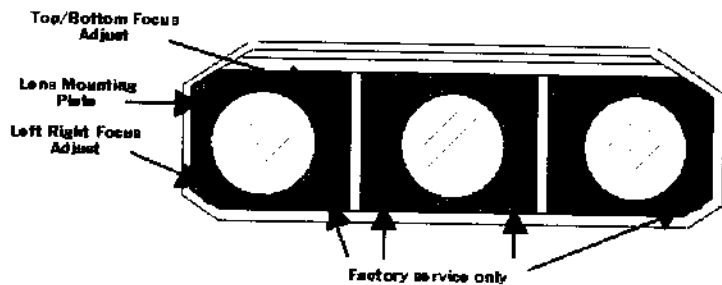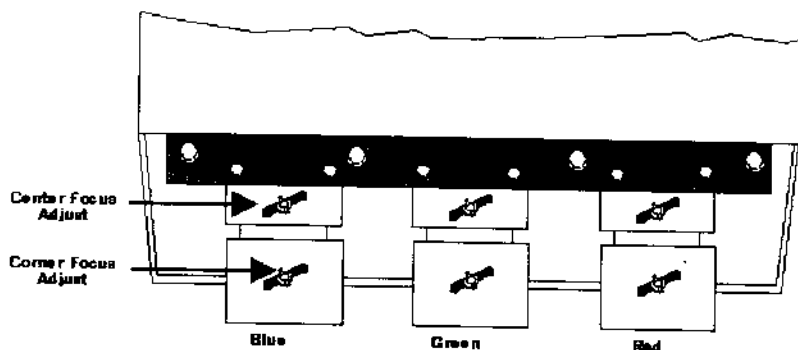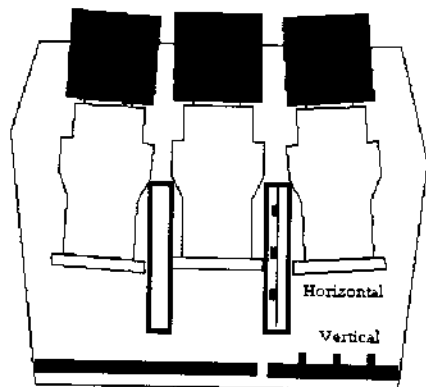$$Y = D \text{ x Cos(10)}$$
$$Y = D \text{ x } 0.985$$

REVERSING THE YOKES

The horizontal and / or vertical deflection yokes can be reversed for ceiling or rear screen use. The yoke plugs are located in the positions shown.

Horizontal

Vertical

Center Focus
Adjust

Corner Focus
Adjust

Blue   Green   Red

Top/Bottom Focus
Adjust

Lens Mounting
Plate

Left Right Focus
Adjust

Factory service only

Marquee 8000 Lens Assembly
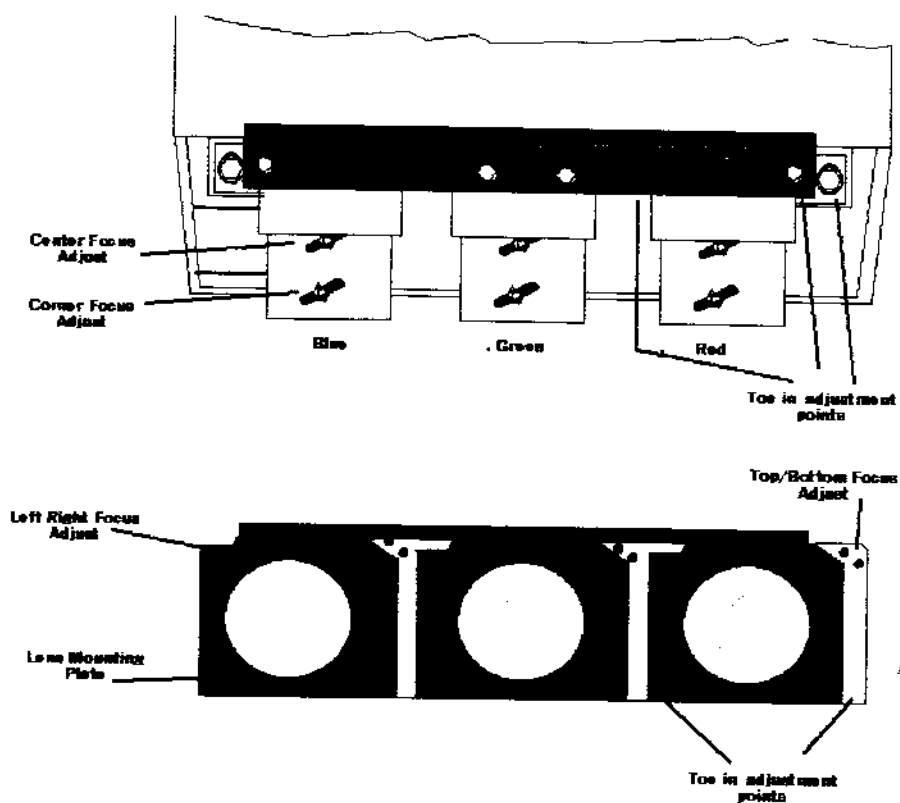
Marquee 8000 Optical alignment

Green CRT
1. Loosen the rear wing nut on the green lens. Rotate the lens using the wing nut to focus the center of the picture. Tighten the wing nut.
2. Loosen the front wing nut on the green lens. Rotate the lens and focus the corners of the picture. Tighten the wing nut.
3. Loosen the 4 bolts labeled 'A' on the top.
4. Select GREEN convergence and turn the contrast low. Now look into the GREEN lens and center the raster using the arrow controls on the remote.
5. Place the projector at the correct throw distance and center the cross hatch on the screen.
6. Make sure the projector is level with the screen and that it is correctly centered on the screen.
7. Adjust the large allen bolt on the upper right corner of the lens mounting plate to make the top and bottom of the test pattern equally defocused. As the focus changes it may be necessary to readjust the center focus again. Refocus the center and corners when a match is achieved. This adjustment matches the vertical focusing plane of the lens to the screen. It is a critical adjustment.
8. Adjust Geometry to make a rectangular test pattern that fits the screen

NOTE: No left/right focus adjustments should be required if the projector is perpendicular to the screen.

Red and Blue CRT's
1. Enter random convergence and center RED and BLUE (press zero to erase any previous adjustments).
2. Loosen the 2 allen bolts labeled 'B'.
3. Physically skew the RED CRT/lens assembly until the edges of the RED test pattern match the GREEN test pattern in the center of the picture. Retighten the allen bolts.
4. Repeat the toe in adjustment on the BLUE lens/crt.
5. Loosen the rear wing nut on the RED lens on slightly defocus the center of the picture.
6. Adjust the top bottom focus for the RED lens as described for GREEN but do not refocus the lens yet.
7. Adjust the large allen bolt on the lower left of the lens mounting plate to make the horizontal center line of the test pattern equally defocused on each side. Refocus the center and corner focus when this is done. This is a critical focusing adjustment.
8. Repeat the above process for the BLUE.
9. Tighten the four bolts labeled 'A' to lock the assembly in place.

Center Focus Adjust

Corner Focus Adjust

Blue   . Green   Red

Toe in adjustment points

Top/Bottom Focus Adjust

Left Right Focus Adjust

Lens Mounting Plate

Toe in adjustment points

Marquee 9000 Lens Assembly

Marquee 9000 Optical Alignment

1. Loosen the rear wing nut on the green lens. Rotate the lens using the wing nut to focus the center of the picture. Tighten the wing nut.
2. Loosen the front wing nut on the green lens. Rotate the lens and focus the corners of the picture. Tighten the wing nut.
3. Select GREEN convergence and turn the contrast low. Now look into the GREEN lens and center the raster using the arrow controls on the remote.
4. Move the projector side to side to center the test pattern in the screen.
5. Place the projector at the correct throw distance and center the cross hatch on the screen.
6. Make sure the projector is level with the screen and that it is correctly centered on the screen.
7. Locate the two allen bolts on the upper right corner of the lens mounting plate The one closer to the top is used to make the top and bottom focus adjustment, while the other locks the adjustment. Adjust the center vertical line of the test pattern to be equally defocused. As the focus changes it may be necessary to readjust the center focus again. Refocus the center and corners when a match is achieved. This adjustment matches the vertical focusing plane of the lens to the screen. It is a critical adjustment.
8. Adjust Geometry to make a rectangular test pattern that fits the screen

Red and Blue CRT's

9. Enter random convergence and center RED and BLUE (press zero to erase any convergence adjustments).
10. Loosen the 2 bolts labeled 'A' and the 4 allen bolts labeled 'B'. One is located above the RED lens and the other two are underneath.
11. Physically skew the RED CRT/lens assembly until the center of the RED test pattern match's the center of GREEN test pattern. Retighten the bolts.
12. Adjust the top bottom focus for the RED lens as described for GREEN but do not refocus the lens yet.
13. Locate the two allen bolts on the upper left corner of the lens mounting plate to make the horizontal center line of the test pattern equally defocused on each side. Refocus the center and corner focus when this is done. This is a critical focusing adjustment the matches the horizontal focus plane of the lens to the screen.
14. Repeat steps 9 thru 13 on the BLUE lens/CRT.

Input Modules

A new family of input modules is available on the Marquee. These modules do not amplify the RGB signals and with the exception of the HDTV module do not process the sync pulses. In the case of HDTV sync processing is required in order to convert HDTV tri-level pulses into composite sync.

The modules are shown on the adjacent page. Any of these modules can be fitted to the Marquee, the switcher or a sleeve power supply.

In order for the Marquee to identify the module itself there is one component on the board to identify the interface.

SOURCE INPUTS

The Marquee projectors are designed to accept three input modules, two of which are the new simple interfaces with no sync processing and the third being the decoder or scan doubler module.

Input 01 is a supplied with the projector and is a standard RGB input. This input is fixed and cannot be changed.

The diagram shows how the three sources are selected. The decoder itself has internal switching and is able to take its input from one of 5 sources:-

        NTSC loop through
        NTSC
        SVHS loop through
        SVHS
        Decoder input via module 01 or 02
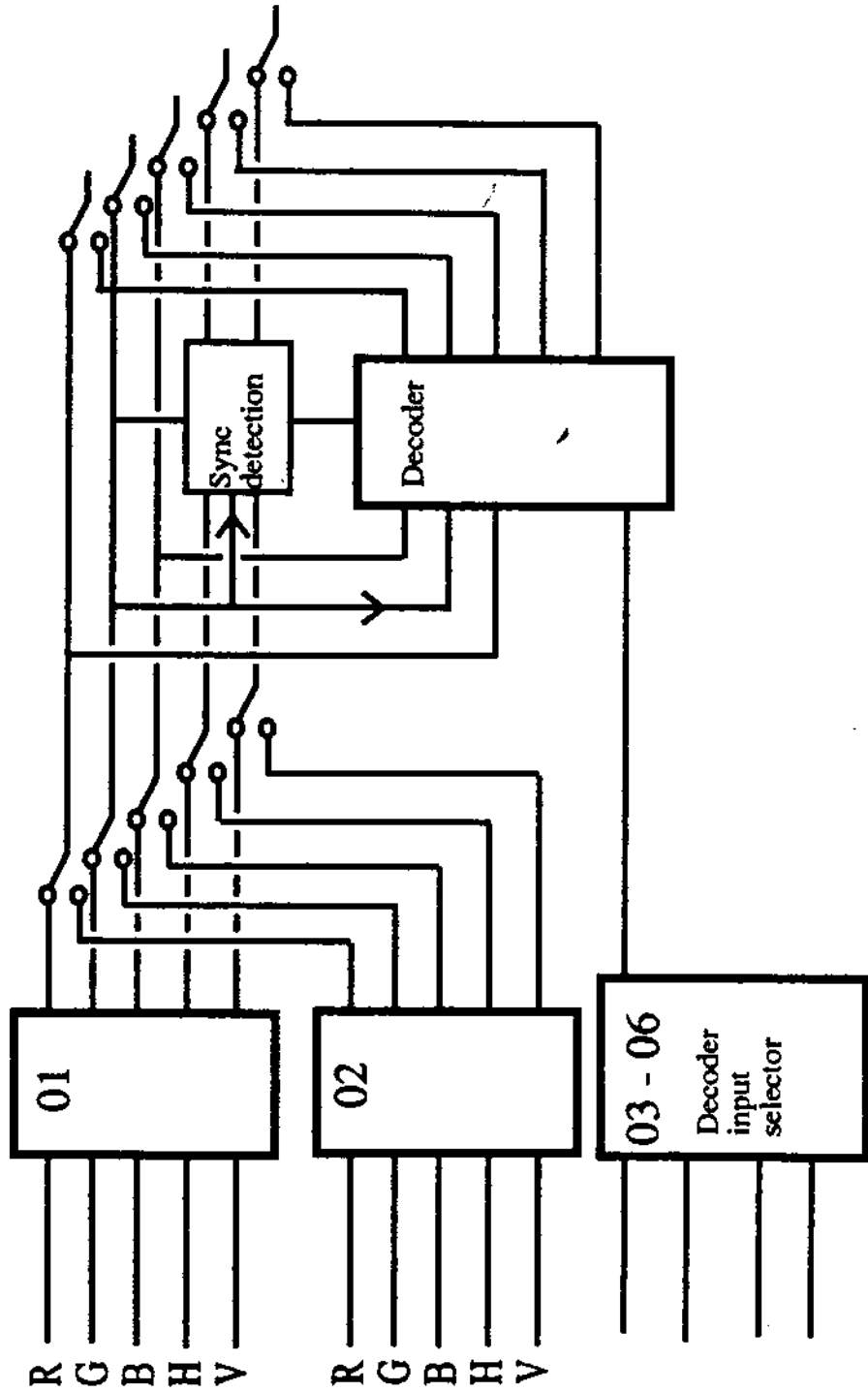
SELECTING SOURCES

There are 3 different methods to switch sources connected to either the projector's or the switcher's input interfaces.

  1. Direct Input command.
  2. Direct Channel command.
  3. Channel Up/Down command.

Direct Input

A Direct Input command is when you tell the projector which input the source is physically connected.

The key sequence <SOURCE> <n> <m> is a Direct Input command.

Where;   n = 0 (Projector) or
           n = 1, 2,...9 (Switcher 1, 2,...9)
           m = slot number

For example, to switch to a VCR connected to slot 4 on the projector, the "Direct Input command would be: <SOURCE> < 0> < 4>   or
A computer connected to slot 3 on switcher 1 would be <SOURCE> < 1> < 3>.

Direct Channel

Channel Selection: Each source can be given a channel number. (See 'Channel List' under <UTIL> button.) Channels are then switched by pressing the 2 digit channel number. DO NOT press the SOURCE button.

For example to switch to Channel 04, press: <0> <4> or <4>.
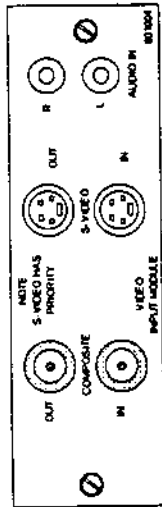
The <0> is optional depending on how the projector is set. See 'Preference' under <UTIL>.
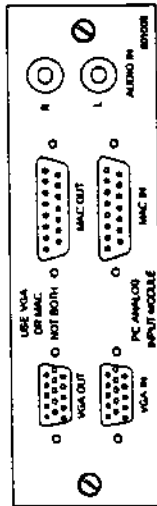

Channel Up/Down

Sources can also be switched using a Channel Up/Down command. By pressing <SOURCE> < ↑ > or < ↓ >, the projector will cycle through the Channel List. The Channel List must first be programmed using the 'Channel List' menu under the <UTIL> button.
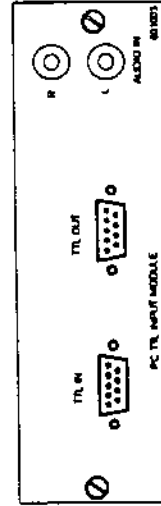
HDTV INPUT MODULE — RED GREEN BLUE TRI-LEVEL COMP SYNC, R AUDIO IN L

This interface is used specifically for HDTV type signals employing tri-level type sync.

RGB INPUT MODULE — RED GREEN BLUE H/COMP/COMP VERT SYNC, R AUDIO IN L

This is an RGB analog style interface.

RGB LOOP THRU MODULE — OUT, RED GREEN BLUE H/COMP VERT SYNC, IN, R AUDIO IN L

This is an RGB analog style interface. Loop thru capabilities are provided. The Output is active and hence isolated from the input. If interface is installed in a switcher (or Power Sleeve), they must be powr for loop OUT to function.

All Input Interface Modules can be used in the Marquee Signal Switcher or in slot 2 of the Marquee Projector.

All Input Interface Modules have audio inputs.

No sync processing occurs within the Input Modules except the HDTV Module.

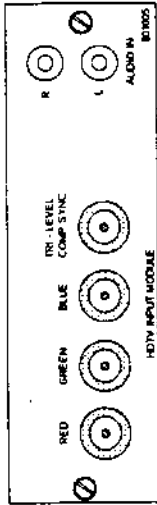**VIDEO INPUT MODULE** — OUT COMPOSITE IN, NOTE S-VIDEO HAS PRIORITY, S-VIDEO OUT IN, R AUDIO IN L

This Video Input Module will accept either Composite or S-Video. Only one of the 2 inputs should be used. If both Composite and S-Video are connected, the S-Video has priority. Loop through capabilities are provided. Using this module assumes the Decoder/Scan Doubler is installed in the Projector.

PC ANALOG INPUT MODULE — VGA OUT, MAC OUT, USE VGA OR MAC NOT BOTH, VGA IN, MAC IN, R AUDIO IN L
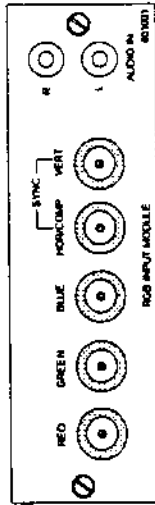
This module accepts any VGA or MAC type signals. Two sets of connectors are provided but only one set should be used at any time. (ie use VGA only or MAC only)
Pin out configuration follows VGA and MAC standards.
Both VGA OUT and MAC OUT are active. This means a terminator is not needed if there is no monitor. If interface is installed into a switcher (or Power Sleeve), they must always be powered up.

PC TTL INPUT MODULE — TTL IN, TTL OUT, R AUDIO IN L

This interface will accept any TTL type signals such as EGA.

Marquee Signal Switcher

A new switcher has been designed specifically for the Marquee Projector. Each switcher has the capacity to accept 9 input interfaces. All nine slots are identical. When one single switcher is connected to the projector, a total of 10 slots are available. (One on the projector plus 9 on the switcher.) Don't forget the video decoder panel discussed earlier which is independent of switcher connections.

Front Panel

The front of the Marquee Signal Switcher contains 9 buttons, one for each of the 9 slots. Two other buttons are provided for control of the projector's functions. The switcher itself always remains active. The ON/OFF button on the switcher is used to turn the projector ON or OFF. Similarly the STANDBY button on the switcher puts the projector either in or out of standby. The switcher must remain active because some of the input interface modules have active loop through. Turning the switcher off would also turn off a monitor's. One only needs to provide constant AC power to the switcher.

Rear Panel

On the back of the switcher there are 2 modules which are permanent parts: the CPU Module and Output Module. The Output Module provides one single video and (follow through) audio. The CPU Module contains the micro-controller for the operations of the switcher.

The face of the CPU Module contains one set of DB 9 connectors used for RS-232 communication. The "Switcher" ID switch is used to identify a switcher within a system. For example, if 3 switchers are connected to one projector, the first switcher will have an ID of 1, the second switcher would have an ID of 2 and the third switcher will be ID 3. There is also a mini jack labelled as "Remote" which will accept either a Remote IR Sensor, Remote Wired Keypad or any third party IR controller.

Multi-Switcher

When more than 10 slots are needed for one projector, additional switchers can be added. Begin your connections with 1 single switcher. The next or second switcher is then added and should be labelled with an ID number of 2. The output of switcher 2 (both video and audio) should then be connected to slot 2 of switcher 1. The output of switcher 3 is connected to slot 3 of switcher 1, etc...

Switcher 1 then behaves like a master switcher receiving all the outputs of the other switchers.

Introduction

One of the less obvious aspect of the Marquee Series Projector is understanding how the memory system works. How does ASR use memories and how do they affect setup of the projector. Operational rules of ASR are different compared to how they presently work in the ECP Series V3.1 software. This document will explain how memories are used and how they apply to ASR for the Marquee Series Projectors. Examples will be given to help illustrate typical applications. *This document does assume the reader has some knowledge of how the ECP V3.1 software functions.*

At the time of writing, the software was still in Beta form. Please be aware that there may be subtle changes by the time of final release version.

Memory System

There are several basic differences with the way memories are used in the Marquee 8000 and 9000's. These difference are;

- **No Zone Memories.**
- **Only 2 type of memories, Input and Recall.**
- **There are a total of 80 memories.**

The concept of Zone Memories have been completely removed. They simply do not exist.

There are only 2 types of memories; Input and Recall. Recall Memories functions exactly the same as before. They are memories which can be moved and used with any source. However, one minor difference exist with the way they are accessed. To access a Recall Memories, you do not need to press the <SOURCE> key. For example to access Recall Memory 02, press <RECALL> <0> <2>. Two digits must always be entered. This means that a leading zero is needed for Recall Memories 1 to 9.

Input Memories are the same as Source Memories. They are the memories associated to each physical slot in a projector or switcher. Of course same as before, the physical location of all memories still resides in the projector on a battery backed-up memory chip.

There is a total of 80 memories to be shared between the Input and Recall Memories. Each time a memory is accessed, one memory is used up. For example, if your system had 4 inputs connected and also used 2 Recall Memories, then the projector will have used up 6 memories or will still have 74 memories remaining. There is only one restriction to the Recall Memory number. Number 00 is not valid. All other numbers as long as they are 2 digits long is valid. (ie Recall Memory 99 is valid)
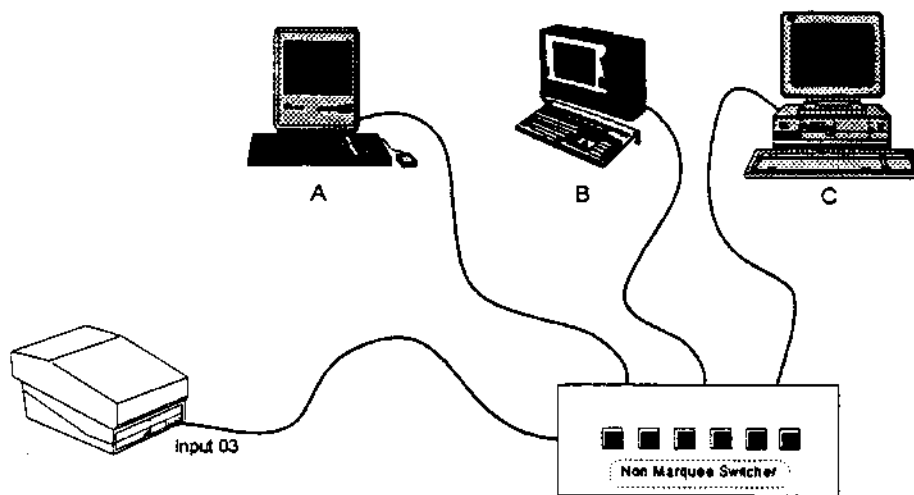
Example 3

In this third example, a switcher without communications is used. Since the projector has no knowledge as to when a new source is selected and hence which memory should be switched, ASR must be used. The 3 computers have been labelled A, B and C to avoid confusions with input numbers. For the purpose of this example Recall Memory 01, 02 and 03 will be assigned to computers A, B and C respectively.

KEYPAD COMMANDS	DESCRIPTIONS
\<SOURCE> \<0> \<1>	Switch to the physical Input.
\<RECALL> \<0> \<1>	Switch-in Recall Memory 01. Check to see that computer A is turned On and selected on the switcher. Adjust projector to setup computer A.
\<RECALL> \<0> \<2>	Switch-in Recall Memory 02. Check to see that computer B is turned On and selected on the switcher. Adjust projector to setup computer B.
\<RECALL> \<0> \<3>	Switch-in Recall Memory 03. Check to see that computer C is turned On and selected on the switcher. Adjust projector to setup computer C.
\<SOURCE> \<0> \<1>	Enter back into Input Memory 0 1 so that you can clear its frequency stamp.

ASR

The attached ASR Logic Chart gives a summary of the new rules which the Marquee software follows. There are several aspects of ASR which may not be explicitly clear from looking at this chart. Here are some of these not so obvious aspects:

In V3.1 software, the projector will always give you the memory you ask for, regardless of whether it matches the scan frequencies. This is a problem since, when you first switch to a source, the scan frequency may not necessarily match the memory. With the Marquee software, *an ASR is performed every time an input is switched to*. (This is true provided the Input Memory being switched to has ASR turned "ON".)

> The conditions under which an ASR occurs are:
> The Input Memory was switched to.
> Scan frequency change greater than 100 Hz horizontal, or 1 Hz vertical
> Projector was powered up manually and it was last on an Input with ASR ON.
> Projector was powered up because of Auto power-up and it was last on an Input with ASR ON.

The concept of turning ASR "ON" or "OFF" is also different. It is now a per Input setting. It is no longer a global setting. For example, it is possible to set ASR "ON" for Input Memory 01 and ASR "OFF" for Input Memory 02. *Status of ASR is set per Input Memory*. Recall Memories do not store ASR ON/OFF status. You can check the ASR status of the current Input Memory by pressing < * > < * >. You can also check the ASR status of all Input Memories by pressing < UTIL > < 4 >.

The scan frequency stored in each memory is updated automatically each time that memory is active and an adjustment is made. This means that there are no longer any special frequency stamp command. The command < SOURCE > < RESET > no longer exist. For example, if the projector was presently on Recall Memory 12 and < CONTRAST > was adjusted, the projector will automatically perform its own frequency stamp and store the currently sensed scan frequency into Recall Memory 12.

Another important difference with ASR is what happens during an ASR. *If the projector finds a Recall Memory which matches, it will actually switch to this Recall Memory*. For example, if the projector found Recall Memory 14 matches, the projector itself will execute a < RECALL > < 1 > < 4 > command. This is different from V3.1 software. Version V3.1 would only take a copy of the matched Recall Memory. The result of this difference is that now if an adjustment is made after an ASR, these adjustments will be stored. Please note that the above is true only for matched Recall Memories and **not** Input Memories.

Examples

Three examples will now be given to illustrate how memories and ASR should be used. These examples were chosen to highlight different aspects of the software.

Always remember one general rule about setting up a projector. **Keep ASR Off while you are setting up the memories of the projector.** This will ensure that the memory you switch to is the one you asked for.

Input 11   Input 12   Input 13
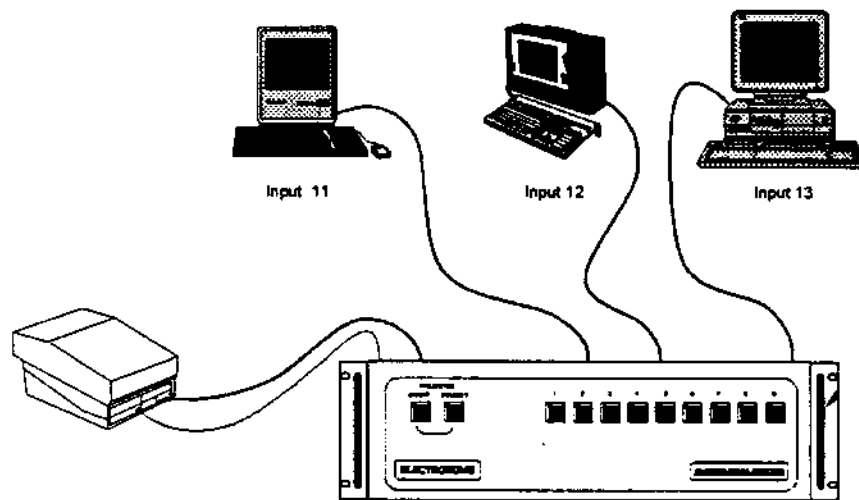
Example 1

In example 1, assume all 3 sources connected to the switcher have fixed scan rates. Although this is a very simple application, it is illustrated to highlight two important points:

•**No Recall Memories used**   •**ASR turned Off for all Input Memories.**

After connecting all sources to switcher, remember to connect the communication line between the switcher and projector. Also remember to set the switcher number to "1".

KEYPAD COMMANDS	DESCRIPTIONS
\<SOURCE\> \<1\> \<1\>	Switch to the first input and setup projector using Input Memory 1 1.
\<SOURCE\> \<1\> \<2\>	Switch to the second input and setup projector using Input Memory 1 2.

KEYPAD COMMANDS	DESCRIPTIONS
\<SOURCE\> \<1\> \<3\>	Switch to the third input and setup projector using Input Memory 1 3.
\<UTIL\> \<4\>	Check to see that all 3 Input Memories have ASR turned Off.

If any of the Input Memories have ASR ON, turn it OFF using the key sequence:
\<UTIL\> \<1\> \<4\>.

31.5K   35.6K

Input 11   Input 12   Input 13
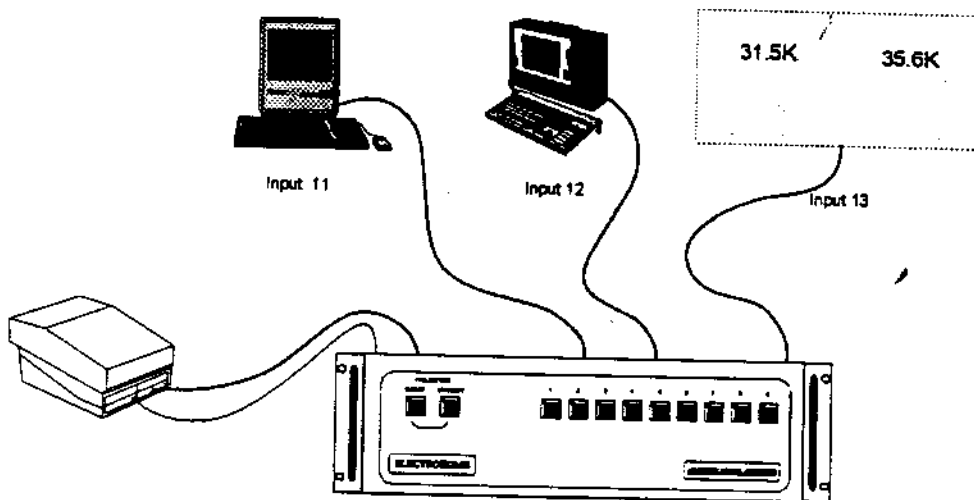
Example 2

In this second example, Input 1 3 is a computer which operates at 2 different scan rates. For the purpose of this example, lets assume that these 2 scan rates are 31.5 KHz (DOS) and 35.6 KHz (Windows). Because of Input 1 3, it is necessary to use ASR. Use the following steps to setup the projector:

KEYPAD COMMANDS	DESCRIPTIONS
\<SOURCE\> \<1\> \<1\>	Switch to the first input and setup projector using Input Memory 1 1.

KEYPAD COMMANDS	DESCRIPTIONS
<SOURCE> <1> <2>	Switch to the second input and setup projector using Input Memory 1 2.
<SOURCE> <1> <3>	Switch to the third input.
<RECALL> <0> <1>	Switch-in Recall Memory 01. Check to see that the computer is running at 31.5 KHz. Adjust projector; converge, geometry, etc..
<RECALL> <0> <2>	Switch-in Recall Memory 02. Check to see that the computer is running at 35.6 KHz. Adjust projector; converge, geometry, etc.
<SOURCE> <1> <3>	Enter back into Input Memory 1 3 so that you can clear its frequency stamp.
<UTIL> <1> <5>	This step will clear Input Memory 1 3 and stamp a frequency of 0.00 into its memory. By doing this, Input Memory 1 3 will not be used during an ASR search.
<UTIL> <1> <3>	This step will lock Input Memory 1 3 to prevent any frequency stamping.
<UTIL> <1> <4>	This step turns ASR "ON" for Input 1 3 (only). Note that this is the last step.
<UTIL> <3> or <4>	Use this command at any time to check the status of the memories for proper frequency stamping.

KEYPAD COMMANDS	DESCRIPTIONS
<SOURCE> <1> <2>	Switch to the second input and setup projector using Input Memory 1 2.
<SOURCE> <1> <3>	Switch to the third input.
<RECALL> <0> <1>	Switch-in Recall Memory 01. Check to see that the computer is running at 31.5 KHz. Adjust projector; converge, geometry, etc..
<RECALL> <0> <2>	Switch-in Recall Memory 02. Check to see that the computer is running at 35.6 KHz. Adjust projector; converge, geometry, etc.
<SOURCE> <1> <3>	Enter back into Input Memory 1 3 so that you can clear its frequency stamp.
<UTIL> <1> <5>	This step will clear Input Memory 1 3 and stamp a frequency of 0.00 into its memory. By doing this, Input Memory 1 3 will not be used during an ASR search.
<UTIL> <1> <3>	This step will lock Input Memory 1 3 to prevent any frequency stamping.
<UTIL> <1> <4>	This step turns ASR "ON" for Input 1 3 (only). Note that this is the last step.
<UTIL> <3> or <4>	Use this command at any time to check the status of the memories for proper frequency stamping.

ASR/ASI Logic Chart

A Recall Memory or Input Change command was requested.

Change in scan frequency detected.

Is ASR turned On for requested Input or Is ASR turned On for current Input, if Recall Memory requested

No → Switch to requested Recall Memory or Input.

Yes

Frequency change greater than 100 Hz horz. or greater than 1 Hz vert. and Input Memory has ASR turned ON

Yes

No → Do nothing

Check current or requested Input Memory.

Match → Do nothing, projector already on Input Memory

No match

"Match" - This is when the current source scan frequencies (H and V) matches the Input or Recall memory. In the event there are more than 1 memory (Input or Recall) with the same scan freq., the one with the ASR √ will be used.

The memory which is last adjusted receives the √.

Search through all Recall Memories.

Match → Switch projector to this "matched" Recall Memory

No match

Any adjustments made at this point will be updated and stored in the current Input or Recall Memory.

Search through all Input Memories.

Match → Make a copy of this Input Memory and display it.

No match → Interpolate using the 2 closes memories. Display the results.

Any adjustments made at this point will be updated but NOT stored in any Recall or Input Memory.

KEYPAD COMMANDS	DESCRIPTIONS
\<UTIL> \<1> \<5>	This step will clear Input Memory 0 1 and stamp a frequency of 0.00 into its memory.
\<UTIL> \<1> \<3>	This step will lock Input Memory 0 1 to prevent accidental frequency stamping.
\<UTIL> \<1> \<4>	This step turns ASR "ON" for Input 0 1 (only).

Deleting Memories

As mentioned before, there are 80 memories in total. It is possible that a projector runs out of memories. This could happen if some one was to continually press Recall Memories 01, 02, 03,... etc.. In the event that the 80 memories are used up, it is possible to *"delete"* memories. The key sequence \<UTIL> \<9> (password) \<8> will give you access to the "Delete a Setup Memory" menu. Use this feature to delete unused memories. It also a good idea to delete memories even though you have not reached the end of your 80 memories. During an ASR search, the projector could choose a memory which was setup long ago for a different screen size and hence be inaccurate.

ASI with Save

This is a feature previously called "Forced ASR" on the ECP V3.1 software. When accessed using the key sequence; \<UTIL> \<1> \<2> the projector will perform an ASR search. An ASI with Save Logic Chart is attached to help illustrate what the projector is doing.