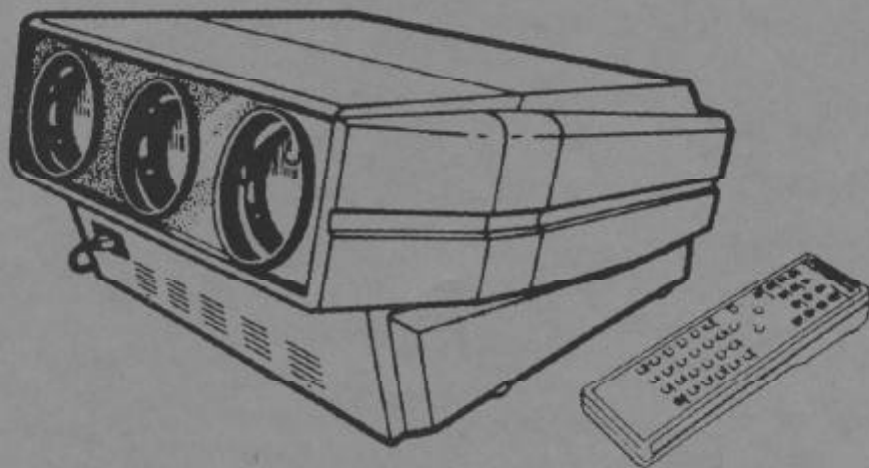


TM

MARQUEE

Training Manual



ELECTROHOME
Projection Systems

The Image of A Winner

MARQUEE TRAINING COURSE

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Static Focus Drawing

OPERATION

THE IR CONTROLLER

There are four methods of controlling the projector:-

- Using the IR controller supplied with the projector
- Using the direct wired controller located inside the front section of the projector.
- External control from another sensor or computer generated control via the rear panel jack.
- Computer control using the RS232 port at the rear of the projector.

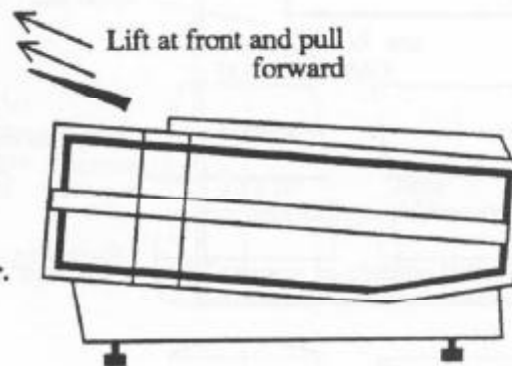
IR Remote

The IR remote uses an IR signal modulated at 300 Khz with the command instructions encoded on it.

In some situations with high ambient light it is possible to get too much external IR to be able to operate the sensor. Usually this occurs in rooms where the lighting is to be dimmed anyway and the control functions are not impaired once the lights are dimmed.

Hard wired controller

The hard wired controller is a useful alternative to the IR controller when working on the projector. It is stored inside the front compartment of the projector and can be accessed by lifting the front panel of the projector.



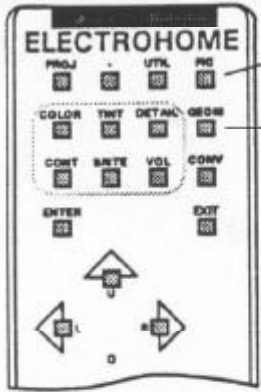
External Control

External control on the rear panel is useful when the projector is to be integrated into a system with tight control of lights sources sound etc. AMX and Crestron are the two main manufacturers of this equipment.

RS232 Control

The RS232 port can also directly control the projector but it requires special software from the controlling computer with all the command sequences and a command menu. This software is not yet available. It is intended to use this port for troubleshooting, downloading parameters etc.

Picture and Geometry Adjustments



- Picture Adjustment**
1. Phase
 2. Size
 3. White Balance
 4. Focus
 5. Change to Slow Sync
 6. Top Blanking
 7. Bottom Blanking
 8. Left Blanking
 9. Right Blanking

- White Balance**
1. 3500 K (reddish)
 2. 6500 K (white)
 3. 9500 K (bluish)
 4. Use Service Settings
 5. Customize White
- Currently Using: 2

- Geometry**
1. Size
 2. Keystone
 3. Side Pin
 4. Top Pin
 5. Bottom Pin
 6. Bow
 7. V Linearity C
 8. V Linearity S
 9. Skew

Keystone

Side Pin

Top Pin

Bottom Pin

Bow

Phase

Size

Focus

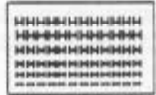
Change to Slow Sync

Top Blanking

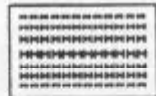
Bottom Blanking

Left Blanking

Right Blanking



V Linearity C



V Linearity S

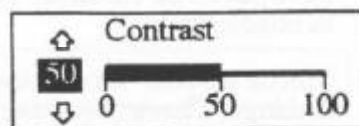
Skew

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.

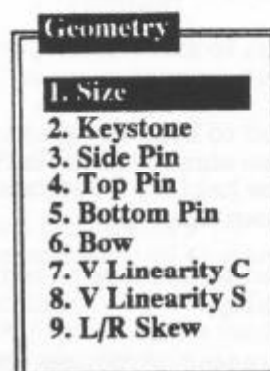
Sidebars

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



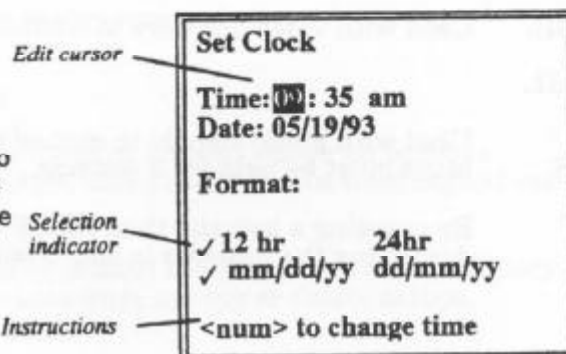
Menus

The four menu keys bring up a list of menu selections as shown. Items can be picked by pressing the item number or by arrowing to the required item and pressing the ENTER key.



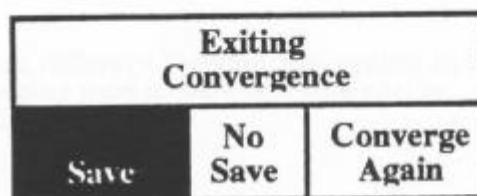
Selection Boxes

These are used for parameters requiring data entry such as date and time shown. The arrow keys are used to move between fields. The bottom of the screen provides instructions on the type of data to be entered. A combination of all four keys is used for text entry.



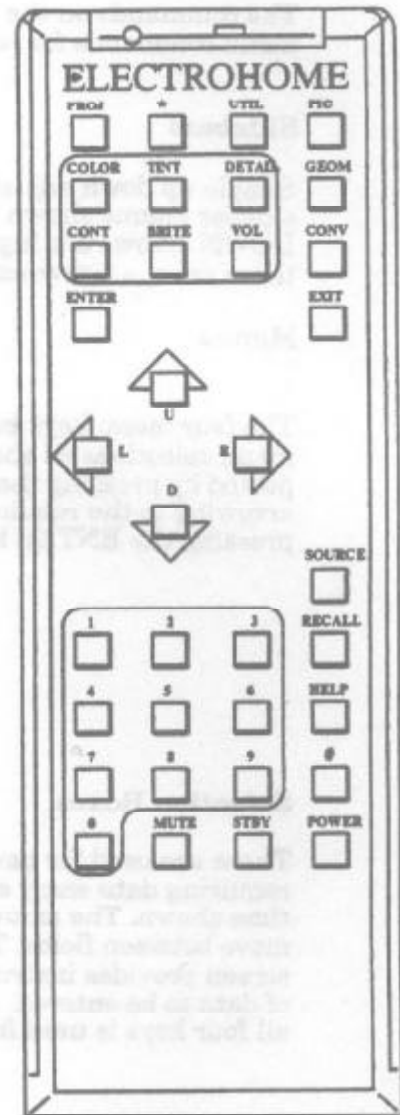
Confirmation Boxes

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 arrow keys are used to move between the choices.



SIMPLE COMMANDS

- Power** Press and hold for 2 - 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. There are three pages of settings 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 running with the video signals to the crt's turned off. 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, TINT, DETAIL** Used with video decoders to control the picture.
- VOL, MUTE** Used with audio signals to control the volume. Mute must be held for 3 seconds.
- HELP** By pressing a key and then HELP a help screen describing the function is displayed.



SETUP MEMORY

Memory parameters

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

Setup Memory Parameters	
Memory Identification <ul style="list-style-type: none">• <i>Input or Recall</i>• <i>Switcher and Slot Number or Recall Number</i>	Primary Display Parameters <ul style="list-style-type: none">• <i>Color</i>• <i>Tint</i>• <i>Detail</i>• <i>Contrast</i>• <i>Brightness</i>• <i>Volume</i>
Memory Status <ul style="list-style-type: none">• <i>Locked or Unlocked</i>• <i>Last used</i>	Geometry Parameters <ul style="list-style-type: none">• <i>Size</i>• <i>Keystone</i>• <i>Pincushion</i>• <i>Bow</i>• <i>Linearity</i>• <i>Skew</i>
Signal Frequencies <ul style="list-style-type: none">• <i>Horizontal Frequency</i>• <i>Vertical Frequency</i>	Convergence Parameters <ul style="list-style-type: none">• <i>Convergence settings at all 45 zones</i>
Picture Parameters <ul style="list-style-type: none">• <i>Phase</i>• <i>Size</i>• <i>White Balance</i>• <i>Focus</i>• <i>Sync</i>• <i>Blanking</i>	Control Settings <ul style="list-style-type: none">• <i>ASR On/Off (input memories only)</i>• <i>Video Format (decoder only)</i>• <i>Signal Type Override</i>• <i>Volume (audio)</i>

Setup, Input and Recall Memories

A setup memory is defined as either an input or a recall where 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 there is no more setup memory left (at 80 setups). The Utilities 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.

When one input has several different signals at different frequencies coming in the recall setup can be used to save each set of display parameters and this can be "recalled" to get a fast smooth setup for the display.

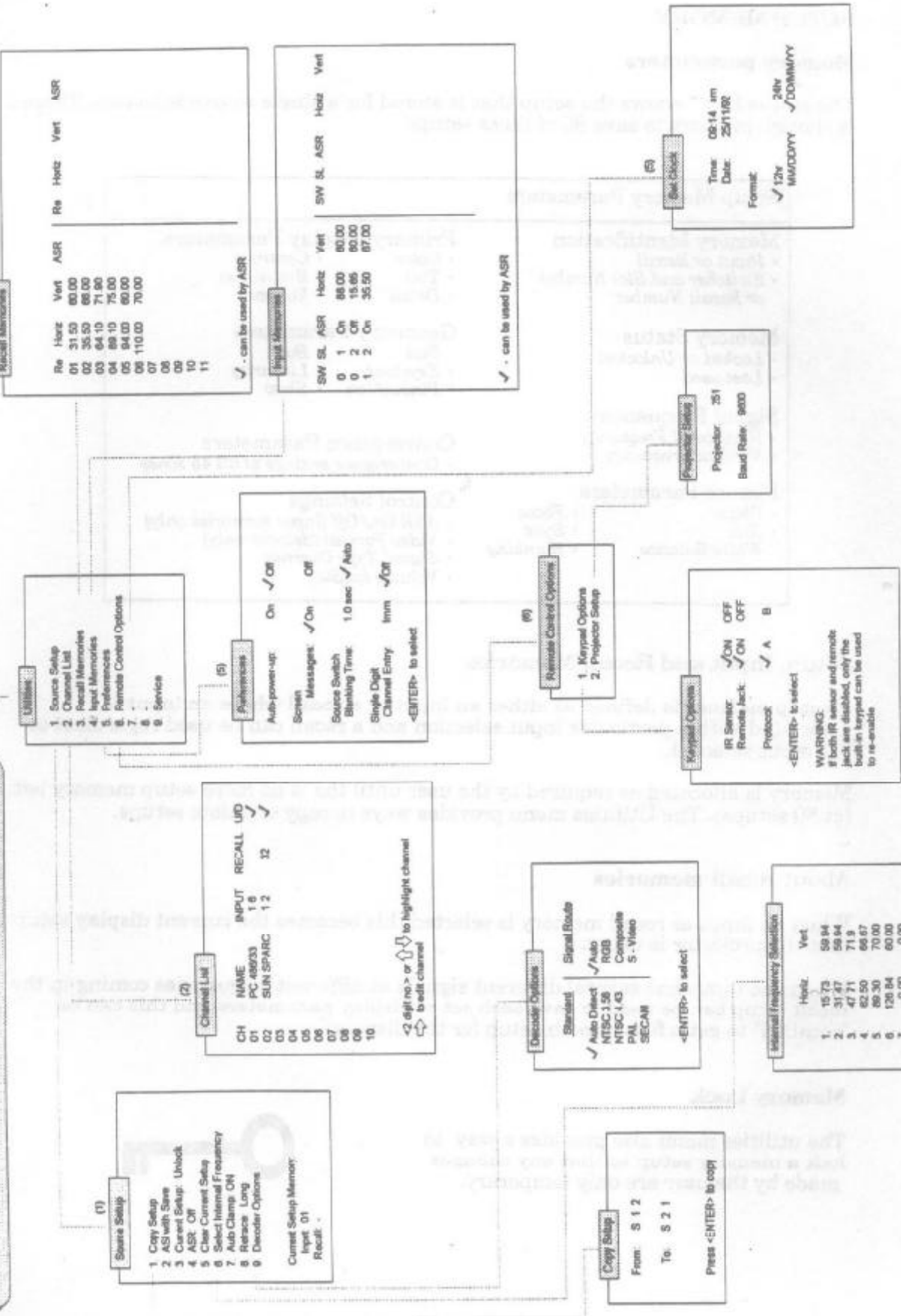
Memory Lock

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



Software Menu Structure

UTIL



Recall Memories

Re	Horz	Vert	ASR	Re	Horz	Vert	ASR
01	31.50	80.00					
02	35.50	65.00					
03	64.10	71.80					
04	89.10	75.00					
05	94.00	60.00					
06	110.00	70.00					
07							
08							
09							
10							
11							

✓ . can be used by ASR

Input Memories

SW	SL	ASR	Vert	SW	SL	ASR	Horz	Vert
0	1	On	88.00	80.00				
0	2	Off	15.65	80.00				
1	2	On	35.50	87.00				

✓ . can be used by ASR

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

- Preferences**
- Auto-power-up: On ✓/Off
 - Screen
 - Messages: /On Off
 - Source Switch: /On Off
 - Blinking Time: 1.0 sec ✓/Auto
 - Single Digit: Inm ✓/Off
 - Channel Entry: Inm ✓/Off
- <ENTER> to select

Channel List

CH	NAME	INPUT	RECALL	UID
01	PC-AS923	1 6		✓
02	SUN SPARC	1 2	12	✓
03				
04				
05				
06				
07				
08				
09				
10				

<2> digit no > or <1> to highlight channel
<4> to edit channel

- Decoder Options**
- | Standard | Signal Route |
|---------------|--------------|
| ✓ Auto Direct | ✓ Auto |
| NTSC 1.56 | RGB |
| NTSC 1.43 | Composite |
| PAL | S - Video |
| SECAM | |
- <ENTER> to select

Internal Frequency Selection

Hz	Vert
1. 15.73	59.94
2. 31.47	59.94
3. 47.71	71.9
4. 62.50	66.67
5. 89.30	70.00
6. 126.94	60.00
7. 0.00	0.00
8. 0.00	0.00
9. 0.00	0.00

Blank Screen

Time: 08:14 am
Date: 25/11/88
Format: ✓ 12v MMDDYY 24v ✓DDMMYY

Projector Status

Projector: 751
Baud Rate: 9600

- Keypad Options**
- IR Sensor: /On Off
 - Remote Jack: /On Off
 - Protocol: /A B
- <ENTER> to select
- WARNING:
If both IR sensor and remote jack are disabled, only the built-in keypad can be used to re-enable

- Remote Control Options**
1. Keypad Options
 2. Projector Setup

- Source Setup**
1. Copy Setup
 2. ASI with Save
 3. Current Setup: Unlock
 4. ASR: Off
 5. Clear Current Setup
 6. Select Internal Frequency
 7. Auto Clamp: On
 8. Retrace: Long
 9. Decoder Options
- Current Setup Memory:
Input: 01
Recall: .

UTILITY MENU

These functions are to do with specific parameters mostly to do with the input signal.

Source Setup

This selection brings up a second menu with parameters to do with the input source:

- Copy setup - to copy to another setup or recall memory
- ASI with save - Performs an ASI operation and saves result in this setup
- Current setup lock/unlock - locks the settings in memory
- ASR ON/OFF - sets ASR on or off for this setup
- Clear current setup - Resets settings for this source
- Select internal frequency - Used for test patterns
- Auto clamp on/off - Black level clamp setting
- Retrace short/long - Sets retrace time
- Decoder options

Channel List

Displays the channel list and allows them to be modified

Recall Memories

Displays the recall memory list

Input Memories

Displays the input memory list

Preferences

Allows the user to set up important global parameters like Auto power on/off, screen messages on/off, source switch blanking time and single digit channel entry for faster source changes.

Remote control options

Sets global functions to turn the IR keypad on or off, the external remote jack on or off and the the IR protocol from "A" to "B".

There is a further menu box for setting the projector number and the RS232 baud rate.

Service

This brings up the service menu which is discussed later.

SERVICE FUNCTIONS AND MENUS

BASIC SERVICE FUNCTIONS

There are no potentiometers inside the Marquee - all adjustments are made from the remote controller. Some of the basic operations are:-

Setting the colours

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

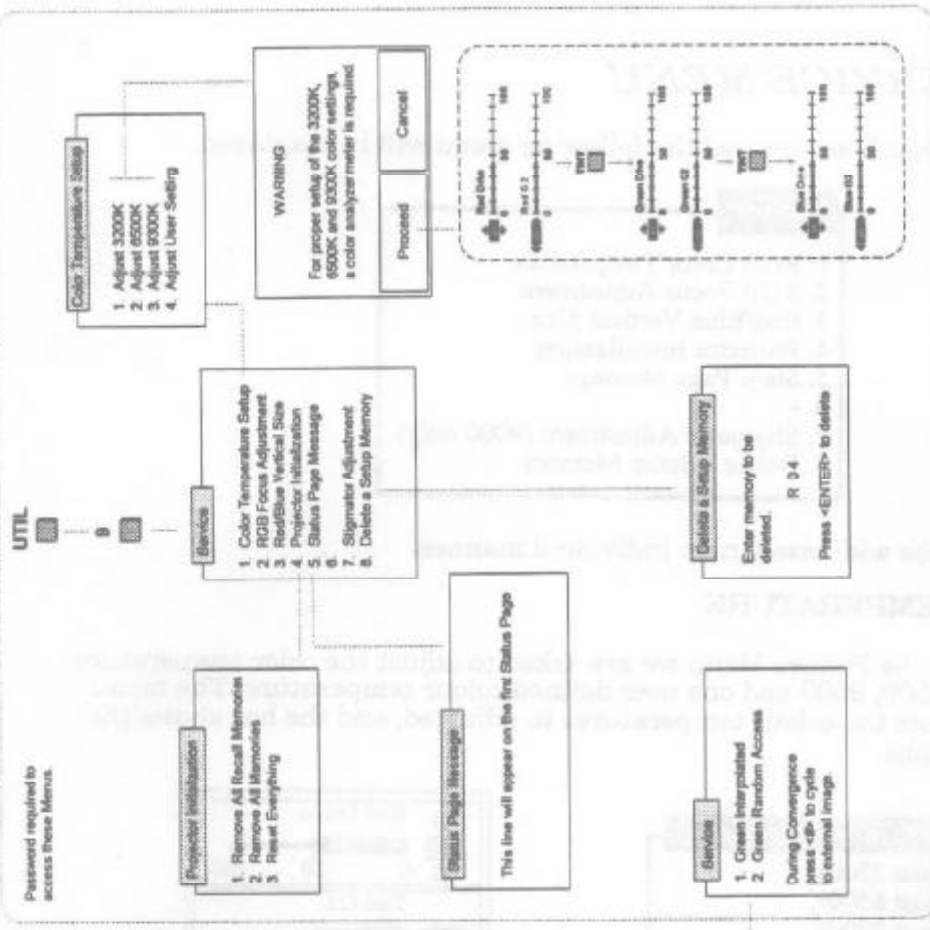
The values of Red and Blue convergence can be zeroed while converging by pressing '0' while in the standard convergence screen. For Green the values can be zeroed while in one of the two Green convergence screens.

Service Password

Entering the service menus from either Convergence or the Utility Menu requires a password.

The factory password is: 0901.

Software Menu Structure



Current Display Settings

Channel: 21 PC 486 D1000

Input: 01

Recall: ---

Contrast: 65	H Size: 45	H Phase: 57
Bright: 50	V Size: 55	V Phase: 50
Volume: 45	Keystone: 25	White Bar: 2
Color: 52	Side Pn: 64	(6500K)
Trt: 52	Top Pn: 33	Focus: 50
Detail: 25	Bot Pn: 35	T Blank: 0
Retrace: Short	Bow: 50	B Blank: 0
Sync: Slow	C Lin: 55	L Blank: 0
AutoClamp: on	S Lin: 45	R Blank: 0
	L/R Skew: 20	

Current Input Parameters

Channel: 37 Apple Mac II

Switcher: 2

Slot: 4

Recall: ---

ASR: On

Interface: Modulator PC Analog

Horz Freq: 35.00 KHz

Vert Freq: 72.00 Hz

Signal Type: RGB

Sync Type: Composite

Video Standard: ---

Electrohome Projection Systems

Marques 9008

Projector No: 010

IR Sensor: On

Remote Jack: On

Protocol: A

Auto Powerup: Off

Messages: Off

Model: 08

Serial No: 123456789

Software: V1.4

Horz Scan: Normal

Vert Scan: Normal

Switcher: 1,3,59

Options: Decoder

UTILITY SERVICE MENU

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

Service

1. RGB Color Temperature
2. RGB Focus Adjustment
3. Red/Blue Vertical Size
4. Projector Initialization
5. Status Page Message
6. -
7. Stigmator Adjustment (9000 only)
8. Delete a Setup Memory

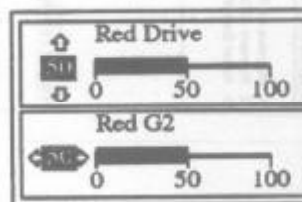
Each of these shall be addressed in an individual manner.

1. RGB COLOR TEMPERATURE

As we remember in the Picture Menu we are asked to adjust the color temperature to 3 presets 3200, 6500, 9500 and one user defined colour temperature. The menu below is used to select the colour temperatures to adjusted, and the box shows the adjustment bar graphs.

Color Temperature Setup

1. Adjust 3200K
2. Adjust 6500K
3. Adjust 9300K
4. Adjust User Setting



Note: The first three items are set up at the factory with calibrated test equipment.

By pushing ENTER the image will display the Gray scale pattern, or by pushing the # key you may cycle through the various patterns or the external input to the projector. When setting up Gray scale the gray scale pattern is preferred.

The Red drive and Red G2 Icons are displayed. The up down controls the Red drive (white levels) and the side arrows control the Red G2 (gray levels). Pushing the TINT key will cycle through the controls for Green and Blue allowing the controls to be adjusted while viewing the gray scale pattern. Pushing the COLOR key will change the colours to Red, Green and Blue respectively. This can be used to view the individual Red, Green, and blue colors to ensure that the proper black levels (G2) as well as white levels (drives) are properly set. Cycling back to the Gray Scale will verify that the proper gray scale balance has been achieved.

Normally the projectors would be set to 6500 °K or 9500 °K depending on the source being viewed. The above adjustment would be used when two or more projector are installed near to each other and proper colour balance can not be achieved.

A note of caution: entering this menu whether or not an adjustment has been made will change the color temperature settings in the picture menu to selection number 4. To restore the correct setting re-enter the picture menu and select white balance and choose the temperature required.

2. RGB FOCUS

RGB Focus is more exact than the "master" focus adjustment used in the Picture menu. It is designed to have a center static adjustment effecting the center region of the screen and four zone adjustments to allow the periphery of the screen to be fine tuned. Each color is adjusted separately to provide the sharpest image possible. Note that the focus adjustments are the same for all frequencies and it only has to be set up once.

To select RGB Focus high light the second item or push 2 the dot/grid pattern will appear with a square in the center of the image. Note that master focus should normally be set to 50% in the bar graph before going to the RGB focus Menu and that Contrast should be set to approximately 80%. To return to the focus adjustment after adjusting contrast press **RECALL**.

Any pattern may be displayed by pressing the # key. The area inside the block will display a number from 00 to 100. By pushing the left right or up down arrow keys the center block will adjust the static focus for each dot. Pressing **ENTER** cycles the adjustment through Red, Green and Blue and then into the zone adjustments for each color.

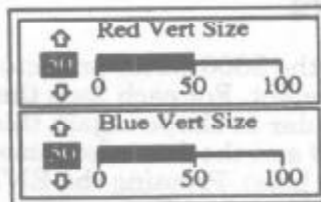
When adjusting the zones try to get the edges of the screen focused rather than the center of the boxes.

Once the last zone is completed in the Blue adjustment, or if **EXIT** is pressed a prompt is displayed to **SAVE**, **CANCEL** or **CONTINUE**. if the image still appears soft at the top, bottom, left or right recheck that the optical focus is correctly set. **DO NOT LOOK DIRECTLY INTO THE CRT!**

Reduce Contrast to proper viewing levels. Adjusting the RGB focus will **AFFECT CONVERGENCE** and a convergence touch up will need to be performed after proper geometry, size and toe in have been properly set.

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 CRT and the side arrows control the Blue CRT.



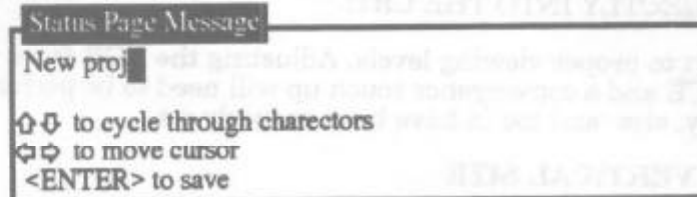
4. PROJECTOR INITIALIZATION

This allows the user the ability to re-initialize the projector in the following stages :-

1. **Remove all Recall Memories**
This will completely remove all the Recall memories currently saved in the projector. *Warning!* There is no prompt warning if highlighted or the 1 key is pressed.
2. **Remove all Memories**
This will clear out all source and slot memories currently saved in the projector. *Warning!* No prompts are given, accidental selection will clear all the memories.
3. **Remove Everything**
This will completely bring the projector to factory defaults. A warning prompt is given! If DO IT is selected followed by the ENTER or EXIT key the projector will power down. Upon powering up the projector displays "Projector Initialization".

5. PROJECTOR STATUS PAGE MESSAGE

This will provide a means of displaying a company name, service call information etc. The message will appear in the status screen when the * key is pressed.



6. RESERVED FOR FUTURE USE

7. STIGMATOR ADJUSTMENTS

This feature is only functional on the 9000 series projector. The adjustment is much the same as the RGB focus adjustment. For each zone the arrow keys are pressed to make the dots within the box circular in shape. Again this adjustment requires the contrast to be driven to at least 80 and the focus defocused so that the dots have a solid edge (not a bright dot with a hole). Pressing the ENTER key steps to the next zone to be adjusted. When all the zones have been adjusted a prompt will come up to save, cancel or continue.

8. DELETE A SETUP MEMORY

When selected a menu will ask "Enter Memory to be Deleted". Source will display S, Recall will display R followed by the numbers you wish to be deleted. Unlike the Projector initialization to remove all memories this selection removes memories one at a time.

CONVERGENCE SERVICE MENU

This adjustment is used to adjust Green convergence in case the geometry cannot be fully corrected or to compensate for screen distortion.

There are two modes in which the convergence can be performed - Interpolated and Random convergence.

If the source was previously converged prior to the green Convergence adjustment the Red and Blue dynamic convergence will "snap" into convergence where the Green lines were placed which means that no additional convergence adjustment should be required. *Note* : The static green will not "snap" to Red and Blue.

1. 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 inside the box . 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 for a first time setup or if there has been a lot of previous adjustment that needs to be reset. Each time a zone is adjusted, at the first arrow press, the convergence values in the zone and in the neighboring zones are reset. Gradually, as more and more zones are adjusted the resetting of adjacent zones is curtailed so that the convergence becomes more and more exact.

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 (such as the "coke bottle distortion" in the vertical deflection). Random convergence is generally the method used once the projector has been initially set up.

RESETTING GREEN CONVERGENCE

Green convergence can be reset by pressing the '0' button while in either of the two convergence methods.

INSTALLATION AND SETUP

The following section provides an overview of the installation procedure for the Marquee projector. The main steps that will be required are:-

- 1: Position the projector - To ensure the correct throw distance and mount it in the ceiling or upright as required.
- 2: Prepare the projector - Reverse the yokes if necessary, hook up the power and connect the source.
- 3: Center the Projector and the RGB rasters - Check the centering of the rasters in the CRTs, make adjustments of the physical centering of the projector to the screen with by adjusting the feet and skewing the projector.
- 4: Optical focus - Carry out a complete optical alignment.
- 5: Geometry - Adjust the skew, key, pin, bow, vertical linearity and green convergence to get a linear rectangular test pattern.
- 6: Electrical Focus - Adjust the static and dynamic focus, for the 9000 also adjust the astigmatism.
- 7: Convergence - Adjust the RED and GREEN convergence.

It is very important to get the projector physically positioned correctly and to have the rasters correctly centered with the right toe in. It minimizes the work later on and makes the projector more stable.

Adjusting the projector to the screen is a critical step in the installation process. The projector should be positioned so that the screen is centered in the projector's beam. The projector should be adjusted so that the screen is centered in the projector's beam. The projector should be adjusted so that the screen is centered in the projector's beam.

Adjusting the projector to the screen is a critical step in the installation process.



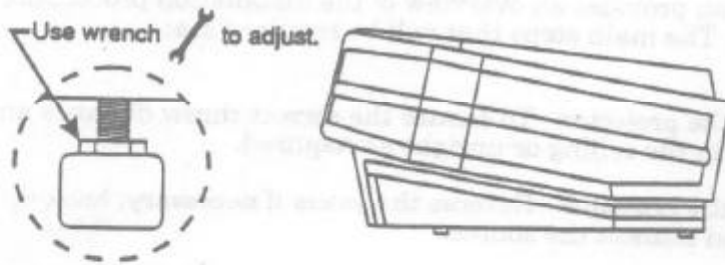
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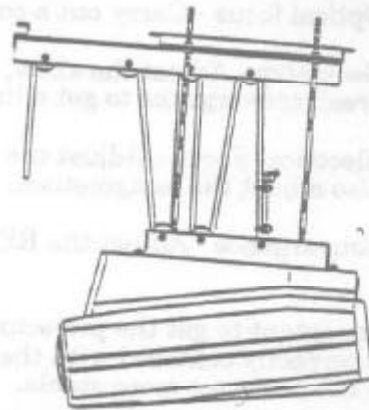
MOUNTING THE PROJECTOR

The projector is supported by four adjustable feet. A wrench is supplied with the projector for adjusting the height.



Ceiling Mount

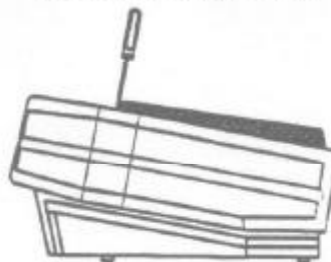
A special ceiling mount is also available and (option number). The ceiling mount is designed to winch up the 175 lb. plus projector and lock it in position. The mount uses aluminum struts to minimize magnetic interference with the projector.



Reversing the Scan

The horizontal and vertical deflection yokes can be reversed for ceiling mount or rear screen use. To change the yokes it is necessary to remove the two top covers as shown in the diagram below.

a) Loosen 2 fixing screws.

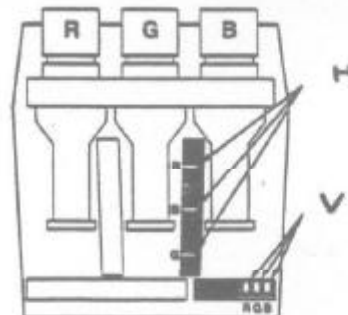


b) Slide rear cover back.



To reverse the horizontal yokes remove the snap on cover from the horizontal deflection module and reverse the connectors shown.

To reverse the vertical yokes remove the connectors on the vertical deflection module and reverse the plug orientation.



Throw Distance Calculation for Marquee Projectors

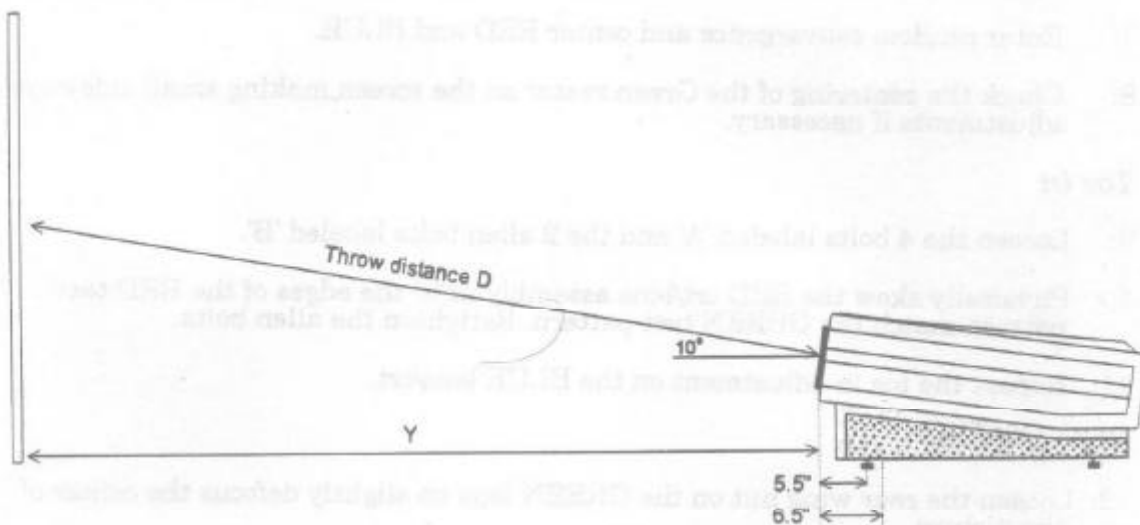
The throw distance for the Marquee 8000 and 9000 are as follows:

Marquee 8000

$D = 1.22 \times W + 10''$ where W = width of screen in inches; D also in inches
or $D = 0.98 \times \text{Diag.} + 10''$ where Diag. = diagonal of screen
(Eg. Screen width of 108" will yield a throw distance of 142")

Marquee 9000

$D = 1.25 \times W + 6''$ where W = width of screen in inches; D also in inches
or $D = \text{Diag.} + 6''$ where Diag. = diagonal of screen



You can also calculate the distance Y , using the following formula:

$$Y = D \times \cos 10^\circ \quad \text{or} \quad Y = D \times 0.985$$

Using Y applies only when the projector is mounted level and the screen is at right angles to the floor or ceiling.

The above formulas were chosen to be effective over the full range of the projector, regardless of scan frequencies or keystone angles. It is possible to optimize your installation. For example, if there is no keystone angle, the projector can be brought closer and hence use more of the CRT phosphor. For optimal throw distances, you will need to simulate the installation with all the sources that will be used in the actual installation.

Marquee 8000 Initial Physical setup

- 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: Move the projector side to side to center the test pattern in the screen.
- 4: Adjust skew and tilt to make a rectangular level test pattern.
- 5: Adjust center and corner focus on the RED and BLUE lenses

Center the Rasters

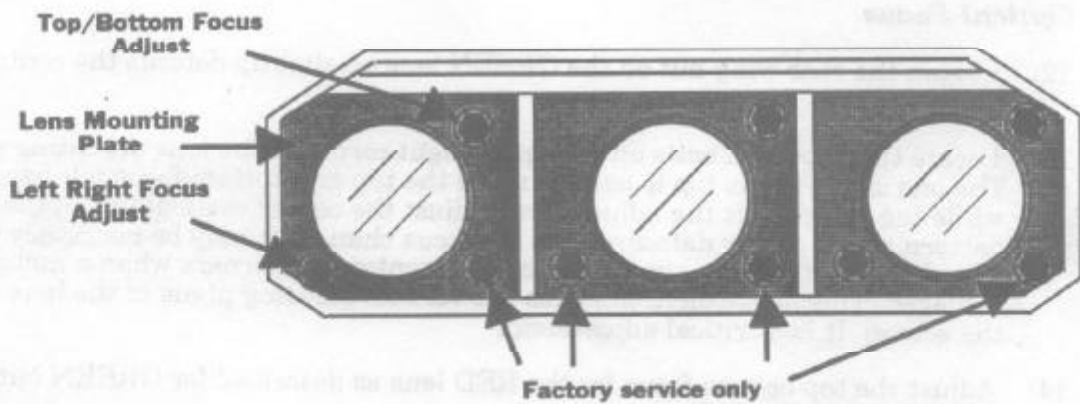
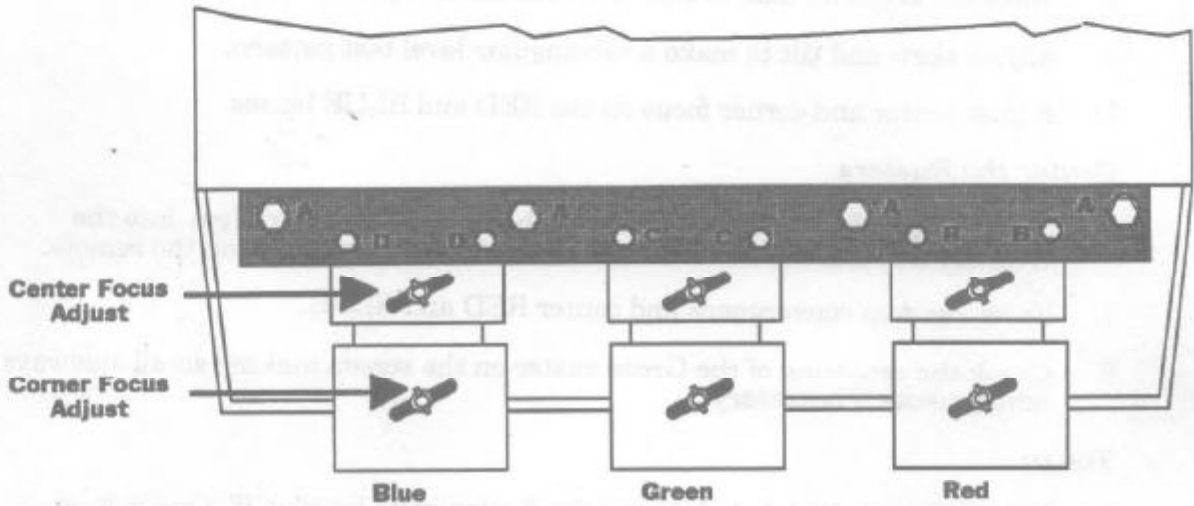
- 6: Select GREEN convergence and turn the contrast low. Now look into the GREEN lens and center the raster using the arrow controls on the remote.
- 7: Enter random convergence and center RED and BLUE.
- 8: Check the centering of the Green raster on the screen making small sideways adjustments if necessary.

Toe in

- 9: Loosen the 4 bolts labeled 'A' and the 2 allen bolts labeled 'B'.
- 10: Physically skew the RED crt/lens assembly until the edges of the RED test pattern match the GREEN test pattern. Retighten the allen bolts.
- 11: Repeat the toe in adjustment on the BLUE lens/crt.

Optical Focus

- 12: Loosen the rear wing nut on the GREEN lens on slightly defocus the center of the picture.
- 13: 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 re-adjust 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.
- 14: Adjust the top bottom focus for the RED lens as described for GREEN but do not refocus the lens yet.
- 15: 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.
- 15: Repeat the above process for the BLUE lens.
- 16: This completes the optical focus and mechanical alignment. Tighten the four bolts labeled 'A' to lock the assemble in place.



Marquee 8000 Lens Assembly

Marquee 9000 Initial Physical setup

- 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: Move the projector side to side to center the test pattern in the screen.
- 4: Adjust skew and tilt to make a rectangular level test pattern.
- 5: Adjust center and corner focus on the RED and BLUE lenses

Center the Rasters

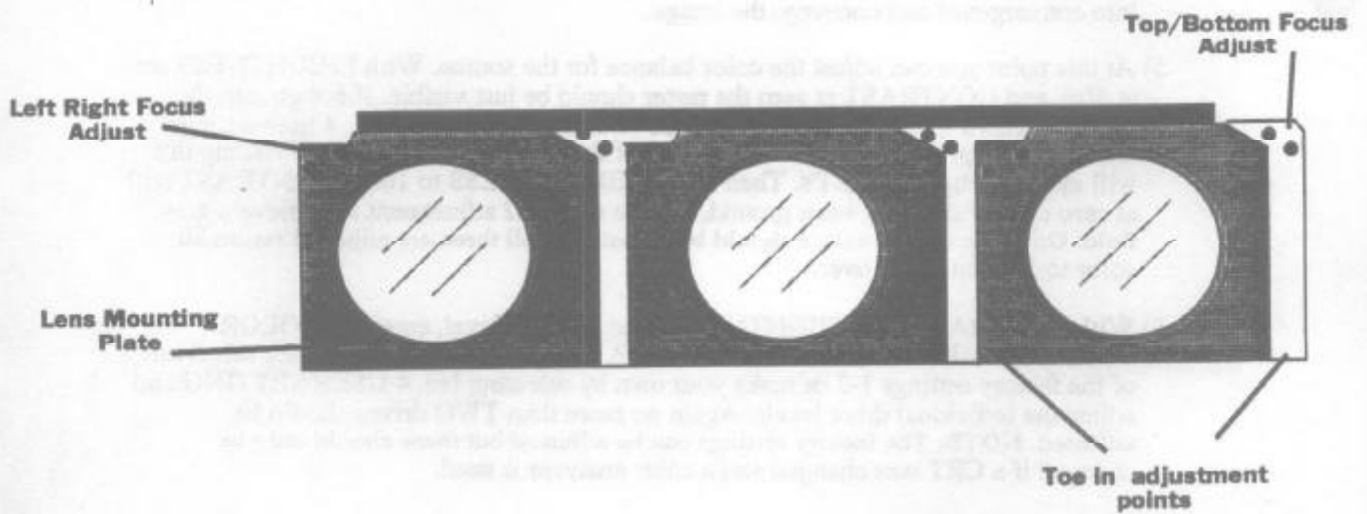
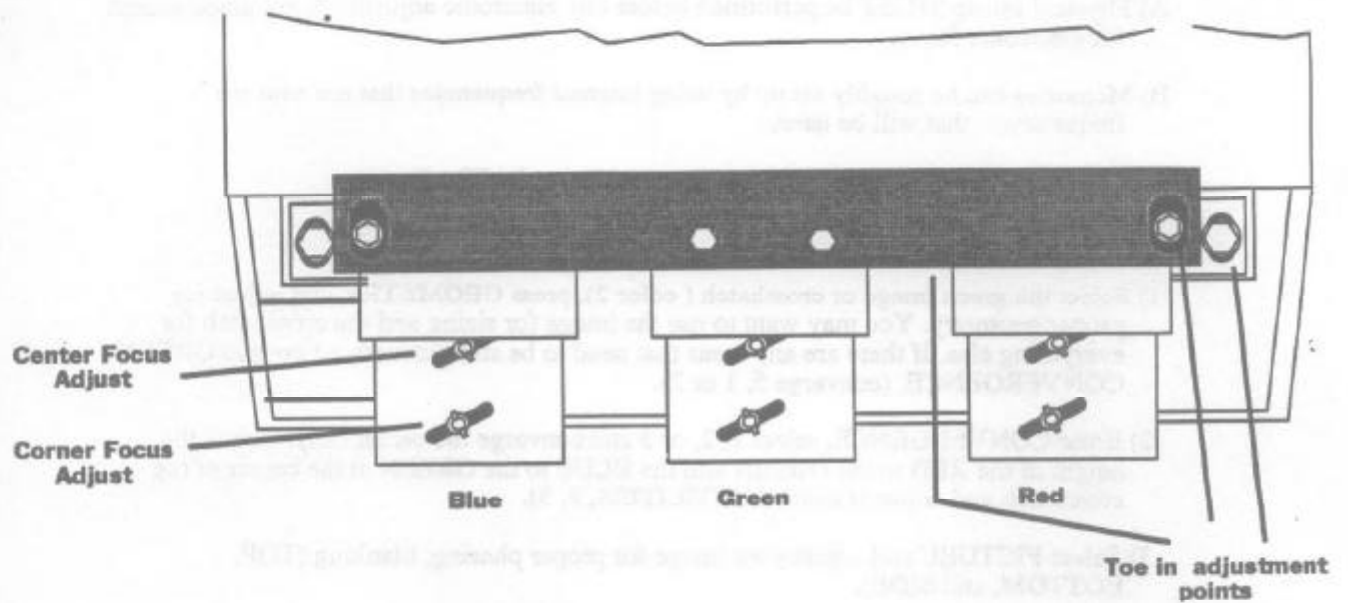
- 6: Select GREEN convergence and turn the contrast low. Now look into the GREEN lens and center the raster using the arrow controls on the remote.
- 7: Enter random convergence and center RED and BLUE.
- 8: Check the centering of the Green raster on the screen making small sideways adjustments if necessary.

Toe in

- 9: Loosen the 4 bolts labeled 'A' and the 3 allen bolts labeled 'B'. One is located above the RED lens and the other two are underneath.
- 10: Physically skew the RED crt/lens assembly until the edges of the RED test pattern match the GREEN test pattern. Retighten the allen bolts.
- 11: Repeat the toe in adjustment on the BLUE lens/crt.

Optical Focus

- 12: Loosen the rear wing nut on the GREEN lens on slightly defocus the center of the picture.
- 13: 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 re-adjust 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.
- 14: Adjust the top bottom focus for the RED lens as described for GREEN but do not refocus the lens yet.
- 15: Locate the two large 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.
- 15: Repeat the above process for the BLUE lens.
- 16: This completes the optical focus and mechanical alignment. Tighten the four bolts labeled 'A' to lock the assemble in place.



Marquee 9000 Lens Assembly

Final Set-up for Marquee 8000 and 9000 Projectors

Before you begin check the following

- A) Physical set-up **MUST** be performed before any electronic adjustment are made except for electronic focus.
- B) Memories can be roughly set up by using internal frequencies that are near the frequency(s) that will be used.
- C) All set-ups should be done with no convergence and ASR off.

Alignment procedure

- 1) Select the green image or crosshatch (color 2), press **GEOMETRY** and adjust for proper geometry. You may want to use the image for sizing and the crosshatch for everything else. If there are any areas that need to be straightened out go into **GREEN CONVERGENCE**, (converge 5, 1 or 2).
- 2) Enter **CONVERGENCE**, select 1, 2, or 3 and converge the center only. Check the height of the **RED** to the **GREEN** and the **BLUE** to the **GREEN** at the center of the crosshatch and adjust if needed. (**UTILITIES**, 9, 3).
- 3) Select **PICTURE** and adjust your image for proper phasing, blanking (**TOP**, **BOTTOM**, and **SIDE**).
- 4) Once the focus, geometry, phasing and sizing of the image is set then you can then go into convergence and converge the image.
- 5) At this point you can adjust the color balance for the source. With **BRIGHTNESS** set at 50% and **CONTRAST** at zero the raster should be just visible. If not go into the **COLOR TEMPERATURE SETUP** menu (Utilities, 9, pass code, 1, 4 user settings) and make the proper adjustment to the G2 of the color that is incorrect. Pressing tint will cycle through the CRT's. Then turn up **BRIGHTNESS** to 100% **CONTRAST** still at zero check for a gray back ground, use the same G2 adjustment to achieve a gray field. Only one or two colors should be adjusted, if all three are adjusted return all color to 50% and start over.
- 6) With **CONTRAST** and **BRIGHTNESS** set at viewing level, enter the **COLOR TEMPERATURE SETUP** menu (Utilities, 9, password, 1). You can either select one of the factory settings 1-3 or make your own by selecting No. 4 **USER SETTING** and adjust the individual drive levels. Again no more than **TWO** drives should be adjusted. **NOTE:** The factory settings can be adjusted but these should only be changed if a CRT was changed and a color analyzer is used.
- 7) If you have multiple sources you can copy your setup to other memories, (**Utilities**, 1,1) this will save some time because even though the convergence and phasing may be off you will be close and the geometry adjustments will not have to be remade.
- 8) Once of your sources are set then you can assign them to channels if desired, turn on **ASR** for the sources that you want and set the preferences from the **UTILITIES MENU** (Auto-power up, screen messages).

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:-

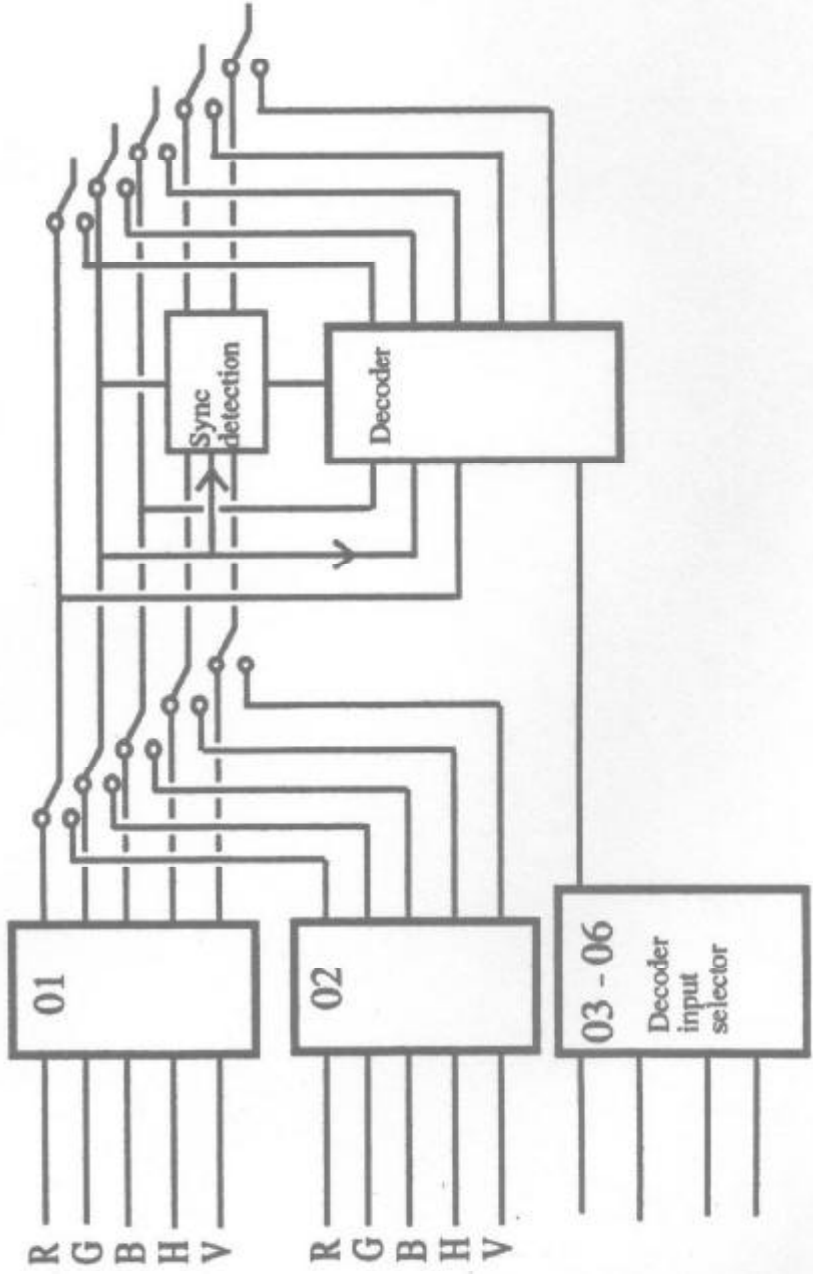
NTSC loop through

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.

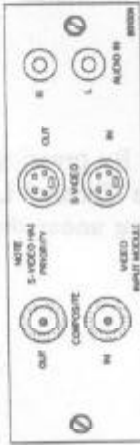
For example to switch to Channel 04, press: <0> <4> or <4>.

The <0> is optional depending on how the projector is set. See 'Preference' under <UTIL>.

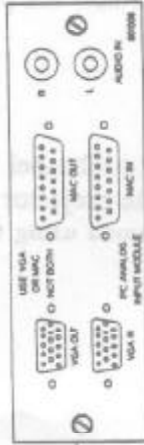
Channel Up/Down

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.

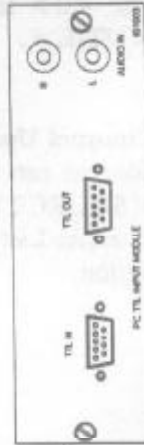
Marquee Input Interfaces



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.



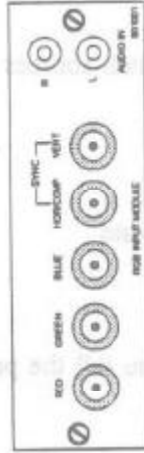
This module accepts any VGA or MAC type signals. Two sets of connectors are provided but only one set should be used at any time. (to use VGA only or MAC only) Pin out configuration follows VGA and MAC standards. Both VGA OUT and MAC OUT are active. This means a terminator is not needed if there is no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



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



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



This is an RGB analog style interface.



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 power...

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.

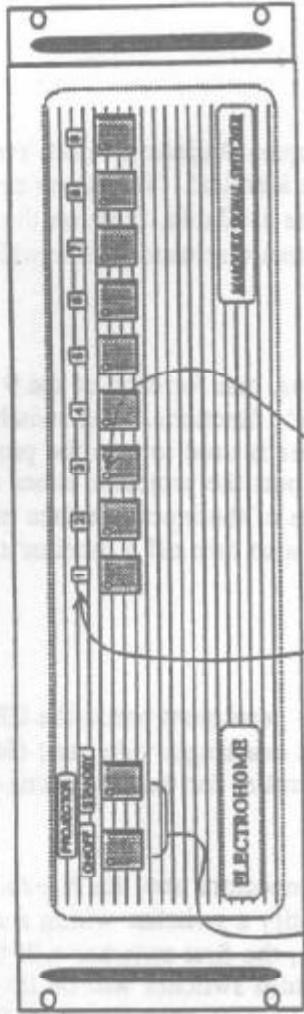
The face of the CPU Module contains one set of DB 9 connectors used for RS-232 communication. The "Switcher" ID switch is used to identify a switcher within a system. For example, if 3 switchers are connected to one projector, the first switcher will have an ID of 1, the second switcher would have an 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.

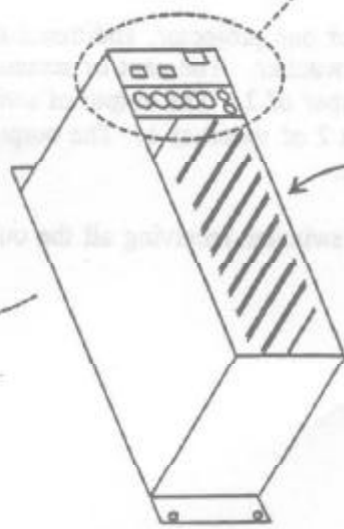
Marquee Signal Switcher



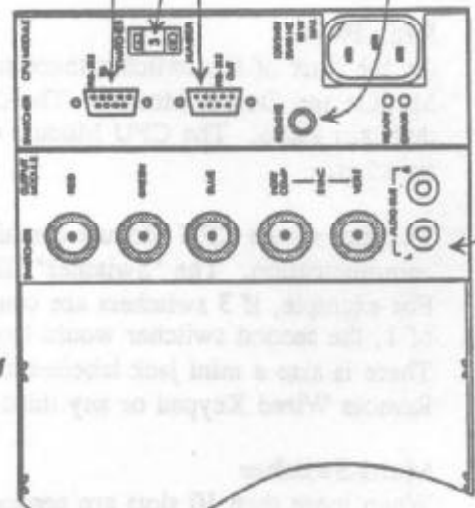
These 2 buttons control the projector's operations.

LED on switch indicates the selected slot.
(i.e. only 1 lit at any time)

Slot numbers are built in with an LED. LED is used to indicate that an interface module is installed in that slot. Slot does not need to be selected for LED to ON.



There are 8 slots available for any of the 8 Microprocessor Modules. All 8 slots are identical. No Output Modules can be used in these slots.



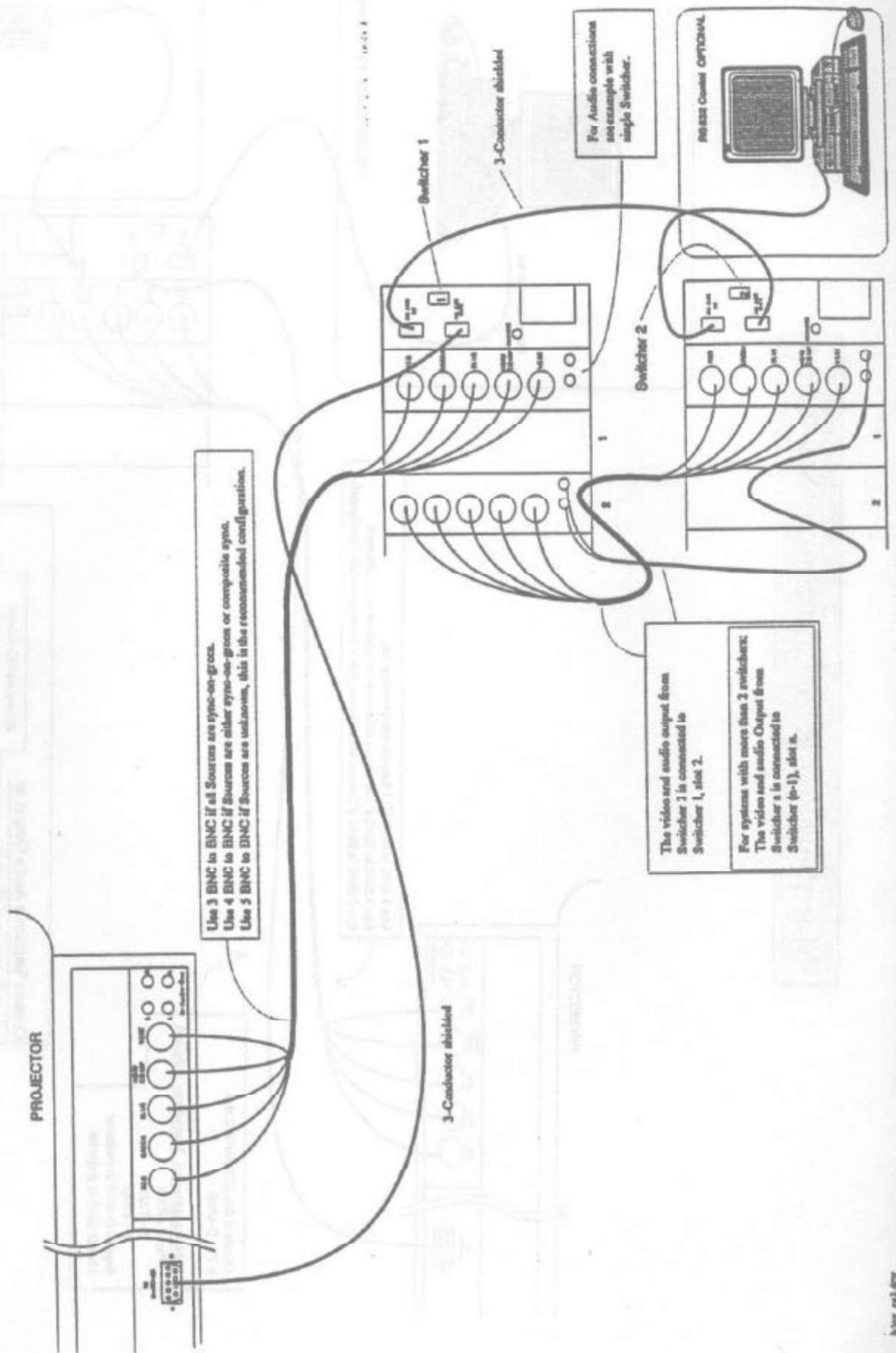
Switcher ID number. Set to 1 for single switcher systems. Use consecutive numbers starting with 1 on multi-switcher systems.

Marquee Signal Switcher designed for Marquee Series Projectors.

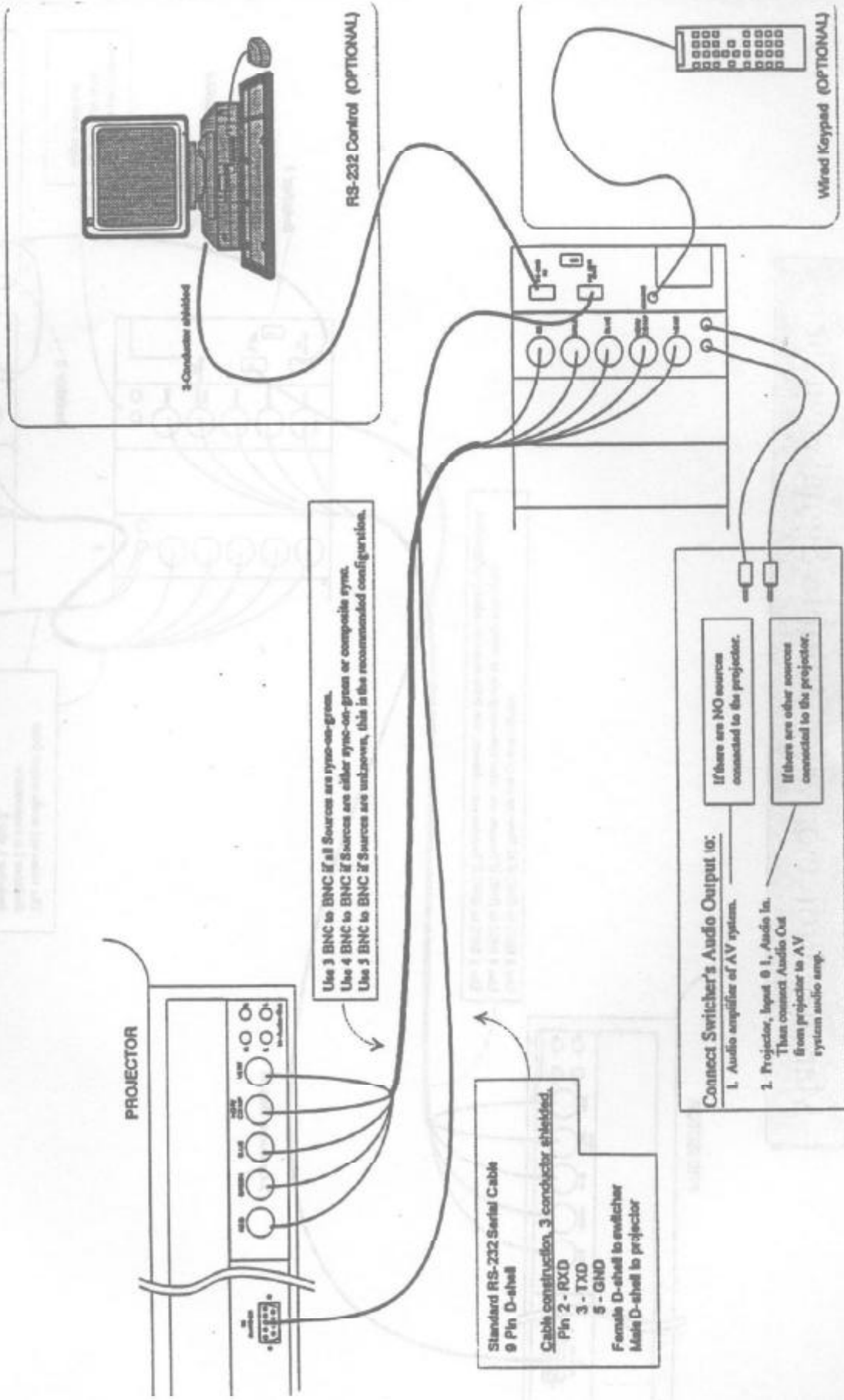
Ready for 19" rack mount.

Switchers can be attached to provide a maximum of 81 inputs. Video outputs are not designed to prevent compositing signal noise.

Marquee Projector with Multiple Signal Switchers



Marquee Projector and Signal Switcher



PROJECTOR

Use 3 BNC to BNC if all Sources are sync-on-green.
 Use 4 BNC to BNC if Sources are either sync-on-green or composite sync.
 Use 5 BNC to BNC if Sources are unbalanced, this is the recommended configuration.

Standard RS-232 Serial Cable
 9 Pin D-shell
 Cable construction, 3 conductor shielded.
 Pin 2 - RXD
 3 - TXD
 5 - GND
 Female D-shell to switcher
 Male D-shell to projector

Connect Switcher's Audio Output to:
 1. Audio amplifier of AV system.
 1. Projector, Input # 1, Audio In.
 Then connect Audio Out from projector to AV system audio amp.

If there are NO sources connected to the projector.

If there are other sources connected to the projector.

3-Conductor shielded

RS-232 Control (OPTIONAL)

Wired Keypad (OPTIONAL)

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;

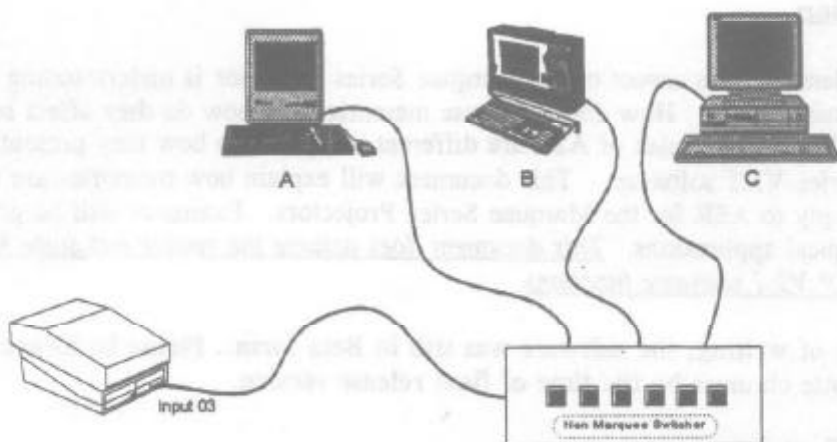
- **No Zone Memories.**
- **Only 2 type of memories, Input and Recall.**
- **There are a total of 80 memories.**

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 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>.

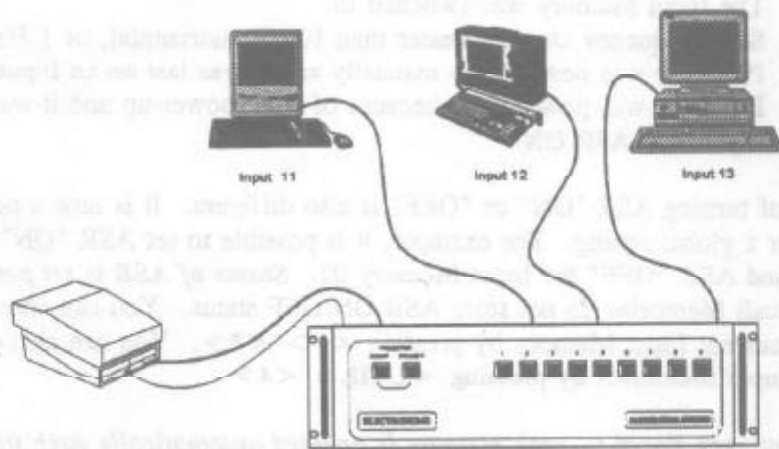
The scan frequency stored in each memory is updated automatically each time that memory is active and an adjustment is made. This means that there are no longer any special frequency stamp command. The command <SOURCE> <RESET> no longer exist. For example, if the projector was presently on Recall Memory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



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.

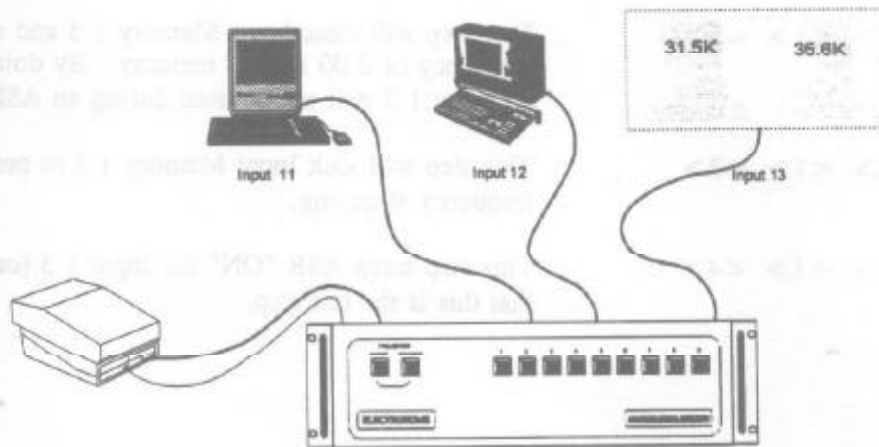
KEYPAD COMMANDS**DESCRIPTIONS****<SOURCE> <1> <3>**

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>.**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>**

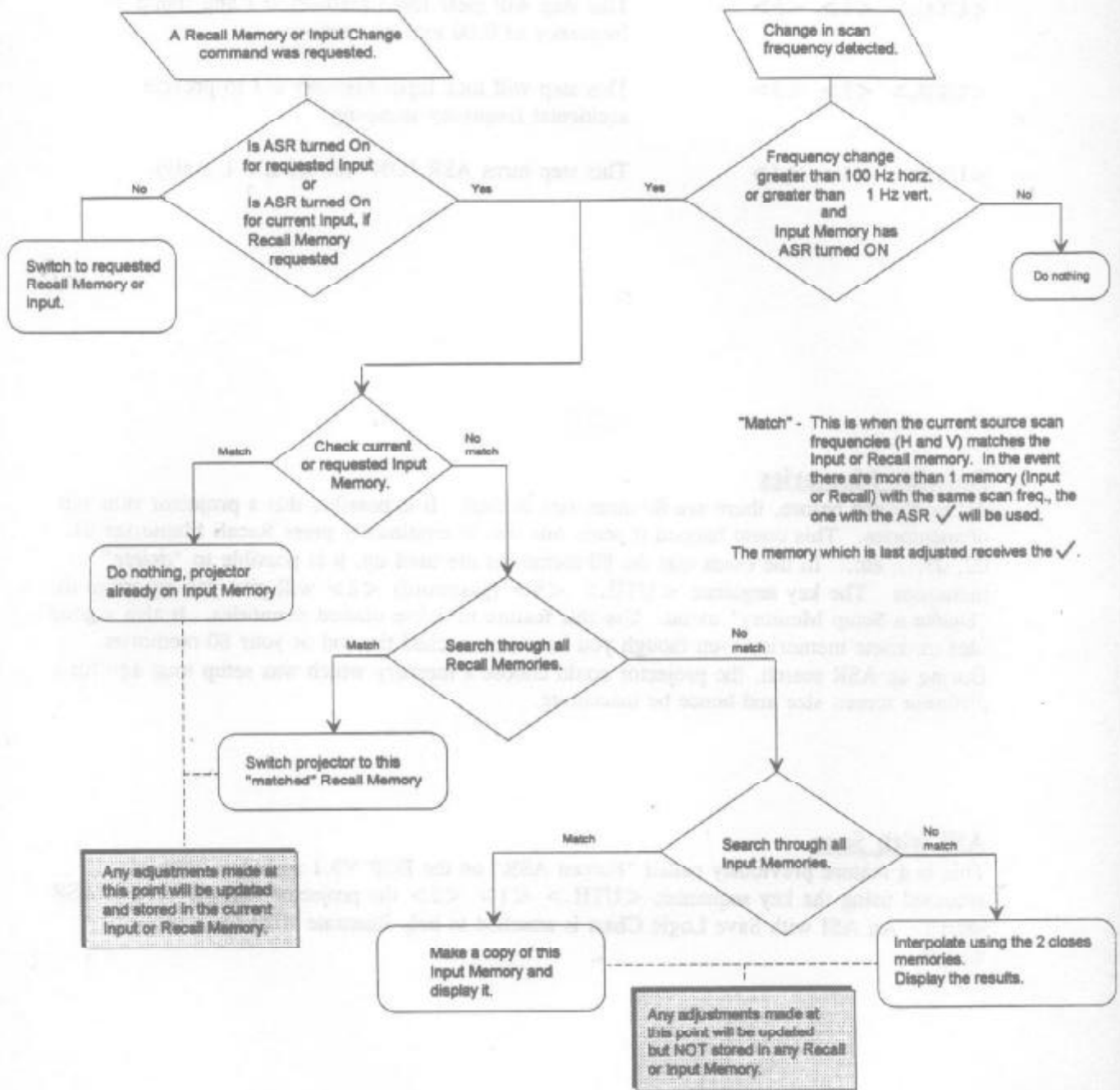
Switch to the first input and setup projector using Input Memory 1 1.

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.

ASR/ASI Logic Chart



KEYPAD COMMANDS

<UTIL> <1> <5>

<UTIL> <1> <3>

<UTIL> <1> <4>

DESCRIPTIONS

This step will clear Input Memory 0 1 and stamp a frequency of 0.00 into its memory.

This step will lock Input Memory 0 1 to prevent accidental frequency stamping.

This step turns ASR "ON" for Input 0 1 (only).

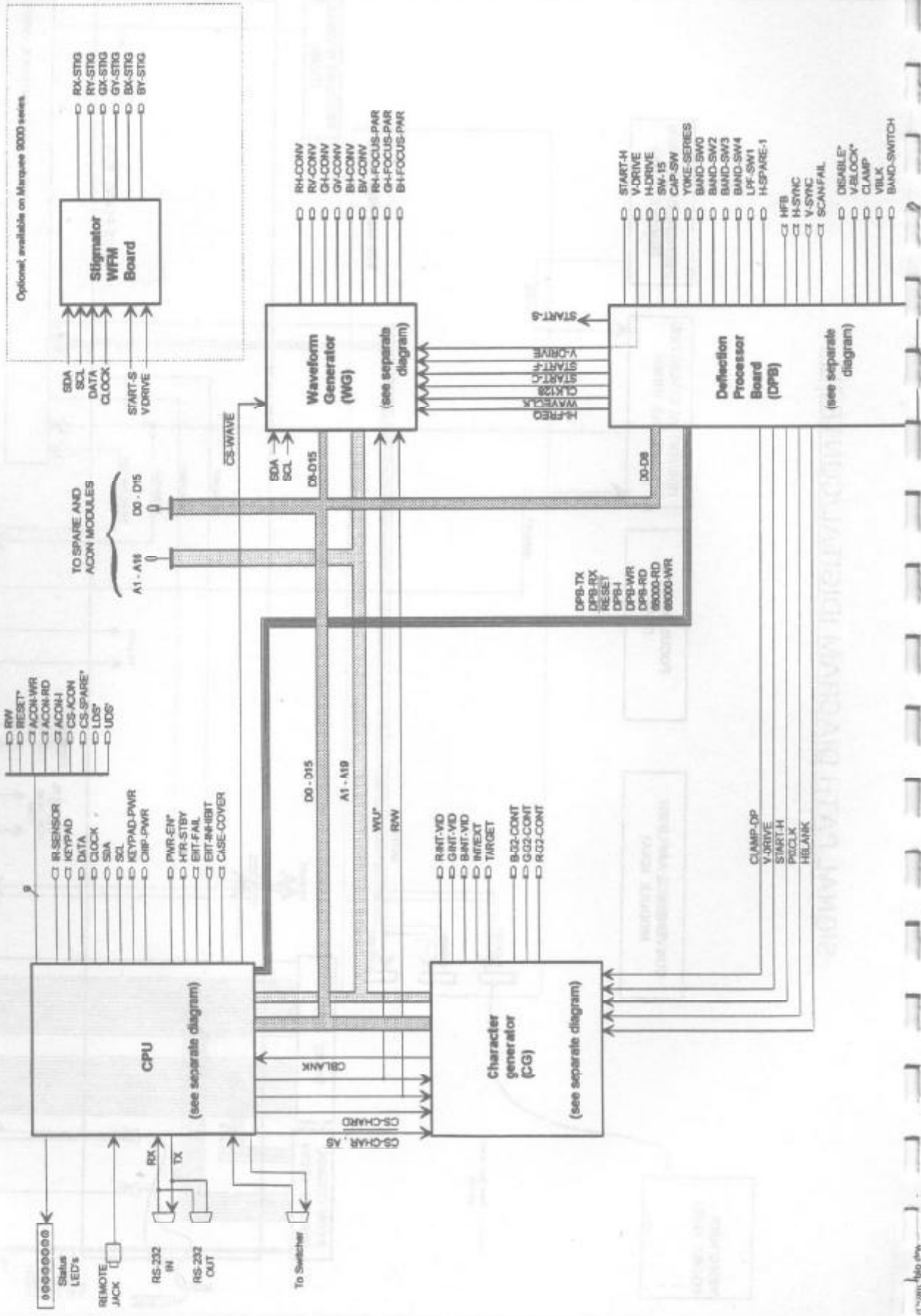
Deleting Memories

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.

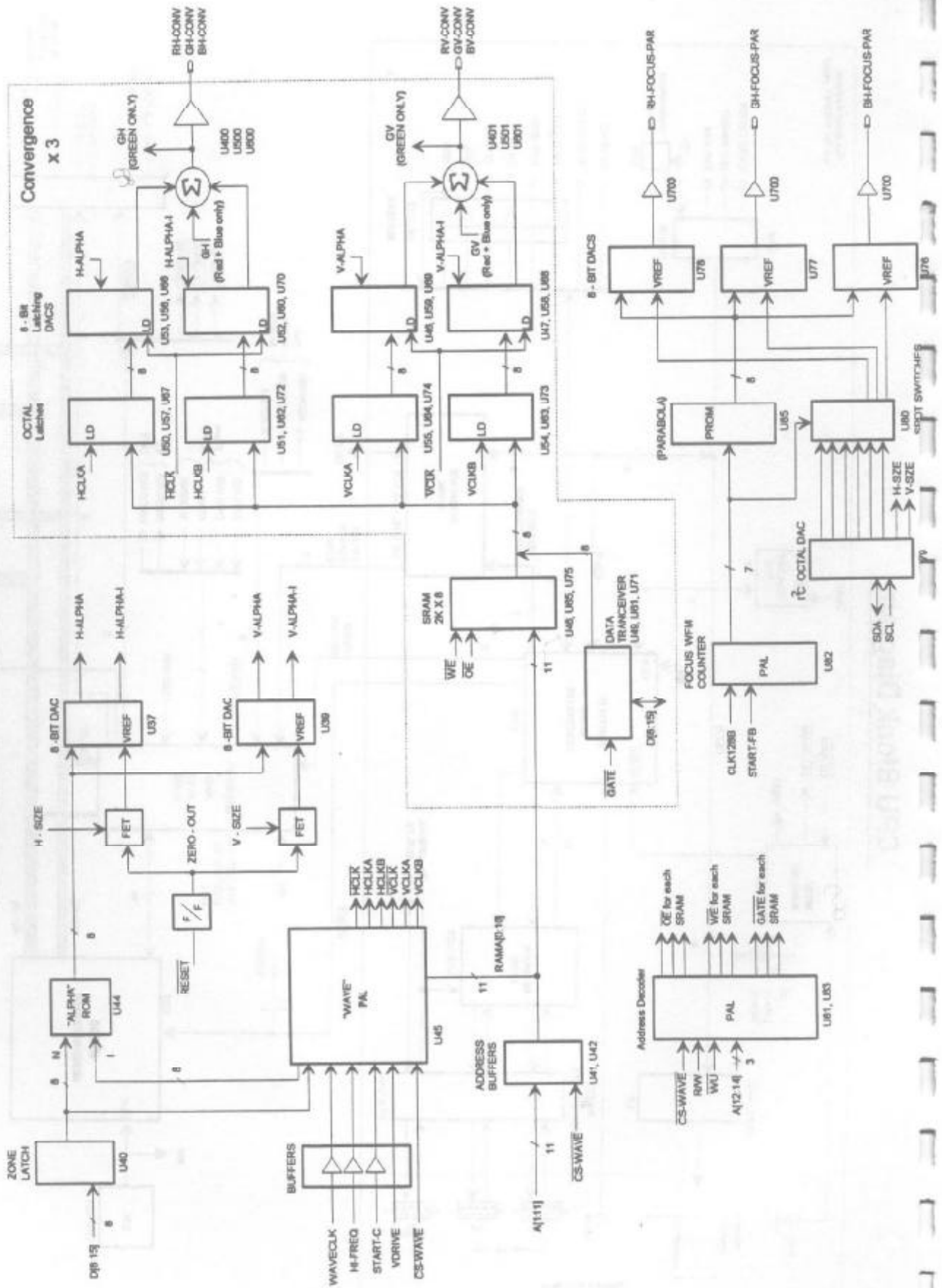
ASI with Save

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.

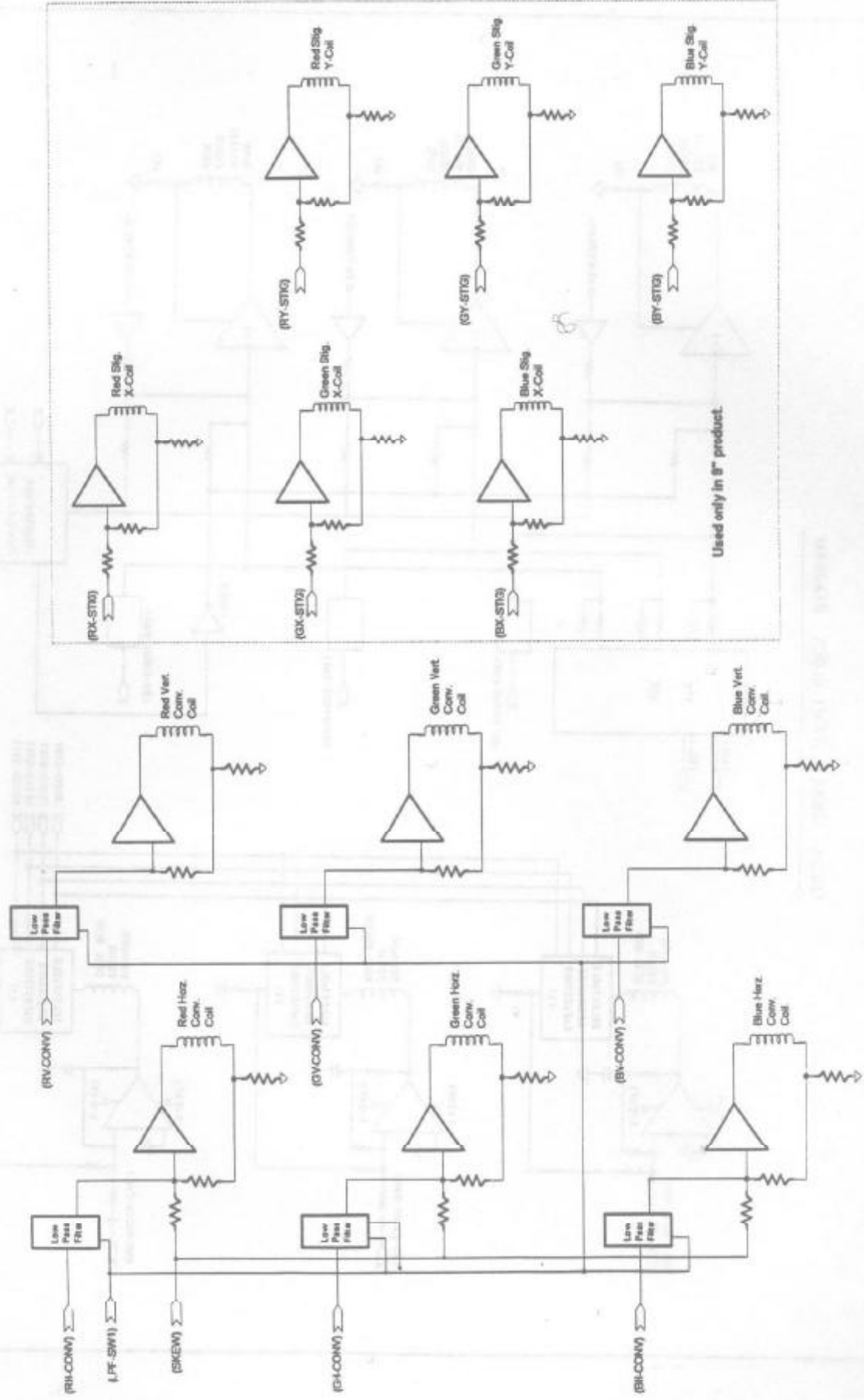
Control Module Function Diagram



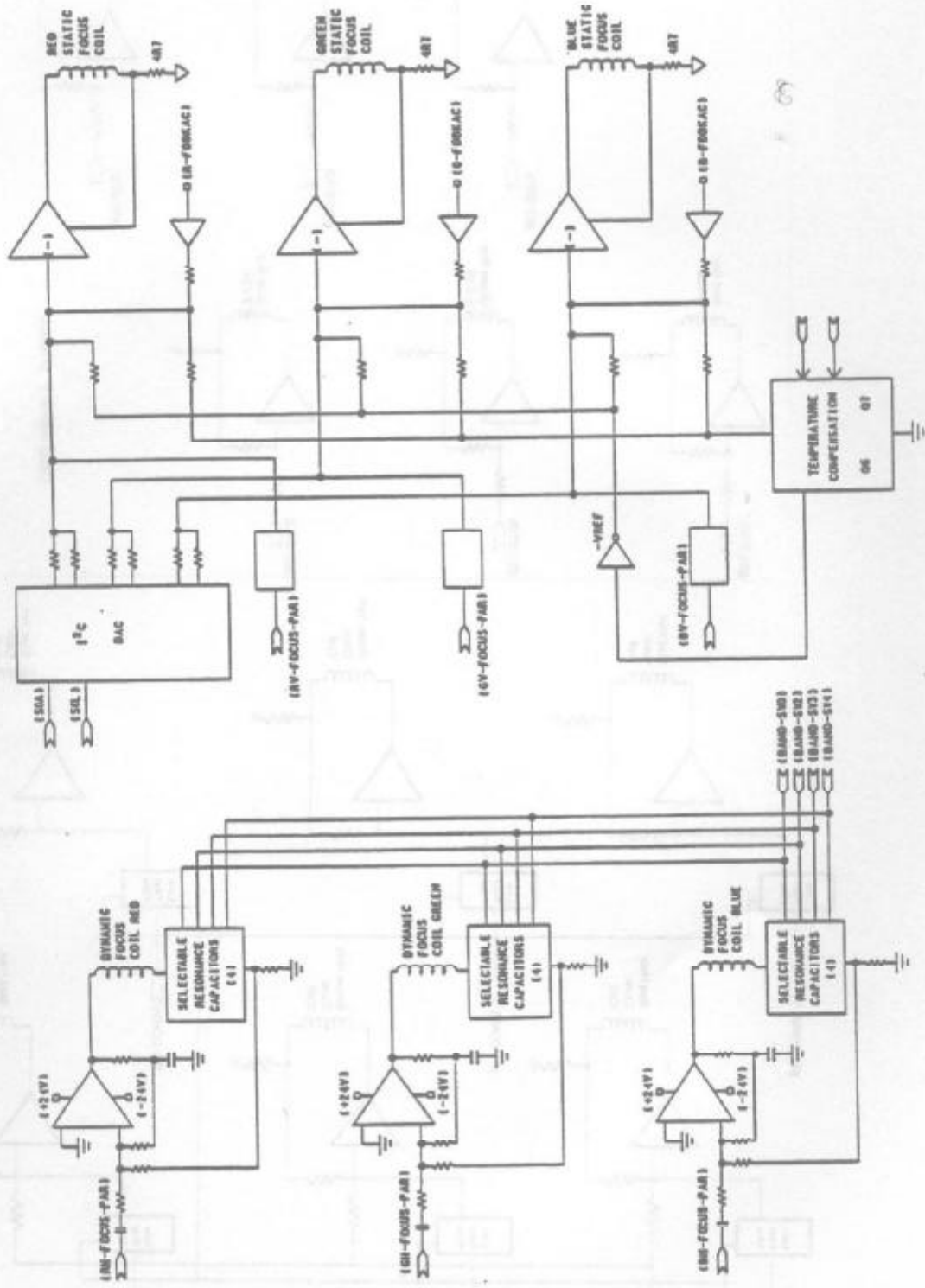
Waveform Generator Block Diagram



CONVERGENCE AMPLIFIER MODULE (CVA) BLOCK DIAGRAM

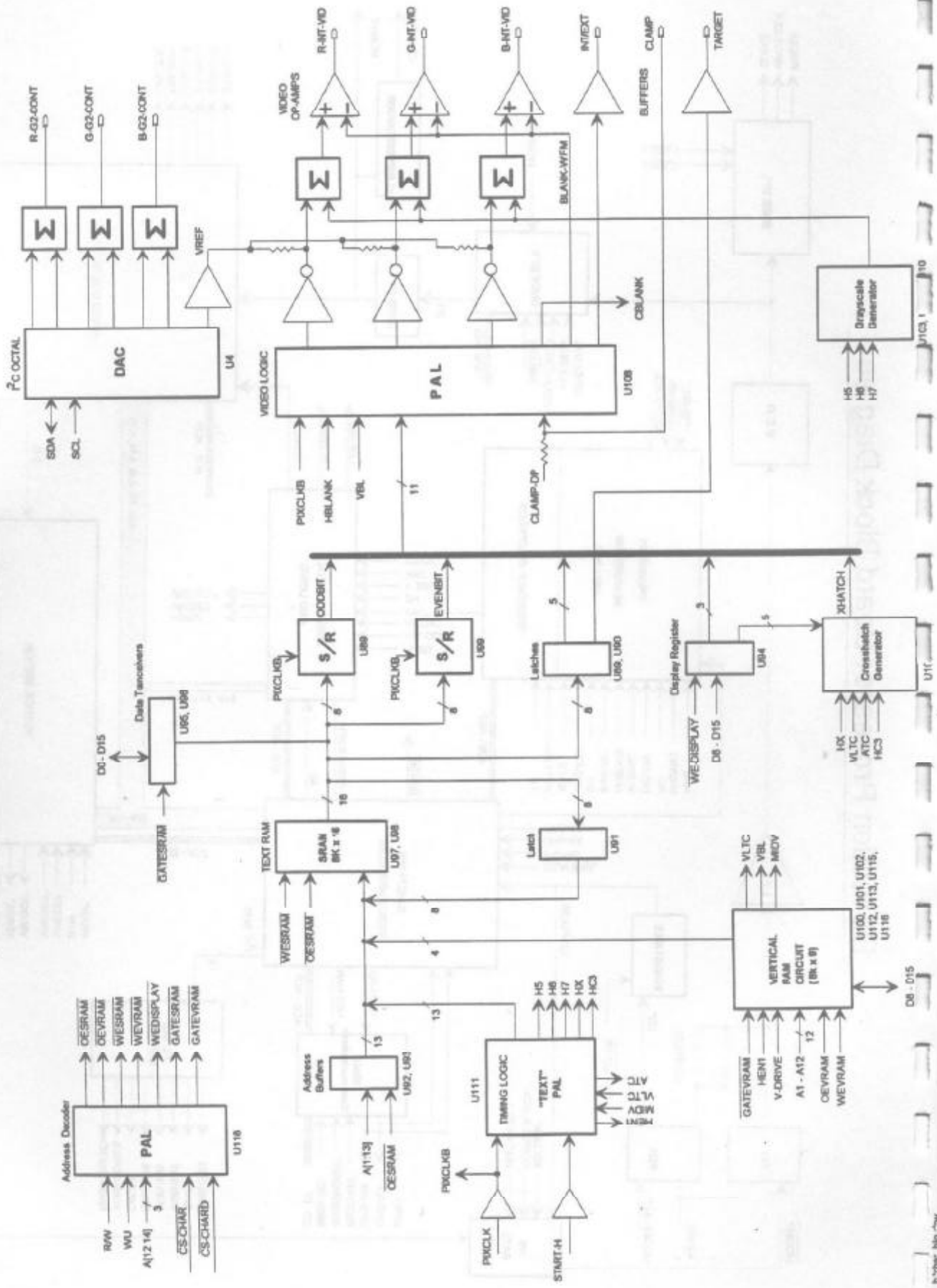


FOCUS MODULE (FCM) BLOCK DIAGRAM

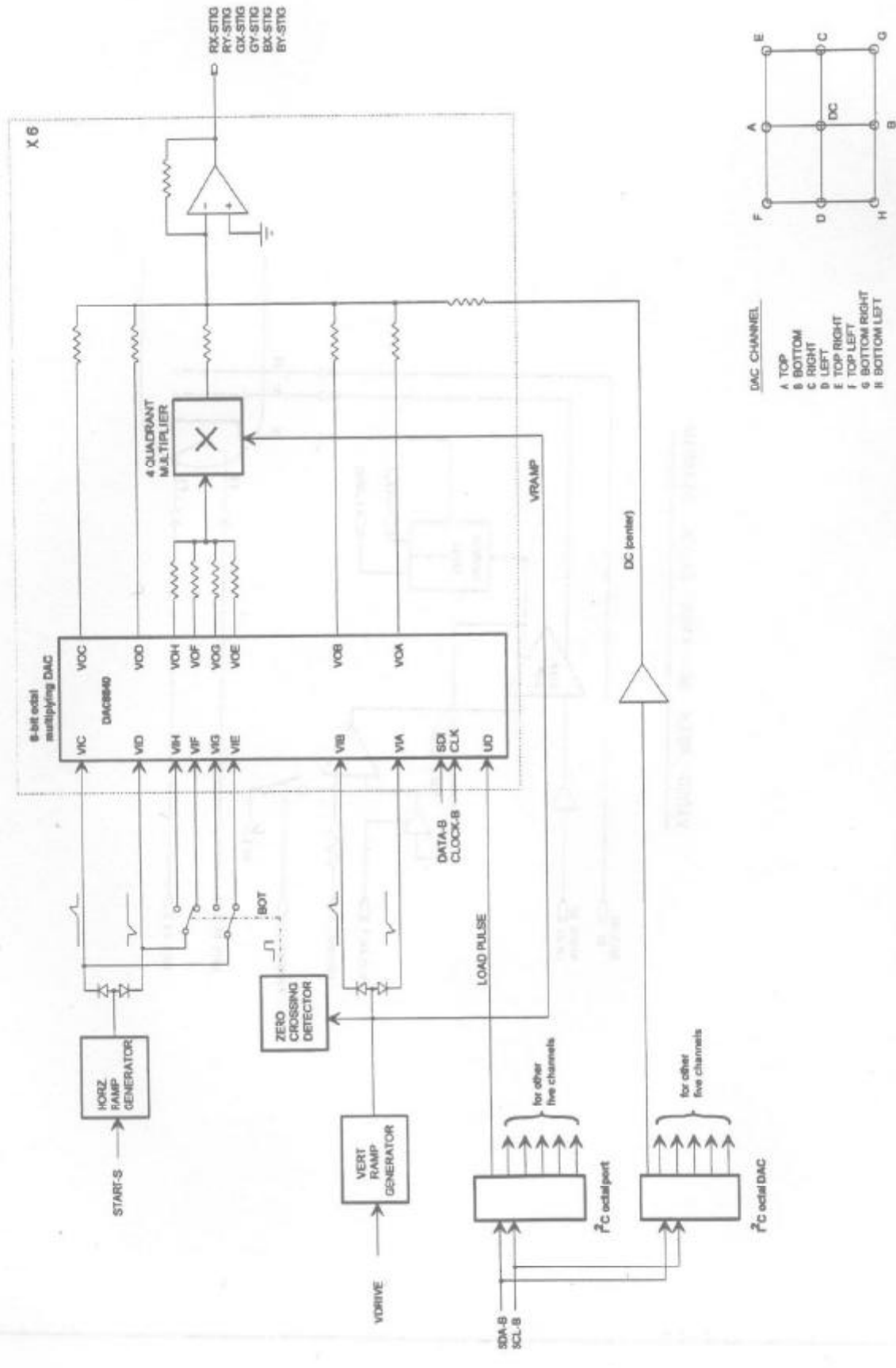


CONFERENCE MATTER NOTE (CAM) BLOCK DIAGRAM

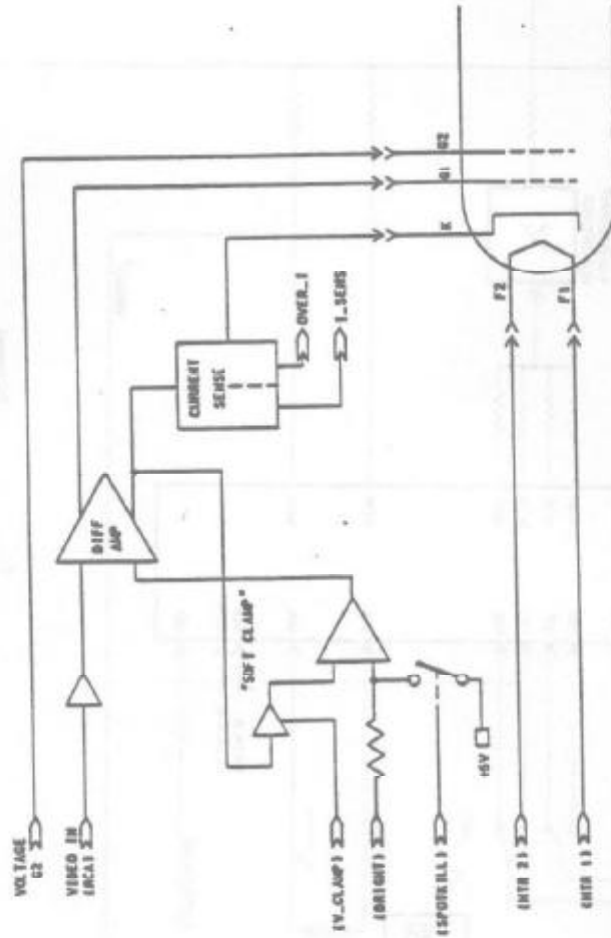
Character Generator Block Diagram



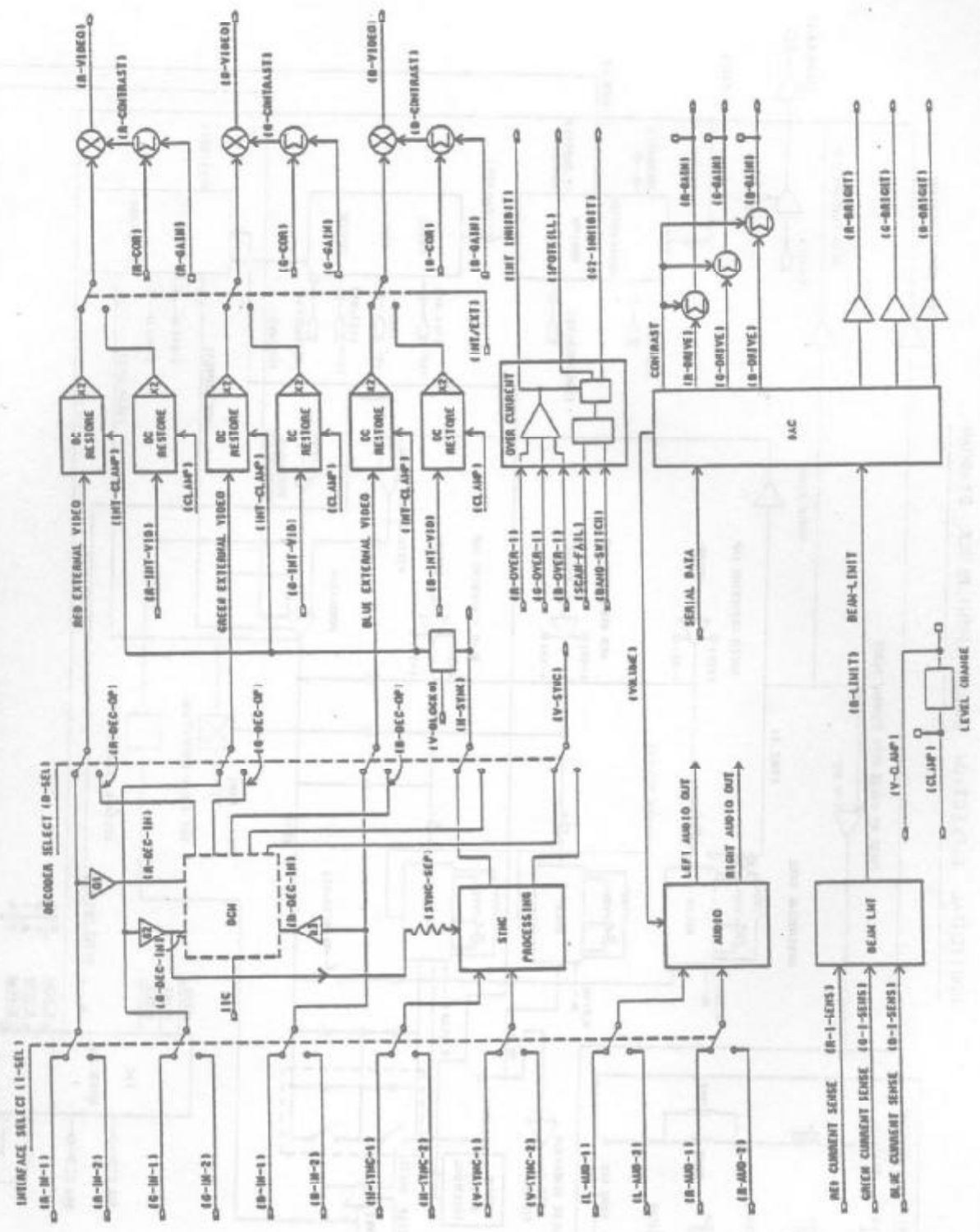
Stigmator Waveform Board



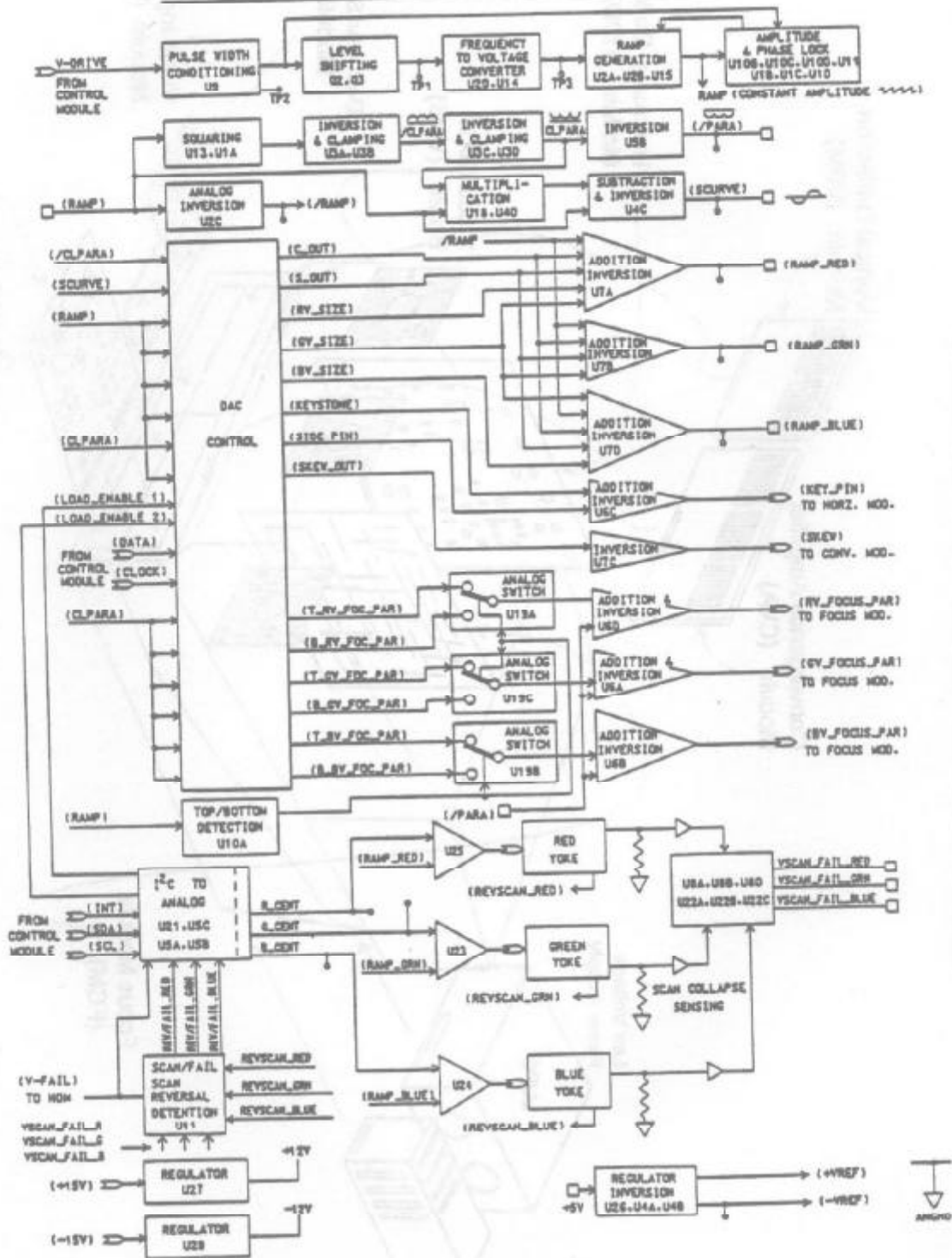
VIDED NECK BD. (WB) BLOCK DIAGRAM



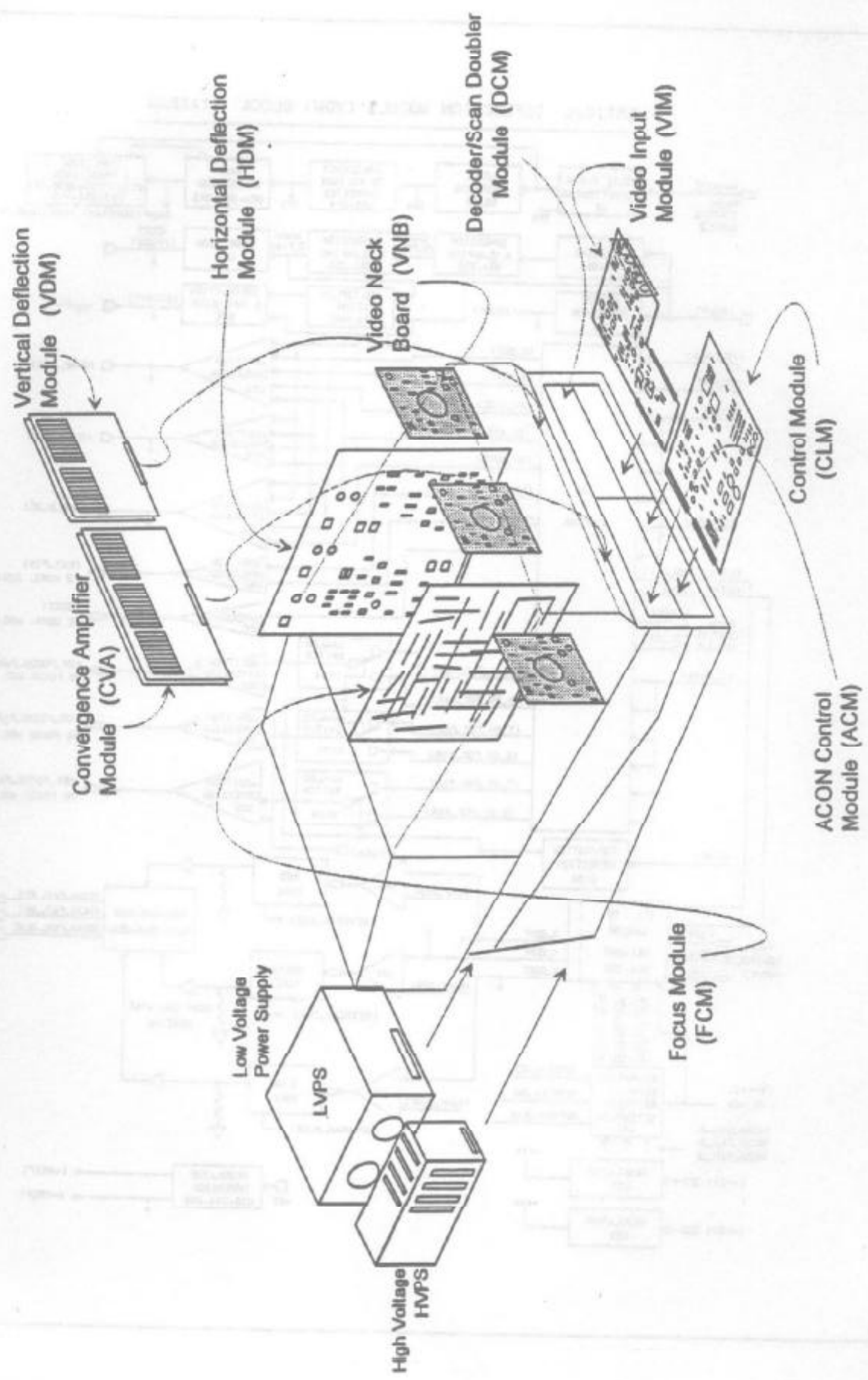
VIDEO INPUT MODULE (VIM) BLOCK DIAGRAM



VERTICAL DEFLECTION MODULE (YDM) BLOCK DIAGRAM

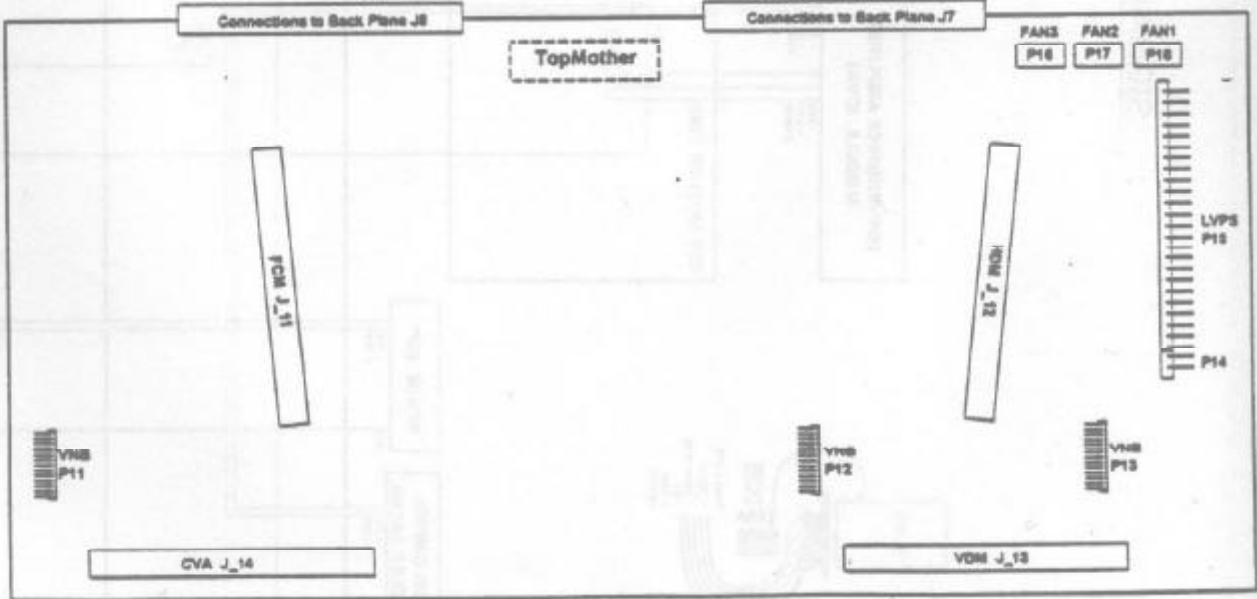
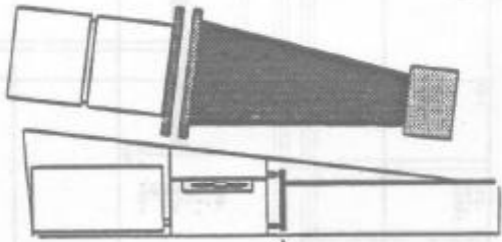


Marquee Projector Module Layout

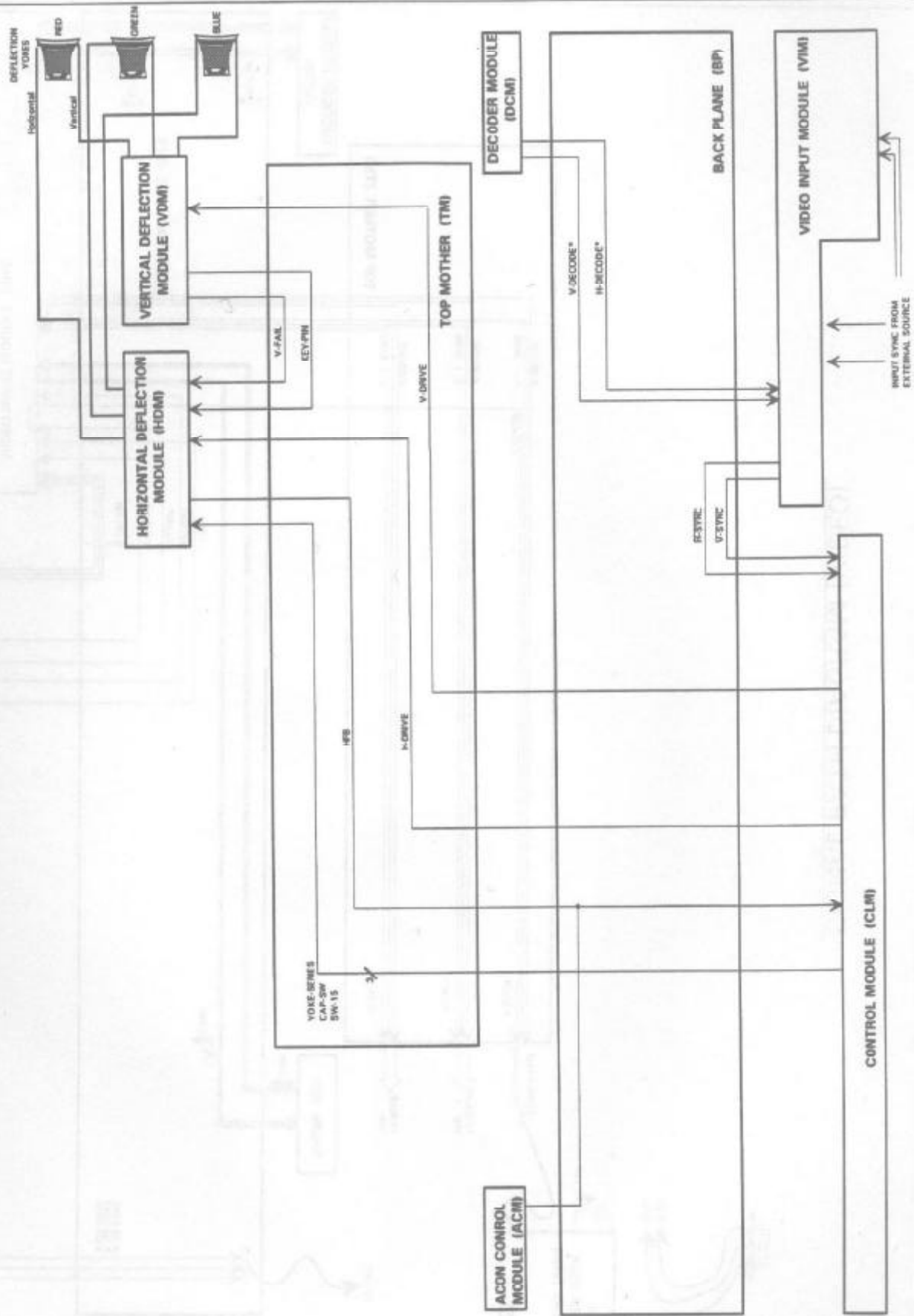


BACKPLANE & TOP MOTHER

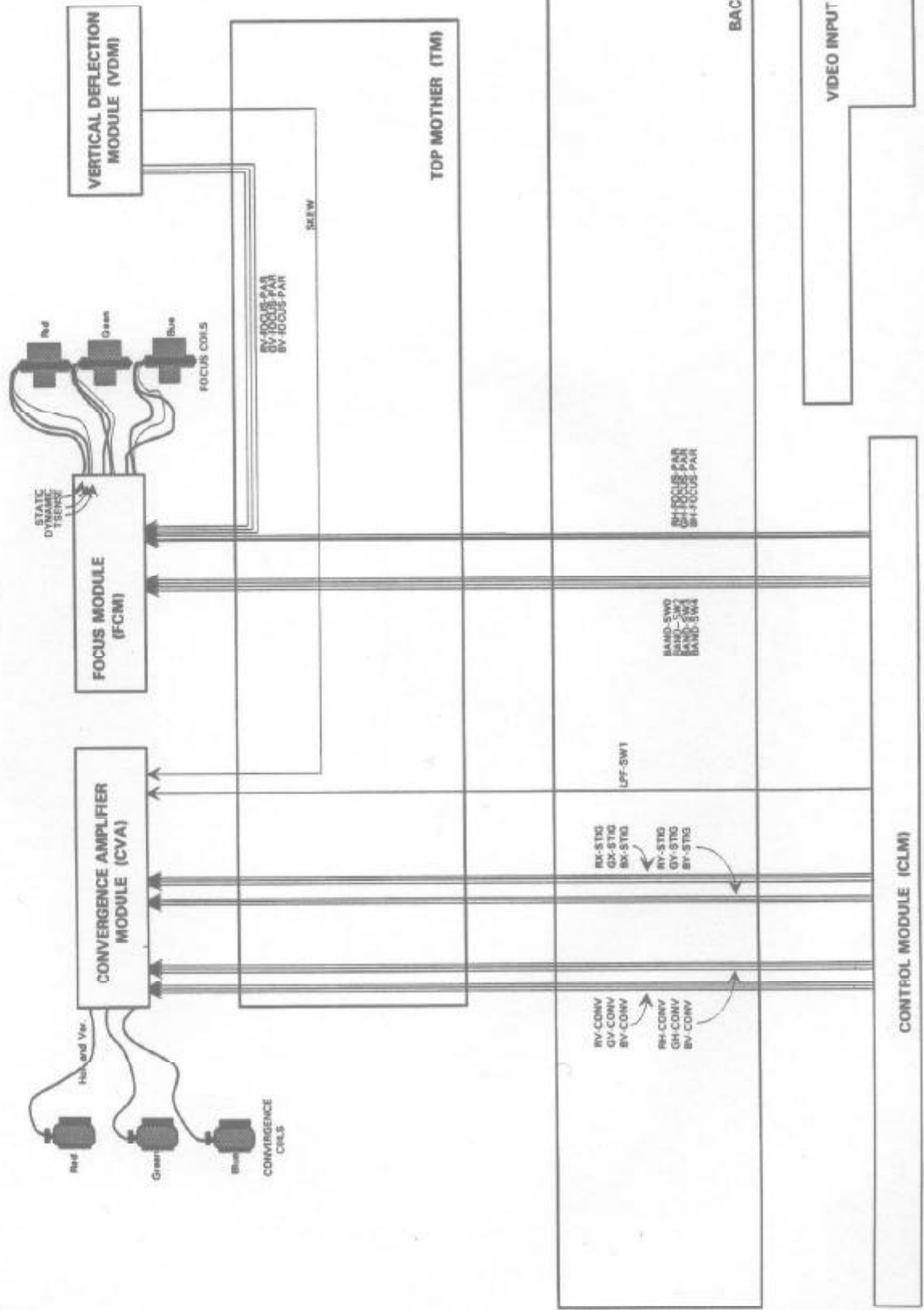
CONNECTOR LOCATIONS

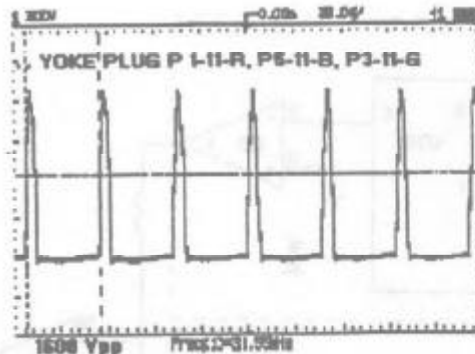
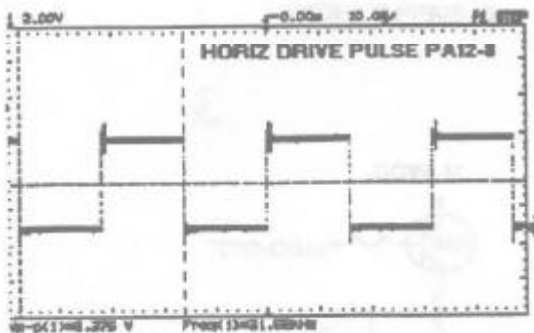


SIGNAL PATH DIAGRAM (DEFLECTION)



SIGNAL PATH DIAGRAM (CONVERGENCE/FOCUS)



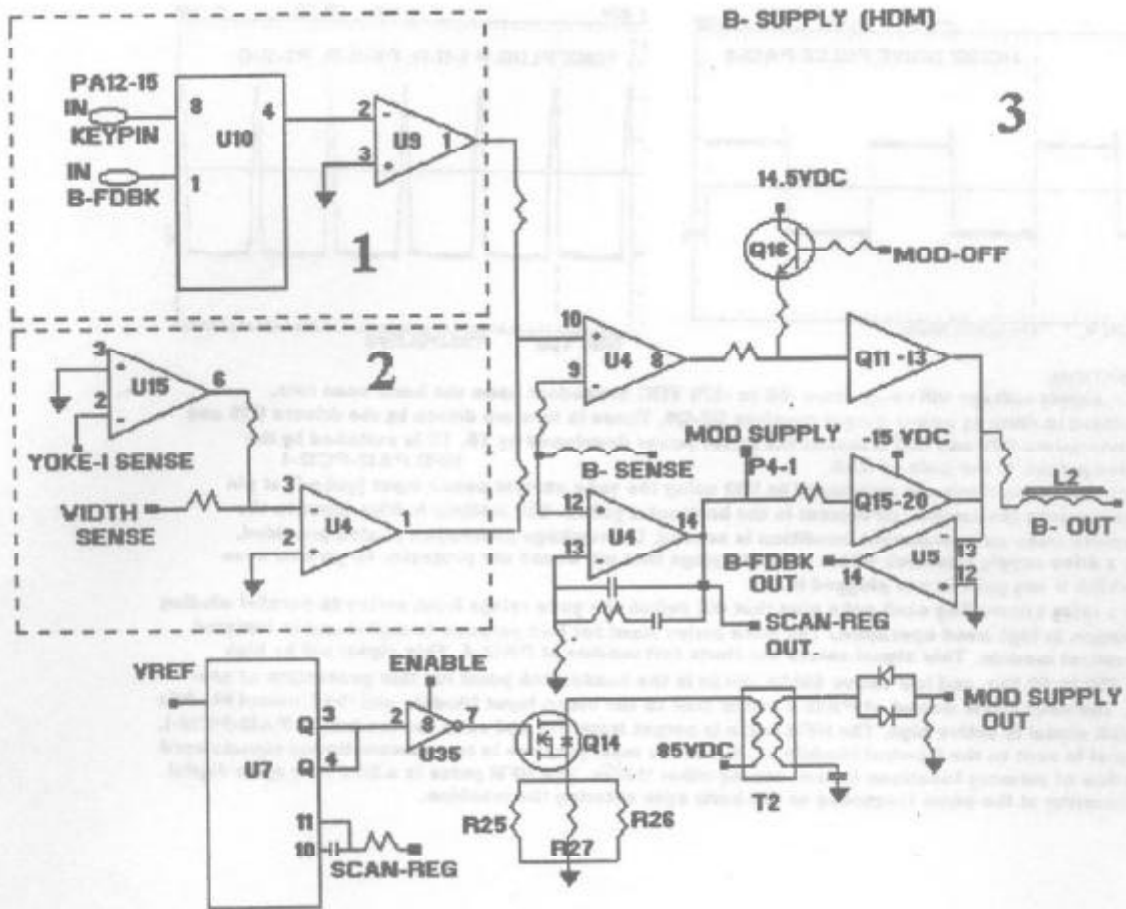


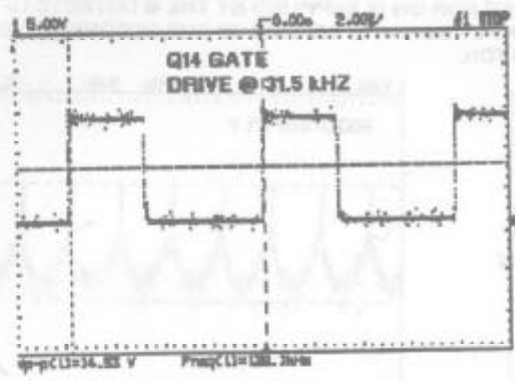
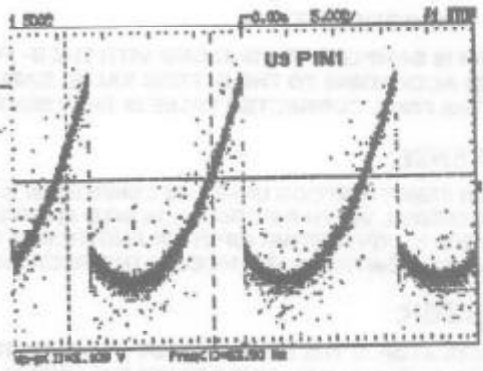
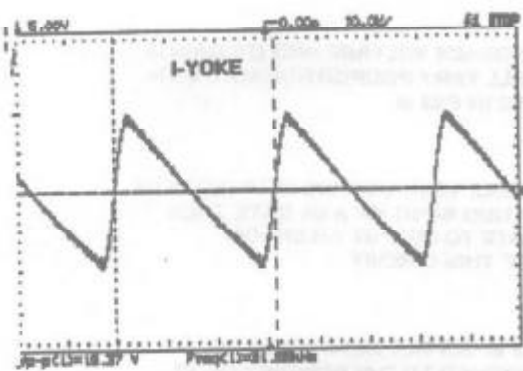
DESCRIPTION:

The B- supply voltage will range from -50 to -270 VDC dependant upon the horiz scan rate. The switching is done by power output mosfets Q2-Q3. These in turn are driven by the drivers U29 and U31. Optocouplers U28 and U30 transmit the driver power developed by T5. T5 is switched by the horiz. drive pulses at the gate of Q33. HFB PA12-PC12-1

Overcurrent conditions are monitored by U33 using the yoke current sense input (yoke-I) at pin 3. This represents the amount of current in the horizontal yokes. U33 inhibits h-drive input to the optocouplers when an overcurrent condition is sensed. Overvoltage protection is also provided. There is a drive supply interlock within the yoke plugs that will cause the projector to go into scan failure inhibit if any yoke is not plugged in.

There is a relay controlling each yoke plug that will switch the yoke relays from series to parallel winding configuration in high band operation. The yoke series input for this purpose is digital and is initiated by the control module. This signal enters the Horiz defl module at PA12-4. This signal will be high from 15.750 to 60 khz, and low above 60khz. 60khz is the bandswitch point for this generation of projectors. The scan fail is output at PA12-2 and is sent to the Video Input Module and the Control Module. The inhibit signal is active high. The HFB pulse is output from U19 and exits the module at PA12-PC12-1. This signal is sent to the Control Module at JC2-15. Its main purpose is to generate timing signals used in selection of memory locations in ram, among other things. The HFB pulse is a 50% duty cycle digital signal occuring at the same frequency as the horiz syne entering the machine.





1. KEY AND PIN CORRECTION:

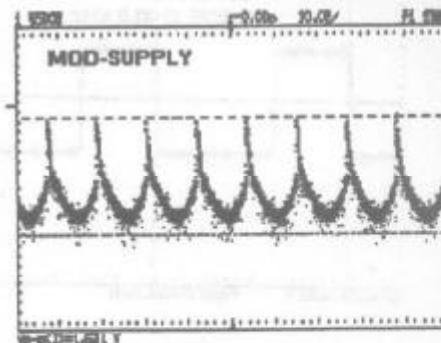
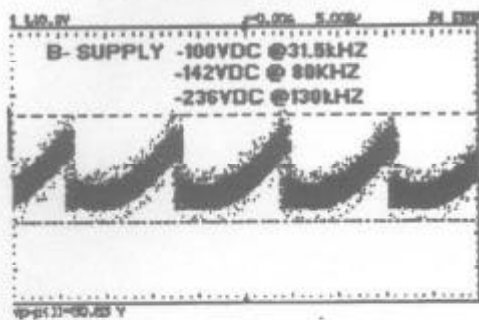
KEYPIN VFM IS SAMPLED AT U10 ALONG WITH THE B- FEEDBACK VOLTAGE AND ITS GAIN IS REGULATED ACCORDING TO THE B- FDBK VALUE. GAIN WILL VARY PROPORTIONALLY WITH B- VALUE. THE FINAL CORRECTED VALUE IS THEN SENT TO U4 PIN 10

2. WIDTH SENSE:

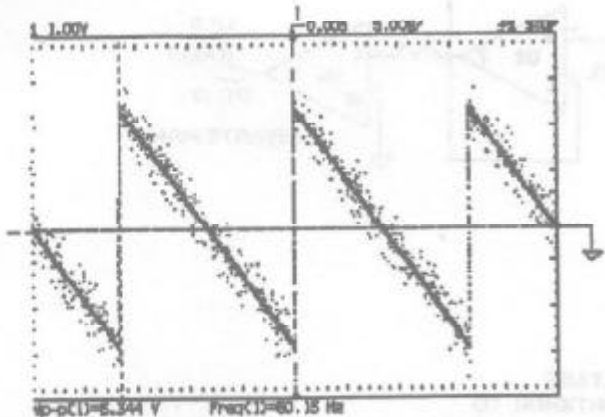
THE WIDTH SENSE PORTION USES THE CURRENT IN A HORIZ YOKE WINDING SUMMED WITH CURRENT DIGITAL WIDTH INFORMATION INTO AN INVERTING INPUT OF A U4 GATE THEN OUTPUT TO A NONINVERTING INPUT OF ANOTHER U4 GATE TO OUTPUT AN ERROR SIGNAL WHICH CONTROLS THE MODULATOR SECTION OF THIS CIRCUIT.

3. MODULATOR:

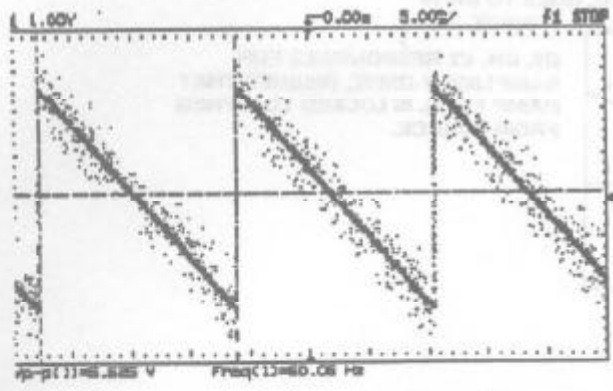
THE MODULATOR IS THE FINAL OUTPUT STAGE OF THE B- SUPPLY COMPRISED OF Q11, Q12, Q13 AND Q15 - Q20. 85VDC FROM THE LYPS IS APPLIED TO THE PRIMARY OF T2 WHICH IS DRIVEN BY Q14. GATE DRIVE FOR Q14 IS SUPPLIED BY THE Q OUTPUTS OF U7 THE CONTROLLER IC. THE MOD SUPPLY SIGNAL IS TAPPED OF THE SECONDARY OF T2 THEN USED TO DRIVE THE MODULATOR.



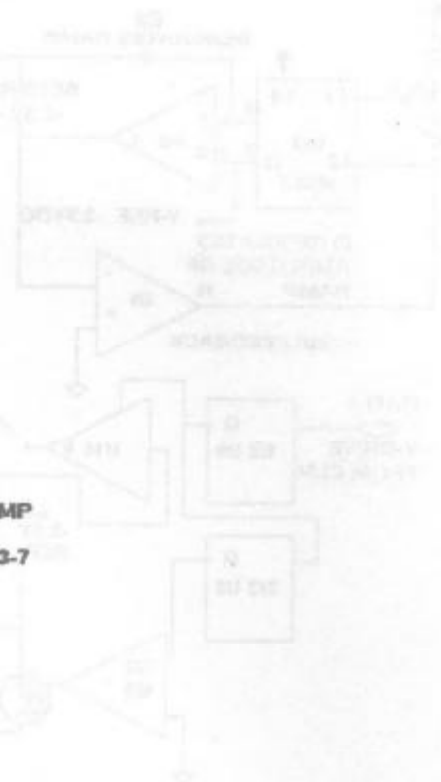
KHZ	VDC
31.5	53
80	73
130	128

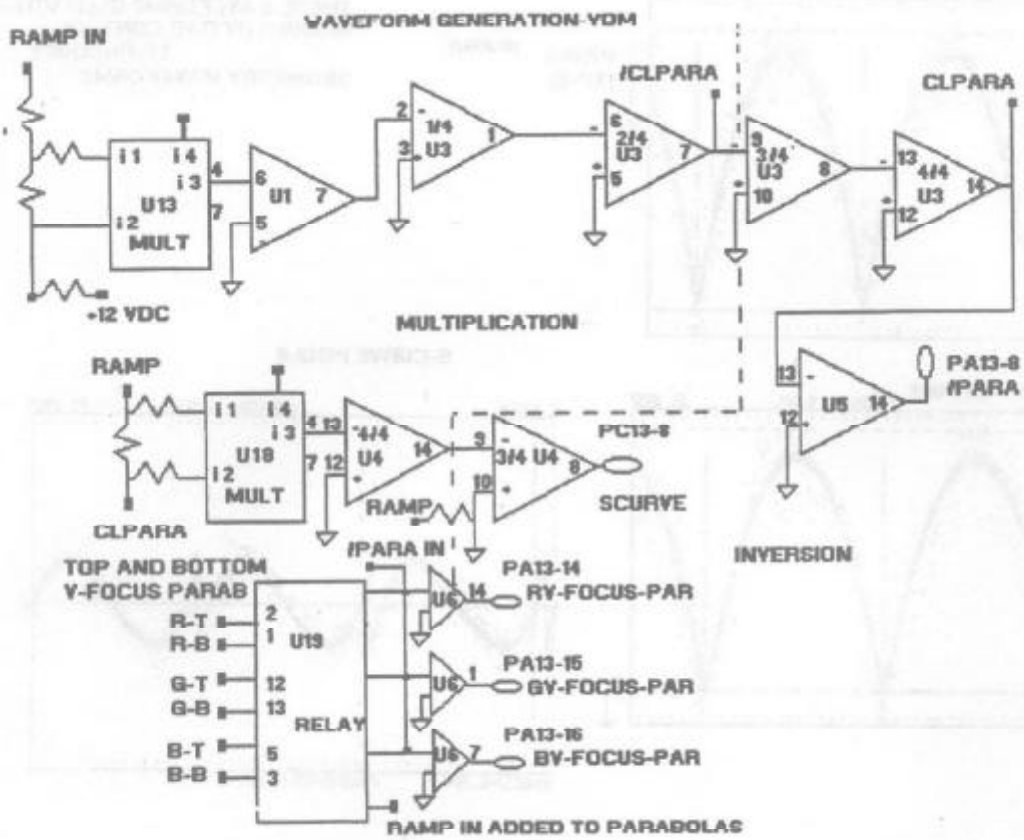


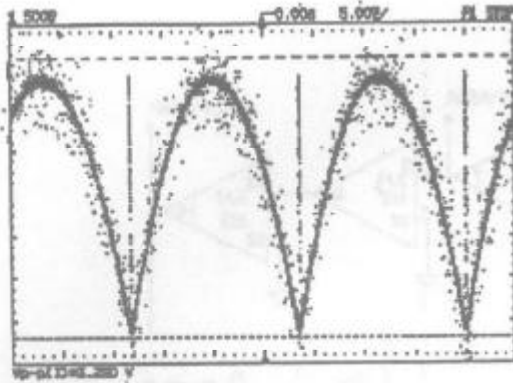
RAMP
U2 PIN7



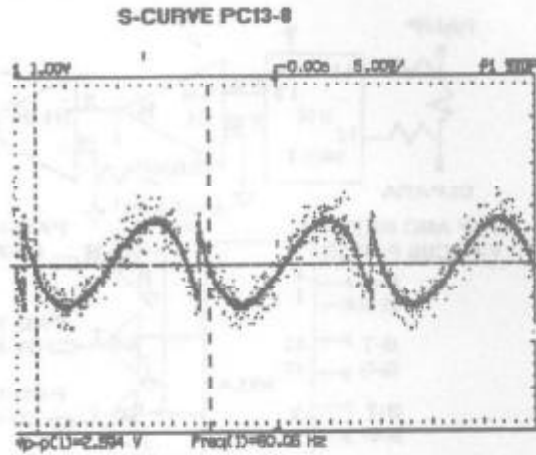
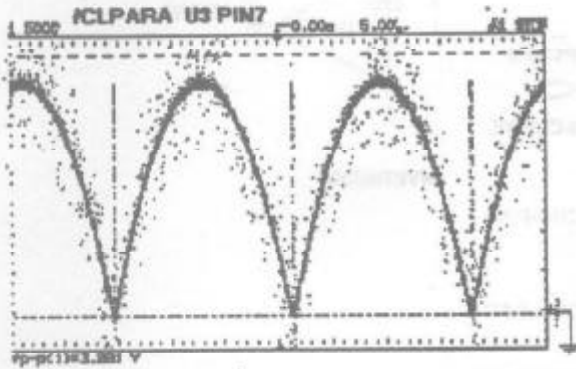
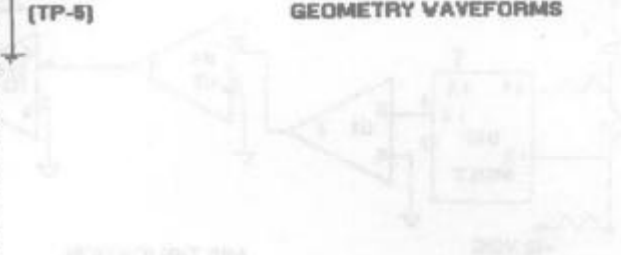
/RAMP
TP4
PC13-7

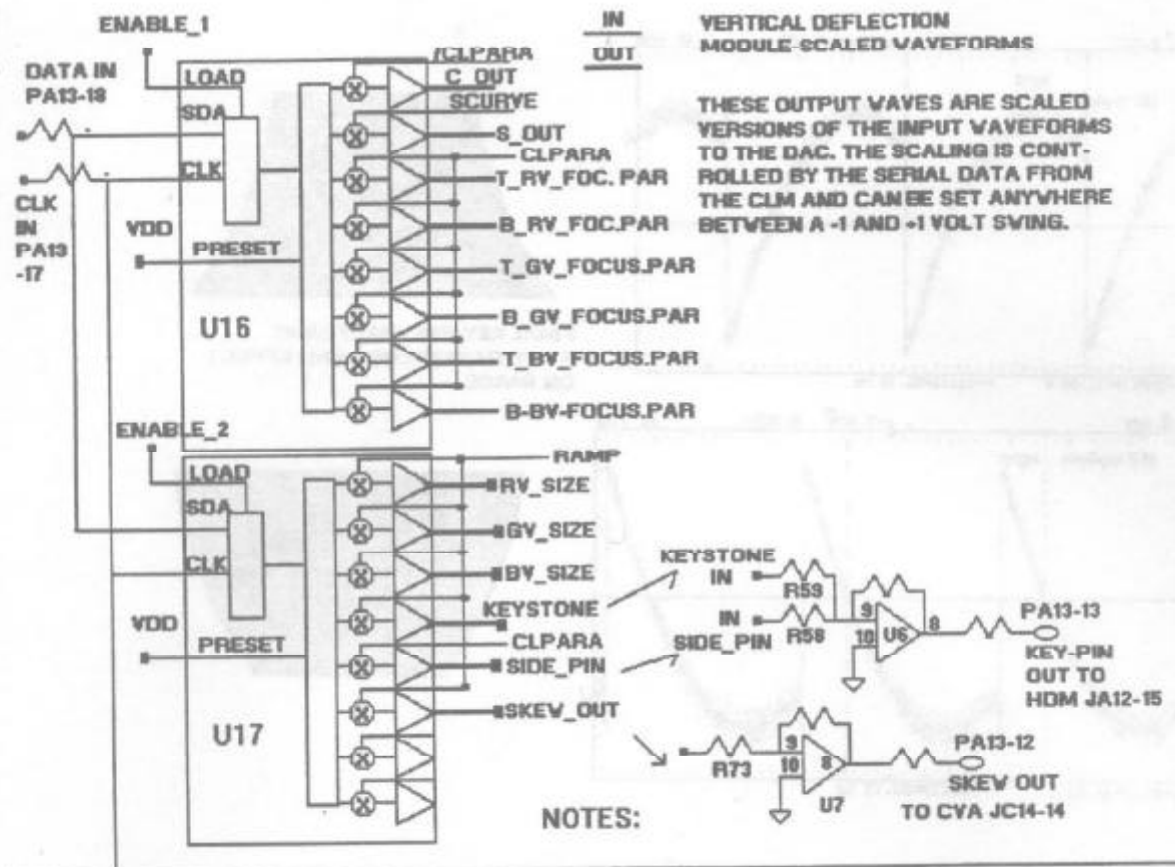


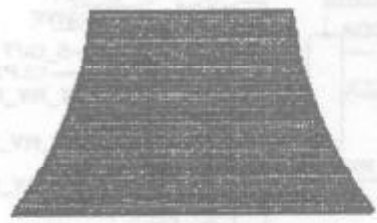
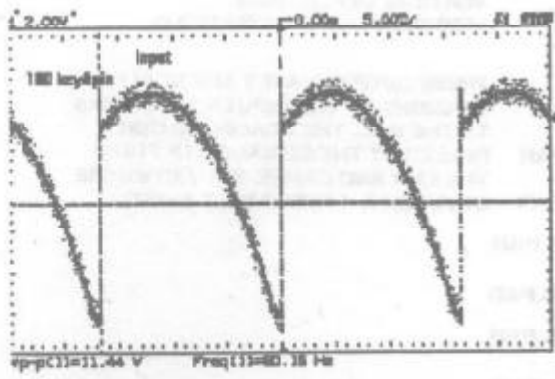




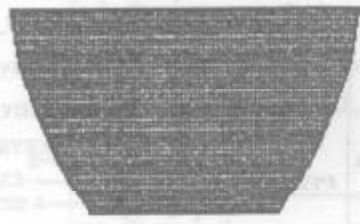
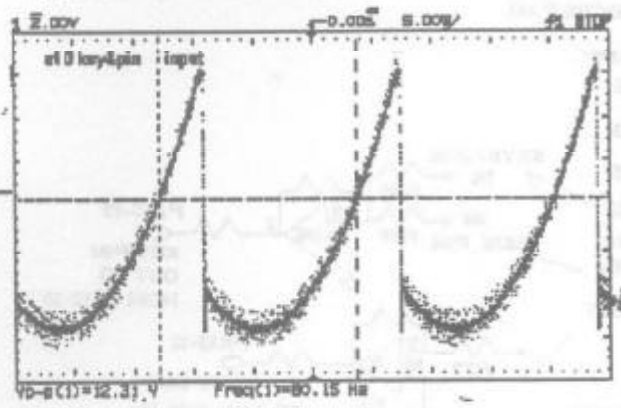
THESE WAVEFORMS USED WITHIN
MODULE BY DAC CONTROL
TO PRODUCE
GEOMETRY WAVEFORMS



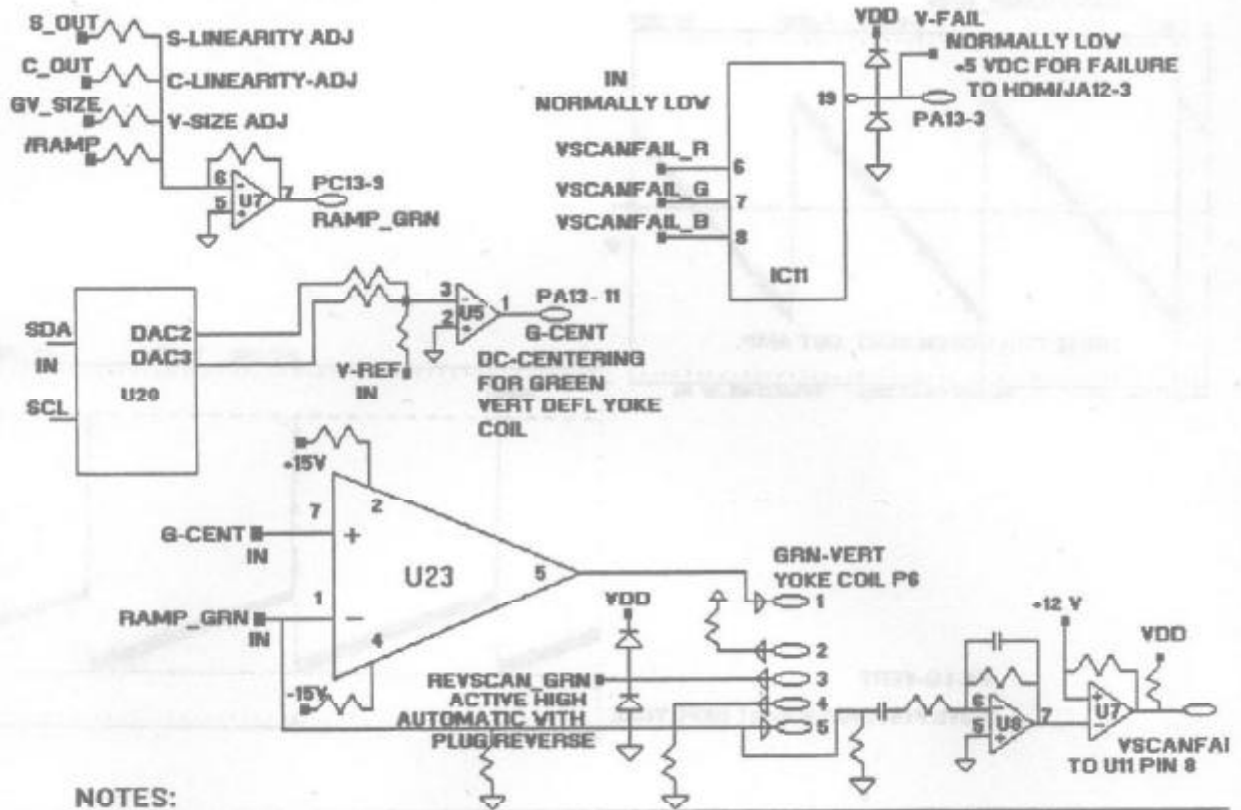




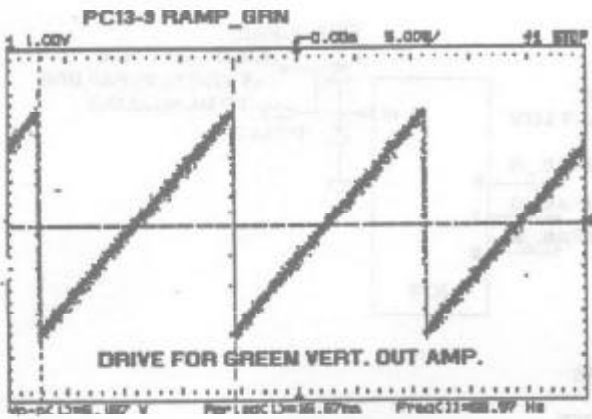
FINAL KEY-PIN WAVEFORMS
AT BOTH EXTREMES AND EFFECT
ON IMAGE



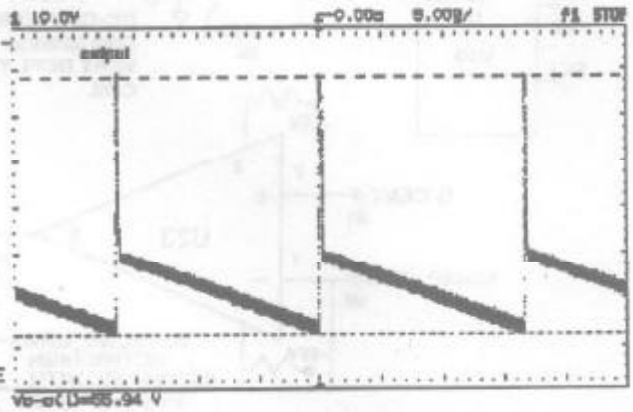
VERTICAL DEFL MOD - DRIVE SECTION- GREEN ONLY

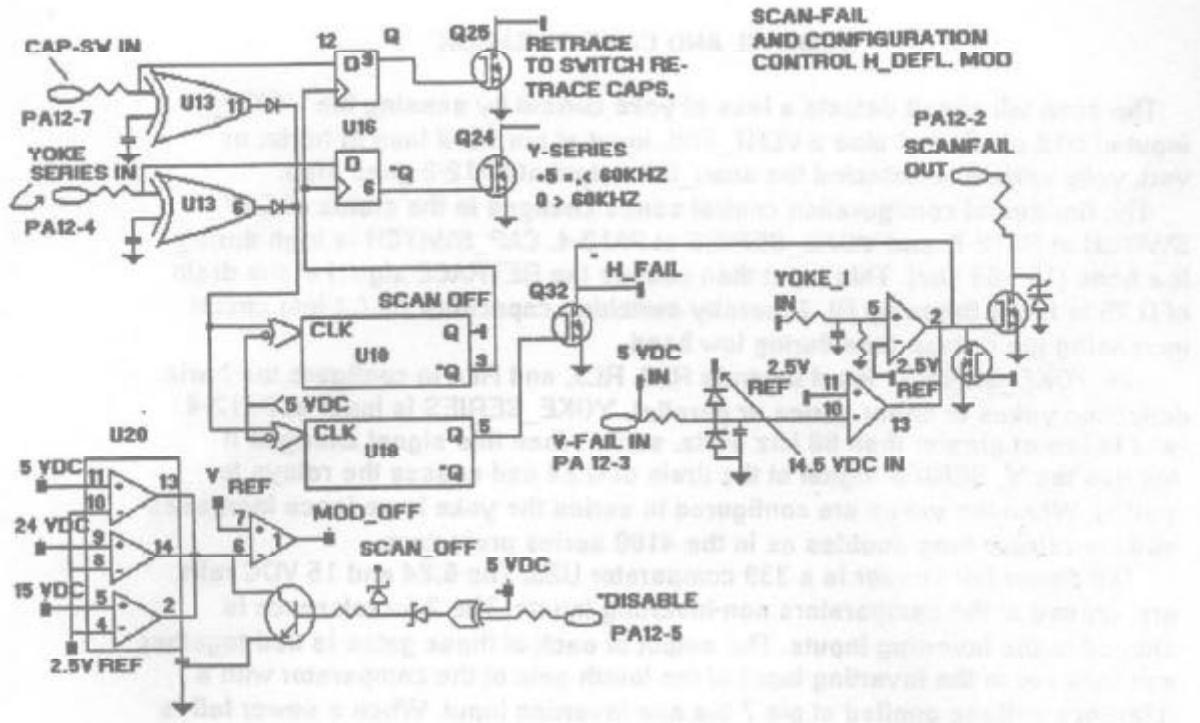


NOTES:



P6-1 G-VERT
DRIVE FOR GREEN VERT DEFL YOKE





SCANFAIL AND CONFIGURATION

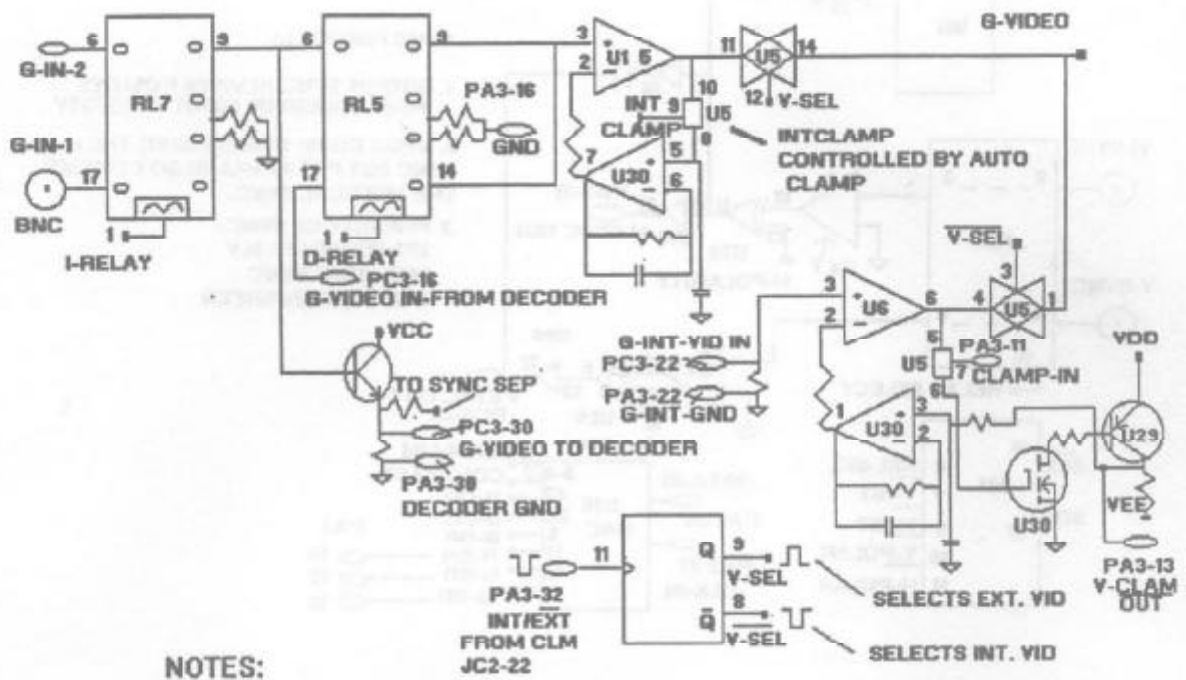
The scan fail circuit detects a loss of yoke current by sensing the YOKE_I input of U19 pin 5, and also a VERT_FAIL input at pin 10. If loss of horiz. or vert. yoke current is detected the scan_fail output at PA12-2 goes high.

The horizontal configuration control sense changes in the status of CAP_SWITCH at PA12-7, and YOKE_SERIES at PA12-4. CAP_SWITCH is high during low band (15 - 60 khz). This input then causes the RETRACE signal at the drain of Q 25 to make the relay RL 1 thereby switching capacitors C3,C4 into circuit increasing the retrace time during low band.

The YOKE_SERIES Input controls RL2, RL3, and RL4 to configure the horiz. deflection yokes in either series or parallel. YOKE_SERIES is input at PA12-4 and is low at greater than 60 khz horiz. scan. When this signal changes it toggles the Y_SERIES signal at the drain of Q 24 and causes the relays to switch. When the yokes are configured in series the yoke impedance increases and the retrace time doubles as in the 4100 series projectors.

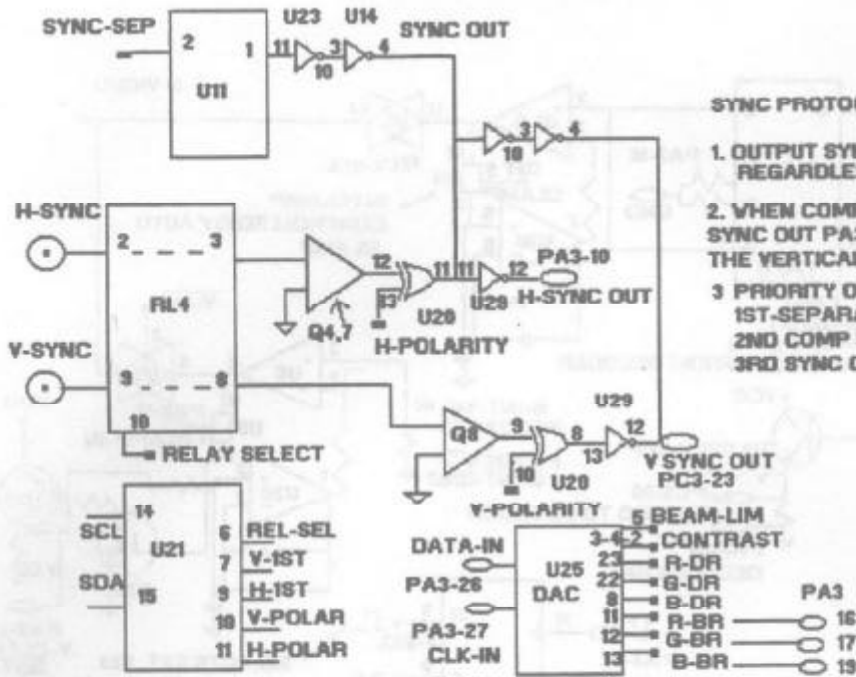
The power fail sensor is a 339 comparator U20. The 5,24 and 15 VDC rails are sensed at the comparators non-inverting inputs. The 2.5v reference is applied to the inverting inputs. The output of each of these gates is tied together and then fed to the inverting input of the fourth gate of the comparator with a reference voltage applied at pin 7 the non-inverting input. When a power fail is sensed the MOD_OFF signal turns off the horiz. scan supply(B-). A disable signal is also input to the module at PA12-5 which is an active low. This is used to hold down the B- supply during power up.

VIDEO INPUT MODULE - GREEN CHANNEL ONLY



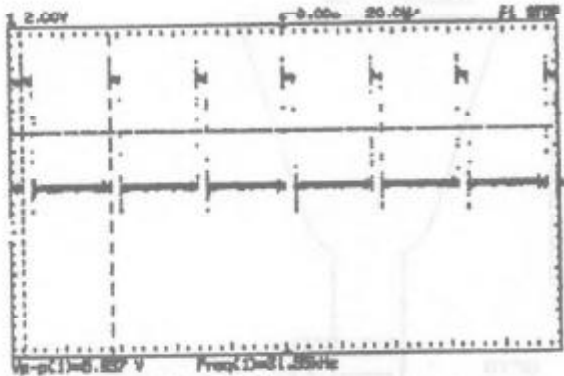
NOTES:

SYNC PROCESSING - VIM

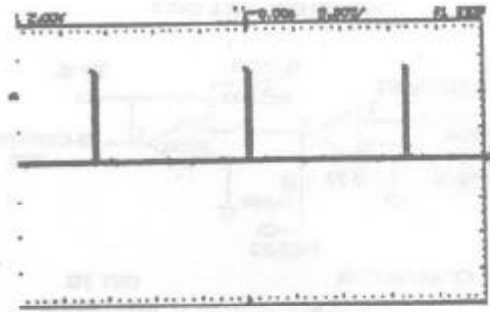


SYNC PROTOCOL

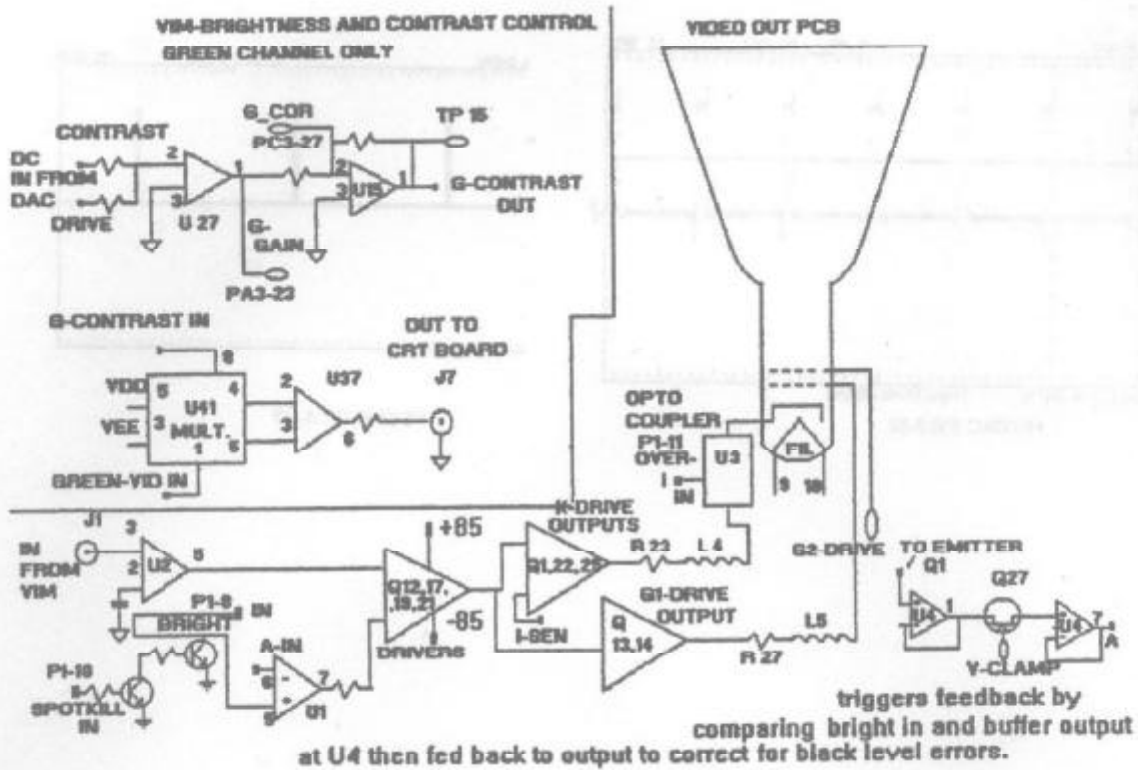
1. OUTPUT SYNC ALWAYS POSITIVE REGARDLESS OF INPUT POLARITY
2. WHEN COMP SYNC IS USED THE H-SYNC OUT PA3-10 WILL ALSO CONTAIN THE VERTICAL SYNC.
3. PRIORITY OF SYNC-
1ST-SEPARATE H,V
2ND COMP SYNC
3RD SYNC ON GREEN



HSYNC PA3-10



VSYNC PC3-23



**VIDEO NECKBOARD SIGNALS
IN ON EDGE CONNECTOR**

P11-RED

P12-GREEN

P13-BLUE

J1-RCA PIN VIDEO IN
FROM VIM
TO U2-PIN 3



- PIN-1 65 VDC SUPPLY
- 2 -5VDC SUPPLY
- 3 HEATER SUPPLY
- 4 HEATER SUPPLY
- 5 -15VDC
- 6 -15VDC
- 7 GND

9 BRIGHT-BRIGHTNESS CONTROL VOLTAGE

-2.5VDC TO -2.5VDC

9 Y-CLAMP ACTIVE HIGH -5VDC

10 SPOTKILL- ACTIVE HIGH -8V LEVEL REMOVES BIAS ON DRIVERS AND SHUTS DOWN VIDEO SIGNAL TO K

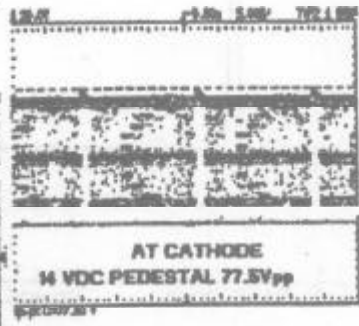
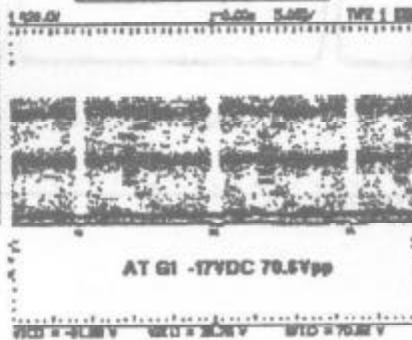
11 OVER-1 2.5VDC TRIP LEVEL INHIBITS HIGH VOLTAGE. THIS IS AN OUTPUT.

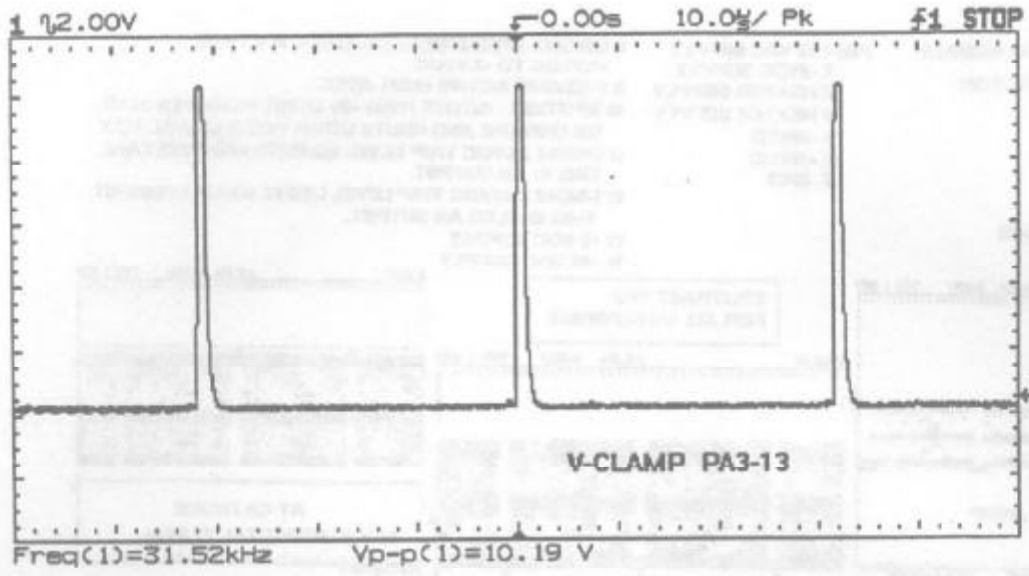
12 I-SENS 2.85VDC TRIP LEVEL LIMITS BEAM CURRENT. THIS IS ALSO AN OUTPUT.

13 -5 VDC SUPPLY

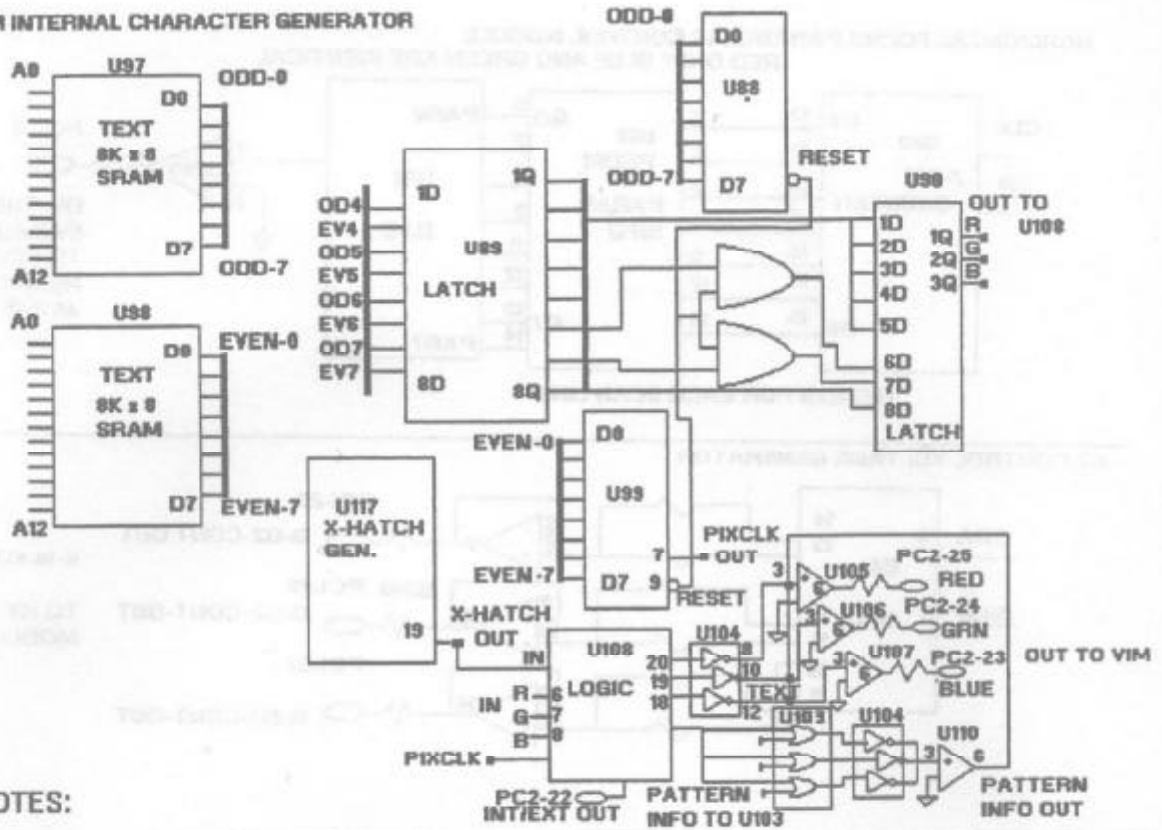
14 -65 VDC SUPPLY

CONTRAST 50%
FOR ALL WAVEFORMS



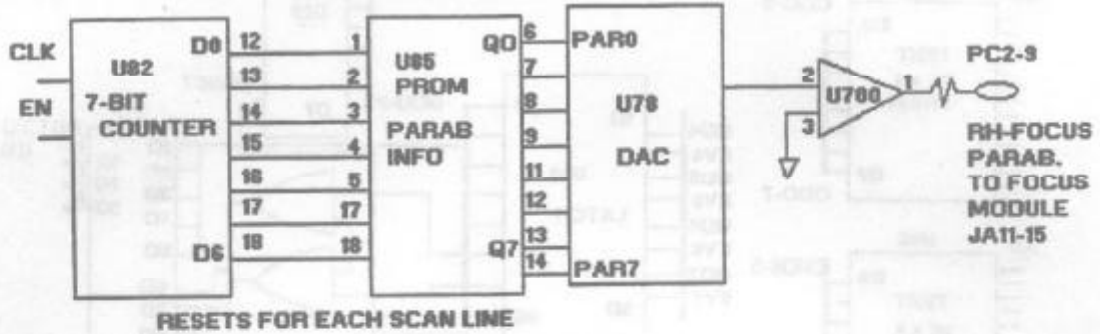


CLM INTERNAL CHARACTER GENERATOR

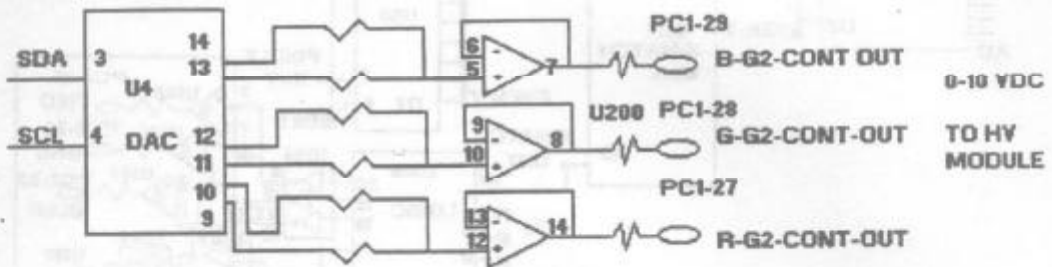


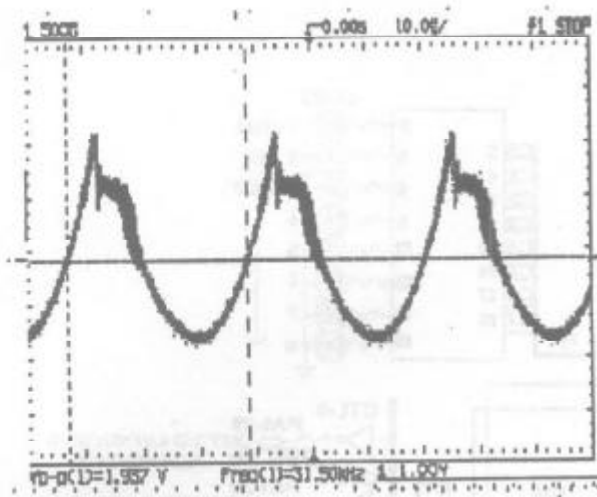
NOTES:

HORIZONTAL FOCUS PARABOLAS CONTROL MODULE
RED ONLY BLUE AND GREEN ARE IDENTICAL



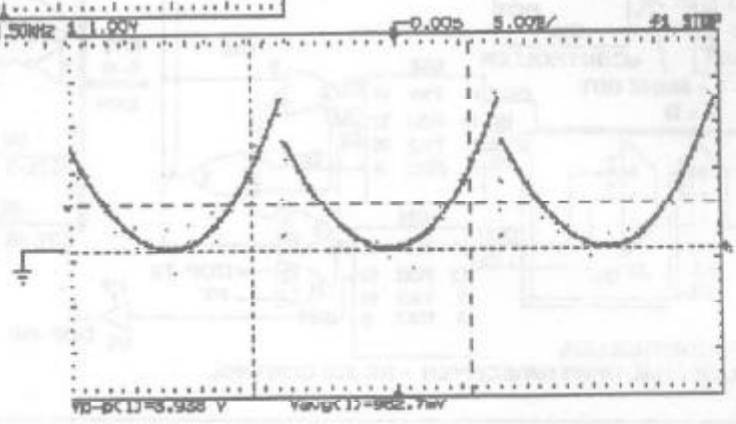
G2 CONTROL VOLTAGE GENERATOR



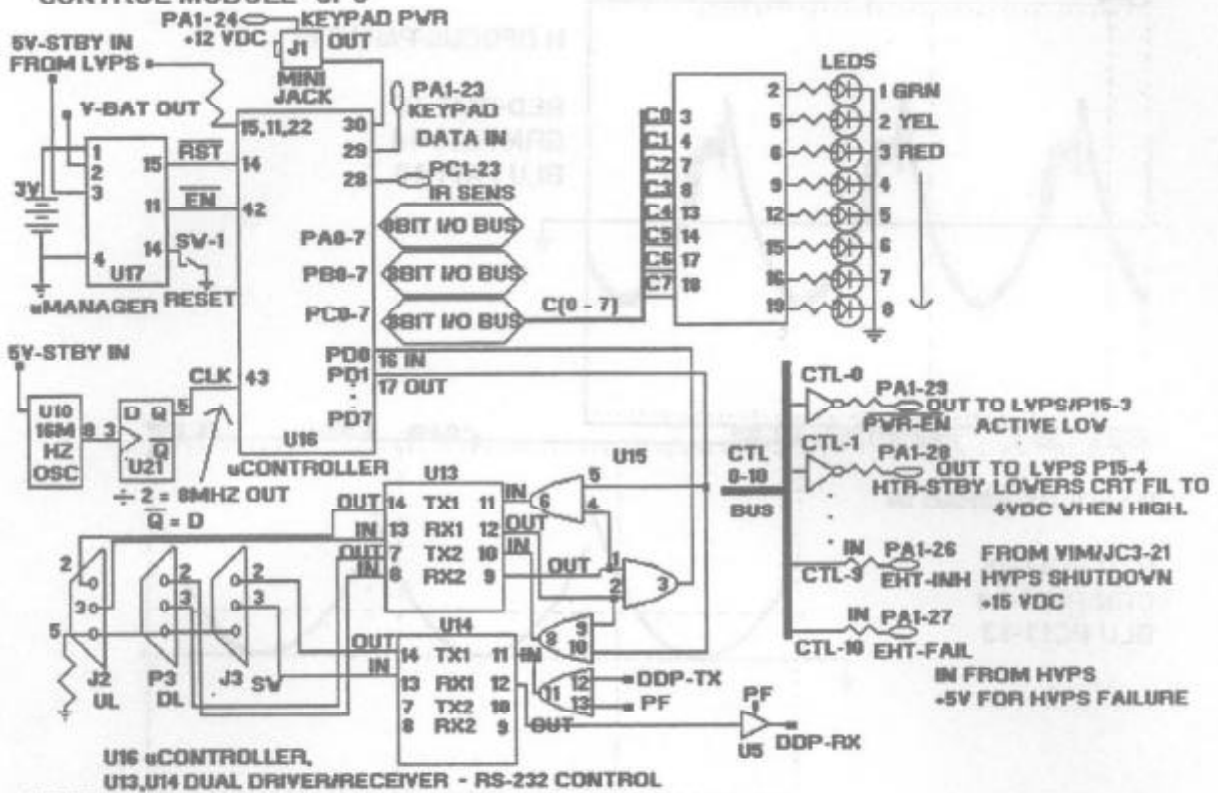


H DFOCUS-PARAB IN
 RED-PA11-15
 GRN-PA11-14
 BLU-PA11-13

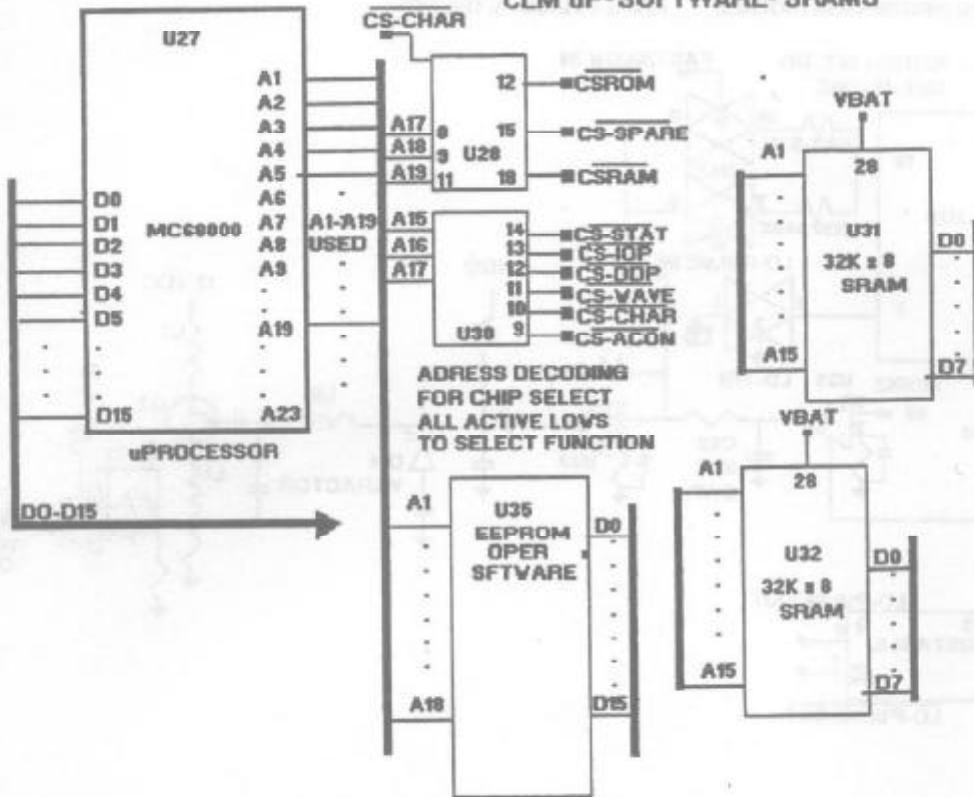
V-SFOCUS PARAB IN
 RED-PC11-15
 GRN-PC11-14
 BLU-PC11-13



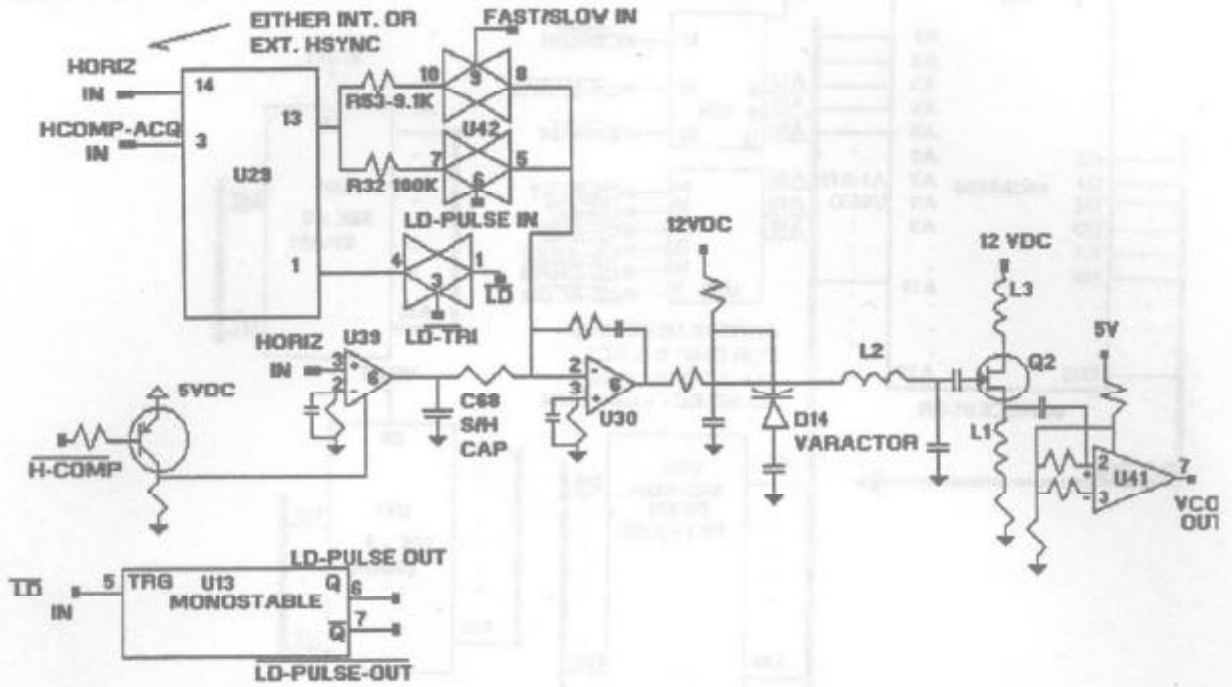
CONTROL MODULE- CPU



CLM uP-SOFTWARE- SRAMS



DIGITAL DEFLECTION PROCESSOR MODULE FREQ-PHASE DETECTION
 LOCATED ON CLM



NOTES:

U39 SAMPLE AND HOLD PHASE DETECTOR-(PD2)

THE HORIZ. INPUT INTO U39 PIN3 IS THE EXTERNAL HORIZONTAL SYNC, OR INTERNALLY GENERATED HORIZONTAL SYNC CALLED HINT. THE SECOND SIGNAL USED IS H-COMP* GENERATED IN THE HORIZONTAL SECTION OF THE SAME MODULE. THE OUTPUT OF U39 AT PIN6 REMAINS CONSTANT IF THE TV REFERENCE SIGNALS ARE IN PHASE SO THE OUTPUT OF THE VCO REMAINS CONSTANT.

IF H-COMP* PRECEEDS HORIZ. THE VOLTAGE TO THE VCO DECREASES AND THEREFORE THE VCO FREQUENCY DECREASES WHICH ALSO DECREASES THE H-COMP* FREQUENCY AT U39 CAUSING THE CIRCUIT TO ACHIEVE LOCK.

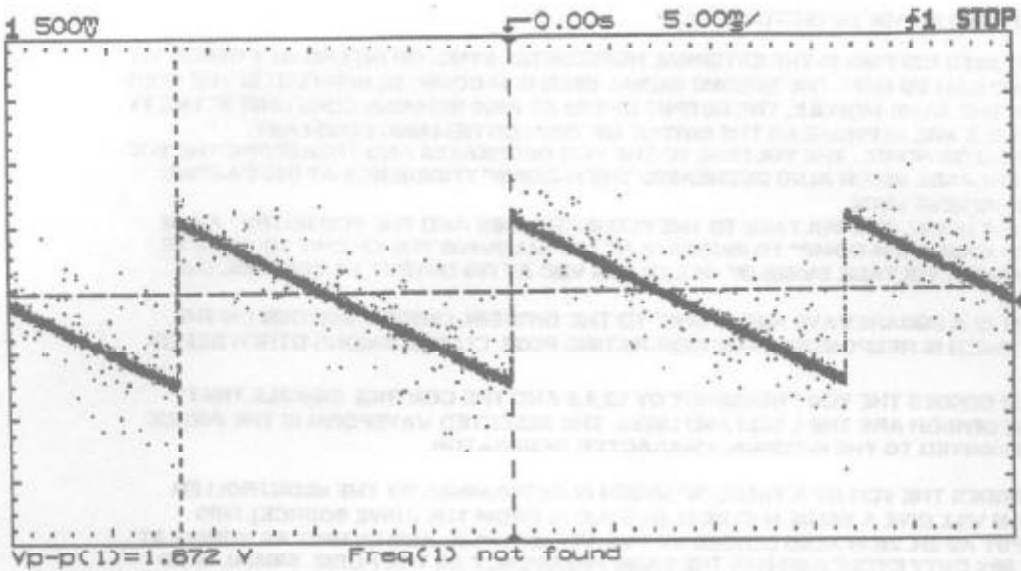
IF H-COMP* TRAILS HORIZ. THE VOLTAGE TO THE VCO INCREASES AND THE VCO OUTPUT FREQ. ALSO INCREASES CAUSING H-COMP* TO INCREASE AT U39 ALLOWING THE CIRCUIT TO ACHIEVE LOCK. U39 WILL HAVE A VOLTAGE SWING OF -10.5 TO -11.5 VDC AT ITS OUTPUT TO CONTROL THE VCO FREQUENCY.

THE VCO OUTPUT IS A SQUAREWAVE AND IS SENT TO THE DIVIDE/N, DIVIDE/L SECTION ON THE SAME MODULE WHICH IS RESPONSIBLE FOR GENERATING PIXEL CLOCKS AMONG OTHER REFERENCE SIGNALS.

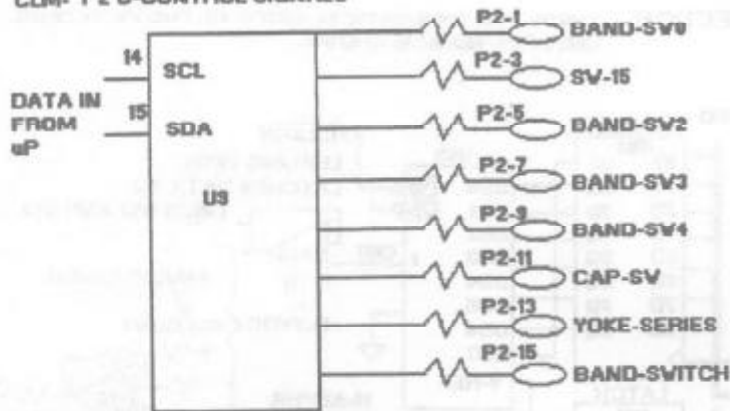
L SECTION - IC12 DIVIDES THE VCO FREQUENCY BY 1,2,4,8 AND THE CONTROL SIGNALS THAT DETERMINE THE DIVISOR ARE THE L SEL1 AND LSEL0. THE SELECTED WAVEFORM IS THE PIXCLK OUTPUT AND IS ROUTED TO THE INTERNAL CHARACTER GENERATOR.

N SECTION - DIVIDES THE VCO BY A VALUE "N" WHICH IS DETERMINED BY THE uCONTROLLER U6. DIVISION BY N WILL GIVE A VALUE $H-SYNC \times 2$. (H-SYNC IS FROM THE DRIVE SOURCE). THIS SIGNAL IS OUTPUT AS 2H. 2H IS ALSO DIVIDED BY TWO WITHIN THE IC AND OUTPUT AS HDRIVE AT PIN 8. IT HAS A 50% DUTY CYCLE AND HAS THE SAME FREQUENCY AS THE HORIZ. SIGNAL USED AS AN INPUT TO U39 FOR PHASE DETECTION. LIKE THE HORIZ. SIGNAL THE HDRIVE SIGNAL WILL HAVE THE SAME FREQUENCY AS THE DRIVE SOURCE OR HINT (INTERNALLY GENERATED SYNC).

CLAMP GENERATION - THE CLAMP IS DERIVED FROM THE HDRIVE SIGNAL JUST DESCRIBED. THE RISING EDGE OF HDRIVE TRIGGERS IC13 (A MONOSTABLE) WHICH OUTPUTS A 1.5uS PULSE. THIS PULSE IS SENT TO THE CHARACTER GENERATOR TO SET THE DC REFERENCE LEVEL FOR INTERNALLY GENERATED VIDEO, AND IS ALSO USED FOR RGB BLANKING.



CLM- 12 C-CONTROL SIGNALS



BAND-SV0 OUTPUT TO THE FOCUS MODULE LOV(0 V) WHEN H SYNC IS BETWEEN 15KHZ AND 60KHZ - USED TO SWITCH RESONANT CAPACITORS ON FOCUS MODULE

SV-15 OUTPUT TO HORIZONTAL DEFL. MOD. SIGNAL IS LOV WHEN HORIZ. FREQ > 30KHZ AND HIGH WHEN HORIZ.FREQ < 30KHZ USED IN YOKE SWITCHING AND RETRACE TIMING.

BAND-SV2 OUTPUT TO FOCUS MODULE FOR RESONANT CAP SWITCHING SIGNAL IS LOV BETWEEN 92KHZ AND 100KHZ INCLUSIVE OTHERWISE HIGH

BAND-SV3 OUTPUT TO FOCUS MODULE FOR RESONANT CAP SWITCHING SIGNAL IS LOV BETWEEN 100KHZ AND 114KHZ INCLUSIVE HIGH OTHERWISE

BAND-SV4 OUTPUT TO FOCUS MODULE LOV BETWEEN 114 - 123.5 KHZ HIGH OTHERWISE

YOKE SERIES - TO HDM HIGH BETWEEN AND INCLUDING SYNC FREQ. OF 15KHZ TO 60KHZ CAUSES SERIES CONNECTION OF H. DEFL YOKE, LOV AT > 60KHZ CAUSING PARALLEL CONNECT

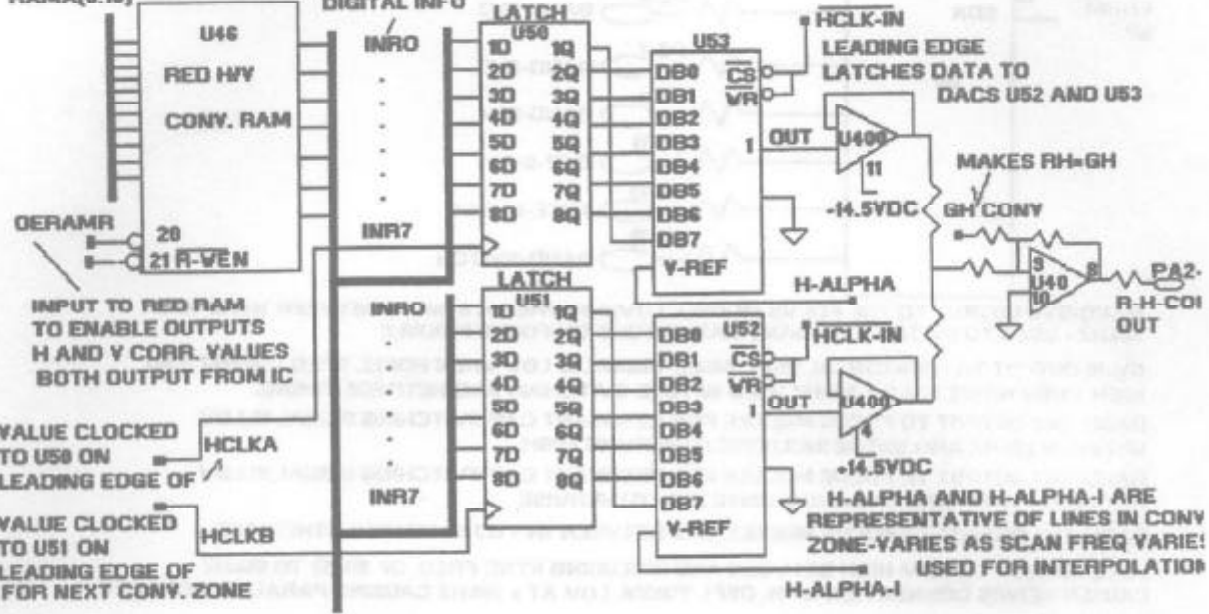
BAND-SWITCH - TO VIM - HIGH WHEN BANDSWITCH OCCURS FROM LOV TO HIGH OR HIGH TO LOV - HV REMAINS ON

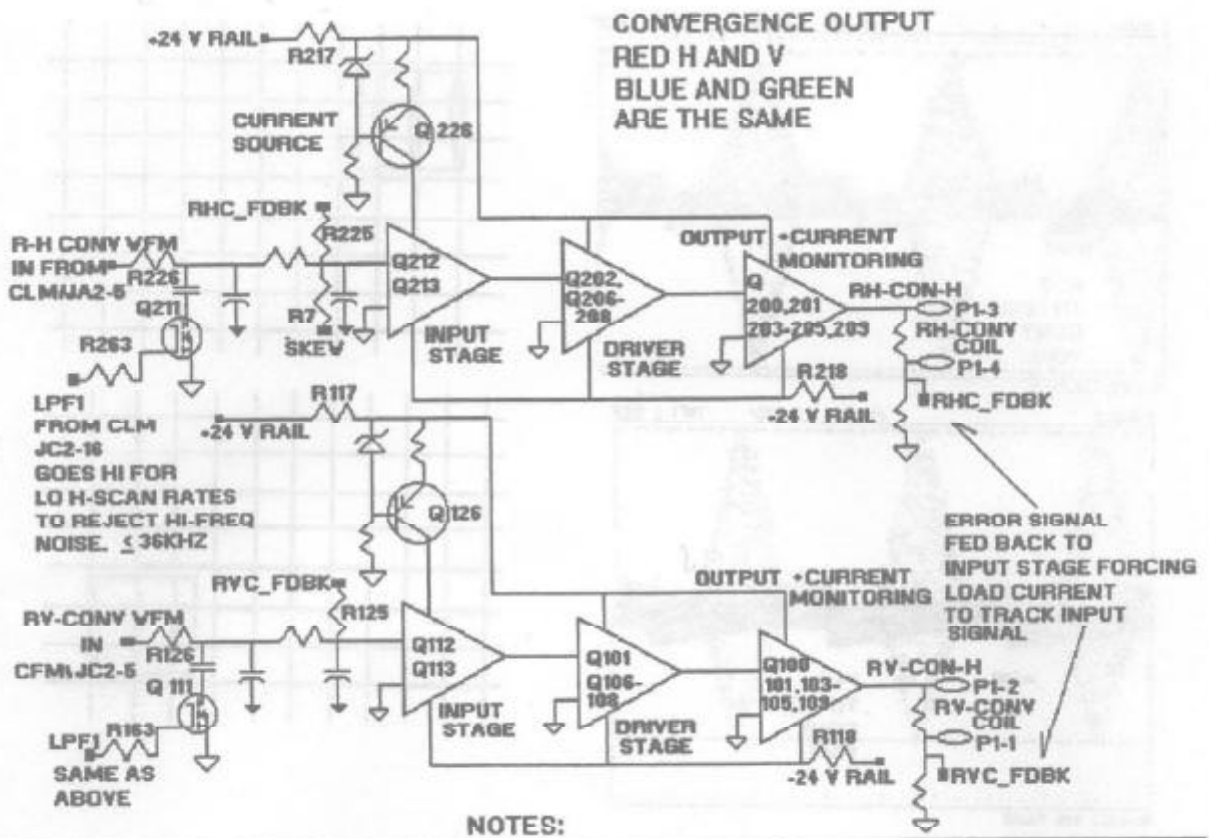
CAP-SV - TO HDM WHEN HIGH THIS SIGNAL INCREASES RETRACE TIME

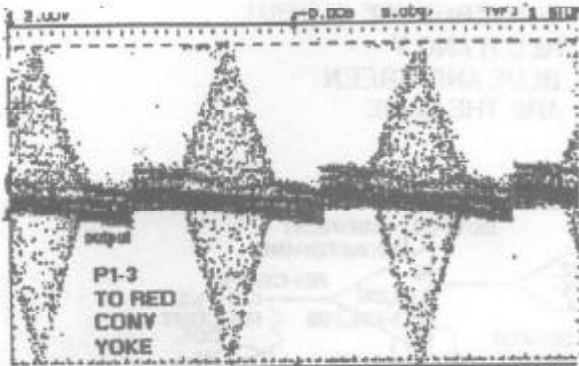
CLM CONVERGENCE RAM SECTION

THERE ARE SIX IDENTICAL CIRCUITS-TWO PER COLOR.
ONLY RED HORIZ IS SHOWN.

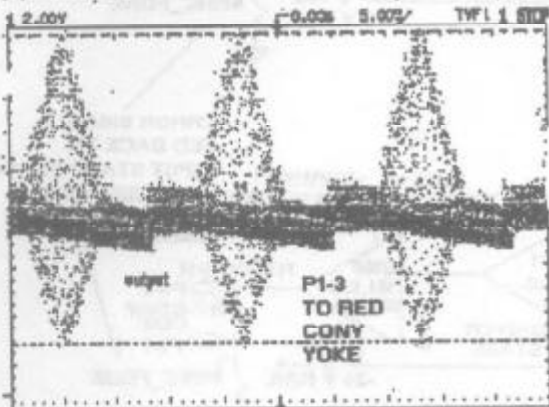
SELECTS MEM LOCATION
✓ TO READ FROM OR WRITE TO
RAMA(8:10)



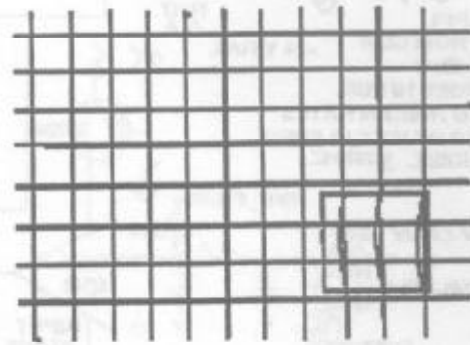
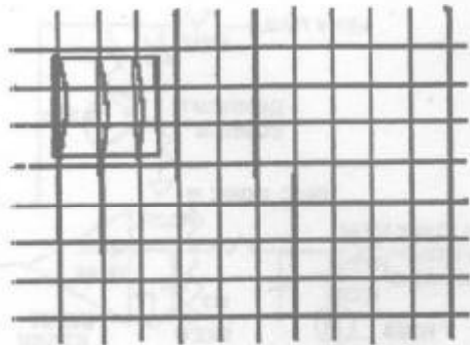


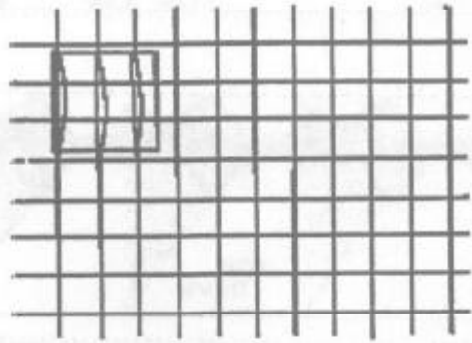
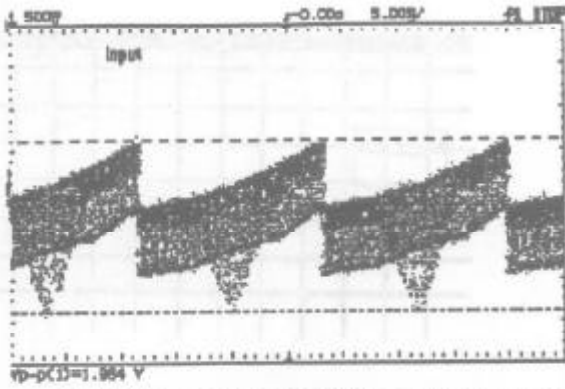


Vo-p(1)=4.85 V

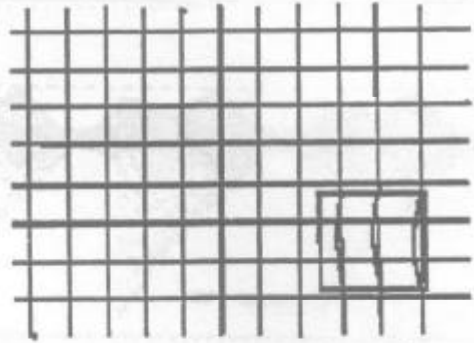
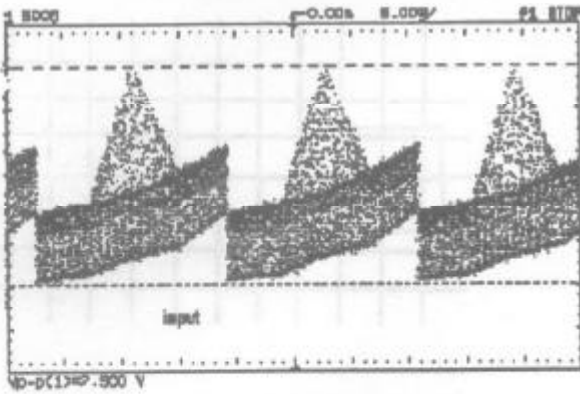


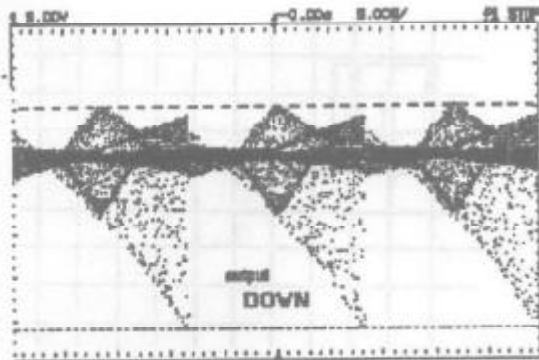
Vo-p(1) not found





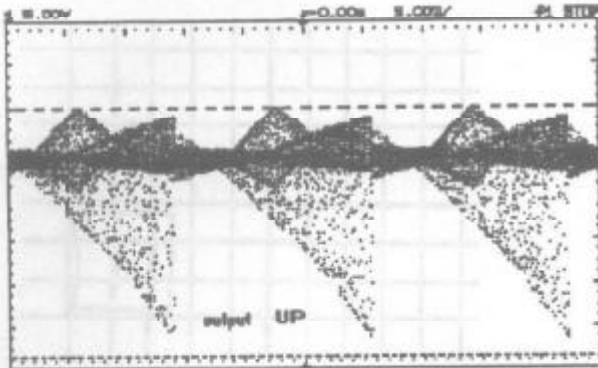
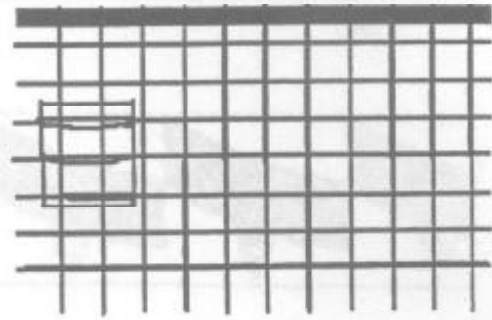
RED HORIZ CONV. VFM IN TO CONV AMP PCB FROM CLM JA2-5



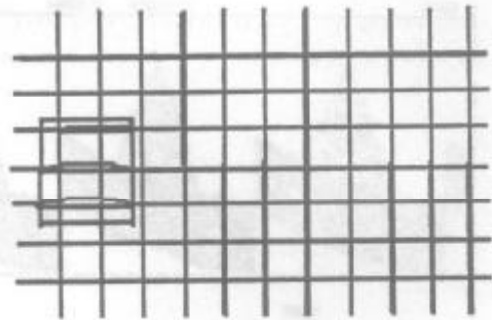


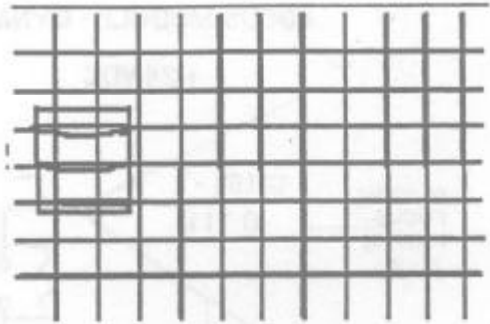
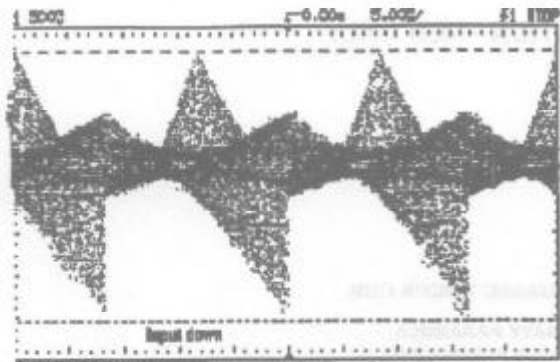
Ab-e(D)=25.25 V

VCONV OUT TO RED COIL P1-2

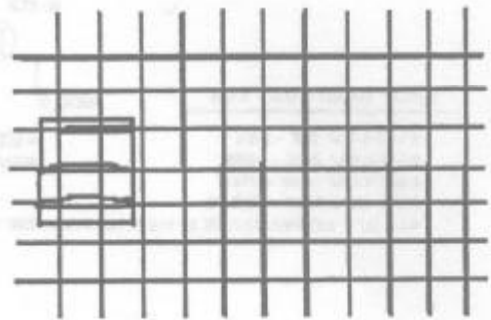
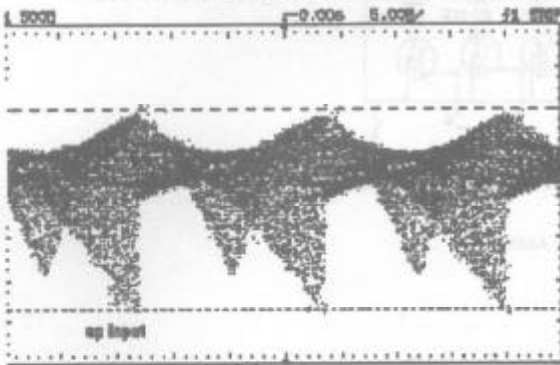


Ab-e(D)=25.59 V

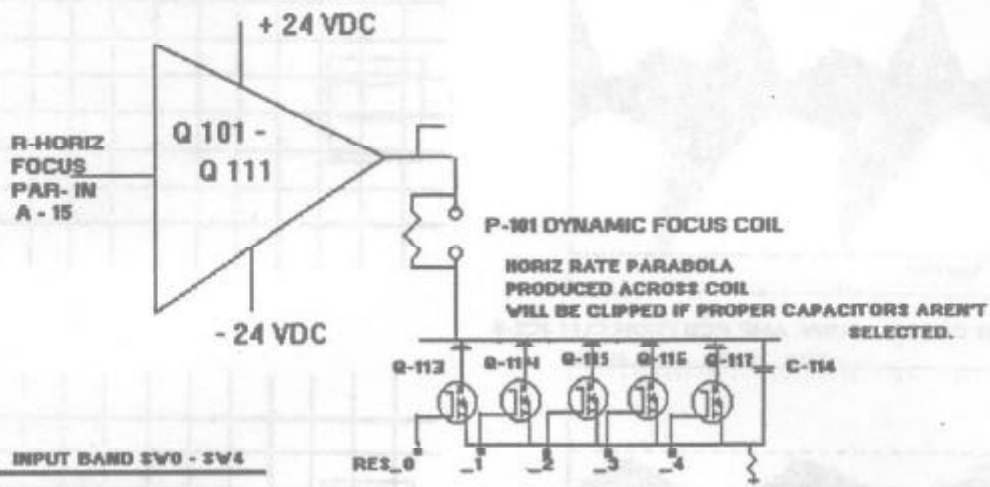




VERT CONV TO CONV. AMP PCB FROM CLM JC2-5



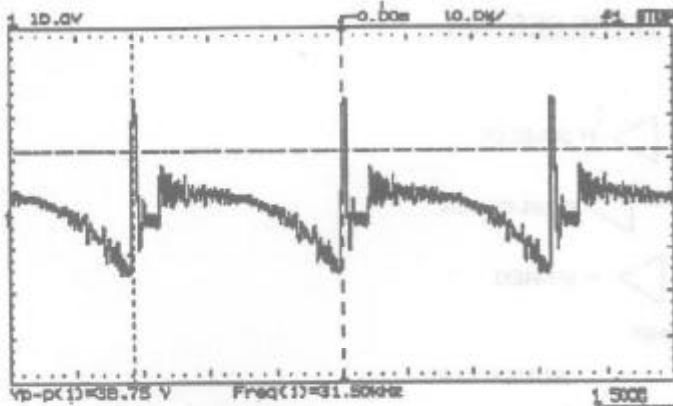
FOCUS MODULE - DYNAMIC SECTION - RED ONLY



INPUT BAND SW0 - SW4

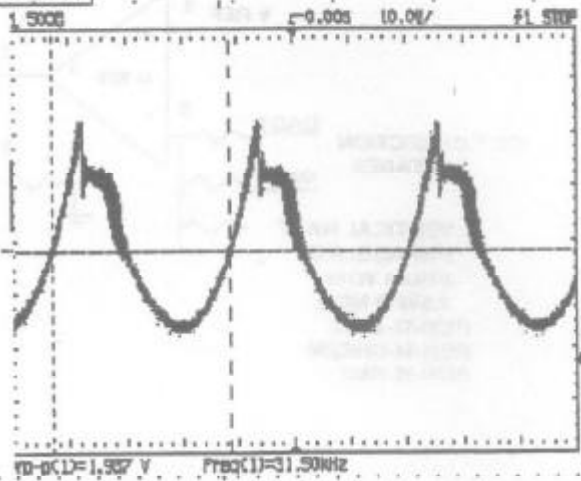
- SW0-LOW 15K - 60K
- SW2-LOW 82K - 100K
- SW3-LOW 100K - 114K
- SW4-LOW 114K - 123.5K
- ALL OFF ABOVE 123.5K C-114 WILL PROVIDE RESONANCE ALONE

FET CONFIGURATION IS DETERMINED BY GATE INPUT FROM DEFLECTION PROCESSOR MODULE.



DYNAMIC FOCUS COIL DRIVE

RED P101-1
 GRN P201-1
 BLU P301-1

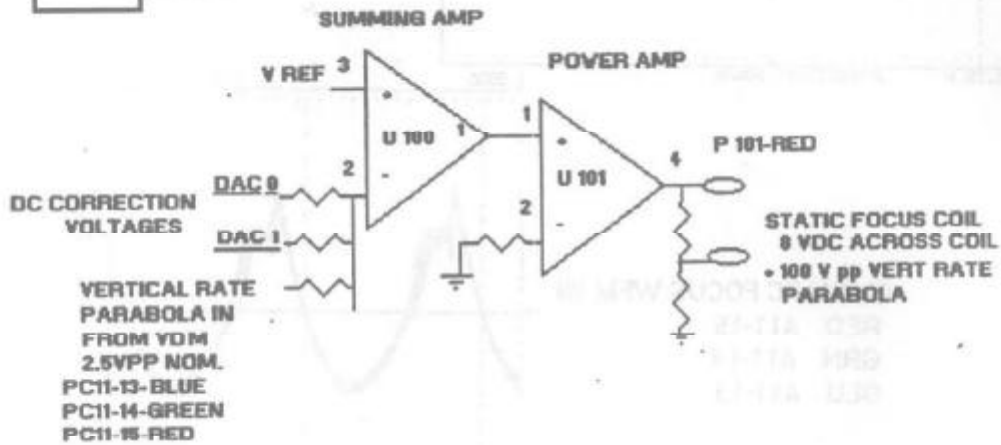
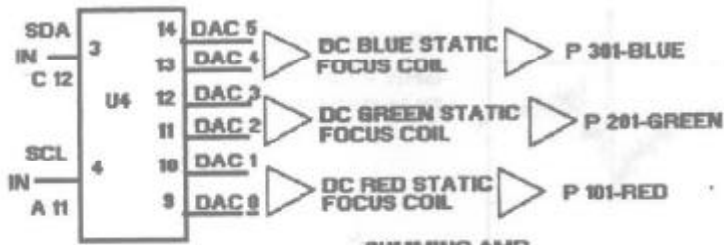


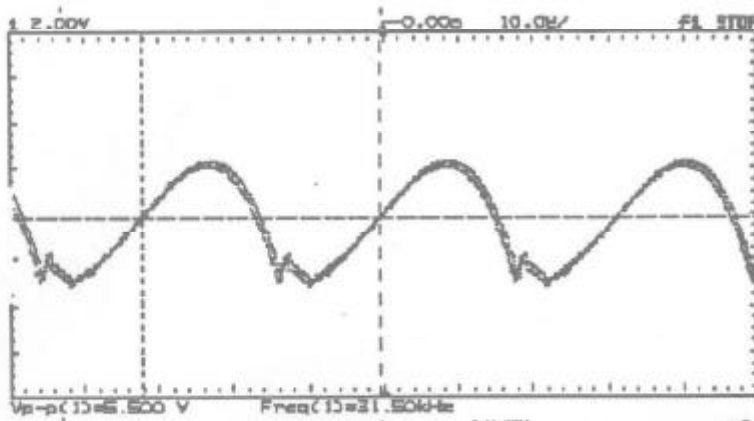
DYNAMIC FOCUS WFM IN

RED A11-15
 GRN A11-14
 BLU A11-13

FOCUS AMPLIFIER (RED ONLY)-

STATIC SECTION





VFOCUS PAR IN

RED PC11-15
GRN PC11-14
BLU PC11-13

OUTPUT TO STATIC FOCUS
COIL
P101-3 RED
P201-3 GREEN
P301-3 BLUE

