

5.0 Setup Adjustments

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This chapter assumes the operator is using a remote control and accessing setup functions through the menu tree. All instructions are given with reference to using the menu tree for setup functions. If using a PC or laptop computer to control the projector refer to Table 4-2 for the equivalent key functions.

Chapter 4 covered mainly operation for projectors that are already positioned, set up, and ready for operation. This chapter covers the complete projector setup procedures. Prior to starting the setup procedures in this chapter, the operator should review Chapter 4 to become familiar with navigating through the menu and the remote control keys.

Prior to performing any adjustments, allow the projector to warm up for at least **60** minutes. Der Projektor muß zunächst mindestens **60** Minuten lang warmlaufen, bevor irgendwelche Einstellungen vorgenommen werden. Avant tout réglage, laisser le projecteur chauffer pendant au moins **60** minutes.

5.1 Test Patterns

For projector adjustments, the operator needs to access various test patterns. Table 5-1 lists the eight test pattern selections that are available internally on the Model 200 projector.

Table 5-1. Test Patterns.

Test Pattern	Description	Purpose
1	Off (External)	External Video. Used to adjust Phase, Centering, Blanking, and Size.
2	RGB X-hatch	XY Convergence.
3	Cont/Bright	Adjust proper Contrast and Brightness while viewing external video.
4	Variable Flat	Adjust Threshold and Sensitivity.
5	X-hatch	Adjust Linearity, Edge Linearity, Keystone, Keystone Balance, Pincushion, Pincushion Balance, Bow, and Skew.
6	Focus	Adjust Projection Lens and Electronic focus.
7	Grey/Pluge	Adjust Black level (G2) and Color Balance.
8	Center/Lin	Use for Size adjustment when using Internal source only.

Access a test pattern through the Main Menu and the System Menu.

5.2 Projection Lens Focus (Rough)

For the Timing and Geometry setup procedures below, it is necessary to obtain a rough focus of the projection lens in order to read menus and do the adjustments. If the focus is adequate to read the menus, this procedure can be skipped until after the Timing and Geometry adjustments are finished. When the Timing and Geometry adjustments are complete, *and prior to starting convergence*, the Projection Lens focus adjustment should be repeated and a sharp focus obtained.

To obtain a rough focus of the projection lens:

1. Press Menu to display the Main Menu on the screen. It may be necessary to press Escape one or more times to back out to the Main Menu.
2. Select #7, System, from the Main Menu.
3. Select #1, Test Pattern, from the System menu.
4. Select #7, Focus from the Test Pattern menu. This test pattern consists of rows and columns of the letter H.
5. At the System menu, select #2, Projection Lens.
6. A small window displaying Focus and Zoom arrows appears on the screen.
7. Use the up/down arrows to zoom the picture to the size desired-raster and image should be smaller than the screen. (This step does not apply for fixed lenses.)
8. After the proper size is selected, use the right/left arrow keys to achieve a rough overall focus that is adequate to read the screen menus. A sharper focus will be obtained later after the geometric procedures are completed.
9. Press Enter to complete this adjustment. Press Escape twice to display the Main Menu.

5.3 Setup Preparation

In the Timing and Geometric adjustments below, Green is the active and on-screen color. Red and Blue are hidden because they track on Green. When the Timing and Geometric adjustments in this section are finished, Red and Blue is then Centered to match Green and converged onto Green in the Convergence procedures. To hide Red and Blue, toggle the RGB key to Red, press Hide, then toggle to Blue and press Hide. Green is now the only color displayed on the screen. Toggle the RGB key to highlight G.

To avoid redundancy in the procedures in this chapter, some general information, instructions, phrases, and definitions are given below:

- References made to **R**, **G** or **B** refer to Red, Green or Blue.
- “**Toggle to Red/Green/Blue**” means to press the RGB key repeatedly until the desired color is selected by observing the highlight on the RGB window on the screen.
- “**Access an item from the menu**” means to press the Menu and/or Escape keys to display the Main Menu, then press the number of the menu or item desired.
- “**Hide a color**” means to highlight that color with the RGB toggle, then press the Hide key.
- An adjustment can be performed for individual colors if the RGB letters are in the window on the screen. Choosing one color makes the selected color adjustable but all three colors still remain on the screen (unless they are hidden with the Hide key).
- Pressing Escape removes RGB displays immediately.
- An “**Active**” channel is the one that is presently on the screen. A “**Highlighted**” channel is one that has been selected by pressing a channel number but has not yet been made “Active” by pressing Enter. Pressing the channel number “**Highlights**” the channel on the channel list and pressing Enter makes it “**Active**” (on screen). An illustration of an “**active**” and “**highlighted**” channel is shown in Figure 5-1, Channels menu.
- An “**Inactive**” channel is one that has either no input connected or no signal coming in to its input or is not active (on screen).
- For any adjustment, pressing Mode speeds up the adjustments by a 4 to 1 ratio. Press Mode again to toggle back to the single digit adjustment rate.
- At the end of any Timing or Geometry adjustment, pressing Enter or Escape exits the adjustment. This is not true for Convergence adjustments. Pressing Enter while doing Convergence changes the nature of the cursor from the Move/Size mode to the Adjust mode. When performing Convergence procedures (Registration, Threshold, Sensitivity) press Escape to exit the adjustment.
- If the screen does not show the window or menu as it should, make sure the Onscrn key is not toggled off.

After completing the timing, geometric, and convergence adjustments for one video source, the adjustment data may be backed up by copying it to another of the 99 channels. **(NOTE:** When backing up a channel-see *the Backing up Settings function from Section 5.12*-be sure that the “copied to” channel is either blank or has no valid setup data. All data will be deleted on the “copied to” channel). This provides backup for a previously set up channel and a good starting point for setting up other channels.

Be sure to complete the Timing section first, Geometry next, and Convergence last. They are performed in this order because Geometry depends on proper Timing settings and Convergence depends on correct Geometry.

Ensure that the projector is installed and positioned correctly at the outset so that all later adjustments will be at their optimal levels and the video image will be the sharpest possible. Positioning the projector is the most important step in the setup procedures. The projector-to-screen alignment should be as square as possible before starting setup procedures in order to accomplish Timing, Geometric, and Convergence adjustments properly.

Prior to starting the procedures, a channel and source (source file) must be selected for the setup adjustments. This is covered below in Section 5.3.1.

5.3.1 Editing Channels, Sources, and VICs

A channel and source (source file) are selected from the Channels and Sources lists. **(NOTE:** “Source” is frequently used to indicate a “source file” that has been set up for a specific video source. See *Section 4.6 for a more detailed description of a channel, source, and source file.*). The Channels and Sources lists must first be edited to select a name for the new channel, the VIC to be used, and the source to be used. Figures 5-1 and 5-2 provide illustrations of the Channels list and the Sources list showing “active” and “highlighted” channels and sources. Be sure the projector is receiving the video source that it is to be set up for.

CAUTION! If the active channel receives a video source that does not have an exact match in a source file, the projector will match the source to the source file that is closest to the new source parameters. If adjustments are attempted, the following statement appears on the screen: “Adjustments are inhibited on an approximate match”. This means that the projector will not allow adjustments to a source file that has been set up for one source and is only being used now as an approximate match for the new source. Adjustments, if allowed, would corrupt the data for the source being used.

To edit a channel and source (*refer to Figure 5-1*):

1. From the Main Menu select #2, Channels.

2. From the Channels list select an unused channel number by pressing the channel number and then pressing Enter. This highlights the channel for editing purposes but does not make it active yet. The channel can also be highlighted by scrolling to it with the arrow keys.
3. Press Mode. This brings up a sub-menu for editing. (This is a toggle key. Pressing Mode again removes the submenu).
4. Use the up/down arrow keys to select Edit and press Enter.
5. The Name field should be highlighted. If not use the left/right arrow keys to highlight the Name field.
6. Press Enter to edit the Name field.
7. Use the up/down arrows to move the characters in the first letter of the Name field. When the desired letter/number is shown, press the right arrow key. This accepts the selection and moves to the next column.
8. Select the next letter/number in the same manner as in Step 11 above. Repeat the above two steps for the remainder of the columns. When complete, press Enter.
9. When the channel name is complete move to the VIC column by pressing the right arrow key.
10. In the VIC column, press Enter first, and edit the VIC number (if more than one VIC, a Quad VIC, or a decoder is being used) in the same manner as editing channels above.

NOTE: If there is only one single-port VIC being used, without a switcher, this VIC number defaults to 1.1. The first number indicates which VIC slot is being used. The second number indicates which port of the VIC is being used (for multi-port VICs and decoders). In situations where switchers are being used, the third number indicates the switcher port #. If there is only one single-port VIC being used, press Enter to accept the VIC number.

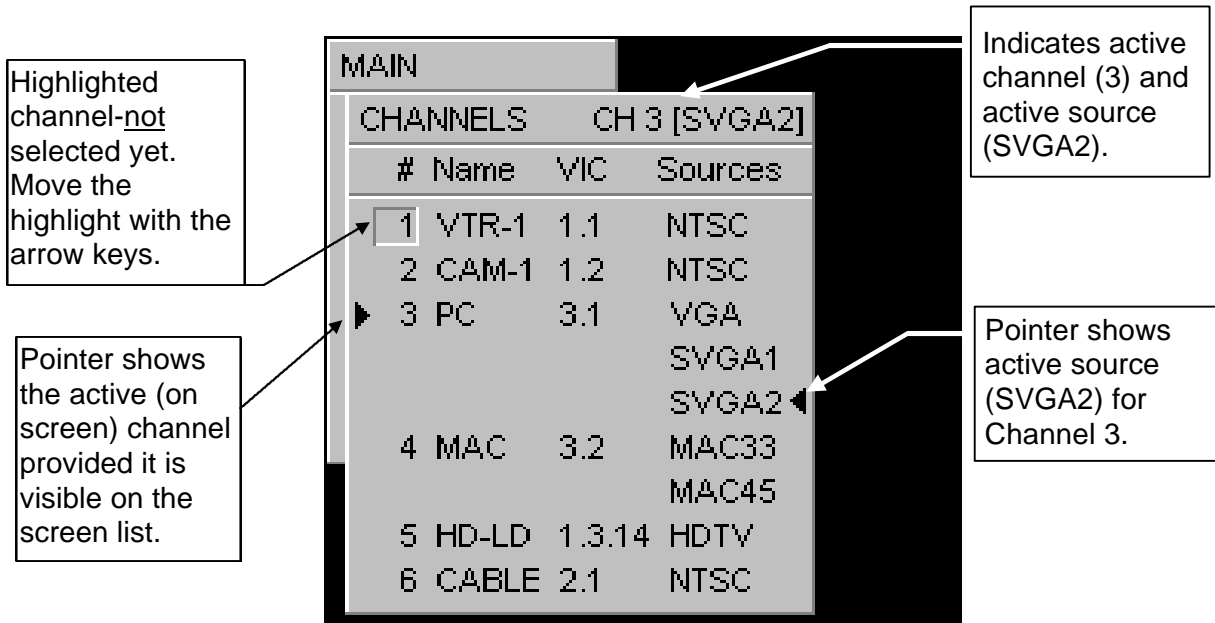


Figure 5-1. Channels Menu. **NOTE:** If a channel has more sources than can be shown on the list above, the last line indicates this with three periods (...).

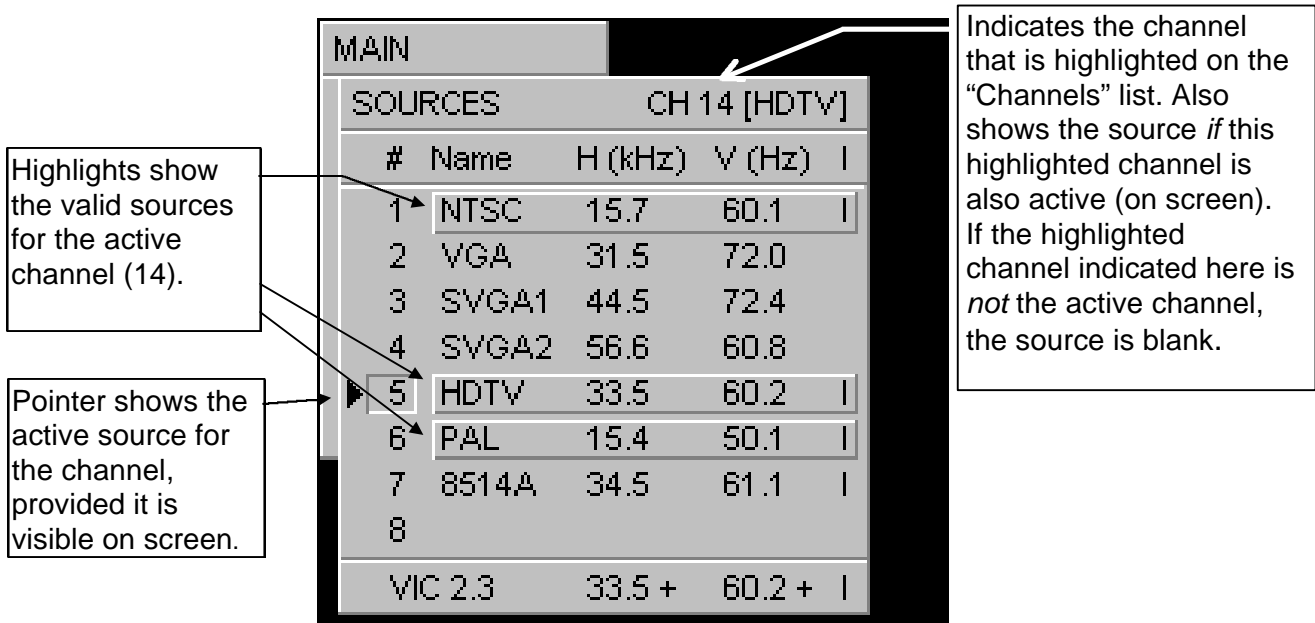


Figure 5-2. Sources Menu.

11. Press Escape to exit the Edit mode.
12. Press the right arrow key to move to the Sources list.
13. Use the up/down arrow keys to select a blank line for a new source or an existing source that is suitable for the new channel. If an existing source (a previously set up source file) is suitable for the new channel, use the arrow keys to select it and press Enter when this source is highlighted. This attaches that source to the highlighted channel. If setting up for a new source, add the new source name in the same way as previously shown for adding a channel name. Press Enter when complete (this attaches the new source *name* to the channel highlighted in the Channels list). **NOTE:** The only item in the Sources list that can be edited is the source name. All other columns and items are sensed by the projector and added automatically when the video source is received.
14. Press Enter when finished naming or attaching a source.
15. Press the left arrow key to move back to the Channels list. Verify that the new source is listed in the highlighted Channel.

Internal Source: Every channel has an internal source attached which is factory preset, but is not shown on the Sources list. This is the “default timing” for the projector with scanning rates of 33KHz (horizontal) and 60Hz (vertical). This internal source is used in order to read menus when there is no source input connected to the projector. To force the projector to use this internal source, select channel number 0 (press 0 and Enter).

Factory-preset Channels and Sources: Some channels have source files that have been preset at the factory. The operator can select one of these factory-preset source files for faster setup. They should be checked for proper timing, geometry, and convergence and readjusted, if necessary.

To use a factory-preset source file, highlight the channel with the source file preferred and attach it to the highlighted channel, as shown in Section 4.7 above. Bear in mind that any adjustments to the “attached” source will also alter the data from the original factory source file. To use the factory source file and still keep it intact for future use, it should be “copied” to the channel desired. Use the “backing up settings” procedure from Section 5.12.

5.4 Timing Settings and Adjustments

Timing settings and adjustments are required for each type of video source the projector will handle. They are completed prior to geometry because the geometry adjustments are dependent on the proper timing of raster scanning. The Timing adjustments are universal to RGB and color selection is not necessary.

NOTE: Although Pincushion Balance and Keystone Balance are also raster timing adjustments, they are both performed in the Geometry section below. This is because Bow and Skew must be performed first in order for Pincushion and Keystone Balancing to be accomplished correctly.

5.4.1 Clamp Type

The Clamp Type setting sets the type of clamping used with the sync pulse. There are three types of clamping; BP (Back Porch) is used in 95% of all computer and video inputs, ST (Sync Tip) is seldom used but is necessary when there is no back porch to clamp on, and TL (Tri-Level) which is used mainly for HDTV. Back Porch is the default.

To set the Clamp Type:

1. Access the Timing menu.
2. From the Timing menu, press #4, Clamp Type.
3. Use the arrow keys and highlight BP, ST, or TL.
4. Press Enter to select.

5.4.2 VTR Mode

VTR mode should be set to the On position only when the projector input comes from a VTR source. This stabilizes the VTR sync input. At all other times the VTR mode should be set to Off (default).

To set the VTR Mode:

1. From the Timing menu select #5, VTR Mode.
2. Press Enter to toggle the VTR Mode to Off (unchecked box) unless using a VTR as a video source.
3. Press Escape to return to the Timing menu.

5.4.3 Blanking

Blanking is used to mask out unwanted anomalies on the picture edges. An unblanked image allows the entire video image to be displayed on the screen. If Blanking is misadjusted the raster may "blank out" at the right or left edges of the image. Adjust Blanking to the *edge* of the active video. (**NOTE:** Blanking, Phase, Size, and Centering are all functions that contribute to the entire video image and the raster being visible, unblanked, and centered on the screen.

When any one of these functions is adjusted the others should be rechecked and retouched, if necessary.)

To adjust Blanking:

1. Select Test Pattern #1 from the Test Pattern menu and use an external video image.
2. Access the Brightness adjustment from the Picture menu.
3. Use the arrow keys and increase the brightness level to allow viewing of the entire raster and video (*see Figure 5-3*). Press Escape when finished.
4. Access #2, T/L (Top/Left) Blanking, from the Timing menu.
5. Verify that the video image and raster are smaller than the screen (*refer to Figure 5-3*). If not, access the Size adjustment from the Geometry menu and use the arrow keys to size the video image to be just smaller than the screen size. Press Escape or Enter when finished.
6. Use the arrow keys to move the masking toward or away from the top and left edges of the screen. When finished press Enter or Escape
7. Access #3, B/R (Bottom/Right), Blanking from the Timing menu.
8. Use the arrow keys to move the masking toward or away from the bottom and right edges of the screen.
10. Press Enter or Escape to exit the adjustment.

5.4.4 Phase

The Phase adjustment positions the *video image* within the raster. Later, in the Geometry section the Centering adjustment is accomplished which positions the raster on the CRT. After completing Centering it may be necessary to touch-up the Phase adjustment.

1. Continue from above with an external video image.
2. Access #1, Phase adjustment, from the Timing menu.
3. Use the arrow keys and adjust the horizontal and vertical phase so that the image does not fold over on either side or at the top and bottom. Center the video image on the raster as shown in Figure 5-3. **NOTE:** Overadjusting vertical phase may cause vertical retrace lines to appear in the video image.
4. Press Escape or Enter to exit this adjustment.

5. Recheck the Blanking adjustment.

NOTE: Phase may also affect Pincushion Balance. Whenever phase is adjusted, recheck (and readjust if necessary) Pincushion Balance.

5.5 Geometric Adjustments

Geometric adjustments are performed for each type of video source. Geometry cannot be performed correctly unless the Timing settings have been completed. **NOTE:** Prior to performing any geometric adjustments, toggle the “Reg Enable” box to the unchecked mode in the Geometry menu (#9). This ensures that any previous convergence corrections won't influence the Geometry adjustments.

5.5.1 Centering (G)

Centering moves the position of the *raster* on the CRT without wrapping around.

1. Continue from above with an external video image.
2. Access #2, Centering, adjustment from the Geometry menu.
3. Use the Hide key and hide R and B. (Toggle the RGB key to select R only and press Hide then toggle the RGB key to select B only and press Hide.)
4. Toggle the RGB key to select G only.
5. Use the arrow keys and position the Green raster vertically and horizontally so that it is centered on the screen (*Refer to Figure 5-3*).
6. Recheck Phase and Blanking and readjust, if necessary.
7. Press Escape or Enter to exit.

5.5.2 Size

The size adjustment fits the size of the video image to the screen size, within the limits of the **ILA**[®] and CRT. The Size adjustment is universal and color selection is not necessary.

1. Continue with an external video image.
2. Access #1, Size, from the Geometry menu.
3. Use the arrow keys and adjust the size of the video image to the screen horizontally and vertically (*refer to Figure 5-3*).

4. Recheck and readjust, if necessary, Centering, Phase, and Blanking to maintain the entire picture in the center of the screen.

NOTE: Initial Size adjustment should be done to make the picture slightly smaller than the screen size. This makes other geometric adjustments easier. When all other geometric adjustments are complete it may be necessary to slightly readjust Size.

5. Press Escape or Enter to exit.

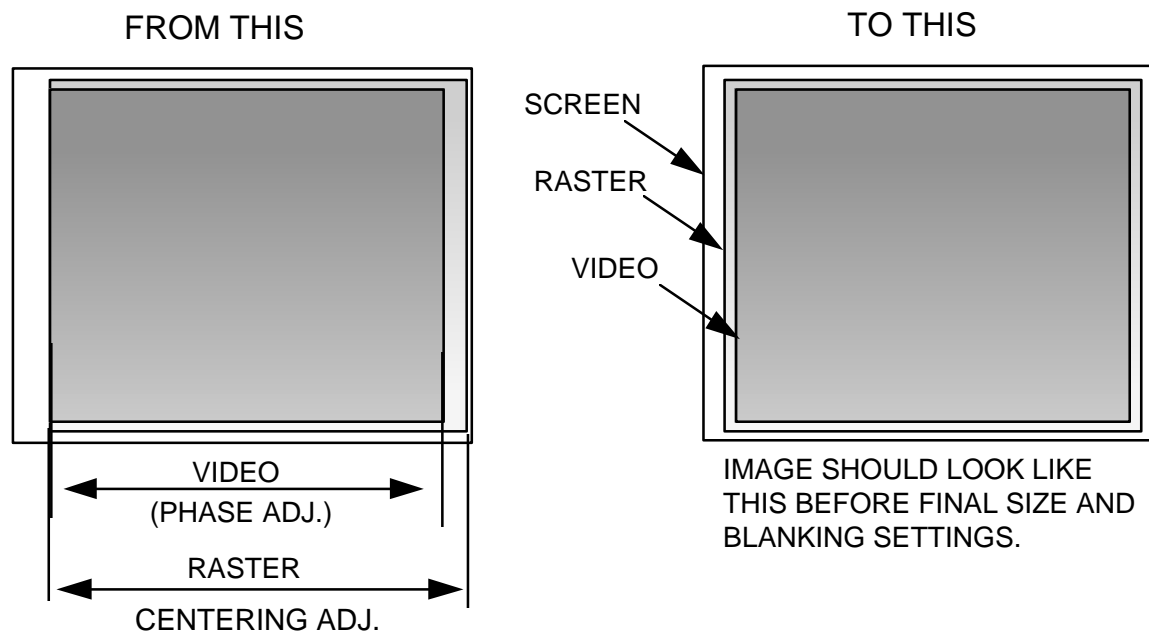


Figure 5-3. Phase, Size and Centering adjustments.

Use the X-hatch test pattern below as a reference for the next twelve projector adjustments (Bow, Pincushion Balance, G-Skew, Keystone Balance, G-Linearity, G-Edge Linearity, Keystone, Pincushion, R/B-Centering, R/B-Linearity, R/B-Edge Linearity, and R/B-Skew). These procedures are all somewhat interactive. Some back and forth repeat adjustments *may* be necessary to obtain the best geometry.

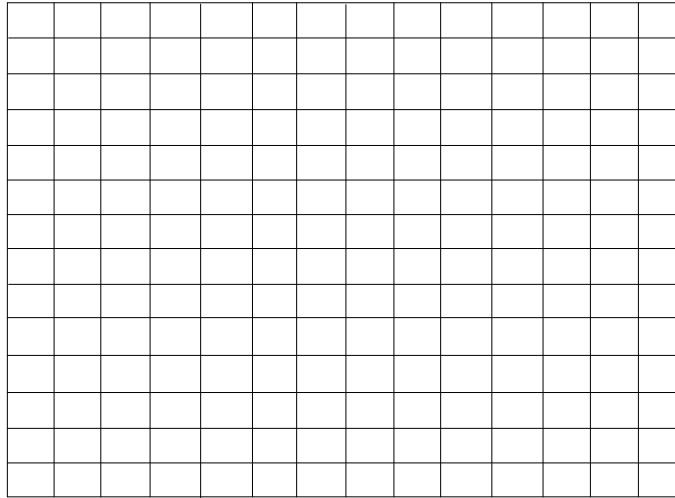


Figure 5-4. Undistorted Test Pattern 5 (X-hatch).

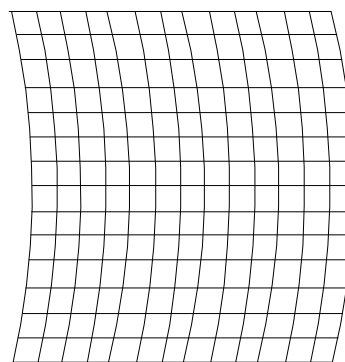
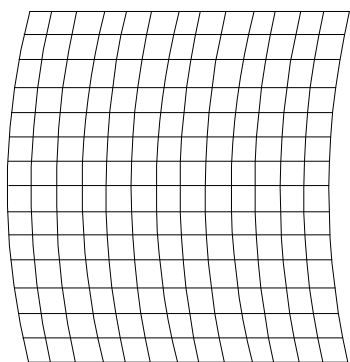
5.5.3 Bow

With bow distortion the picture bends in the same direction on the edges and in the center of the test pattern. This means that the vertical or horizontal centerline is bowed in one direction causing the entire pattern to bend in that same direction (*see Figure 5-5*). The Bow adjustment is universal and color selection is not necessary. **(NOTE:** Prior to making any adjustments, observe the vertical and horizontal centerlines. If the vertical centerline is vertical and the horizontal centerline is level, the Bow adjustment is correct and should not be changed.) Test Pattern 8 (Center/Lin) can also be used for this adjustment. In this test pattern only the horizontal and vertical centerlines are shown. This makes it easier to observe Bow distortion at the centerlines.

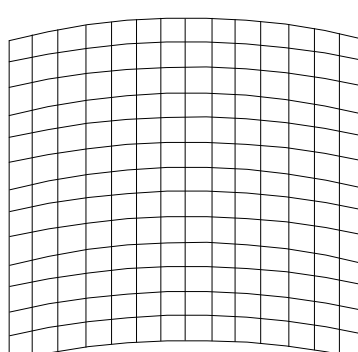
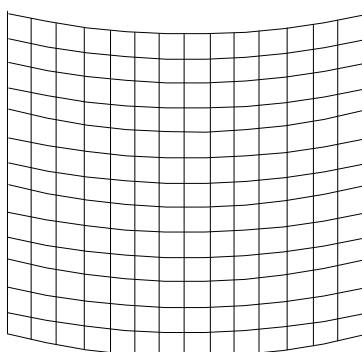
To correct for Bow distortion:

1. Select Test Pattern 5 or 8 from the Test Pattern menu.
2. Access #5, Bow, from the Geometry menu.
3. Use the up/down arrow keys to correct for vertical bow distortion. Adjust to make the center line exactly horizontal (not bending upward or downward).
4. Use the left/right arrow keys to correct for horizontal bow distortion. Adjust to make the center line exactly vertical (not bending to the left or right).

5. Press Escape/Enter to exit.



Horizontal bowing (vertical centerline off) -use left/right arrow keys to correct.



Vertical bowing (horizontal centerline off) -use up/down arrow keys to correct.

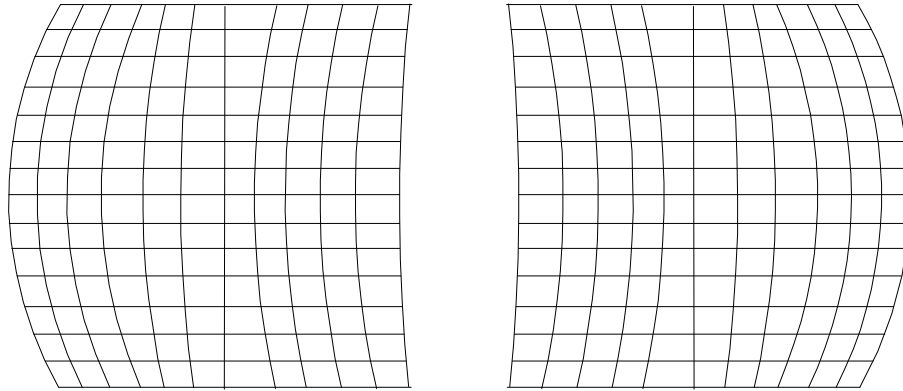
Figure 5-5. Bow distortion.

5.5.4 Pincushion Balance

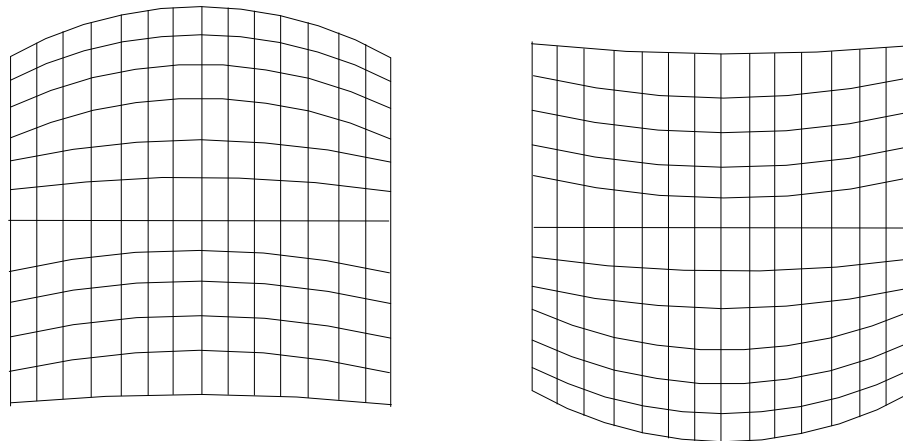
The Pincushion Balance adjustment balances the pincushion error (see *Figure 5-6*) equally on both sides or top and bottom so that the Pincushion adjustment can be accomplished properly later. Although the center lines are straight, too much pincushion distortion on any side prevents the Pincushion adjustment from correcting the error. Balance the error equally so the result looks like one of the pincushion illustrations in *Figure 5-12*. Pincushion Balance is normally within range and should be observed first. Pincushion Balance is universal and color selection is not necessary.

To balance the pincushion distortion:

1. Select the X-hatch test pattern (#5).
2. Access Pincushion Balance from the Timing menu.
3. Use the left/right arrow keys to balance pincushion error on the left and right. Use the up/down arrow keys to balance pincushion error at the top or bottom.
4. Press Escape/Enter to exit.



Horizontal Pincushion imbalance. Use right/left keys to balance error.

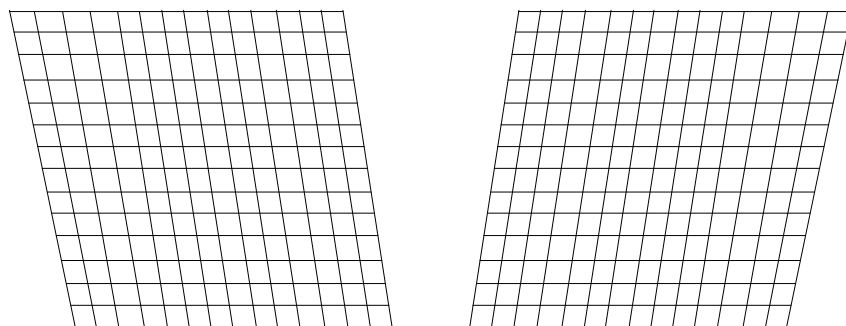


Vertical Pincushion imbalance. Use up/down keys to balance error.

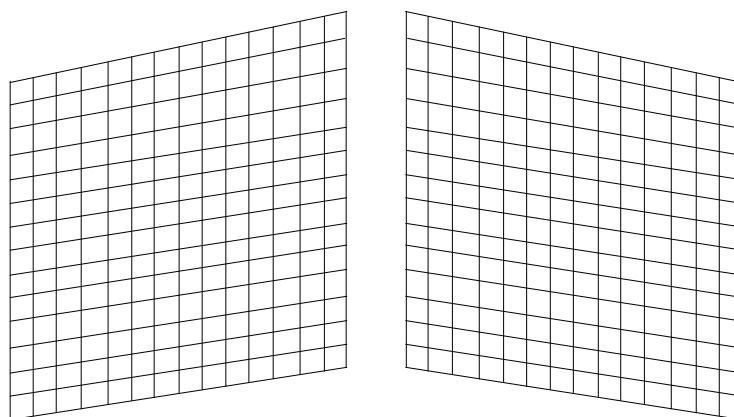
Figure 5-6. Improper pincushion error. Use arrow keys to balance.

5.5.5 Skew (G)

With skew the distortion “leans” like a parallelogram pattern (horizontally or vertically). This means that the vertical or horizontal centerline is skewed in one direction or another causing the entire pattern to lean in the same direction. (*Refer to Figure 5-7.*) Test Pattern 8 can also be used for the Skew adjustment. In T.P. 8 the centerlines only are shown, making it easier to observe Skew. If the vertical centerline is vertical and the horizontal centerline is level, the Skew setting is correct and should not be changed.



Horizontal skew (vertical centerline tilted)-use left/right arrow keys



Vertical skew (horizontal centerline slanted)-use up/down arrow keys

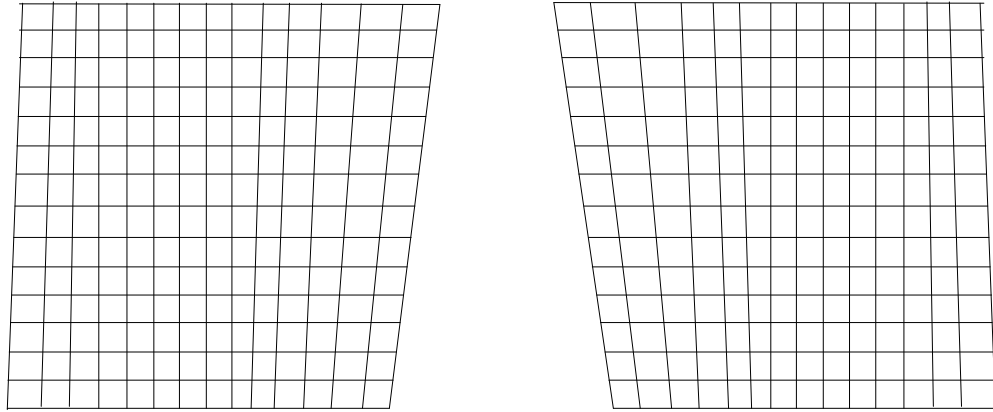
Figure 5-7. Skew distortion.

To correct for Skew:

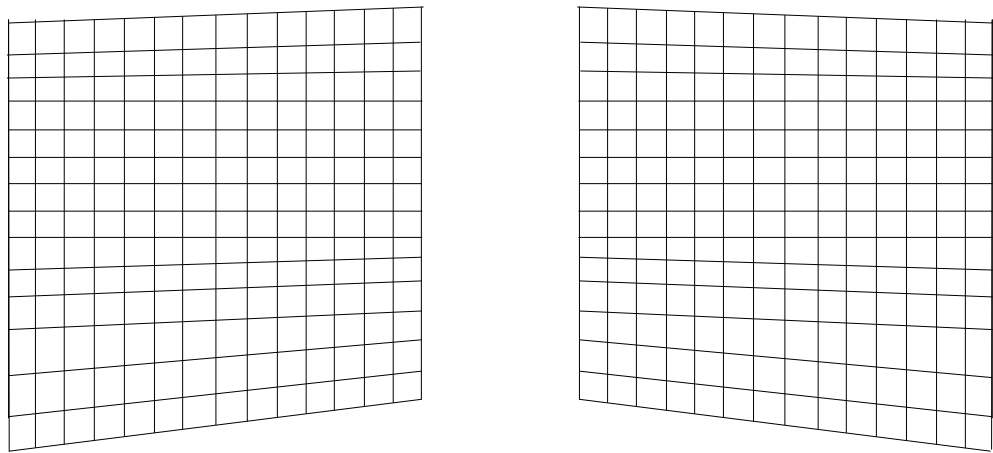
1. Select Test Pattern 5 or 8.
2. Access #6, Skew, from the Geometry menu.
3. Toggle the RGB key to select G only.
4. Use the Hide key and hide R and B.
5. Use the left/right arrow keys to correct for horizontal skew and the up/down arrow keys to correct for vertical skew.
6. Press Escape/Enter to exit.

5.5.6 Keystone Balance

Keystone Balance balances the keystone error equally on both sides or top and bottom so that the Keystone adjustment can be accomplished properly. Too much keystone distortion on one side prevents the Keystone adjustment from correcting the error. (*Refer to Figure 5-8, below, for examples of Keystone imbalance.*) Keystone Balance is normally within range and should be observed first. If adjustment is necessary proceed with the steps below. Color selection is not necessary.



Horizontal keystone imbalance. Use left/right arrow keys to balance error.



Vertical keystone imbalance-use up/down arrow keys to balance error.

Figure 5-8. Improper Keystone Balancing.

To balance the keystone distortion:

1. Continue with the Crosshatch test pattern.
2. Access #7, Keystone Balance, from the Timing menu.
3. Use the left/right arrow keys to balance any keystone distortion on the left and right. Use the up/down arrow keys to balance any keystone distortion at the top or bottom.
4. Press Escape/Enter to exit.

The projector saves adjustment data once every hour. A power failure at this time would result in the loss of data from the above procedures since the last automatic save. It is advisable to save changes after completing every 6-7 procedures. This can be done at any time during the procedures below.

To save the above data:

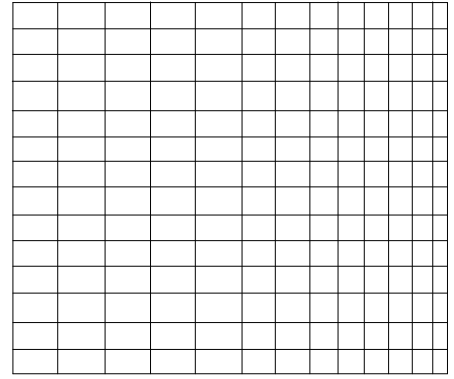
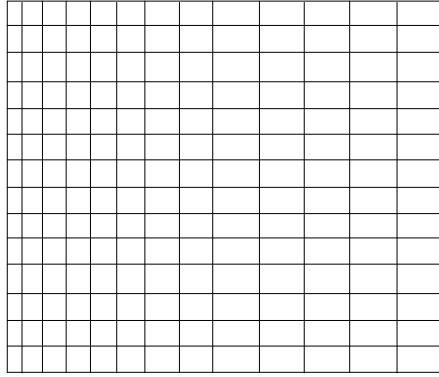
1. Access the Maintenance menu.
2. Use the arrow keys and select #2, Save Changes Now.
3. Press Enter to save the changes.

5.5.7 Linearity (G)

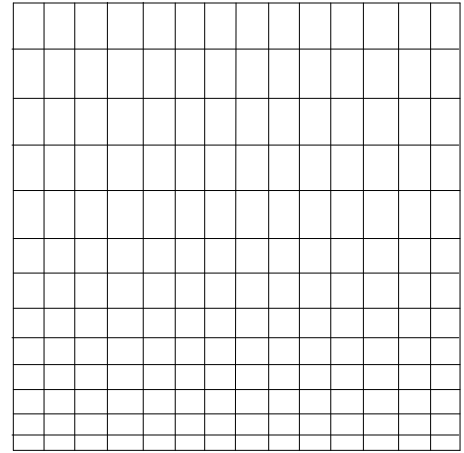
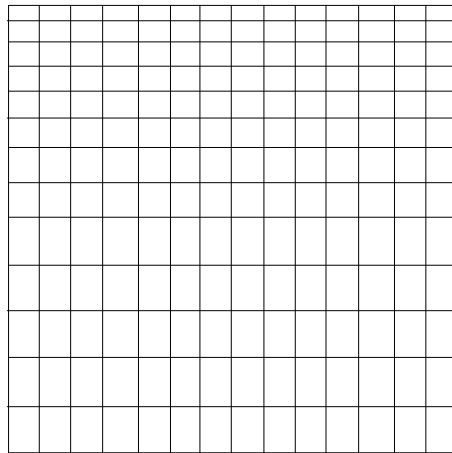
The Linearity adjustment corrects for improper horizontal or vertical grid spacing on an image. With distorted linearity, lines in the grid are spaced closer together on one side and farther apart on the other (see *Figure 5-9*).

To correct for linearity distortion:

1. Access #7, Linearity from the Geometry menu.
2. Toggle the RGB key to select G only.
3. Use the Hide key and hide R and B.
4. Use left/right arrows to correct horizontal linearity distortion and up/down arrows to correct vertical linearity distortion. Make grids the same width on the left/right side and the same height at the top and bottom.
5. Additional linearity correction can be accomplished in the Edge Linearity adjustment.
6. Press Escape/Enter to exit.



Horizontal Linearity Distortion. Use left/right arrow keys to correct.

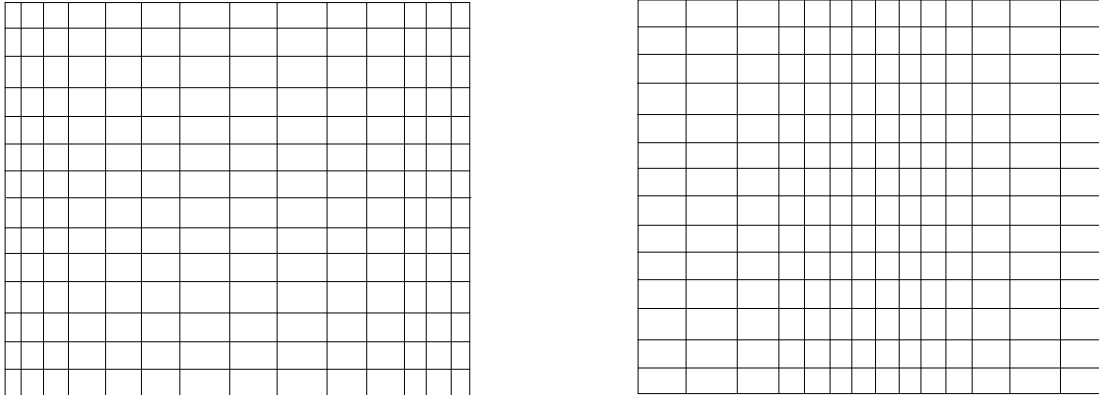


Vertical Linearity Distortion. Use up/down arrow keys to correct.

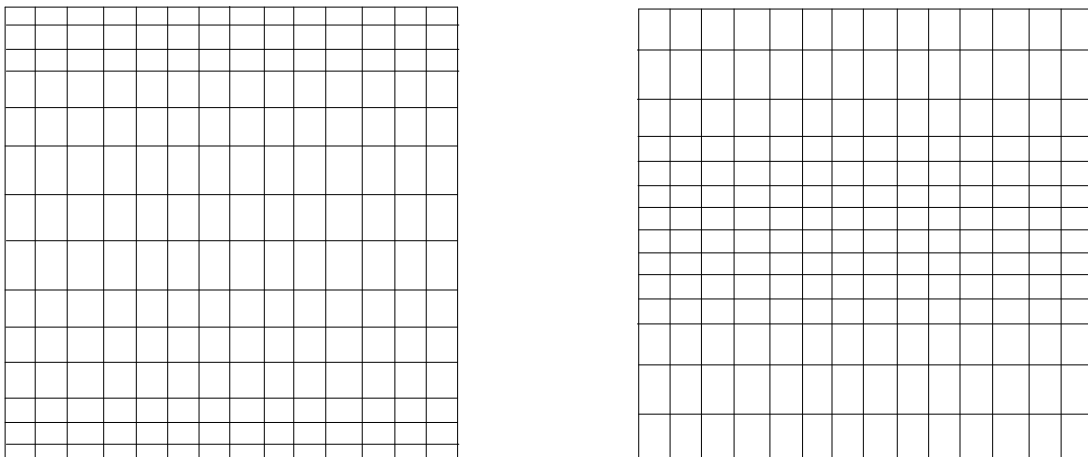
Figure 5-9. Linearity Distortion

5.5.8 Edge Linearity (G)

The Edge Linearity adjustment corrects for improper grid spacing at the left/right edges and top/bottom of the image (see *Figure 5-10*).



Horizontal Edge Linearity Distortion. Use left/right arrow keys to correct.



Vertical Edge Linearity Distortion. Use up/down arrow keys to correct.

Figure 5-10. Edge Linearity distortion.

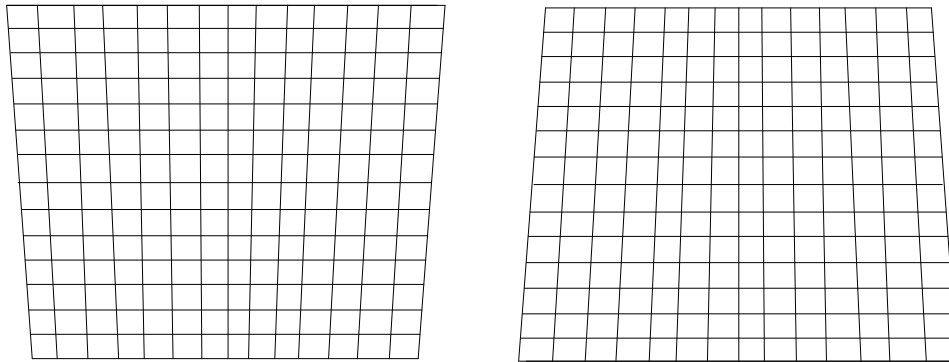
To correct for Edge Linearity distortion:

1. Access #8, Edge Linearity, from the Geometry menu.
2. Continue with G only selected and R and B hidden.
3. Use the left/right or up/down arrow keys to correct for Edge Linearity distortion. Try to make the edge grids the same width as the center grids.
4. Press Escape/Enter to exit.

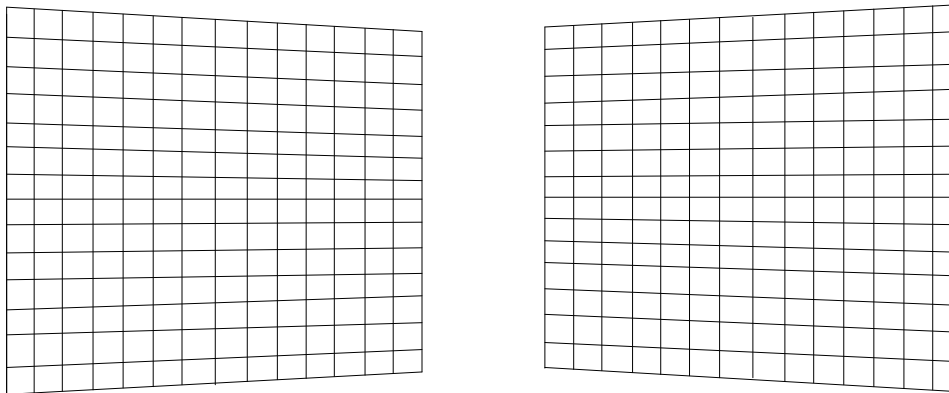
5.5.9 Keystone

The Keystone adjustment corrects the lines nearest to the screen edge to make them parallel to the center line of the test pattern or square to the screen edge as shown in Figure 5-11. The Keystone adjustment is universal and color selection is not necessary.

NOTE: If the keystone distortion is not balanced equally on the left/right or the top/bottom of the image, it may be necessary to perform the Keystone Balance adjustment (see Section 5.5.6) prior to doing the Keystone adjustment.



Horizontal (side to side) Keystone Distortion-Use Left/Right arrow keys



Vertical (top/bottom) Keystone Distortion-Use Up/Down arrow keys

Figure 5-11. Horizontal and Vertical Keystoning

To correct for horizontal and vertical keystone distortion:

1. Access #3 Keystone from the Geometry menu.
2. Use the left/right arrow keys to correct for horizontal keystone distortion. Use the up/down arrow keys to correct for vertical keystone distortion.
3. Press Escape/Enter to exit. **NOTE:** Recheck and readjust (if necessary) Pincushion Balance after correcting Keystone distortion.

5.5.10 Pincushion

The Pincushion adjustment corrects for warped distortion at the sides or top and bottom of the image. The Pincushion adjustment is universal and color selection is not necessary.

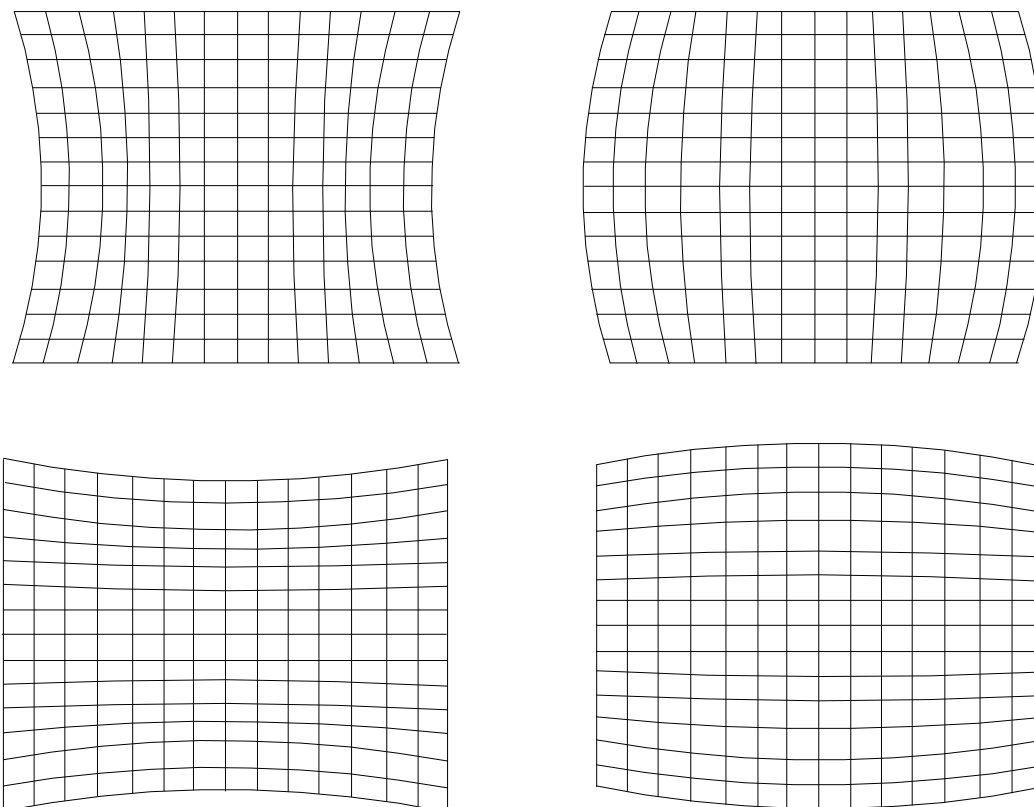


Figure 5-12. Four views of Pincushion Distortion. Use left/right keys for distortion at top and up/down keys for distortion at bottom.

NOTE: If the pincushion error is not balanced on both sides of the test pattern, the Pincushion Balance adjustment (see *Section 5.5.4 below*) must be performed before doing the Pincushion correction.

To correct for pincushion distortion:

1. Access the Pincushion adjustment from the Geometry menu.
2. Use the left/right arrow keys to correct pincushion distortion as shown on the top two patterns in Figure 5-12. Use the top/bottom arrow keys to correct pincushion distortion as shown on the bottom two patterns in Figure 5-12.
3. Press Escape/Enter to exit.

Some of the above Geometry adjustments were performed for Green only (Centering, Linearity, Edge Linearity, and Skew). The next procedures will align Red and Blue to Green for those previous adjustments. If Red and Blue are aligned to Green as closely as possible now, convergence will be much easier to accomplish later on resulting in a better video image.

5.5.11 Centering (Red and Blue)

Red and Blue are now centered horizontally and vertically to match Green as closely as possible.

To center Red and Blue:

1. Use the Hide key to unhide R. Be sure that R and G are both on the screen with B hidden.
2. Access Centering from the Geometry menu.
3. Toggle the RGB key to select R.
4. Use the arrow keys and center Red to overlay the Green as closely as possible. If there is an error between the Red and Green lines, use the arrow keys and adjust Red to split the error difference between the sides or top and bottom. Balancing this error makes it easier to perform convergence later. Strictly matching the center may cause a larger error on one side than the other that will make convergence harder.
5. Toggle the RGB key to select B.
6. Use the Hide key and unhide B-all three colors should now be on the screen. (**NOTE:** This step can also be performed with B and G only on screen.)
7. Use the arrow keys and position the Blue lines to overlay the Green and Red lines.
8. When finished centering Red and Blue to Green, press Escape/Enter to exit the adjustment.

5.5.12 Linearity (R and B)

Red and Blue Linearity are now adjusted to match Green as closely as possible.

To adjust the Red and Blue Linearity:

1. Access Linearity from the Geometry menu.
2. Use the Hide key and hide B. Be sure that R and G are both on the screen with B hidden.
3. Toggle the RGB key to select R.
4. Use the arrow keys and adjust the Red Linearity to match Green as closely as possible. If there is an error between the Red and Green lines, adjust Red to split the error difference between the sides or top and bottom.
5. Toggle the RGB key to select B.
6. Use the Hide key and unhide B-all three colors should now be on the screen. (**NOTE:** This step can also be performed with B and G only on screen.)
7. Use the arrow keys and adjust the Blue Linearity to match the Green and Red lines. Balance any error, as in Step 4.
8. When finished matching the Red and Blue Linearity to Green, press Escape/Enter to exit the adjustment.

5.5.13 Edge Linearity (R and B)

Red and Blue Edge Linearity are now adjusted to match Green as closely as possible.

To adjust the Red and Blue Edge Linearity:

1. Access Edge Linearity from the Geometry menu.
2. Use the Hide key and hide B. Be sure that R and G are both on the screen with B hidden.
3. Toggle the RGB key to select R.
4. Use the arrow keys and adjust the Red Edge Linearity to match Green as closely as possible.
5. Toggle the RGB key to select B.
6. Use the Hide key and unhide B-all three colors should now be on the screen. (**NOTE:** This step can also be performed with B and G only on screen.)
7. Use the arrow keys and adjust the Blue Edge Linearity to match the Green and Red lines.
8. Press Escape/Enter to exit the adjustment.

5.5.14 Skew (R and B)

Adjust Red and Blue Skew to match Green as follows:

1. Access Skew from the Geometry menu.
2. Hide B. Be sure that R and G are both on the screen with B hidden.
3. Toggle the RGB key to select R.
4. Use the arrow keys and adjust the Red Skew to match Green as closely as possible.
5. Toggle the RGB key to select B.
6. Use the Hide key and unhide B-all three colors should now be on the screen. (**NOTE:** This step can also be performed with B and G only on screen.)
7. Adjust the Blue Skew to match Green and Red.
8. Press Escape/Enter to exit the adjustment.

Save the above changes (Select "Save Changes Now" from the Maintenance menu). In the Geometry menu, reset "Reg Enable" back to On (checked box).

5.5.15 Projection Lens Focus (Fine)

Prior to the Timing and Geometry adjustments the projection lens was roughly focused in order to read the menus and perform adjustments. The projection lens should now be focused sharply to perform the Convergence procedures properly.

To obtain a sharp focus of the projection lens:

1. Access #7, System from the Main Menu.
2. Select Test Pattern from the System menu.
3. Select Focus from the Test Pattern menu.
NOTE: This H pattern is the preferred pattern to use for focusing the Projection Lens.
4. Press the right arrow to move over to #2, Projection Lens, and press Enter to select it.
5. A small window displaying Focus and Zoom arrows appears on the screen.
6. Use the right/left arrow keys to achieve a sharp focus at the screen center using the green "spacer balls" to focus on. **NOTE:** "Spacer Balls" can be seen from directly in front of the screen in the bright areas of the image. They are tiny, random, irregularly shaped spots that are visible throughout the image. When these

spots are distinctly defined, the projection lens is in sharp focus.

7. Press Enter to complete this adjustment. **NOTE:** The H pattern should also be in sharp focus. If it is not, the Electronic Focus may be in need of readjustment. This factory-setting does not normally require readjustment. In the event the electronic focus needs to be reset, follow the procedure in Section 5.6.

5.6 Electronic Focus

The Electronic Focus is set at the factory and will not normally require adjustment. It may need touch-up after component replacement, maintenance, or when temperature variations exist between the factory and the field environment or between different projector locations.

The Electronic Focus adjustment focuses the electron beam in the CRT. View one color at a time for these adjustments. Recheck the focus of each color because some interaction between R, G, and B may occur. The adjustments are located on the right side of the projector (see *Figure 5-13*).

To set the Electronic Focus:

1. From the Test Pattern menu select Focus.
2. Use the RGB key and toggle to any one color.
3. Use the Hide key and hide the other two colors.
4. Adjust the Electronic Focus (see *Figure 5-13*) for a sharp focus of the H pattern at the center of the screen.
5. Repeat the above steps for the other two colors.

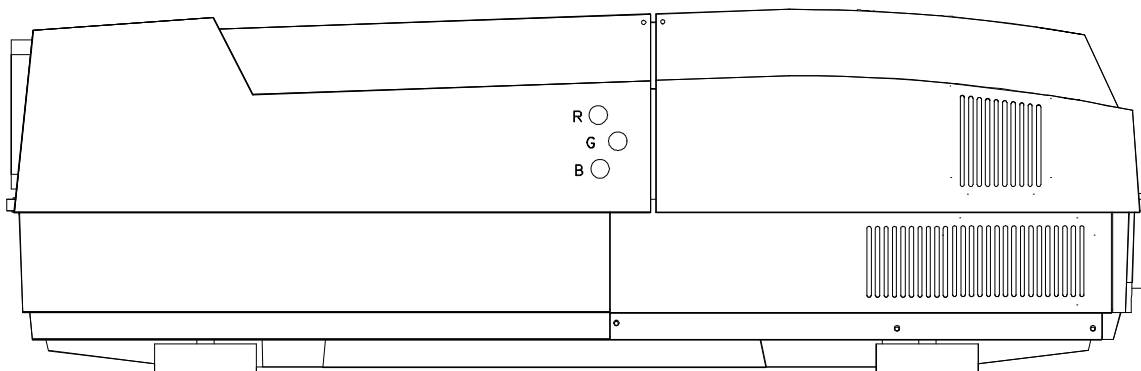


Figure 5-13. Electronic Focus adjustment screws.

5.7 ILA[®] Sensitivity and Bias

The ILA[®] Sensitivity and Bias is factory-set and will not normally require adjustment. Occasionally readjustments may be required due to variations between the factory and the field environments.

The ILA[®] Sensitivity and Bias may be adjusted for any color. It is not necessary to adjust all the colors unless there is a need to. The ILA[®] Sensitivity is the frequency of the ILA[®] biasing and affects the resolution and brightness on the screen. The ILA[®] bias settings adjust the electrical bias levels to each ILA[®] assembly to a “just off” threshold point so that even the smallest incoming light from the CRT makes the ILA[®] assembly react. When properly set, this adjustment will put each ILA[®] assembly at the threshold of operation. If not properly set, image black level will be adversely affected and the ILA[®] assembly won’t react properly to incoming light. To be performed correctly, the ILA[®] Bias adjustments should be done in a darkened room.

To set the ILA[®] Sensitivity:

1. Toggle the RGB key to highlight the color to be adjusted. Use the Hide key and hide the other two colors.
2. Access ILA[®] Sensitivity Adjust from the Maintenance menu.
3. Use the right/left arrow keys to select an ILA[®] Sensitivity of 11 as indicated in the screen window . This is the default setting and should be acceptable for general viewing. A higher setting may be preferred for HDTV and will provide better resolution with less image lag. A lower setting will result in higher brightness but greater image lag and less resolution. The ILA[®] Sensitivity setting depends on the type of viewing the projector is used for. Some trial and error may be needed to get the exact setting for each situation.
4. Press Escape when the setting is complete.

To set the ILA[®] Bias:

1. Continue with the same color from the ILA[®] Sensitivity adjustment and with the other two colors hidden.
2. Access ILA[®] Bias Adjust from the Maintenance menu.
3. Use the right/left arrow keys to decrease the ILA[®] Bias to the point where the brightest area of the ILA[®] image just extinguishes and any further adjustment does not make the screen any darker. Then increase the bias

level until the **ILA**[®] image just begins to appear on the screen.

NOTE: It is crucial for the optimum operation of the projector to set the bias level to the point where the selected color *just begins* to appear on the screen. Find the spot on the screen where the selected color first begins to get brighter and use that as the reference point. Adjust the bias level above and below this point to find the setting where one click causes an increase in brightness and stop at that point. This insures that the weakest video signal will cause the **ILA**[®] assembly to respond.

Repeat the above ILA[®] Sensitivity and ILA[®] Bias procedures for the remaining two colors.

Save the changes.

5.8 Convergence

Convergence (XY Registration) overlays the CRT beams onto each other. XY Registration procedures are required to align the Red, Blue, and Green CRT beams together on the screen.

5.8.1 XY Registration

NOTE: For a better understanding of what is being accomplished, please take the time to read the entire XY Registration section prior to making any adjustments.

Purpose of Convergence: The XY Convergence adjustments are used to converge or overlay the Red, Green and Blue CRT images over the entire screen area. The Model 200 handles many different video sources and convergence is tied directly to a video source. One channel can contain up to 20 different video sources (source files) with different formats. Each of these video sources must have its own set of convergence data.

Cursor Shapes and Sizes: The convergence adjustments are performed using three different cursor modes; the Move mode which is used to move around the screen, the Size mode which is used to increase or decrease the cursor size, and the Adjust mode which is used to make the actual convergence adjustments. Examples of each of these modes is shown in Figure 5-16 below.

There are many different cursor sizes available depending on how large and what shape an area is that needs adjusting. In most cases it is not necessary to use any smaller cursors than what is shown in Figures 5-14 and 5-15. Some areas may be satisfactory and will not

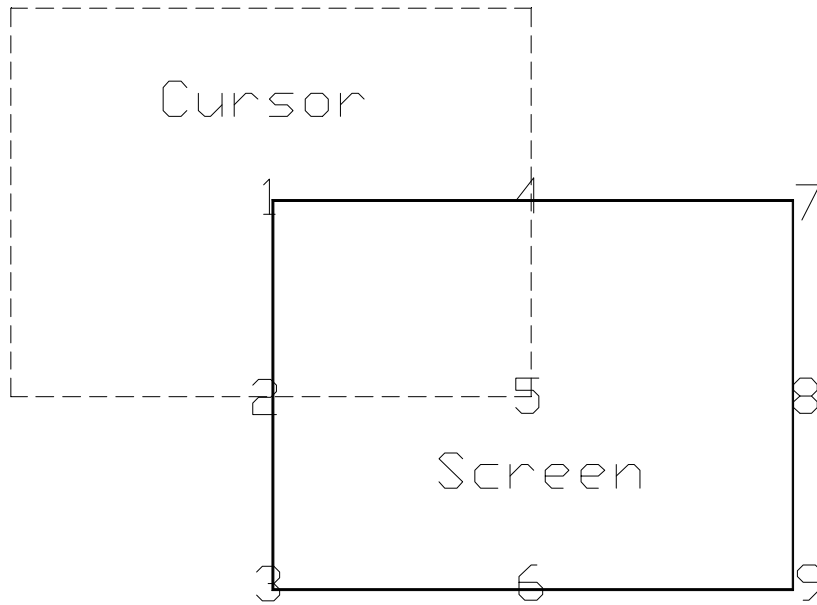
need converging. Use whatever size and shape cursor required to converge any area of the screen.

Bear in mind that the greatest convergence corrections are made at the center of the cursor. Don't try to make corrections at the edges of the cursor. Always move the center of the cursor over the area that needs correction.

It may be necessary to use an odd shaped cursor to converge some portion of the screen. An area where a long thin area appears out of convergence may be corrected easier and quicker with a long, thin cursor shaped like the area. A cursor with a long center line is affected equally all along its center line by the adjustments.

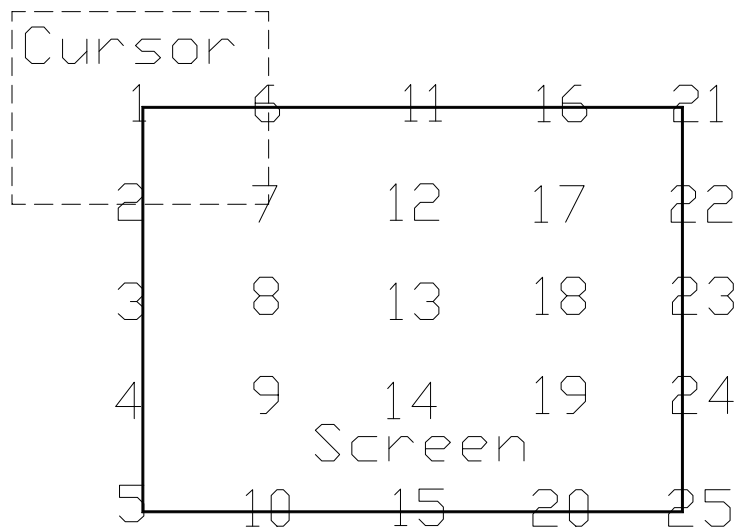
Convergence profiled: When a complete screen convergence is necessary, begin with a full screen cursor. Start with the *center* of the cursor at the upper left corner (the cursor is off the screen at the top and left as shown in Figure 5-14). Make corrections, then move the *center* of the cursor to the numbered areas in Figure 5-14 in the sequence shown. Next, size down to a $\frac{1}{4}$ screen cursor size. Move down and across the screen in the sequence shown in Figure 5-15. When complete, if there are still some small areas that need convergence, size down to a cursor that encloses about nine of the rectangles. Proceed in the same general pattern as with the previous cursors.

Prior to beginning the adjustments, experiment with the different cursors by accessing Registration from the Convergence menu. Press Mode to change the type of cursor. When the Size mode cursor is displayed, try using the arrow keys to observe the various cursor sizes. In the Move mode, use the arrow keys to move the cursor around the screen. **CAUTION! If the Adjust mode cursor is displayed (refer to Figure 5-16), pressing the arrow keys will change the convergence settings. Be careful to experiment with the arrow keys only when in the Move or Size modes, not while in the Adjust mode.**



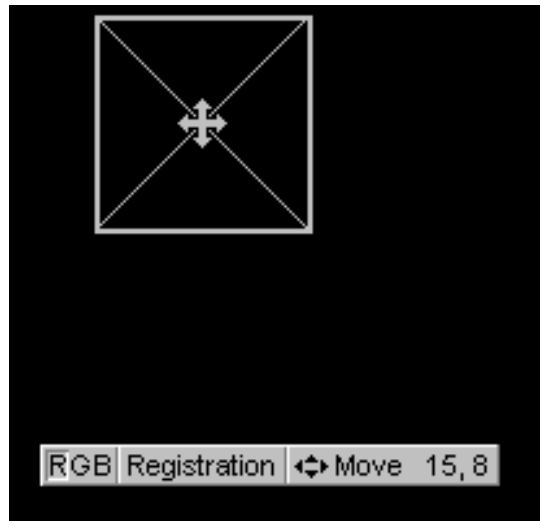
Start with the full screen cursor center at point 1 and make corrections. Then move center of cursor down to point 2 and make corrections. Continue placing center of cursor to points numbered over entire screen (top line of the current cursor should be at the same point as the bottom line of the previous cursor). When as much as possible has been done with the full screen cursor, change to the ¼ screen cursor in Figure 5-15.

Figure 5-14. Full screen cursor center at upper left (point 1).

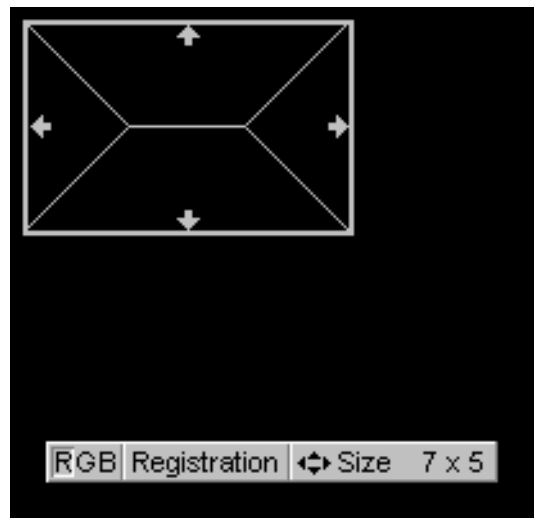


Start converging with the ¼ screen cursor at the upper left corner. Then move the center of the cursor through the points in the sequence shown in the same manner and adjust in the same manner as the full screen cursor.

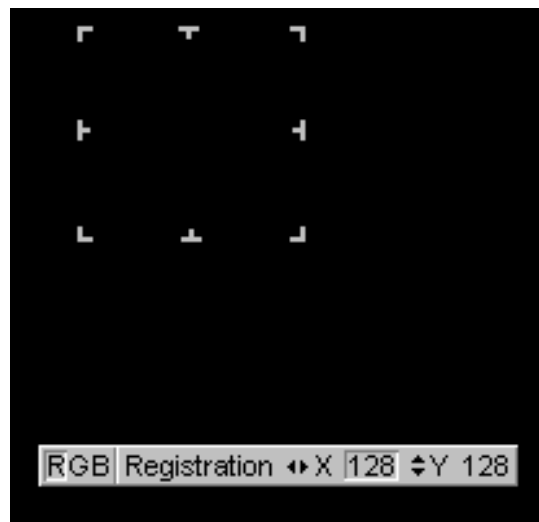
Figure 5-15. The ¼ screen cursor at starting point 1.



Move mode with arrow pattern in center. Use up/down and right/left keys to move cursor to area of screen that needs convergence. When cursor is in area desired, press Mode to change cursor to Size mode below.



Size mode with arrows at edges. Use left/right and up/down arrow keys to adjust cursor to size needed.



Adjust mode. Area to be adjusted is enclosed in a rectangular border. Areas outside the rectangle are not affected. Area most affected is center of rectangle. Do not try to make large adjustments at edges of rectangle. Move cursor so center is over area to be corrected.

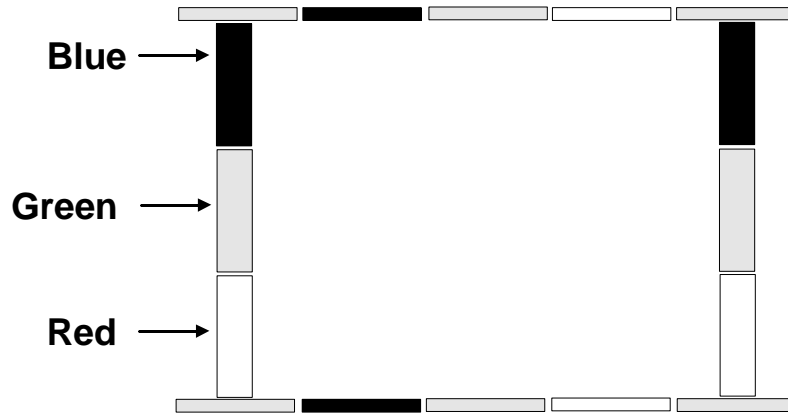
Figure 5-16. The three modes of Cursors.

To adjust XY Registration:

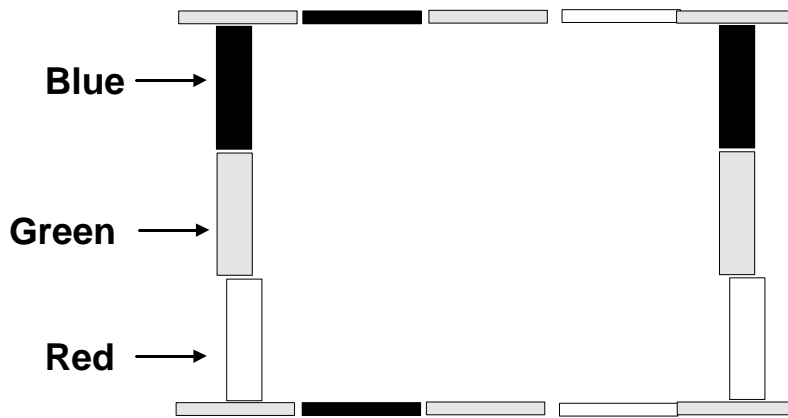
1. Access the Geometry menu.
2. Verify that the Reg Enable box is checked. This toggle is normally On and is toggled to Off only when necessary for maintenance.
3. Use the RGB toggle and the Hide key and hide Red and Blue.

NOTE: If there is any question about the Green geometry, now is the time to recheck it. Use the Standard Crosshatch test pattern and verify that it is satisfactory. If the Green geometry is not satisfactory, make whatever touch-up corrections that are necessary because Green is the reference to which Red and Blue will be converged. If necessary, repeat any of the Timing and Geometry adjustments from Sections 5.4 and 5.5.

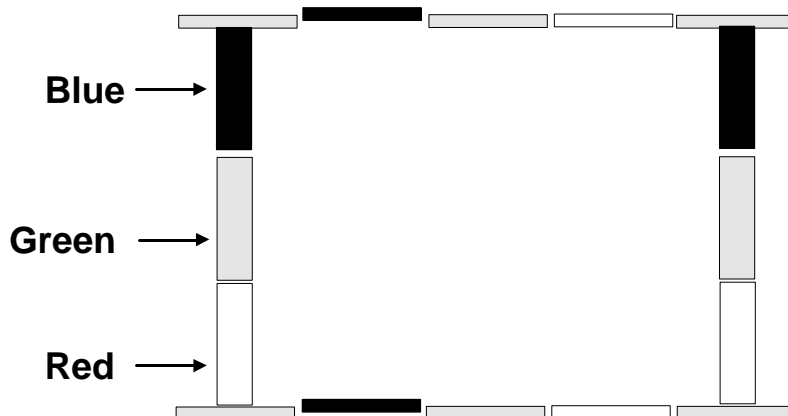
4. If Green geometry looks good, unhide Red and Blue.
5. Access the Test Pattern menu and select RGB X-hatch. This test pattern is a series of Red, Green, and Blue bars that form small rectangles on the screen. Figure 5-17 below shows what one of these rectangles looks like in three different situations. In this black and white illustration, Red is shown as white, Green as shaded, and Blue as black.



Correctly converged RGB pattern.



Red not correctly converged in horizontal direction. Use right/left arrows.



Blue not correctly converged in vertical direction. Use up/down arrows.

Figure 5-17. Examples of correct and incorrect convergence.

6. Access the Convergence menu and select #1, Registration. The convergence screen displays one of the cursor modes shown in Figure 5-16 (the mode displayed will be the last cursor mode used).
7. The first mode to be used is the Size mode. If the Move mode displays, press Mode to toggle to the Size mode. If the Adjust mode displays, press Enter to toggle to the Move/Size mode then, if necessary, press Mode to toggle to the Size mode.
8. Use the Size mode and increase the cursor size to a full screen cursor. **NOTE:** It may be necessary to move the cursor to the center of the screen to be able to view a full screen cursor. If this is the case, toggle the Mode key to the Move cursor and use the arrow keys to place the cursor at the center of the screen, then toggle the Mode key to return to the Size mode and continue to size the cursor to a full screen.
9. With the cursor at full screen, toggle the Mode key to the Move mode.
10. Use the arrow keys and move the center of the cursor to the upper left position as shown in Figure 5-14.
11. Using the illustrations in Figure 5-17, note if the area needs horizontal or vertical convergence.
12. If the area is in need of convergence, press Enter to go into the Adjustment mode.

NOTE: XY convergence can be performed with all 3 colors on the screen or with Red or Blue hidden and converging one color at a time to Green. This is a matter of operator choice and either method can be used. Be sure to verify convergence over the entire screen area with all three colors showing.

13. Toggle the RGB key to the color that needs to be converged.
14. While observing the test pattern, use the up/down arrow keys to converge vertically and the left/right arrow keys to converge horizontally (*refer to Figure 5-17*). Bear in mind that the area most affected is at the center of the cursor. Don't try to make corrections near the edges of the cursor. Instead, move the cursor center over the area where corrections are needed.
15. When the upper left corner is converged satisfactorily, press Enter to return to the Move/Size mode. Toggle the Mode key to the Move mode. Refer to Figure 5-14 and center the cursor over each of the positions shown, sequentially, wherever convergence is required.

16. Repeat Step 15 for each area that needs convergence.
17. Move through the screen in the sequence shown in Figure 5-14 repeating the Move/Size/Adjustment steps.
18. When everything possible has been accomplished with the full screen cursor, press Enter and toggle the Mode key to the Size mode.
19. Use the arrow keys to size down to a cursor of approximately $\frac{1}{4}$ screen size.
20. Select the areas to be converged and converge the entire screen in the sequence shown in Figure 5-15. Start at the upper left corner and continue in the same manner as performed with the full screen cursor.

When finished XY Registration, save the changes.

5.9 Black Level (G2) and Sensitivity Offset

G2 sets the threshold of the CRT image and is adjusted using the Grey/Pluge test pattern along with the Sensitivity Offset. Together, these adjustments determine the level of the darkest and brightest areas of the video image. These adjustments are performed one color at a time. They should be performed in the order shown. The two adjustments below are performed for Blue. When the Blue settings are complete, the same adjustments are then performed for Green and Red.

NOTE: The G2 adjustment is preset at the factory and may need very little or no adjustment.

5.9.1 Black Level (G2)

To set the Black Level for Blue:

1. Use the RGB and Hide keys to hide R and G.
2. Toggle the RGB key to select B only.
3. Access the Convergence menu and select Reset (read the Caution below first).

CAUTION! Be very sure that only the color that is to be adjusted is highlighted. Otherwise all colors will be reset and good data from a previous setup will be deleted.

4. From the selection window shown, use the arrow keys, highlight Sensitivity, and press Enter. This resets the Blue Sensitivity level to 128.
5. Use the arrow keys and highlight Threshold and press Enter. This resets the Threshold level to 128.

6. Access the Grey/Pluge test pattern.
7. Access #4, Black Level, from the Convergence menu.
8. Use the up/down arrow keys and adjust the black level to a point where the small, black square in the center of the larger black square is *just barely visible* (refer to Figure 5-18). Press Enter when finished.

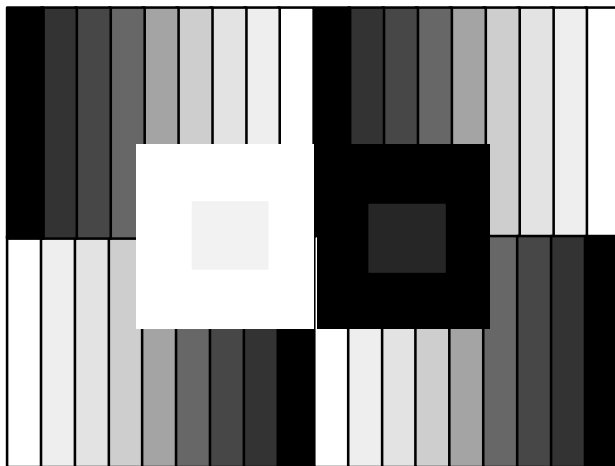


Figure 5-18. Grey/Pluge Test Pattern

5.9.2 Sensitivity Offset

To adjust the Sensitivity Offset for Blue:

1. With Blue still the only color on the screen and the Grey/Pluge test pattern selected, access Sensitivity from the Convergence menu.
2. A screen appears with a Sensitivity window and cursor displayed. The window shows that Red and Green are hidden (greyed out) and Blue is the active color to be adjusted (if this is not the case, repeat Steps 1 and 2 from the G2 procedure above).
3. The window also shows the Sensitivity adjustment with the right/left arrow keys to adjust Sensitivity and the up/down arrow keys to adjust the Sensitivity Offset. Data numbers are also displayed. **NOTE:** The Sensitivity Offset sets the brightest level for the overall screen image, whereas the Sensitivity adjustment balances the uniformity in specific areas of the image. The Sensitivity adjustment is performed in the Sensitivity Uniformity section below.
4. Use the up/down arrow keys to adjust the Sensitivity Offset to a point where the small, white square is just

barely visible inside the larger white square in the test pattern (see Figure 5-18).

5. Press Enter when finished.

Repeat Sections 5.9.1 and 5.9.2 for Green and Red.

5.10 Uniformity (Shading)

The Uniformity adjustments correct for inconsistencies and brightness differences in the CRTs and ILA[®] assemblies in specific areas of the video image.

5.10.1 Sensitivity Uniformity

Sensitivity sets the brightness at high (white) video levels and is used to achieve a flat, uniform brightness in the white areas. This adjustment is performed one color at a time.

To adjust the Sensitivity for Blue:

1. Darken the room as much as possible.
2. Use the RGB and Hide keys to hide R and G.
3. Toggle the RGB key to select B only.
4. Access Variable Flat from the Test Pattern menu.
5. Use the right/left arrow keys and select a Flat Field level of about 160.
6. Access the Convergence menu and select #3, Sensitivity Uniformity. The Sensitivity cursor and a window appear on the screen showing the current data value of the Sensitivity level for the entire screen. This will be the reset value of 128 plus or minus the amount of Offset from the Sensitivity Offset adjustment above.
7. Prior to making any adjustments, first observe the center of the Flat Field screen. This is the brightest area and should be used as a reference for the rest of the screen areas to match. Be careful not to overlap this reference area with the cursor while making adjustments or the reference brightness level could change.
8. Use the Size cursor (press Mode to toggle to the Size cursor, if necessary) and select a cursor size of 12 X 12 as shown in the Cursor Size window.
9. Toggle the Mode key to the Move Cursor and move the cursor to an area of the screen that is not as bright as the reference area observed in Step 9.
10. Press Enter to display the Adjustment Cursor.

11. Use the right/left arrow keys to bring the darker areas of the screen up to match the reference area. **Do not** try to make adjustments at the edges of the cursor. Move the center of the cursor over the area that needs to be adjusted.
12. After achieving the best possible uniformity over the entire screen, repeat Steps 9-11 for a cursor size of 8 X 8.
13. When Step 12 is complete, select a cursor size of 4 X4 and repeat Steps 9-11 again for this cursor. There is ordinarily no need to go to any smaller size cursor than the 4 X 4. This is a judgment call and if there are small areas that look as if they could be improved, reduce the cursor size and adjust these areas.
14. Press Enter to complete this adjustment.

5.10.2 Threshold Uniformity

Threshold sets the brightness at low (black) video levels and is used to achieve a flat, uniform brightness in the black areas. This adjustment is performed one color at a time.

To adjust the Threshold for Blue:

1. Darken the room as much as possible.
2. Use the RGB and Hide keys to hide R and G.
3. Toggle the RGB key to select B only.
4. Access Variable Flat from the Test Pattern menu.
5. Use the right/left arrow keys and select a Flat Field level of about 50.
6. Access the Convergence menu and select #2, Threshold Uniformity. The Threshold cursor and window appear on the screen showing the reset value of 128.
7. The same reference area that was identified in Step 7 of Section 5.10.1, above, is used as the reference area for the Threshold Uniformity adjustment. Be careful not to overlap this reference area with the cursor while making adjustments or the reference brightness level could change.
8. Select a cursor size of 12 X 12 (as shown in the Cursor Size window).
9. Use the Move Cursor and move the cursor to an area of the screen that is darker than the reference area observed in Step 7.

10. Press Enter to display the Adjustment Cursor.
11. Use the right/left arrow keys to bring the darker areas of the screen up to match the reference area. Bear in mind that the area most affected is at the *center* of the cursor. **Do not** try to make adjustments at the edges of the cursor. Move the center of the cursor over the area that needs to be adjusted.
12. After achieving the best possible uniformity over the entire screen, repeat Steps 9-11 for a cursor size of 8 X 8.
13. When Step 12 is complete, select a cursor size of 4 X4 and repeat Steps 10-13 again for this cursor size. There is ordinarily no need to go to any smaller size cursor than the 4 X 4. This is strictly a matter of judgment. If there are small areas that look as if they could be improved, reduce the cursor size and adjust those areas.
14. Press Enter to complete this adjustment.

Recheck and readjust, if necessary, Sensitivity and Threshold back and forth for good uniformity for Blue. Then repeat Sections 5.10.1 and 5.10.2 for Green and Red. Be sure to have only one color at a time selected when resetting to avoid losing valid data from a previously adjusted color.

Save the above changes.

5.10.3 Color Balance (Grey Scale)

Color balancing may be necessary after the Threshold and Sensitivity procedures are complete. This adjustment sets the color balance over the entire screen. The Grey/Pluge test pattern should be "Grey" throughout the entire screen area with a normal, gradual brightness transition from bar to bar and no perceived coloration. If this is not the case, color balancing is necessary. For a better understanding, read through the entire Color Balance section prior to making adjustments.

Threshold and Sensitivity "Offsets" can be made for the entire screen to achieve proper Color Balance for the bright and dark areas.

To check for proper Color Balance:

1. Access Grey/Pluge from the Test Pattern menu.
2. Toggle the RGB key and make sure all colors are selected and on screen.

3. Observe the two or three **darkest** bars in each of the four sections of the test pattern. If any color is too prominent in these two or three bars, adjust the Threshold Offset for that color as shown below.
4. Observe the two or three **brightest** bars in each of the four sections of the test pattern (see Figure 5-18). If any color is too prominent in these two or three bars, adjust the Sensitivity Offset for that color as shown below.

NOTE: A color may also be not prominent enough, shown by the other two colors being dominant. In this case the deficient color may need its Sensitivity Offset increased slightly.

To adjust the Sensitivity Offset for the best Color Balance:

1. Toggle the RGB key and select the color that is too prominent in the brightest bars .
2. Access Sensitivity from the Convergence menu. The Sensitivity window appears on the screen. The adjustment will be highlighted at whichever adjustment (Sensitivity or Offset) was performed last.
3. Use the up/down arrow keys to increase or decrease the Sensitivity Offset slightly so that the brightest bars in the test pattern are without color, i.e. grey (**NOTE:** Make a note of the Offset data number setting before making any adjustments. This allows for a resetting back to the same point in the event a mistake is made in the selection of the color to adjust). Recheck the test pattern for a normal, gradual transition from bar to bar. If increasing the Offset, be careful not to saturate any of the colors-there should always be a normal, gradual brightness transition between the two brightest bars.
4. Recheck and readjust, if necessary, the Threshold Color Balance.

To adjust the Threshold Offset for the best color balance:

1. Toggle the RGB key and select the color that is too prominent in the dark bars .
2. Access Threshold from the Convergence menu. The Threshold window appears on the screen. The adjustment will be highlighted at whichever adjustment (Threshold or Offset) was performed last.
3. Use the up/down arrow keys to increase or decrease the Threshold Offset slightly so that the darkest bars in the test pattern are without color, i.e. grey (**NOTE:** Make a note of the Offset data number setting before

making any adjustments. This allows for a resetting back to the same point in the event a mistake is made in the selection of the color to adjust). Recheck the test pattern for a normal, gradual transition from bar to bar. Do not overadjust any of the colors-there should always be a normal, gradual brightness transition between the two darkest bars.

4. Recheck and readjust, if necessary, the Sensitivity Color Balance.

NOTE: If the Threshold Offset for one of the colors is at the end of its limit and will not adjust down to a lower level, bring the other two colors up to match instead.

5.11 Picture Settings

All Picture Settings have an effect on image quality. Brightness and Contrast can be adjusted for any type of video source. Color Tint, and Sharpness are only active with Composite or S-Video inputs. **Do not** adjust these settings until Color Balancing is complete.

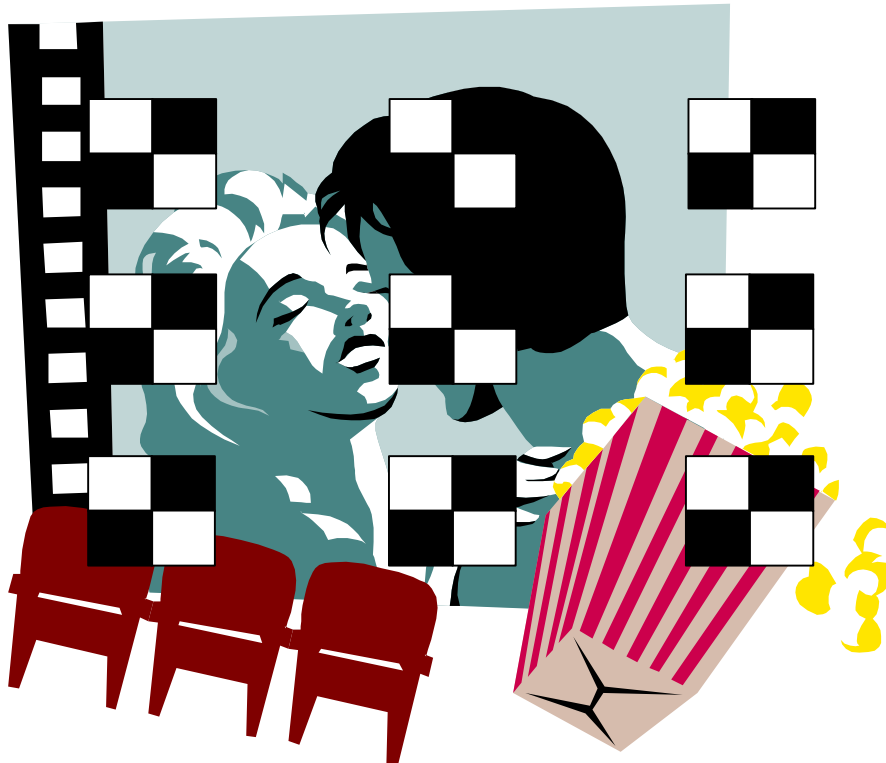


Figure 5-19. Cont/Bright Test Pattern . The nine black and white squares overlay the video image on the screen.

5.11.1 Brightness

To adjust Brightness:

1. Ensure that an external video image is displayed.
2. Access the Cont/Bright test pattern from the Test Pattern menu.
3. Access Brightness from the Picture menu.
4. Use the right/left arrow keys to increase or decrease the Brightness setting to a point where the blackest part of the video image is equal to the black squares in Figure 5-19.
5. Press Escape to leave the Brightness adjustment.

5.11.2 Contrast

To adjust Contrast:

1. Continue with the external video image and the Cont/Bright test Pattern from above.
2. Access Contrast from the Picture menu.
3. Use the right/left arrow keys to increase or decrease the Contrast setting to a point where the whitest part of the video image is equal to the white squares in Figure 5-19. **NOTE:** Contrast can be adjusted for individual colors as well as all colors combined. To adjust only one color, toggle the RGB key to the color desired, hide the other two colors, and use the left/right arrow keys to adjust. Access Test Pattern 1 (Off) to remove the Cont/Bright overlay pattern.

5.11.3 Color, Tint, Sharpness

The Color, Tint, and Sharpness settings are only active with Composite (NTSC) or S-Video inputs. Continue with an external video image.

To adjust Tint:

1. Access Tint from the Picture menu.
2. Use the right/left arrow keys to set the desired Tint level.

To adjust Color:

1. Access Color from the Picture menu.
2. Use the right/left arrow keys to set the desired Color level.

To adjust Sharpness:

1. Access Sharpness from the Picture menu.
2. Use the right/left arrow keys to set the desired level.

5.11.4 Black/White Enhance

The Black and White Enhance (default=Off) is a toggle to enhance the black and/or white detail. After completing the other Picture Settings above, access the Picture menu and select Black or White Enhance. Press Enter to toggle Black or White Enhance On and Off. Observe the black and white areas of the video image and select the settings that provide the best detail in those areas.

5.11.5 VIC Settings

Access VIC Settings from the Picture menu. This brings up a submenu that allows the operator to select specific VIC option settings when setting up new channel. If the projector uses only one VIC, press Escape. If the projector has more than one VIC option, use the arrow keys and highlight the VIC desired and press Enter to select it. Follow the submenu to select the proper decoder, if applicable.

VNR (Video Noise Reduction) is also selectable in a submenu. This option reduces noise in the image but also reduces detail somewhat. This is because, with VNR on, the video bandwidth is narrowed. Use a trial and error method to determine if this VNR option enhances the image or not.

5.12 Backing up Settings

The above source parameters (and all other sources attached to one channel) can be copied to another channel. This is sometimes done when sources have the same basic parameters but differ in some picture settings. One channel can be set up for a source with picture settings proper for that source video, then copied to another channel. Then, change to the second channel (the “copied to” channel) and adjust the picture settings for the type of video that will be received on that channel. Two channels are now set up for the same type of video source but with different picture settings. This saves the time of readjusting picture settings every time the operator switches between these channels and also backs up the settings from the original channel.

To copy settings from one channel to another channel:

1. Access the Channels menu and highlight (press the number or scroll with arrow keys) the channel that is to be copied.
2. Press Mode on the remote.

3. Select Copy from the sub-menu. This copies the channels' name, VIC path, and all attached sources into a Paste Buffer.
4. A dialog box will ask what channel you want the channel data copied to. Press that channel number (see Caution below).

CAUTION!!! Be sure that the channel copied to is blank or does not contain any source data information that is needed. Copying a channel deletes all of the sources and their setup data from the "copied to" channel.

VORSICHT!!! Der für den Kopiervorgang vorgesehene Zielkanal muß leer sein bzw. darf keine Quelldaten enthalten, die noch benötigt werden. Beim Kopieren eines Kanals werden im Zielkanal alle Quellen mit ihren Einstellungsdaten gelöscht.

PRUDENCE !!! S'assurer que le canal sur lequel la copie est faite est vide ou ne contient pas de données de la source nécessaires. Copier sur un canal efface toutes les données et les paramètres du canal sur lequel la copie est faite.

5. If all of the sources that were copied over from the first channel are not needed in the second channel, they can be detached from the second channel. Select the unwanted sources with the arrow keys and unhighlight them by pressing Enter. This detaches them from the channel.
6. These "copied" sources can be adjusted to match any incoming source for the new channel without affecting the original source from the first channel.

HINT: For convenience, store a list of all available sources in one specific channel. This can be used as a source "master" list. For example, have all available sources attached to Channel 99. Use this as a master list from which any source can be attached at any time. Having all available sources in 1 "master" channel avoids having to remember where any specific source is located and the time involved in hunting through various channels to find a particular source.

