

SECTION 4

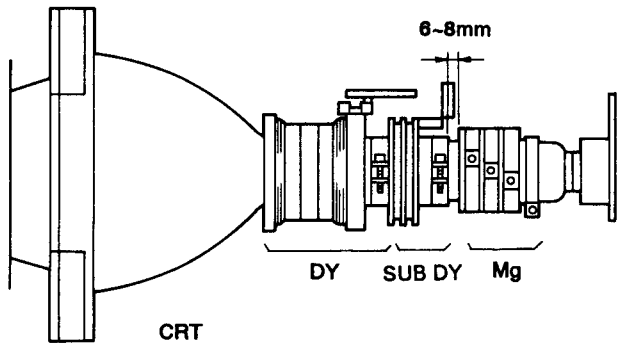
SET-UP ADJUSTMENTS

Note:

- When exchanging CRT, fit tightly DY to CRT, set neck assembly position and adjust.
- Service mode is released when the power is turned OFF.

4-1. NECK ASSEMBLY INSTALLATION

1. Fit DY tightly to CRT funnel first and then tightly fit Sub DY.
2. Temporary install 2-pole and 4-pole magnet assembly 6~8mm away from left DY.
3. Installing CB board.



4-2. DISPLAY INCLINATION ADJUSTMENT BY MAIN DY

1. Turn on the power switch of the set and the power key of the remote commander.
2. Press the **TEST** key for five seconds, and press the arrow **▲** key to set the service man mode.
3. Press **SKEW**, and use the **▲** and **▼** keys to set the V direction data of R, G, B to "128".

R- $\begin{cases} \text{H: --} \\ \text{V: 128} \end{cases}$ G- $\begin{cases} \text{H: --} \\ \text{V: 128} \end{cases}$ B- $\begin{cases} \text{H: --} \\ \text{V: 128} \end{cases}$

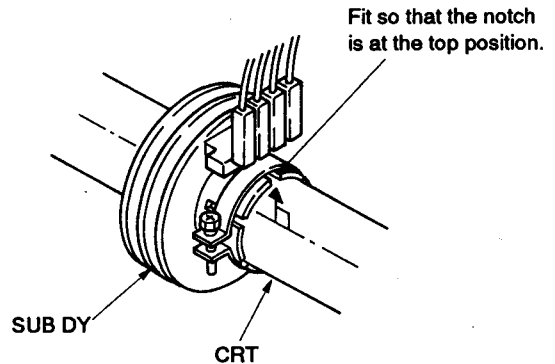
4. Rotate the main DY, and adjust the inclination of the display.
 - If the red CRT has been replaced, output the green and red cross hair patterns, and adjust the horizontal lines of the cross hair pattern to the green CRT which have been adjusted.
 - If the green or blue CRT have been replaced, output the cross hair patterns as above, and output the two colors of the CRT that was replaced and other CRT which have been adjusted, and adjust the horizontal lines of the cross hair pattern to the CRT which have been adjusted.
5. Secure the main DY in place after completing the adjustments.

Note 1. Be sure to adjust the main DY after the V direction data of **SKEW** has been adjusted to "128".

Note 2. Adjust so that the horizontal lines of the cross hair pattern coincide. (The vertical lines are adjusted during SKEW adjustments, after the main DY has been adjusted.)

4-3. SUB-DY ADJUSTMENT

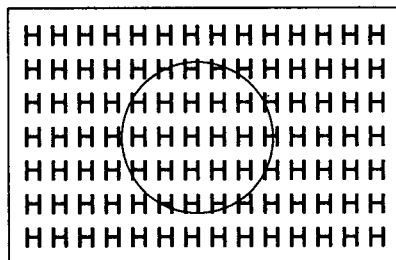
1. Fit to main DY and set at the mechanical center.

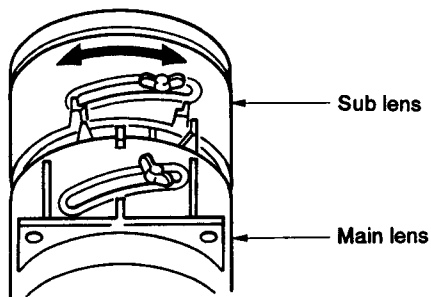


4-4. GREEN LENS FOCUS ADJUSTMENT

1. Use the commander to select an input not connected to a signal, and set it into a non signal condition. (To set $f_H=34$ kHz.)
2. Press the **TEST** key for five seconds, and press the **▲** key next to set the service man mode. (Not required when already in the service man mode).
3. Press the **TEST** key, and output the H pattern.
4. Adjust "CONTR" and "BRT" of PICTURE CONTROL, and set CONTR: 50 BRT: 50.
5. Press the CUT OFF **R** and **B** keys, and set to green (single color).
6. Loosen the screw of the main lens of green, rotate the lens so that the H pattern at the center of the screen becomes the clearest, and tighten the screw once more.

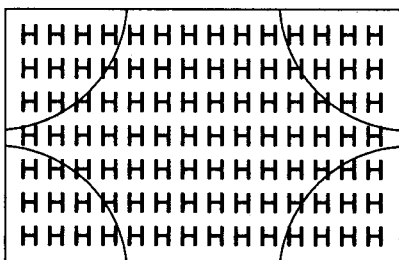
* Pay attention to the center of the screen.
(Around ○ in the figure below)





- Loosen the screw of the green sub lens, and rotate the lens so that the H pattern on the screen becomes the clearest. Then, tighten the screw once again.

* At this time, adjust the areas in the figure below so that the focus at the four corners are uniform.



- Repeat 6. to 7. two to three times, and adjust so that the H pattern on the whole screen is clear.

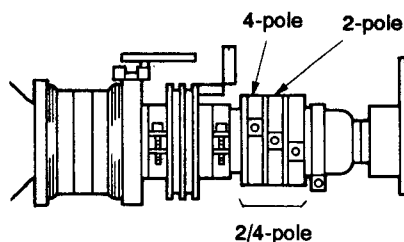
4-5. RED LENS FOCUS ADJUSTMENT

- Press the CUT OFF **[G]** and **[B]** keys of the commander, and set to red (single color).
- Adjust as in the green lens focus adjustment.

4-6. BLUE LENS FOCUS ADJUSTMENT

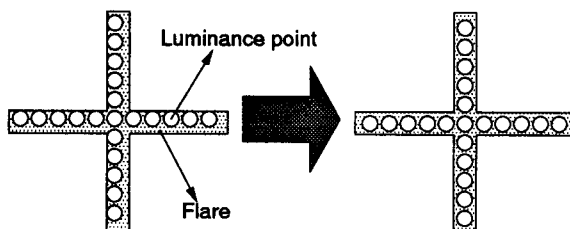
- Press the CUT OFF **[R]** and **[G]** keys of the commander, and set to blue (single color).
- Adjust as in the green lens focus adjustment.

4-7. GREEN 2/4-POLE ADJUSTMENT

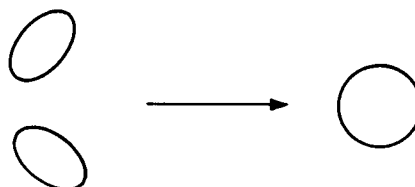


- Use the commander to select an output not connected to a signal, and set it into a non signal condition. (To set $f_a=34$ kHz)
- Press the **[TEST]** key for five seconds, and press the **[▲]** key to set the service man mode (Not required when already in service man mode).
Press the **[RESET]** key, and set CONTR:MAX, BRT:50.
- Press the CUT OFF **[R]** and **[B]** keys, and set to green (single color).
- Press the **[TEST]** key, and output the cross hair pattern.
- Rotate the green focus VR of the focus pack slightly to the left of the JUST point, and adjust so that there is flare on the cross hair pattern.
- Adjust the 2-pole magnet so that the luminance point lies at the center of the flare.

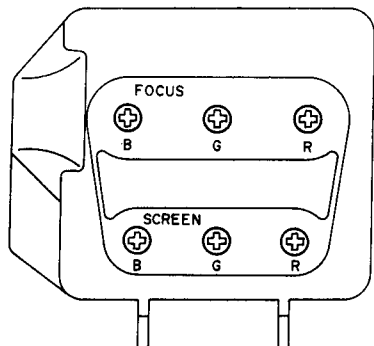
* Adjust so that the luminance point lies at the center of the flare.



- Press the **[TEST]** key and output the dot pattern.
- Rotate the green focus VR of the focus pack slightly to the right of the JUST point, and over-focus the dot.
- Adjust the 4-pole magnet so that the dot becomes round.



10. Repeat steps 4. to 9. and perform tracking as required.
11. Set the focus to JUST.



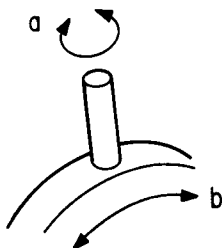
4-8. RED 2/4-POLE ADJUSTMENT

1. Press the CUT OFF **[G]** and **[B]** keys of the commander and set to red (single color).
2. Perform as in the green 2/4-pole adjustment.

4-9. BLUE 2/4-POLE ADJUSTMENT

1. Press the CUT OFF **[R]** and **[G]** keys of the commander and set to blue (single color).
2. Perform as in the green 2/4-pole adjustment.

Note: Method of adjusting the 2/4-pole



- a Modulates the power of the magnetic force
b Modulates the direction of the magnetic force.

To adjust the 2-pole or 4-pole, rotate the knob in the direction shown a and then in the direction shown b, and adjust to optimum.

4-10. GREEN ELECTRIC FOCUS ADJUSTMENT

1. Use the commander to select an input not connected to a signal, and set it into a non signal condition.
(To set fH=34 kHz)
2. Press the **[TEST]** key continuously for five seconds, and press the **[▲]** key to set the service man mode.
(Not required if already in the service man mode.)
3. Press the **[RESET]** key and set CONTR: 80, BRT: 50.
4. Press the CUT OFF **[R]** and **[B]** keys, and set to green (single color).
5. Rotate the GREEN volume of the focus pack, and adjust so that the H pattern is the clearest.

4-11. RED ELECTRIC FOCUS ADJUSTMENT

1. Press the CUT OFF **[G]** and **[B]** keys of the commander and set to red (single color).
2. Adjust as in the green electric focus adjustment.

4-12. BLUE ELECTRIC FOCUS ADJUSTMENT

1. Press the CUT OFF **[R]** and **[G]** keys of the commander, and set to blue (single color).
2. Adjust as in the green electric focus adjustment.

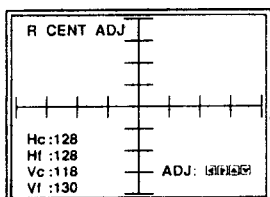
Note 1: The brightness in the blue electric focus adjustment changes according to its focus point. The brightest spot is at the JUST point.

Note 2: When the blue electric focus adjustment has been performed, the brightness of blue will change and the W/B may shift. Do not adjust unless the CRT has been replaced.

4-13. REGISTRATION ADJUSTMENT

Centering Adjustment

1. Press **ZONE** to display cross-hairs.
2. Press **ADJ [R]** when the red CRT is replaced.
3. Use the arrow keys **◀ ▶ ▲ ▼** and align the red center line with the green center line.



Note 1: Zone control mode ① adjust centering.

CENT **[R]** and **[B]** provide small variation width for users.

CENT **[R]** and **[B]** become the G centering adjust mode when pressed simultaneously. The variation width is also small.

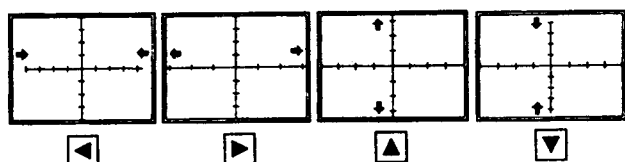
Note 2: When the computer display is shifted, press RGB SHIFT and adjust with arrow keys **◀ ▶ ▲ ▼**. Then, press **MEMORY**. The test signal position does not shift after pressing **TEST**.

Note 3: Follow the instructions below when the VIDEO display position is shifted:

- ① Press **ZONE**.
- ② Press **ADJ [G]**.
- ③ Press **TEST** for minimum 5 seconds to display VIDEO.
Press CUT OFF R and B for G mono color. Adjust with arrow keys **◀ ▶ ▲ ▼**.
- ④ Press **ZONE** again.
Press **ADJ [R]**.
Match G and R.
- ⑤ Press **ADJ [B]** to match R and B.
- ⑥ Press **NORMAL** to match R and B.
- ⑦ Press **TEST**.
Test signal position is shifted.

Size Adjustment

1. Press **SIZE** for size adjustment mode.
2. Adjust display size against the screen with arrow keys.
3. Match four display dimensions.



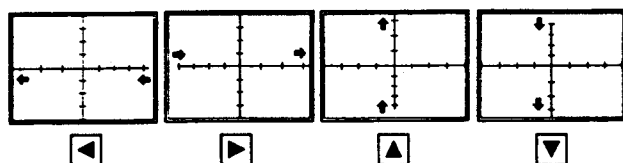
size is too small or too large. Press RGB **SIZE** and adjust with arrow keys **◀ ▶ ▲ ▼**.

Press **MEMORY** key.

Test signal size is same when pressing **TEST**.

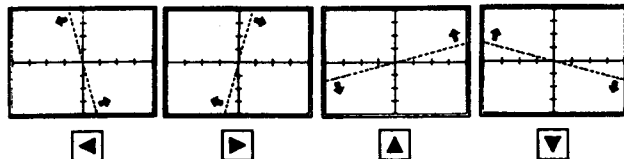
Linearity Adjustment

1. Press **LIN** and set at linearity adjustment mode.
2. Use arrow keys to adjust vertical and horizontal balance.
3. Adjust in four direction.



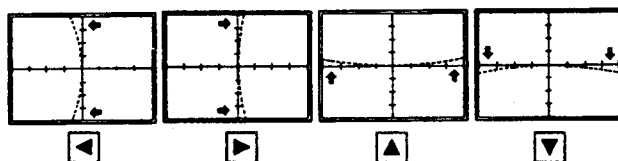
Skew Adjustment

1. Press **SKEW** and set at skew adjustment mode.
2. Use arrow keys to adjust each center line vertically and horizontally.



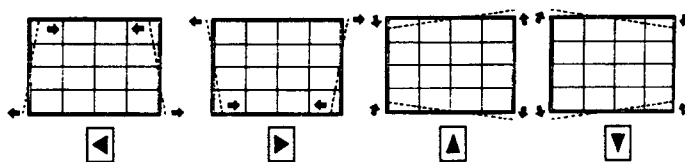
Bow Adjustment

1. Press **BOW** and set at bow adjustment mode.
2. Use arrow keys to straighten bowing line.



Keystone Adjustment

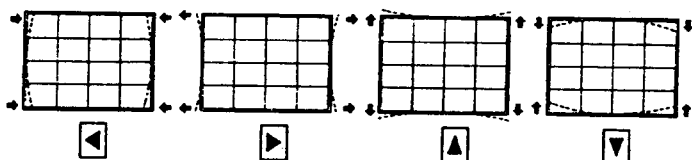
1. Press **KEY** and set at keystone adjustment mode.
2. Use arrow keys to adjust trapezoid shape distortions vertically and horizontally.



4. Follow the instructions below when the computer display

Pincushion Adjustment

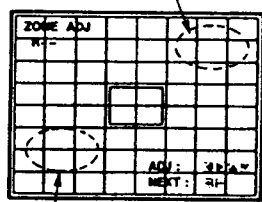
1. Press **[PIN]** and set at pin adjustment mode.
2. Use arrow keys to adjust spool shape distortion vertically and horizontally.



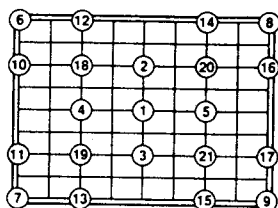
Zone Adjustment

1. Press **[ZONE]** and set at zone adjustment mode.
2. Press **POSITION** **[+]** and **[-]** keys to select part to be adjusted.
3. Use arrow keys **[←]** **[→]** **[▲]** **[▼]** to adjust line distortion near cursor.

The cursor position is displayed.



The data is displayed.



NOTE: Refer to the installation manual for details of the registration adjustment.

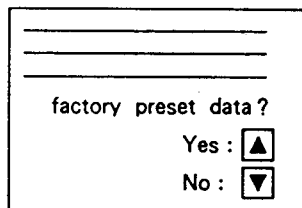
4-14. WHITE BALANCE ADJUSTMENT

<Preparations>

- ① Press **[TEST]** for more than 5 sec.
- ② Screen display will change to service man mode display.
- ③ Press arrow key **[▲]**.

1. G2 (Screen) VR Adjustment

- ① Use the commander to select an input not connected to a signal and set it into a non signal condition.
(Set f_H : 34 kHz)
- ② Press the **[TEST]** key continuously for five seconds, and press the **[▲]** key to set the service man mode.
(Not required if already in the service man mode.)
- ③ Press the **[PAGE]** key and set the color temperature to 6500 °K.
- ④ Press the **[BIAS]** key and set the bias adjustment mode.
- ⑤ Press the arrow **[←]** and **[→]** keys simultaneously and check that the following messages are displayed.
- ⑥ Press the arrow **[▲]** key. (This will input the factory preset data in the memory.)



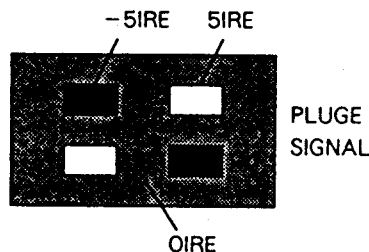
7. When performing adjustments using the digital voltmeter, adjust as follows.
 - 1) Adjust the BLUE G_2 VR so that the voltage between Pins ① and ② of connector CFB-5 becomes $4 \pm 0.2VDC$.
 - 2) Adjust the GREEN G_2 VR so that the voltage between Pins ① and ③ of connector CFB-5 becomes $4 \pm 0.2VDC$.
 - 3) Adjust the RED G_2 VR so that the voltage between Pins ① and ④ of connector CFB-5 becomes $4 \pm 0.2VDC$.

8. When performing adjustments without using the digital voltmeter, adjust as follows.

- 1) Short circuit 1. and 2. of the CFB-3 connector (2P) of the CFB board.

Note: The 2P connector to be short-circuited is inserted in connector L302 of the L board. After the adjustment, insert it back into the L board.

- 2) View the tube surface of each CRT directly from the lens, and adjust the brightness of the R, G, B single colors to the following, by rotating G2VR.



Note: Adjust with the tube display turned on.
The background (OIRE) becomes as bright as -5IRE. Adjust to the point where +5IRE is slightly shining.

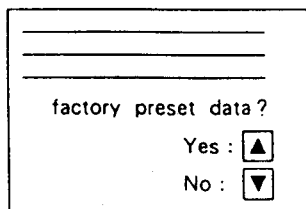
- 3) Release the short-circuit in ⑥.

2. 9,300 °K Adjustment

- ① Input video signal. (100IRE white)
- ② Press **PAGE** and set color temperature at 9,300°K.
- ③ Press **BIAS** or **GAIN** and set at bias adjustment mode.
- ④ Press arrow keys **◀** and **▶** simultaneously, and confirm the following message is displayed.
- ⑤ Press arrow key **▲**. (This will input factory preset data in memory)
- ⑥ Press **BIAS**.
- ⑦ Press **TEST** until screen is white signal.
- ⑧ Set CONT: Minimum, BRT: Minimum.
- ⑨ Use color analyzer and adjust blue and red so that;
x: 0.284 ± 0.015
y: 0.297 ± 0.025 .
Do not adjust green bias.
- ⑩ Press **MEMORY**.
- ⑪ Press **GAIN**.
- ⑫ Press **TEST** until screen displays external signal.
- ⑬ Press **RESET** and set CONT: 80%, BRT: 50%.
- ⑭ Use color analyzer and set green and red so that;
x: 0.284 ± 0.015
y: 0.297 ± 0.025 .
Do not adjust blue gain.
- ⑮ Press **MEMORY**.

3. 6,500 °K Adjustment

- ① Input video signal.
- ② Press **PAGE** and set color temperature at 6,500°K.
- ③ Press **BIAS** or **GAIN** and set at bias adjustment mode.
- ④ Press arrow keys **◀**, **▶** simultaneously and confirm the following message is displayed.

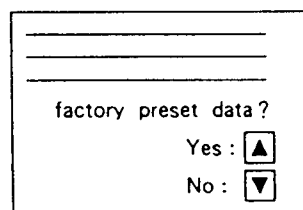


- ⑤ Press arrow **▲** key. (This will input factory preset data in memory)
- ⑥ Press **BIAS**.
- ⑦ Press **TEST** until screen is blank.
- ⑧ Set CONT: Minimum, BRT: Minimum
- ⑨ Use color analyzer and adjust blue and red so that;
x: 0.313 ± 0.015
y: 0.329 ± 0.015
Do not adjust green bias.
- ⑩ Press **MEMORY**.
- ⑪ Press **GAIN**.

- ⑫ Press **TEST** until screen displays external signal.
- ⑬ Press **RESET** and set CONT: 80%, BRT: 50%.
- ⑭ Use color analyzer and adjust green and red so that;
x: 0.313 ± 0.015
y: 0.329 ± 0.015
Do not adjust blue gain.
- ⑮ Press **MEMORY**.

4. 3,200 °K Adjustment

- ① Input video signal.
- ② Press **PAGE** and set color temperature at 3,200°K.
- ③ Press **BIAS** or **GAIN** and set at bias adjustment mode.
- ④ Press arrow keys **◀**, **▶** simultaneously and confirm the following messages are displayed.



- ⑤ Press arrow key **▲**. (This will input factory preset data in memory)
- ⑥ Press **BIAS**.
- ⑦ Press **TEST** until screen is blank.
- ⑧ Set CONT: Minimum, BRT: Minimum.
- ⑨ Use color analyzer and adjust blue and red so that;
x: 0.423 ± 0.015
y: 0.399 ± 0.015
Do not adjust green gain.
- ⑩ Press **MEMORY**.
- ⑪ Press **GAIN**.
- ⑫ Press **TEST** until screen displays external signal.
- ⑬ Press **RESET** and set CONT: 80%, BRT: 50%.
- ⑭ Use color analyzer and adjust red and blue so that;
x: 0.428 ± 0.015
y: 0.399 ± 0.015
Do not adjust green gain.
- ⑮ Press **MEMORY**.

5. Preset Adjustment

- ① Press **PAGE** and preset color degree.
- ② Press **GAIN** and set R, G, B gain data at 6,500°K data.
- ③ Press **BIAS** and set R, G, B bias data at 6,500°K data.
- ④ Press **MEMORY**.
- ⑤ Press **PAGE** and after setting color temperature at 6,500°K, press **MEMORY**.

6. CRT Timer Reset

If you replace the cathode-ray tubes, reset the timer to "0000".

- ① Press the **[PAGE]** key five times to display PAGE 5.
- ② Select "1. CRT TIMER DISPLAY" with the **[▶]** key.
The PAGE 5-1 tells how long the cathode-ray tubes were used.

PAGE 5-1	INPUT-A
CRT TIMER	
DISPLAY MODE	
RED:	0005 hours
GREEN:	0005 hours
BLUE:	0005 hours
EXIT: [PAGE]	

- ③ Press the **[◀]** and **[▶]** keys simultaneously to enter the CRT timer reset mode.

PAGE 5-1	INPUT-A
CRT TIMER	
RESET MODE	
RED:	0005 hours
GREEN:	0005 hours
BLUE:	0005 hours
COLOR SELECT: [◀▶]	
TIMER PRESET: [◀]	
ENTER: [MEMORY]	
EXT: [PAGE]	

- ④ Select the color to reset with the **[▲]** and **[▼]** keys.
The selected color blinks.
- ⑤ Press the **[◀]** key.
The blinking timer is reset to "0000".

PAGE 5-1	INPUT-A
CRT TIMER	
RESET MODE	
RED:	0000 hours
GREEN:	0005 hours
BLUE:	0005 hours
COLOR SELECT: [◀▶]	
TIMER PRESET: [◀]	
ENTER: [MEMORY]	
EXT: [PAGE]	

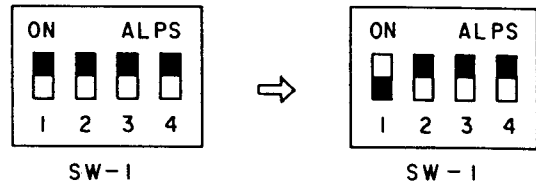
- ⑥ Repeat steps ④ and ⑤ for other colors.
- ⑦ Press the **[MEMORY]** key.

4-15. Y BOARD, IC4 (EEPROM) REPLACEMENT

4-15-1. Initialization

IC4 (EEPROM) on Y board requires initialization at its replacement. Perform the initialization using following procedures.

1. Turn MAIN POWER SW of the projector off.
2. Remove cabinet, ED bracket and the cover of Y shield case to make possible to access to Y board.
3. Remove Y board from the projector. Replace the EEPROM. Set ① of SW-1 only to its lower position, then restore it to original position.



4. Disconnect connectors DC-10/DC-11/DC-12 on DC board.
5. Turn MAIN POWER SW of the projector on, then using the commander, POWER ON the projector.
6. Press SW-2 on Y board (flushing of red LED on Y board stops).
7. Press SW-2 on Y board again (red LED on Y board turns on, then turns off after 30 seconds to 1 minute).
8. Using the commander, POWER OFF the projector, then turn MAIN POWER SW off.
9. Connect again connectors DC-10/DC-11/DC-12 on DC board.
10. After STAND BY lamp completely turned off, turn MAIN POWER SW on while holding down SW-2 on Y board (Press and hold down SW-2 for more than 5 seconds after turning MAIN POWER SW on. Red LED on Y board still turns on).

This ends EEPROM initialization.

4-15-2. Generation of Factory Data

No factory data exists in the EEPROM just initialized.

Generate the factory data by performing following adjustment items.

- (a) RGB registration data of 8 blocks between 15 kHz to 75 kHz (including VIDEO size/blanking data).
- (b) GAIN/BIAS data at preset color temperature of 9300° 6500° and 3200°
- (c) SHIFT (left/right direction only) data of VIDEO signal
- (d) SHIFT (left/right direction only) data of cross-hatch with no input signal
- (a) Generation of RGB registration data of 8 blocks between 15 kHz to 75 kHz:

1. Install the projector on floor with a 120" screen combined.

CAUTION:

Ensure that the projector and the screen are in correct optical location.

- Input a signal with $f_H = 34\text{kHz}$ to the projector. Perform adjustment of registration at registration-block 4.

CAUTION:

Do not perform this adjustment without input signal (if perform the adjustment without input signal, perform it after adjustment in step (d) SHIFT data of cross-hatch with no input signal has been completed).

NOTE:

Register block 4 : $f_H = 30$ to 37 kHz .

- Then, perform adjustment of blanking on register block 4.
- Press and hold down MEMORY key to perform STANDARD SAVE.
- Change f_H of the signal, then perform adjustment of registration and blanking on remaining register blocks 1 to 3 and 5 to 8.

NOTE:

register block No.	f_H
1	15 kHz to 19 kHz
2	19 kHz to 24 kHz
3	24 kHz to 30 kHz
4	30 kHz to 37 kHz
5	37 kHz to 45 kHz
6	45 kHz to 55 kHz
7	55 kHz to 66 kHz
8	66 kHz to 85 kHz

For method of installation, adjustment of registration/blanking, refer to the installation manual.

(b) Generation of W/B data

- Perform adjustment on GAIN/BIAS at color temperature of 9300° , 6500° and 3200° .
For the method of color temperature adjustment, refer to "W/B adjustment" on PAGE xxxx of this manual.

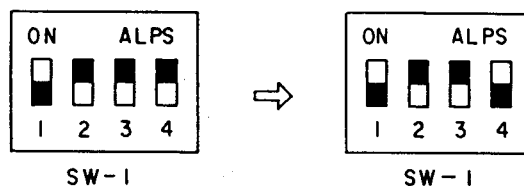
(c) Adjustment of SHIFT (left/right direction only) data of VIDEO signal.

- Connect a VIDEO signal, and select the input.
- Press TEST key to display cross hatch pattern. Check that cross hatch pattern is projected at the center of screen. If not, adjust RGB registration data again.
- Press BLKG key on the commander, and adjust to display all video at the left and the right sides (Set messages LF: to MIN, and RI: to MAX respectively. These messages are at the lower-left corner of screen).
- Press SHIFT key, and adjust the VIDEO to its best position (no up-down adjustment is possible).

- Press BLKG key, and adjust VIDEO to its best condition at the left and the right sides of screen. Press MEMORY key.

(d) Adjustment of SHIFT (left/right direction only) data of cross-hatch with no input signal

- Using the commander, turn POWER to the projector off. Remove Y board. Set ④ of SW-1 to its lower position, then restore it to original position.

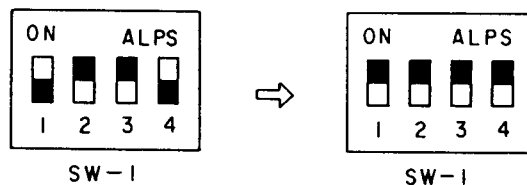


- Using the commander, turn POWER to the projector on. Select the input to which a signal is connected.
(NOTE: Recommend to use a signal of $f_H = 34\text{ kHz}$, or so).
- Press TEST key, and mark the center location of cross-hatch on the screen.
- Select an input to which no signal is connected. Press SHIFT key followed by TEST key.
- Using arrow keys (\leftarrow , \rightarrow), align vertical line of cross-hatch to the position marked in step 3, then press MEMORY key.
(Pressing arrow keys \uparrow or \downarrow changes data in the message V: at the lower-left corner of screen, but does not move the location of cross-hatch. Set this data to 128).

4-15-3. Saving the Factory Data

Save the factory data just adjusted into the EEPROM.

- While POWER to the projector is on, set ④ and ① of SW-1 to ON position, ④ first, then ①. (red LED turns on at the same time when setting ① of SW-1 to ON position, and turns off after a few seconds).



CAUTION:

Pressing SW-1 before you set ① of SW-1 on Y board to ON position causes all the data to be set to center value (128).

- Using the commander, turn POWER to the projector off. After more than 5 seconds, POWER ON again. This saves the factory data to the EEPROM.
- Finally, adjust the blanking of Video signal again and save data into memory.