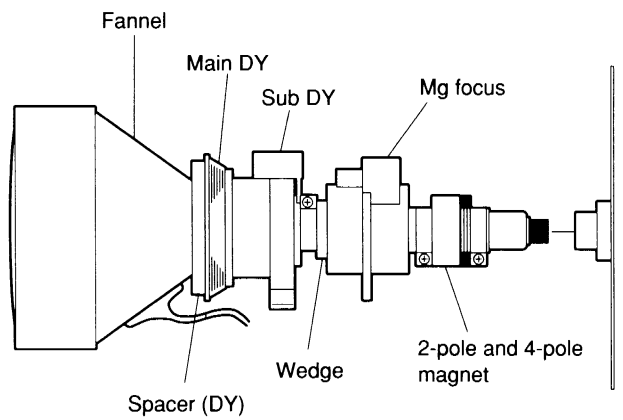
SECTION 3
SET-UP ADJUSTMENTS

3-1. PRECAUTIONS UPON ADJUSTMENT

1. When the CRT (a cathode-ray tube) has been replaced, fix the DY (deflection yoke) to the funnel and decide the position of the neck assembly before beginning adjustments.
2. When the power is turn off, the service mode is canceled.

3-2. ATTACHING THE NECK ASSEMBLY

1. Fix DY to the CRT funnel, then fix the Magnet Focus Coil.
2. Tentatively secure the 2-pole and 4-pole magnet assembly in contact with the Magnet Focus Coil.
3. Attach the CB board.

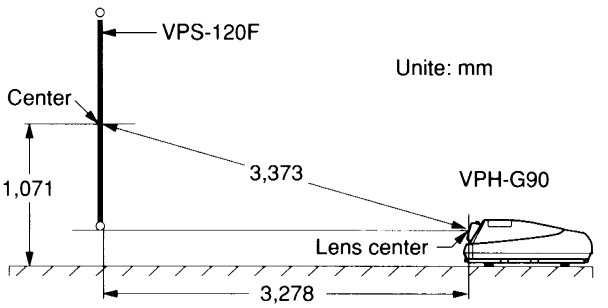


3-3. ADJUSTING CONDITIONS

3-3-1. Projecting System

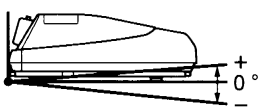
Place the unit on a table which satisfies the projection conditions as shown in the figure.

Basic Optical System



Inclination Angle at Top and Bottom

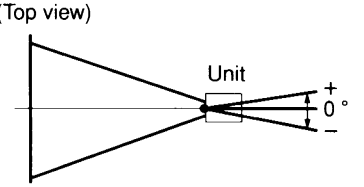
(Side view)



Specifictions:
Within $0^{+0.2}_{-0.5}$°

Left and Right Tilt of the Unit

(Top view)



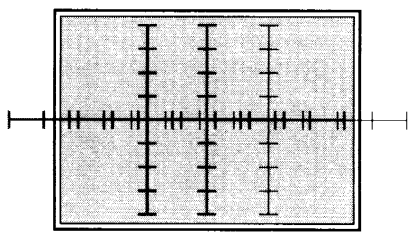
Within 0 ±0.5 °

3-3-2. CRT Convergence Angle Check

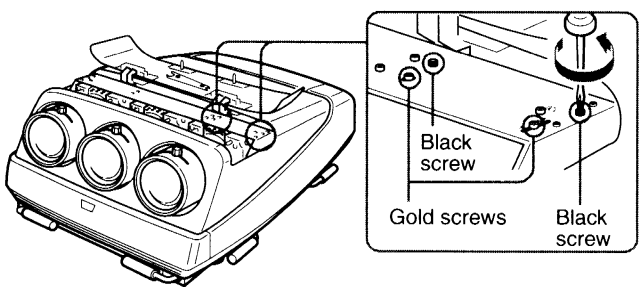
Open the top cover and check that there are adjusting screws in the adjusting holes for 120-inch screen. If there are no adjusting screws in the 120-inch adjusting holes, adjust as follows.

1. Turn on the power of the projector.
2. Set the remote commander to the serviceman adjustment mode. For details, see "Remote Commander" in the instruction manual.
3. Reset the red, green and blue registration data. For details, see "Resetting the Data" in the instruction manual.
4. Observe the screen and confirm the following.
   - The center of the green hatch pattern aligns with the horizontal center of the screen.
   - The centers of the red and blue hatch patterns align at even intervals from the green hatch pattern.

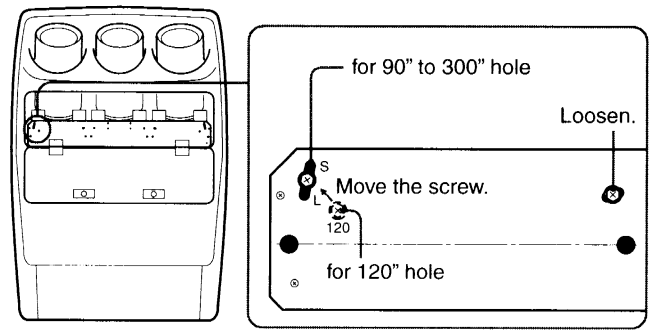
   If the center of the green hatch pattern does not align with the screen center, the projector may not be installed correctly. Re-install it rightly.



5. Loosen the CRT fixing screws (two black screws) used for the red with the use of the supplied tool. Make sure not to remove the screws.



6. Insert the adjusting screws (two gold screws) in the adjusting holes for the 120-inch screen.



When the unit is shipped from a factory, the adjusting screws are screwed into the adjusting holes for 120-inch screen.

7. Tighten the CRT fixing screws (two black screws) used for the red, which were loosened at Step 5.
8. Repeat Steps 5 to 7 to loosen the CRT fixing screws (two black screws) used for the blue, adjust the CRT convergence angle for the blue, then tighten the CRT adjustment screws (two gold screws) used for the blue.

3-4. FOCUS ADJUSTMENT

3-4-1. Preparations

1. Turn ON the MAIN POWER SW, and press the POWER ON key to turn on the power.
2. Press the NORMAL key.
3. Continue pressing the keys as follows.
   ENTER key ⇨ ENTER key ⇨ ↑ key ⇨ ↓ key ⇨ ENTER key ⇨
4. Select "YES" on the screen with ↑ and ↓ keys, then press the ENTER key.
5. Press the MENU key. "S" is displayed on the screen and the serviceman adjusting mode is set.
6. Keep pressing the RESET key for five seconds.
7. Select "YES" on the screen with ↑ and ↓ keys, then press the ENTER key.
8. Select "ALL MEMORY" on the screen with ↑ and ↓ keys, then press the ENTER key.
9. Select "FACTORY DATA" on the screen with ↑ and ↓ keys, then press the ENTER key.
   With the above procedure, the same state as that at the time of factory shipment can be set for the unit, and adjustment can be made for the replaced color.
10. Set INPUT-A to the no-signal state, then select INPUT-A.
11. Select the INT OSC PATTERN from INT. OSC menu with the MENU key, then select P5 (fH = 64 kHz, fV = 60 Hz).

3-4-2. Focus Rough Adjustment

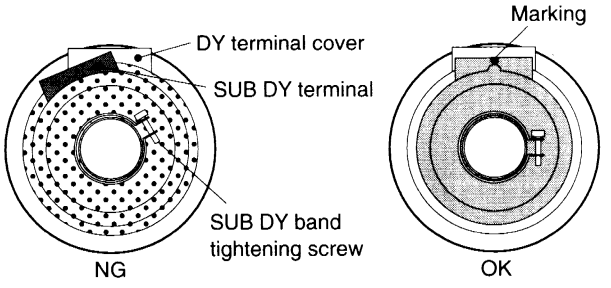
1. Set INPUT-A to the no-signal state, then select INPUT-A.
2. Select the ME pattern, as test pattern, with the PATTERN key.
3. Cut off the colors other than the one to be adjusted with the CUT OFF key and set a single color. Then adjust the lens focus roughly.
4. Press the MG FOCUS key to set the MG FOCUS adjustment mode, then select the ME pattern with the PATTERN key.
5. Press the ALL key to adjust the center focus of R, G and B roughly.
6. Repeat Steps 3 to 5 until the best center focus is attained.

3-4-3. DY Angle Adjustment

Note: Angle adjustment should be made only with DY for the color for which CRT was replaced.

GREEN DY Angle Adjustment

1. Set INPUT-A to the no-signal state, then select INPUT-A.
2. Press the REGISTRATION CENT key and ADJ G key to make the cross-hair pattern appear.
3. Press the CUT OFF key and B key to set green only on the screen.
4. Roughly adjust GREEN DY angle so that the horizontal cross-hair pattern can be parallel to the horizontal line of the screen.
5. Roughly adjust the coil so that the marking section of the GREEN MG FOCUS coil can face up.



CRT rear

6. Adjust the GREEN CENT to the screen center using ↑, ↓, ← and → keys.
7. Roughly adjust the GREEN H.SIZE, H.LIN and V.BOW so that the horizontal line at the center can be straight. In H.SIZE/LIN adjustments, the screen edge or the 30 to 50 mm marks inside the screen serve as the reference.
   In order to adjust the DY tilt easily, adjustment is made so that the external lines of the cross-hatch come slightly outside these marks in the H. SIZE adjustment.
8. Press REGISTRATION SKEW on the remote commander to set to the skew adjustment model. Make sure that the "V.SKEW" data on the screen shows "128." Adjust to "128" if it is not so.
9. Adjust GREEN DY angle so that the cross-hair horizontal line can be parallel to the horizontal line of the screen, then tighten the fixing screws.

   Note:
   - **Use a non-magnetized screwdriver to tighten the screws.**
   - **Fix the DY to the CRT funnel.**
   - **Tighten the DY band with the following torque.**
     Tightening Torque:
     80 to 120 N•cm (8.16 to 12.24 kgf•cm).

10. After fixing DY, check that the values of V.SKEW is within the following specification.
    Specification: Green: V.SKEW data = 128 ±5

RED DY Angle Adjustment

11. Adjust RED DY tilt in the same way as the one for GREEN DY (see Steps 1 to 10).
    - Press the CUT OFF B key to set the screen to RED and GREEN.
    - Use the horizontal lines of GREEN cross-hair pattern as reference of adjustment.

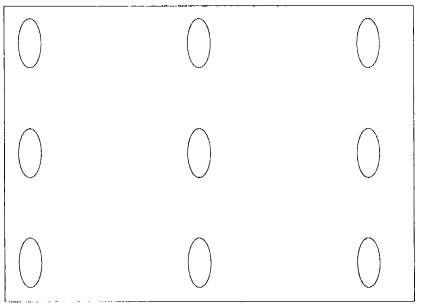
BLUE DY Angle Adjustment

12. Adjust BLUE DY tilt in the same way as the one for GREEN DY (see Steps 1 to 10).
    - Press the CUT OFF R or G key.
    - Use the horizontal lines of GREEN or RED cross-hair pattern as reference of adjustment.

3-4-4. MG FOCUS Coil Angle Adjustment

BLUE MG FOCUS COIL Angle Adjustment

1. Set INPUT-A to the no-signal state, then select INPUT-A.
2. Select the INT OSC PATTERN from INT. OSC menu with the MENU key, then select P3 (fH = 31.5 kHz, fV = 60 Hz).
3. Press the MG FOCUS key to set to Magnet Focus mode. Press the ADJ B key to set to BLUE adjustment mode, then press the PATTERN key to select the dot (9 × 9) pattern.
4. Press the CUT OFF R and G keys to set BLUE only on the screen.
5. Press the CONTR (+) key to set contrast to the maximum.
6. Press the MG FOCUS key, then press ↑ or ↓ key to select "ALL." Press ← key to set the data of "ALL" to the minimum.
7. Adjust the AQP, DQP, AHP, and DHP so that the dots can be round.
8. Select "ALL" with ↑ or ↓ key, then press ← or → key to set the dots to the minimum.
9. Press the MG FOCUS key to set to DEFOCUS mode. Adjust the COIL angle so that the dot on the screen center can be vertically longer, then fix it.

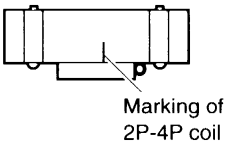


Note:
- **Use a non-magnetized screwdriver to tighten the screws.**
- **Fix the MG FOCUS Coil at the rear of Sub DY.**
- **Tighten the MG FOCUS Coil with the following torque.**
  Tightening Torque: 80 to 120 N•cm
  (8.16 to 12.24 kgf•cm)

10. Press the PATTERN key to select ME Pattern. Select "ALL" with ↑ or ↓ key, then roughly adjust the focus by pressing ← or → key.
11. Press the COUNT (+) or (−) key to set the CONTRAST display on the screen to "80."
12. Keep pressing MEMORY key for 5 seconds or more.
13. Select "YES" on the screen with ↑ and ↓ keys, then press the ENTER key.
14. Select "FOCUS DATA" on the screen with ↑ and ↓ keys, then press the ENTER key.

R/G/B 2P-4P COIL Angle Adjustment

Adjust the angle of 2P-4P coil so that its marking secion becomes upward.



3-4-5. 64 kHz Signal Registration Rough Adjustment

1. Set INPUT-A to the no-signal state, then select INPUT-A.
2. Select the INT OSC PATTERN from INT. OSC menu with the MENU key, then select P3 (fH = 64 kHz, fV = 60 Hz).

GREEN Registration Adjustment

3. Press the REGISTRATION CENT key and ADJ G key.
4. Press CUT OFF R and B keys to set GREEN only on the screen.
5. Adjust the GREEN center to the screen center using the ↑, ↓, ← and → keys.
6. Press REGISTRATION SIZE key.
7. Roughly adjust H. SIZE (the horizontal size) with ← and → keys, then V. SIDE (the vertical size) with ↑ and ↓ keys. Adjust the external circumference of the GREEN test signal to the position 30 to 50 mm inside the screen.
8. Press REGISTRATION KEY key.
9. Roughly adjust H. KEY and V. KEY (the horizontal and vertical keystones) using the ↑, ↓, ← and → keys.
10. Press REGISTRATION BOW key.
11. Roughly adjust H. BOW and V. BOW (the horizontal and vertical bows) using the ↑, ↓, ← and → keys.
12. Press REGISTRATION SKEW key.
13. Roughly adjust H. SKEW and V. SKEW (the horizontal and vertical skews) using the ↑, ↓, ← and → keys.
14. Press REGISTRATION PIN key.
15. Roughly adjust H. PIN and V. PIN (the horizontal and vertical pin cushions) using the ↑, ↓, ← and → keys.

RED Registration Adjustment

16. Press the ADJ R key.
17. Press CUT OFF B keys to set RED and GREEN only on the screen.
18. Adjust RED registration in the same way as Steps 5 to 15. Adjust the RED signal to GREEN signal.

BLUE Registration Adjustment

19. Press the ADJ B key.
20. Press CUT OFF R keys to set BLUE and GREEN only on the screen.
21. Adjust BLUE registration in the same way as Steps 5 to 15. Adjust the BLUE signal to GREEN signal.

Saving Registration Data

22. Keep pressing MEMORY key for 5 seconds or more.
23. Select "YES" on the screen with ↑ and ↓ keys, then press the ENTER key.
24. Select "REGISTRATION DATA" on the screen with ↑ and ↓ keys, then press the ENTER key.
25. Press the NORMAL key to exit from the adjustment mode.
26. Press the PATTERN key to output the cross-hatch on the screen, then check that the RED, GREEN and BLUE registration have been adjusted roughly.

3-4-6. RED/GREEN/BLUE Focus Adjustment

1. Set INPUT-A to the no-signal state, then select INPUT-A.
2. Select the INT OSC PATTERN from INT. OSC menu with the MENU key, then select P3 (fH = 31.5 kHz, fV = 60 Hz).

GREEN Focus Adjustment

3. Press the MG FOCUS key and ADJ G key.
4. Press CUT OFF R and B keys to set GREEN only on the screen.
5. Press CONTR (+) key to set the contrast to the maximum.
6. Press PATTERN key to select "Dot (17 × 17) & Hatch (5 × 5)" pattern.
7. Select "ALL" on the screen with ↑ and ↓ keys, then press the ENTER key.
8. Increase the ALL data (+40) with ← and → keys, then output the flare.
9. Select "2PH (2-Pole H)" on the screen with ↑ and ↓ keys, then adjust the dot core to the center of the flare in the horizontal direction with ← and → keys.
10. Select "2PV (2-Pole V) and adjust the dot core to the center of the flare in the vertical direction.
11. Select "2PH (2-Pole V) and adjust the dot core to the center of the flare in the vertical direction.
12. Return to "ALL," and decrease the ALL data (−80) to increase the dot size.
13. Select "6PA" and perform adjustment to transform the triangle in the vertical direction of the dot to an ellipse.
14. Select "6PD" and perform adjustment to transform the triangle in the skew direction of the dot to an ellipse.
15. Select "4PA" and perform adjustment to transform the ellipse in the vertical and horizontal directions of the dot to be round.
16. Select "4PD" and perform adjustment to transform the ellipse in the skew direction of the dot to be round.
17. Repeat Steps 9 to 16 until the dot becomes round.

RED Focus Adjustment

18. Press the ADJ R key.
19. Press CUT OFF, G and B keys to set RED only on the screen.
20. Adjust RED centering in the same way as GREEN centering.

BLUE Focus Adjustment

21. Press the ADJ B key.
22. Press CUT OFF, R and G keys to set BLUE only on the screen.
23. Adjust BLUE centering in the same way as GREEN centering.
24. Press CONTR (−) key to set the contrast to "80."
25. Repeat Steps 3 to 23 until the dot becomes round.

Saving Focus Data

26. Keep pressing MEMORY key for 5 seconds or more.
27. Select "YES" on the screen with ↑ and ↓ keys, then press the ENTER key.
28. Select "FOCUS DATA" on the screen with ↑ and ↓ keys, then press the ENTER key.
29. Press the NORMAL key to exit from the adjustment mode.

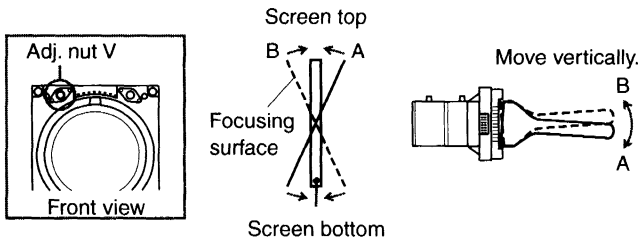
3-4-7. Zenith Angle Adjustment

1. Input the 64 kHz RGB signal to the INPUT-A connector, then select INPUT-A.
2. Press the MG FOCUS key and ADJ G key.
3. Press CUT OFF R and B keys to set GREEN only on the screen.
4. Press PATTERN key several times and select ME pattern.
5. Roughly adjust the "ALL" for "POSITION No. 1." In succession, roughly adjust the AQP, DQP, AHP, and DHP for "POSITION No. 2" to "POSITION No. 5."
6. Set ME pattern on the screen, and roughly adjust the lens corner focus.

   Note: If the center focus is not precisely adjusted, adjust it again. Patterns other than ME pattern are also available.

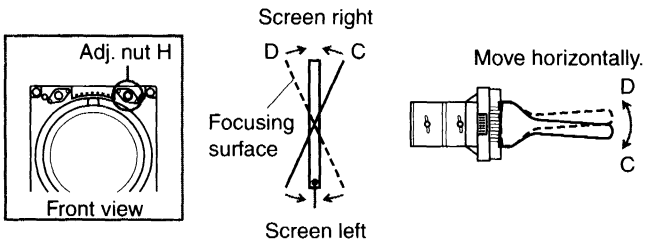
7. Adjust the lens center focus so that ME pattern at the bottom part of the screen center can be best focused.
8. Look at the top part of the screen center. Rotate the lens center focus to the "Left" and check if a best focus position exists. If so, take the point as "Left."
9. If not, adjust the focus at the bottom part of the screen to the best then look at the top part and rotate the lens focus to the "Right." Check if the best focus point exists. If so, take the point as "Right."
10. Adjust again the focus at the bottom part precisely.
11. Rotate the zenith angle adjustment nut (V) in the same direction as that obtained in Step 8 or Step 9 so that the focus at the top and the bottom can be the same.
    [Zenith Angle Adjustment Specification]
    Adjust the main lens focus precisely so that the bottom part (or the top part) of the center can be best focused. At this time, the best focus point of the top part (or the bottom part) of the center should be within 20 mm from the screen toward the unit main body.

    Note: If the focus point is the far end of the screen, change the measuring points (change from the bottom to the top and vice versa).



12. Adjust the focus at the bottom part precisely, then check that the focus at the top part is within the reference. If not, adjust again in the same way.
13. Perform the H zenith angle adjustment in the same way as above Steps.
14. Adjust the lens center focus so that ME pattern at the left part of the screen center can be best focused.
15. Look at the right part the screen center. Rotate the lens center focus to the "Left" and check if a best focus position exists. If so, take the point as "Left."
16. If not, adjust the focus at the left part of the screen to the best then look at the right part and rotate the lens focus to the "Right." Check if the best focus point exists. If so, take the point as "Right."
17. Adjust again the focus at the left part precisely.
18. Rotate the zenith angle adjustment nut (H) in the same direction as that obtained in Step 15 or Step 16 so that the focus at the right and the left can be the same.
    [Zenith Angle Adjustment Specification]
    Adjust the main lens focus precisely so that the left part (or the right part) of the center can be best focused. At this time, the best focus point of the right part (or the left part) of the center should be within 20 mm from the screen toward the unit main body.

    Note: If the focus point is the far end of the screen, change the measuring points (change from the left to the right and vice versa).



19. Adjust the focus at the left part precisely, then check that the focus at the right part is within the reference. If not, adjust again in the same way.
20. After completion of the above, roughly adjust the lens focus of the screen center again.
21. Adjust RED and BLUE in the same way as GREEN.

3-4-8. HWC (H Width Coil) Adjustment

Note: Perform this adjustment when the E board or deflection yoke has been replaced.

1. Set INPUT-A to the no-signal state, then select INPUT-A.
   Select the INT OSC PATTERN from INT. OSC menu with the MENU key, then select P3 (fH = 31.5 kHz, fV = 60 Hz).
2. Press the REGISTRATION CENT key and the ADJ G key to set the CENT GREEN adjustment mode and press the CUT OFF R key and B key to set GREEN only.
3. Adjust the GREEN center to the screen center.
4. Press the REGISTRATION SIZE key to set the SIZE GREEN adjustment mode, adjust the H.SIZE, move the left and right edges of the test pattern near the screen edge. Then press the REGISTRATION LIN key, set the LIN adjustment mode and adjust the linearity.
5. Repeat the SIZE and LIN adjustment to align the left and right edges of the test pattern to the screen edge. (If necessary adjust CENT again.)
6. Press the REGISTRATION CENT key and the ADJ R key to set CENT RED adjustment mode and press the CUT OFF B key to cut off BLUE.
7. Adjust the RED center to the GREEN center.
8. Perform LIN adjustment again to align the RED left and right edges of the test pattern to GREEN.
9. Set the RED H. SIZE data to "128."
10. Press the REGISTRATION CENT key and the ADJ B key to set CENT BLUE adjustment mode and press the CUT OFF R key to cut off RED.
11. Adjust the BLUE center to the GREEN center.
12. Perform LIN adjustment again to align the BLUE left and right edges of the test pattern to GREEN.
13. Set the BLUE H. SIZE data to "128."
14. Adjust RED HWC (LV1), GREEN HWC (LV2) and BLUE HWC (LV3) on the E board and perform adjustment so that any other two colors can be matched to the color with the smallest H SIZE values.

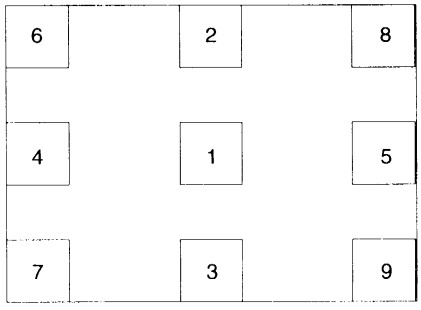
3-4-9. Video Size Adjustment

Note: Perform this adjustment when the E board ED board, or Green deflection yoke has been replaced.

1. Press the INPUT SELECT VIDEO key, input the NTSC monoscope signal and receive the image.
2. Press the CUT OFF R key and the B key to set GREEN only.
3. Press the MG FOCUS key and the ADJ G key to set MG FOCUS GREEN adjustment mode, then adjust the GREEN CENTER FOCUS (Mg-ALL).
4. Press the REGISTRATION CENT key and ADJ G key to set GREEN adjustment mode and adjust the hatch center to the screen center.
5. Press the RGB SHIFT key to set RGB SHIFT adjustment mode, input the monoscope signal and receive the signal.
   Further press the CUT OFF R key and the B key to set GREEN only. Adjust the monoscope center to the screen center with SHIFT adjustment.
6. Press the REGISTRATION SIZE key and set the SIZE GREEN adjustment mode. Press the PATTERN key several times to receive the monoscope signal, move the left and right edges of the monoscope near the screen edge, then press the REGISTRATION LIN key to set the LIN adjustment mode and adjust the linearity.
7. Press the CUT OFF R key and the B key to set GREEN only.
8. Repeat the SIZE and LIN adjustment (and CENT adjustment) and adjust the left and right edges of the monoscope to the screen edge.
   Note: To change the linearity considerably in H.LIN adjustment, perform the CENT adjustment again.
9. Press RGB SIZE key to set RGB SIZE mode. Adjust H SIZE data (Hc) to Maximum.
10. Press RGB SIZE key to set RGB SIZE mode. Adjust H SIZE data (Hf) to "145."
11. Press the MEMORY key.
12. Adjust RV2 on the EA board, and set the H size of the monoscope to 15.5 ±0.15 frames.

3-4-10. MG FOCUS Adjustment for 31.5 kHz Signal

1. Set INPUT-A to the no-signal state, then select INPUT-A.
   Select the INT OSC PATTERN from INT. OSC menu with the MENU key, then select P3 (fH = 31.5 kHz, fV = 60 Hz).
2. Press the REGISTRATION CENT key and the ADJ G key to set the CENT GREEN adjustment mode and press the CUT OFF key and B key to set GREEN only.
3. Adjust the GREEN center to the screen center (When it has been aligned, adjustment is not needed).
4. Press the REGISTRATION SIZE key to set the SIZE adjustment mode, adjust the H.SIZE and V.SIZE again.
5. Press the PATTERN key to output the cross-hatch pattern, and check that the image distortion has been roughly adjusted. (If not, adjust it again).
6. Press the MG FOCUS key to set the MG Focus adjustment mode, and press the PATTERN key several times to output the ME pattern.
7. Adjust ALL FOCUS at "POSITION No. 1" so that the ME pattern of the center can be focused in the optimum condition.
8. Adjust the GREEN main lens to make the focus of the central part optimum, then fix it.
9. Press the FUNCTION key to set to SPOT SHAPE ADJ mode.
10. Press the PATTERN key to output the dot pattern. Then press the POSITION (+) key to set to "POSITION No. 2" mode.
11. Move the AQP adjustment mode with ↑ and ↓ keys, then perform adjustment so that the dot can become most rounded.
12. Move the DQP adjustment mode with ↑ and ↓ keys, then perform adjustment so that the dot can become most rounded.
13. Move the AHP adjustment mode with ↑ and ↓ keys, then perform adjustment so that the dot can become most rounded.
14. Move the DHP adjustment mode with ↑ and ↓ keys, then perform adjustment so that the dot can become most rounded.
15. Repeat Steps 11 to 14 several times to adjust the dot to the most rounded conditions while adjusting the tracking.
16. Press the FUNCTION key to finish the SPOT SHAPE ADJ mode.
17. Press the PATTERN key several times to output the ME pattern.
18. Press the POSITION (+) key to set to "POSITION No. 2" mode.
19. Press the MG FOCUS key and the ADJ G key.
20. Press the CUT OFF R key and B key to set GREEN only on the screen.
21. Adjust the focus of the upper ME pattern to the optimum.
22. Move the AQP adjustment mode with ↑ and ↓ keys, adjust the focus of the upper ME pattern to the optimum.
23. Move the DQP adjustment mode with ↑ and ↓ keys, adjust the focus of the upper ME pattern to the optimum.
24. Repeat Steps 21 to 23 several times to adjust the ME pattern to the optimum while adjusting the tracking.
25. Press the POSITION (+) key to set to "POSITION No. 3" mode.
26. Adjust it in the same way as Steps 19 to 24.
27. Adjust "POSITION No. 4" to "POSITION No. 9" in the same way as Steps 25 and 26.
28. Press the MEMORY key to save the adjustment data.
29. Perform the MG FOCUS adjustment of RED and BLUE in the same way as GREEN.
30. Save the data after adjustment.



* The number in the figure indicates the POSITION during AQP, DOP, AHP, and DHP adjustments.

3-4-11. VIDEO Block MG FOCUS Adjustment

1. Press the INPUT SELECT VIDEO key, and receive the NTSC monoscope signal.
2. Press the MG FOCUS key and the ADJ G key to set the GREEN MG FOCUS adjustment mode and press the CUT OFF R key and B key to set GREEN only. Roughly adjust "ALL FOCUS" at POSITION No. 1.
3. Roughly adjust GREEN "CENT," "SIZE," "LIN," "BOW," "SKEW," "PIN" and "KEY."
4. Perform the rough adjustment of RED and BLUE in the same way as Steps 2 and 3.
5. Set the MG FOCUS GREEN adjustment mode again, and press the CUT OFF R key and the B key to set GREEN only.
6. Press the CONTR (+) key and set the contrast to the maximum.
7. Decrease the "ALL" data and increase the dot size.
8. Adjust AQP, DQP, AHP and DHP so that the dot can become dead-round.
9. Return the CONTR data back to "80."
10. Press the POSITION (+) key to set to "POSITION No. 1" mode.
11. Perform the "ALL-FOCUS" adjustment and adjust the focus of the ME pattern to the optimum.
12. Roughly adjust the GREEN centering again.
13. Using the same method as in 3-4-10, "3.15 kHz MG FOCUS Adjustment," adjust the GREEN MG FOCUS, AQP, DQP, AHP and DHP of "POSITION No. 2" to "POSITION No. 9" of the video signal block (15 kHz).
14. Adjust RED and BLUE in the same way as above.

3-4-12. MG FOCUS Adjustment for 64 kHz and 106 kHzSignals

1. Set INPUT-A to the no-signal state, then select INPUT-A. Select the INT OSC PATTERN from INP. OSC menu, then select P5 (fH = 64 kHz, fV = 60 Hz). Perform the same adjustment as Section 3-4-11 "Video Block MG FOCUS Adjustment."
2. Select P8 (fH = 106 kHz, fV = 85 Hz), then perform the same adjustment as Section 3-4-11 "Video Block MG FOCUS Adjustment."

3-4-13. Adjustment of Other Frequencies

Adjustment of the other frequencies are automatically performed by copying the adjusted data in accordance with the next adjustment "3-5. REGISTRATION ADJUSTMENT."

3-5. REGISTRATION ADJUSTMENT

3-5-1. INPUT MEMORY No. 0 Adjustment

1. Input the monoscope signal to VIDEO IN.
2. Press the BLKG key and move the top blanking outside the effective screen with the ↑ key.
3. Press the POSITION (+) key and move the bottom blanking outside the effective screen with the ↓ key.
4. Press the POSITION (+) key and move the left blanking outside the effective screen with the ← key.
5. Press the POSITION (+) key and move the right blanking outside the effective screen with the → key.
6. Press the MEMORY key.
7. Press the REGISTRATION CENT key and the ADJ G key to set the GREEN adjustment mode.
8. Adjust the vertical and horizontal lines to the screen center lines using the ↑, ↓, ← and → keys.
9. Press the REGISTRATION SIZE key to adjust the outer circumference of the cross-hair to the position 60 ±20 mm inside the screen using the ↑, ↓, ← and → keys.
10. Set the modes of LIN, SKEW, BOW, KEY, KEY (TOP/BOTTOM/LEFT/RIGHT), PIN, PIN (TOP/BOTTOM/LEFT/RIGHT) and ZONE, then adjust them to the values within the specification using the arrow keys (up to 21 blocks).

    Note:
    - **For adjusting four corners, use KEY, KEY (TOP/BOTTOM/LEFT/RIGHT), PIN, PIN (TOP/BOTTOM/LEFT/RIGHT). The adjusted value of "POSITION No. 1" – "POSITION No. 9" in ZONE adjustment should be "128 ±5."**
    - **When the size is deviated during adjustment, adjust it as required.**

11. Press the MEMORY key.
12. Press the REGISTRATION CENT key and the ADJ R key to set the RED adjustment mode, then adjust the vertical and horizontal lines of RED to the GREEN center lines using the ↑, ↓, ← and → keys.
13. Press the REGISTRATION SIZE key to adjust the outer circumference of the cross-hair to the position 60 ±20 mm inside the screen using the ↑, ↓, ← and → keys.
14. Set the modes of LIN, SKEW, BOW, KEY, KEY (TOP/BOTTOM/LEFT/RIGHT), PIN, PIN (TOP/BOTTOM/LEFT/RIGHT) and ZONE, then adjust them to the values within the specification using the arrow keys (up to 21 blocks).

    Note:
    - **For adjusting four corners, use KEY, KEY (TOP/BOTTOM/LEFT/RIGHT), PIN, PIN (TOP/BOTTOM/LEFT/RIGHT). The adjusted value of "POSITION No. 6 to "POSITION No. 9" in ZONE adjustment should be "128 ±5."**
    - **When the size is deviated during adjustment, adjust it as required.**

15. Press the MEMORY key.
16. Adjust BLUE in the same way.
17. Copy the adjusted data to INPUT MEMORY No. 1 and INPUT MEMORY No. 2.

3-5-2. INPUT MEMORY No. 3 Adjustment

1. Set INPUT-A to the no-signal state, then select INPUT-A. Select the INT OSC PATTERN from INT. OSC menu with the MENU key, then select P3 (fH = 31.5 kHz, fV = 60 Hz).
2. Press the BLKG key and move the top blanking outside the effective screen with ↑ key.
3. Press the POSITION (+) key and move the bottom blanking outside the effective screen with the ↓ key.
4. Press the POSITION (+) key and move the left blanking outside the effective screen with the ← key.
5. Press the POSITION (+) key and move the right blanking outside the effective screen with the → key.
6. Press the MEMORY key.
7. Press the REGISTRATION CENT key and the ADJ G key to set the GREEN adjustment mode.
8. Adjust the vertical and horizontal lines to the screen center lines using the ↑, ↓, ← and → keys.
9. Press the REGISTRATION SIZE key to adjust the outer circumference of the cross-hair to the position 60 ±20 mm inside the screen using the ↑, ↓, ← and → keys.
10. Set the modes of LIN, SKEW, BOW, KEY, KEY (TOP/BOTTOM/LEFT/RIGHT), PIN, PIN (TOP/BOTTOM/LEFT/RIGHT) and ZONE, then adjust them to the values within the specification using the arrow keys (up to 21 blocks).

    Note: When the size is deviated during adjustment, adjust it as required.

11. Press the MEMORY key.
12. Copy the adjusted data to INPUT MEMORY No. 4, INPUT MEMORY No. 11, and INPUT MEMORY No. 12.

3-5-3. INPUT MEMORY No. 5 Adjustment

1. Set INPUT-A to the no-signal state, then select INPUT-A. Select the INT OSC PATTERN from INT. OSC menu with the MENU key, then select P3 (fH = 64 kHz, fV = 60 Hz).
2. Press the BLKG key and move the top blanking outside the effective screen with the ↑ key.
3. Press the POSITION (+) key and move the bottom blanking outside the effective screen with the ↓ key.
4. Press the POSITION (+) key and move the left blanking outside the effective screen with the ← key.
5. Press the POSITION (+) key and move the right blanking outside the effective screen with the → key.
6. Press the MEMORY key.
7. Press the REGISTRATION CENT key and the ADJ G key to set the GREEN adjustment mode.
8. Adjust the vertical and horizontal lines to the screen center lines using the ↑, ↓, ← and → keys.
9. Press the REGISTRATION SIZE key to adjust the outer circumference of the cross-hair to the position 60 ±20 mm inside the screen using the ↑, ↓, ← and → keys.
10. Set the modes of LIN, SKEW, BOW, KEY, KEY (TOP/BOTTOM/LEFT/RIGHT), PIN, PIN (TOP/BOTTOM/LEFT/RIGHT) and ZONE, then adjust them to the values within the specification using the arrow keys (up to 21 blocks).

    Note: When the size is deviated during adjustment, adjust it as required.

11. Press the MEMORY key.
12. Copy the adjusted data to INPUT MEMORY No. 6 and INPUT MEMORY No. 7.

3-5-4. INPUT MEMORY No. 8 Adjustment

1. Set INPUT-A to the no-signal state, then select INPUT-A. Select the INT OSC PATTERN from INT. OSC menu with the MENU key, then select P3 (fH = 106 kHz, fV = 60 Hz).
2. Press the BLKG key and move the top blanking outside the effective screen with the ↑ key.
3. Press the POSITION (+) key and move the bottom blanking outside the effective screen with the ↓ key.
4. Press the POSITION (+) key and move the left blanking outside the effective screen with the ← key.
5. Press the POSITION (+) key and move the right blanking outside the effective screen with the → key.
6. Press the MEMORY key.
7. Press the REGISTRATION CENT key and the ADJ G key to set the GREEN adjustment mode.
8. Adjust the vertical and horizontal lines to the screen center lines using the ↑, ↓, ← and → keys.
9. Press REGISTRATION SIZE key to adjust the outer circumference of the cross-hair to the position 60 ±20 mm inside the screen using the ↑, ↓, ← and → keys.
10. Set the modes of LIN, SKEW, BOW, KEY, KEY (TOP/BOTTOM/LEFT/RIGHT), PIN, PIN (TOP/BOTTOM/LEFT/RIGHT) and ZONE, then adjust them to the values within the specification using the arrow keys (up to 21 blocks).

    Note: When the size is deviated during adjustment, adjust it as required.

11. Press the MEMORY key.
12. Copy the adjusted data to INPUT MEMORY No. 9 and INPUT MEMORY No. 10.

3-5-5. Horizontal/Vertical Reverse Mode Centering Adjustment

1. Turn off the power of the unit.
2. Set S2001 (Horizontal/Vertical Deflection Switch) on the EC Board to the reverse mode.
3. Turn on the power of the unit.
4. Input the NTSC monoscope signal.
5. Press the ON/STANDBY key on the remote commander or the control panel.
6. Check that the horizontal and vertical deflections are reversed.
7. Press the REGISTRATION CENT key and the ADJ G key to set the GREEN adjustment mode.
8. Adjust the horizontal and vertical centering using the ↑, ↓, ← and → keys.
9. Press the MEMORY key.
10. Adjust RED and BLUE in the same way as GREEN.
11. Turn off the main power switch.
12. Return S2001 (Horizontal/Vertical Deflection Switch) on the EC Board to the original settings.

3-6. WHITE BALANCE ADJUSTMENT

3-6-1. Preparations

Equipment required

VPH-G90 (Focus, size, registration, and lens focus had been adjusted completely.)

W/B checker: Philips PM5639/10

Test signal generator: Tektronix TSG-100 or equivalent

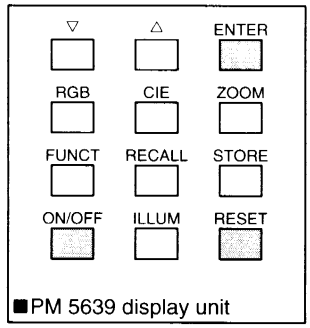
Note: If test signal generator is not available, use internal test signal.

Color temperature setting range

9300 °K/6500 °K/5400 °K/3200 °K + 8MPCD

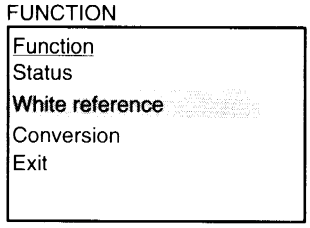
1. Attach a lens-ball of the W/B checker to the lens.
2. Connect a test signal generator.
   If there is no test signal generator, use the test signals generate inside the unit. Press the W/B GAIN key, select 100 IRE White, then select 10 IRE with W/B BIAS key.
3. Press the ON/OFF key on the W/B checker.

Buttons on the Display Unit

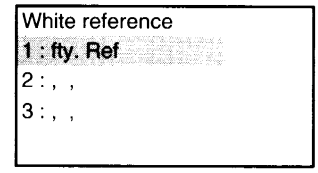


4. Press the FUNCTION key of the W/B checker, select "White reference" with ▲,▼ keys, then press the ENTER key.

FUNCTION

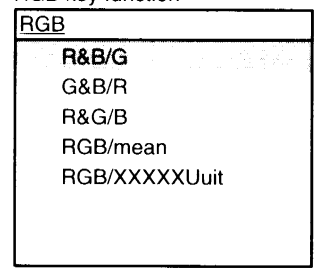


5. Select "1: fty. Ref" from the "White reference" menu with ▲,▼ keys, then press the ENTER key.



6. Press the RGB key, select "R&B/G" with ▲,▼ keys, then press the ENTER key.

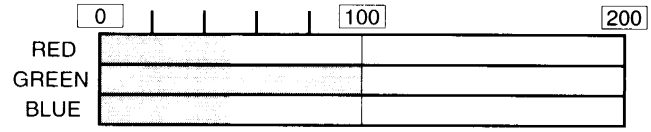
RGB key function



7. Color temperature and bars indications of the W/B checker are as follows:

Color Temp.	R	G	B	x	y
9300	50	100	60	0.283	0.297
6500	60	100	40	0.313	0.329
5400	60	100	30	0.335	0.349
3200	90	100	10	0.427	0.408

Unit: mm



Bars display

3-6-2. Color Temperature Adjustment with a Test Signal Generator

■ Color Temperature 9300 °K Adjustment

1. Turn on the power and warm up for about 20 minutes.
2. Input the 100 IRE White signal to the VIDEO IN connector.
3. Press the W/B GAIN key, and select "9300" with POSITION +/− keys.
4. Press the PATTERN key several times to select the 100 IRE White signal input at VIDEO IN connector.
5. Press the ADJ G key to set the GREEN adjustment mode, and adjust the gain for maximum.
6. Press the STATUS OFF key to erase the characters displayed on the screen.
7. Attach the Lens-ball of the W/B checker to VPH-G90's lens.

[Gain Adjustment (100 IRE)]

Note: Normally, the maximum green bars indication is 200 %; however, it becomes 100 % in GREEN adjustment mode.

8. Press the ADJ B key to set the BLUE adjustment mode.
9. Press the W/B GAIN key. Adjust the blue gain for 60 % with ←, → keys. If not, decrease the green gain with arrow keys.
10. Press the ADJ R key to set the RED adjustment mode. Adjust the red gain for 50 % with ←, → keys.

[Bias Adjustment (10 IRE)]

11. Input the 10 IRE White signal to the VIDEO IN connector.
12. Press the ADJ G key to set the GREEN adjustment mode.
13. Press the W/B BIAS key. Press the CUT OFF R and B keys, then adjust the Y level for 180 % with ←, → keys.
14. Press the ADJ B key to set the BLUE adjustment mode. Adjust the blue gain for 60 % with ←, → keys.
15. Press the ADJ R key to set the RED adjustment mode. Adjust the red gain for 50 % with ←, → keys.
16. Repeat steps 8 to 10 and steps 11 to 15 several times.
17. Press the MEMORY key.
18. Remove the lens-ball attached in step 7.

■ Color Temperature 6500 °K Adjustment

1. Input the 100 IRE White signal to the VIDEO IN connector.
2. Press the W/B GAIN key, and select "6500" with POSITION +/− keys.
3. Press the PATTERN key several times to select the 100 IRE White signal input at VIDEO IN connector.
4. Press the ADJ G key to set the GREEN adjustment mode, and adjust the gain for maximum.
5. Press the STATUS OFF key to erase the characters displayed on the screen.
6. Attach the Lens-ball of the W/B checker to VPH-G90's lens.

[Gain Adjustment (100 IRE)]

Note: Normally, the maximum green bars indication is 200 %; however, it becomes 100 % in GREEN adjustment mode.

7. Press the ADJ B key to set the BLUE adjustment mode.
8. Press the W/B GAIN key. Adjust the blue gain for 40 % with ←, → keys. If not, decrease the green gain with arrow keys.
9. Press the ADJ R key to set the RED adjustment mode. Adjust the red gain for 60 % with ←, → keys.

[Bias Adjustment (10 IRE)]

10. Input the 10 IRE White signal to the VIDEO IN connector.
11. Press the ADJ G key to set the GREEN adjustment mode.
12. Press the W/B BIAS key. Press the CUT OFF R and B keys, then adjust the Y level for 180 % with ←, → keys.
13. Press the ADJ B key to set the BLUE adjustment mode. Adjust the blue gain for 40 % with ←, → keys.
14. Press the ADJ R key to set the RED adjustment mode. Adjust the red gain for 60 % with ←, → keys.
15. Repeat steps 7 to 9 and steps 10 to 14 several times.
16. Press the MEMORY key.
17. Remove the lens-ball attached in step 6.

■ Color Temperature 5400 °K Adjustment

1. Input the 100 IRE White signal to the VIDEO IN connector.
2. Press the W/B GAIN key, and select "5400" with POSITION +/− keys.
3. Press the PATTERN key several times to select the 100 IRE White signal input at VIDEO IN connector.
4. Press the ADJ G key to set the GREEN adjustment mode, and adjust the gain for maximum.
5. Press the STATUS OFF key to erase the characters displayed on the screen.
6. Attach the Lens-ball of the W/B checker to VPH-G90's lens.

[Gain Adjustment (100 IRE)]

Note: Normally, the maximum green bars indication is 200 %; however, it becomes 100 % in GREEN adjustment mode.

7. Press the ADJ B key to set the BLUE adjustment mode.
8. Press the W/B GAIN key. Adjust the blue gain for 30 % with ←, → keys.
9. Press the ADJ R key to set the RED adjustment mode. Adjust the red gain for 60 % with ←, → keys.

[Bias Adjustment (10 IRE)]

10. Input the 10 IRE White signal to the VIDEO IN connector.
11. Press the ADJ G key to set the GREEN adjustment mode.
12. Press the W/B BIAS key. Press the CUT OFF R and B keys, then adjust the Y level for 180 % with ←, → keys.
13. Press the ADJ B key to set the BLUE adjustment mode. Adjust the blue gain for 30 % with ←, → keys.
14. Press the ADJ R key to set the RED adjustment mode. Adjust the red gain for 60 % with ←, → keys.
15. Repeat steps 7 to 9 and steps 10 to 14 several times.
16. Press the MEMORY key.
17. Remove the lens-ball attached in step 6.

■ Color Temperature 3200 °K Adjustment

1. Input the 100 IRE White signal to the VIDEO IN connector.
2. Press the W/B GAIN key, and select "3200" with POSITION +/− keys.
3. Press the PATTERN key several times to select the 100 IRE White signal input at VIDEO IN connector.
4. Press the ADJ R key to set the RED adjustment mode, and adjust the gain for maximum.
5. Press the STATUS OFF key to erase the characters displayed on the screen.
6. Attach the Lens-ball of the W/B checker to VPH-G90's lens.

[Gain Adjustment (100 IRE)]

Note: Normally, the maximum green bars indication is 200 %; however, it becomes 100 % in GREEN adjustment mode.

7. Press the ADJ R key to set the RED adjustment mode.
8. Press the W/B GAIN key. Adjust the red gain for 90 % with ←, → keys.
9. Press the ADJ B key to set the BLUE adjustment mode. Adjust the blue gain for 10 % with ←, → keys.

[Bias Adjustment (10 IRE)]

10. Input the 10 IRE White signal to the VIDEO IN connector.
11. Press the ADJ G key to set the GREEN adjustment mode.
12. Press the W/B BIAS key. Press the CUT OFF R and B keys, then adjust the Y level for 180 % with ←, → keys.
13. Press the ADJ B key to set the BLUE adjustment mode. Adjust the blue gain for 10 % with ←, → keys.
14. Press the ADJ R key to set the RED adjustment mode. Adjust the red gain for 90 % with ←, → keys.
15. Repeat steps 7 to 9 and steps 10 to 14 several times.
16. Press the MEMORY key.
17. Remove the lens-ball attached in step 6.

3-6-3. Color Temperature Adjustment with No Test Signal Generator

■ Color Temperature 9300 °K Adjustment

1. Turn on the power and warm up for about 20 minutes.
2. Press the W/B GAIN key, and select "9300" with POSITION +/– keys.
3. Press the PATTERN key twice to select the internal 100 IRE White signal.
4. Press the ADJ G key to set the GREEN adjustment mode, and adjust the gain for maximum.
5. Press the STATUS OFF key to erase the characters displayed on the screen.
6. Attach the Lens-ball of the W/B checker to VPH-G90's lens.

[Gain Adjustment (100 IRE)]

Note: Normally, the maximum green bars indication is 200 %; however, it becomes 100 % in GREEN adjustment mode.

7. Press the ADJ B key to set the BLUE adjustment mode.
8. Press the W/B GAIN key. Adjust the blue gain for 60 % with ←, → keys. If not, decrease the green gain with arrow keys.
9. Press the ADJ R key to set the RED adjustment mode. Adjust the red gain for 50 % with ←, → keys.

[Bias Adjustment (10 IRE)]

10. Press the ADJ G key to set the GREEN adjustment mode.
11. Press the W/B BIAS key.
12. Press the PATTERN key twice to select the internal 10 IRE White signal.
13. Adjust the Y level for 180 % with ←, → keys.
14. Press the ADJ B key to set the BLUE adjustment mode. Adjust the blue gain for 60 % with ←, → keys.
15. Press the ADJ R key to set the RED adjustment mode. Adjust the red gain for 50 % with ←, → keys.
16. Repeat steps 7 to 9 and steps 10 to 15 several times.
17. Press the MEMORY key.
18. Remove the lens-ball attached in step 6.
19. Perform adjustment of 6500 °K/5400 °K/3200 °K in the same manner of above.

3-7. SIZE/SHIFT BLKG ADJUSTMENT

3-7-1. SIZE/SHIFT/BLKG of Video/HDTV Adjustment

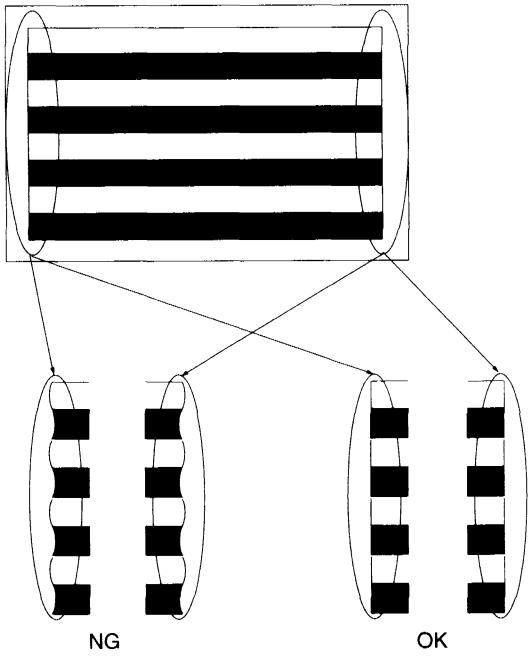
1. Input the monoscope signal to VIDEO IN.
2. Press the INPUT SELECT VIDEO key to project the monoscope signal on the screen.
3. Press the RGB SHIFT key and adjust the center of the monoscope signal to the screen center using the ↑, ↓, ← and → keys.
4. Press the RGB SIZE key and adjust the horizontal and vertical sizes of the monoscope signal using the ↑, ↓, ← and → keys.
5. Press the BLKG key to adjust the screen top blanking to the position 40 ±10 mm outside the effective screen using ↑ and ↓ keys.
6. Press the MEMORY key.
7. Input the HDTV monoscope signal to INPUT A.
8. Press the MENU key and select Initial Setting 1, then select HDTV-YPBPR from INPUT A.
9. Select INPUT A to project the HDTV monoscope signal on the screen.
10. Press the RGB SHIFT key and adjust the center of the monoscope signal to the screen center using the ↑, ↓, ← and → keys.
11. Press the RGB SIZE key and adjust the horizontal and vertical sizes of the monoscope signal using the ↑, ↓, ← and → keys.
12. Press the BLKG key to adjust the screen top blanking to the position 40 ±10 mm outside the effective screen using ← and → keys.
13. Press the MEMORY key.
14. Press the MENU key and select Initial Setting 1, then select RGB from INPUT A.

3-7-2. Video Memory SIZE/SHIFT/BLKG Adjustments

1. Input the monoscope signal to VIDEO IN.
2. Press the INPUT SELECT VIDEO key to project the monoscope signal on the screen.
3. Select VIDEO MEMORY 1 using the SWITCHER/ VIDEO MEMORY/INDEX changing switch and the SWITCHER/VIDEO MEMORY/INDEX key.
4. Press the RGB SHIFT key and adjust the center of the monoscope signal to the screen center using the ↑, ↓, ← and → keys.
5. Press the RGB SIZE key and adjust the horizontal and vertical sizes of the monoscope signal to 4:3 using the ↑, ↓, ← and → keys.
6. Press the BLKG key to adjust the screen top blanking to the position 40 ±10 mm outside the effective screen using ↑ and ↓ keys.
7. Press the MEMORY key.
8. Store the data of VIDEO MEMORY 1 to VIDEO MEMORY 2 to 5, too.
9. Select VIDEO MEMORY 6.
10. Press the RGB SHIFT key and adjust the center of the monoscope signal to the screen center using the ↑, ↓, ← and → keys.
11. Press the RGB SIZE key and adjust the horizontal and vertical sizes of the monoscope signal to 4:3 using the ↑, ↓, ← and → keys.
12. Press the BLKG key to adjust the screen top blanking to the position 40 ±10 mm outside the effective screen using ← and → keys.
13. Store the data of VIDEO MEMORY 6 to VIDEO MEMORY 7−10, too.

3-8. HIGH VOLTAGE SCREEN DISTORTION ADJUSTMENT

1. Select INPUT A and input the fH = 64 kHz RGB stripe signal to the RGB terminals.
2. Press CONTR (+) and BRIGHT (+) to set the contrast and bright levels to the maximum.
3. Adjust RV1 of the EA board so that the left and right vertical lines of the stripes can be straight.



3-9. PROCEDURE AFTER COMPLETING ADJUSTMENTS

After completing all adjustment, change the dip switch S201-1 on the YA board from "OFF (right)" to "ON (left)" to save the adjustment data in the memory.