

SECTION 3 ADJUSTMENTS

3-1. Basic Adjustments

Note 1: Precautions Upon Adjusting

- When the CRT has been replaced, fix DY, and decide the position of the neck assembly before beginning adjustments.
- The service mode can be exited by turning OFF the power.

1-2-2. Video Back Voltage Adjustment

- (1) Connect a digital voltmeter between the \oplus and GND of C101 of the CF board.
- (2) Turn ON the POWER, adjust RD100 of the CF board, and set it to $+195 \pm 0.5V$.

1-1. Attaching the Neck Assembly

1. Fix DY to the CRT funnel, and then fix the sub DY.
2. Secure the 2-pole and 4-pole magnet assemblies 6 to 8 mm away from the sub DY.
3. Attach the CB, CG and CR board.

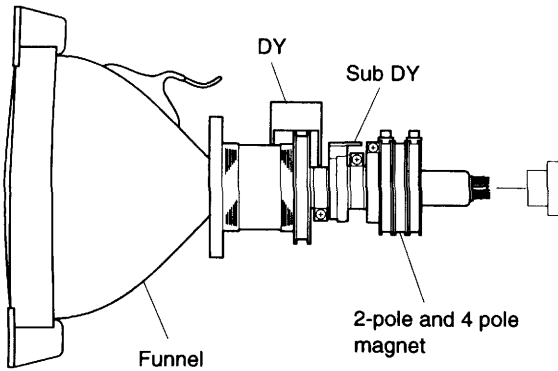


Fig. 1

1-2. Adjusting Conditions

1-2-1. Projector

- (1) Place the unit on a table which satisfies the projection conditions in Fig. 2.
- (See Fig. 2-1, Fig. 2-2, Fig. 2-3.)

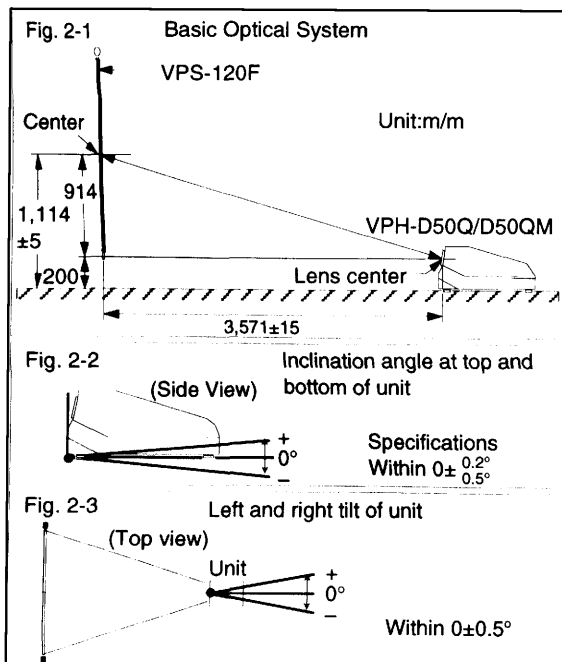


Fig. 2

1-3. Focus Adjustment

- Open the serviceman adjustment cover of the remote commander.

1-3-1. Focus Rough Adjustment

- (1) Set INPUT-A to the no-signal state, press the INPUT A key, and select P3 of the internal oscillation frequency of the service setting mode.
Set the service mode.
- (2) Press the REGISTRATION CENTER ADJ G key, and display the cross-hair.
- (3) Press the CUT OFF key to set GREEN only.
- (4) Adjust the focus of the screen center by GREEN lens main focusing.
- (5) Adjust the focus of the screen center by GREEN electrical focusing.
- (6) Adjust the top, bottom, left, and right focus of the screen by GREEN lens peripheral focusing.
- (7) Adjust in the same way for RED and BLUE.

1-3-2. FACTORY RESET

- (1) Continue pressing the RESET key to set the ALL RESET mode.
- (2) Select YES, press the **[ENTER]** key, select ALL INPUT, and press the **[ENTER]** key.
- (3) Select FACTORY DATA RESET, and press the **[ENTER]** key to set the FACTORY RESET state.
- (4) Turn OFF the power, and turn OFF the MAIN POWER.
- (5) Open the DE bracket, disconnect the 2P short-circuit connector inserted in CN933, and insert it into CN932.
- (6) Turn ON the MAIN POWER, and turn on the power using the remote commander.

1-3-3. Convergence angle adjustment

- (1) Press the INPUT A key. Set NO INPUT (31.5kHz).
- (2) Press the REGISTRATION CENT ADJ G key, and output the cross-hair.
If the horizontal line on the screen is slanting, rotate DY and adjust it roughly so that it becomes horizontal.
- (3) Look inside the GREEN LENS, and if the cross-hair center vertical line is not at the center of the screen, adjust so using the ◀, ▶ arrow keys.
- (4) Likewise, adjust the cross-hair center vertical line to the center of the screen for RED and BLUE as well.
- (5) Press the CUTOFF R and B keys to set GREEN only.

- (6) Check if the GREEN cross-hair vertical line is at the center of the screen.

If it is not, move the unit so that cross-hair vertical line comes to the center of the screen.

If the line is still not at the center of the screen, loosen the four screws of the CRT bracket securing the GREEN CRT, and move the GREEN CRT so that the line comes to the center of the screen.

- (7) Press the ADJ R key, and adjust CENT only in the V direction using the ▲ and ▼ arrow keys.
- (8) Press the ADJ B key, and adjust CENT only in the V direction using the ▲ and ▼ arrow keys.
- (9) Press the CUT OFF B key to set only RED and GREEN.
- (10) Loosen the four screws securing the CRT bracket of RED so that convergence angle adjustment can be performed.
- (11) Adjust the convergence angle so that the RED vertical line coincides with the GREEN vertical line on the screen.
- (12) Tighten the loosened screws temporarily while ensuring that the RED vertical line does not deviate from the GREEN vertical line by watching the screen.
(Tighten from the screws on the GREEN CRT side.)
- (13) Adjust the BLUE convergence angle in the same way as RED.
- (14) After adjusting BLUE, tighten the ten screws.

Tightening torque: 1.5N • m (15KgF • Cm)

- (15) Check that the RED CENT and BLUE CENT are coinciding with the GREEN CENT.

Specification: Within one cross-hatch

1-3-4. DY, SUB DY angle adjustment

- (1) Set the SIZE ADJ G mode, and set the GREEN H SIZE to the 20 to 40 mm position inside of the screen using the ◀ and ▶ arrow keys. (Adjust H.LIN roughly if it is not correct.)
- (2) Perform rough adjustments for RED and BLUE as well if H.SIZE and H.LIN are not correct.
- (3) Check that the V.SKEW and V.BOW of R, G, and B is 128. (Set it to 128 if not.)
- (4) Open the ED bracket.
- (5) Check that the SUB DY terminals (connectors) of R, G, and B are mechanically at the top. (If they are not, adjust so that they come to the top.)

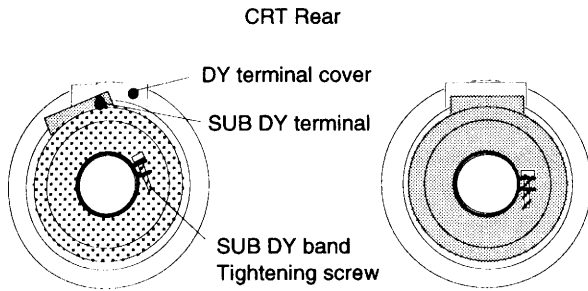


Fig. 3

- (6) Press the CUT OFF R and B keys to set only GREEN.
- (7) Adjust the GREEN DY angle, adjust the horizontal line of the cross-hair to the horizontal line on the screen, and fix DY.

DY band tightening torque:

80 to 120N • Cm (8.16 to 12.24 KgF • Cm)

* DY should be attached firmly to the CRT funnel.

- (8) Fix SUB DY so that the SUB DY terminal (connector) is at the top.

SUB DY band tightening torque:

80 to 120N • Cm (8.16 to 12.24 KgF • Cm)

- (9) Adjust the RED and BLUE DYs in the same way.
- (10) Check that the RGB horizontal lines on the screen are correct.

1-3-5. Registration rough adjustment

- (1) Press the SKEW ADJ G key to set only GREEN.
- (2) Adjust so that the GREEN vertical line coincides with the vertical line on the screen using the ◀ and ▶ arrow keys..
- (3) Press the BOW key, and adjust so that the GREEN vertical line coincides with the vertical line on the screen using the ◀ and ▶ arrow keys.
- (4) Press the KEY key, and adjust so that the horizontal line at the top coincides with the vertical line at the bottom using the ◀ and ▶ arrow keys.
- (5) Press the PIN key, and adjust so that the top, bottom, left, and right vertical and horizontal lines become straight using the ◀, ▶, ▲ and ▼ arrow keys.
- (6) Check that the cross-hatch on the screen is more or less square.
- (7) Press the CUT OFF R key, and press the ADJ R key.
- (8) Adjust the CENT, SIZE, LIN, SKEW (H only), BOW, and (KEY) (V only) of RED in the same way according to GREEN.
- (9) Adjust the CENT, SIZE, LIN, SKEW (H only), BOW, and (KEY) (V only) of BLUE in the same way according to GREEN or RED.
- (10) After completing the registration rough adjustments for R, G, and B, press the MEMORY key.
- (11) Press the RGB SHIFT key. Adjust so that the image comes to the center of the screen using the ◀, ▶, ▲ and ▼ arrow keys.

1-3-6. 2/4-pole Mg adjustment

- (1) Set the internal oscillation mode to P5 (64 kHz), Press the PATTERN key and select the DOT pattern.
- (2) Press the CUTOFF R and B keys and set GREEN only. (If the DOT appears blur, press the + CONTR key so that it becomes clear.)
- (3) Rotate G4 VOL GREEN in the counterclockwise direction, and output flair around the dots.
- (4) While looking at the dots at the center, adjust the 2-pole Mg so that the luminance points come to the center of the flare. (See Fig. 4.)
- (5) Rotate G4 VOL GREEN in the clockwise direction.
- (6) Adjust the 4-pole Mg so that the dots become dead-round. (See Fig. 1.)

2/4-pole Mg adjustment

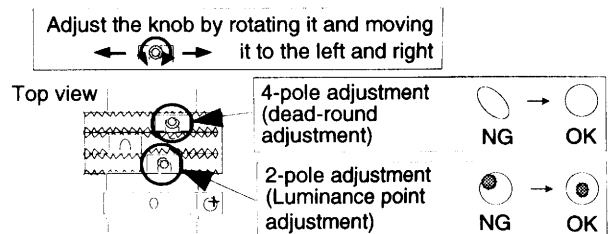


Fig. 4

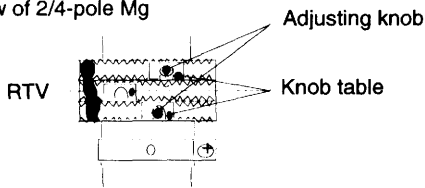
- (7) Adjust the 2-pole Mg and 4-pole Mg while performing tracking 2 or 3 times.

* The 2/4-pole Mg should be attached firmly to the Sub DY.

- (8) Adjust the RED and BLUE 2/4-pole MG in the same way.
- (9) Apply RTV to the 2/4-pole Mgs of RED, GREEN, and BLUE to secure them.
(See Fig. 5.)
- (10) Set the internal oscillation mode back to P3.

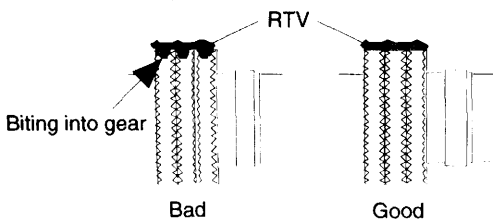
Applying RTV

Top View of 2/4-pole Mg



* Do not apply RTV on the adjusting knob and knob table.

Side View of 2/4-pole MG



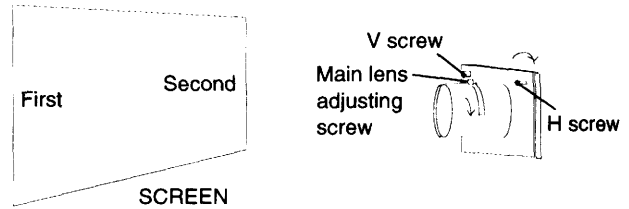
* Do not apply inside the gear.

Fig. 5

1-3-7. Zenith angle adjustment

- (1) Press the PATTERN key, and select the ME pattern.
- (2) Press the CUT OFF R and G keys to set only GREEN.
- (3) Adjust the electrical focus (G4VOL) so that the focus of the screen center becomes correct.
- (4) Adjust RED and BLUE in the same way.
- (5) Set GREEN only again, and decrease the data value using the - CONTR key until the DOT of the ME pattern becomes clear.
- (6) Loosen the screws securing the zenith angle adjusting screws for R, G, and B.

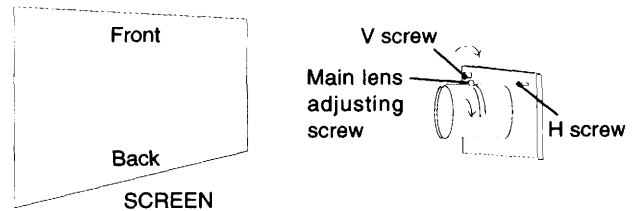
- (7) Rotate and adjust the zenith angle adjusting screw of H so that the left and right focuses of the screen become correct.



Rotate the main focus lens in the clockwise direction, and if the left focuses at first and the right at second, rotate the H adjusting screw in the clockwise direction.

Fig. 6

- (8) Rotate and adjust the zenith angle adjusting screw of V so that the top and bottom focuses of the screen become correct.



Rotate the main focus lens in the clockwise direction, and if the top focuses at first and the bottom at second, rotate the V adjusting screw in the clockwise direction.

Fig. 7

- (9) After completing the top and bottom focus adjustment, check that the left and right focuses are correct.
(If they are not, re-adjust them again, and then check again of the top and bottom focuses are correct.)
- (10) Tighten the screws securing the zenith angle adjusting screws temporarily.
- (11) Check again if the top, bottom, left, and right focuses are correct.
(If they are not, loosen the screws securing the zenith angle adjusting screws, and adjust the zenith angle.)
- (12) Adjust the main lens, and adjust the focus of the screen center.
- (13) Adjust the peripheral lens, and adjust the focus of the screen corners.
- (14) Adjust RED and BLUE in the same way.
- (15) Secure the screws securing the zenith angle adjusting screws.

Screw tightening torque for securing the zenith angle adjusting screw: 1.2N • Cm (12KgF • Cm)

- (16) Secure the main lens and peripheral lens adjusting knob screws.

Main lens: Tightening torque: 0.9N • Cm (9KgF • Cm)

Peripheral lens: Tightening torque: 0.9N • Cm (9KgF • Cm)

1-3-8. Electrical focus adjustment

- (1) Set INPUT-A to the no-signal state, and press the INPUT-A key.
- (2) Set the CONTR data to 80 using the + and – CONTR keys.
- (3) Press the PATTERN key and set the reverse ME pattern on the screen.
- (4) Cover RED and BLUE with a lens cap to set GREEN only.
- (5) Rotate and adjust the electrical focus (G4 VOL) GREEN and focus correctly.
- (6) Adjust RED and BLUE in the same way.

1-3-9. HWC adjustment

- (1) Press the INPUT VIDEO key, and input the monoscope signal.
- (2) Press the REGISTRATION SIZE key, and press the ADJ G key.
- (3) Check that the H SIZE data is 128.

* If it is not, adjust to 128 using the ◀ and ▶ arrow keys.

- (4) Press the ADJ R key, and check as above.
- (5) Press the ADJ B key, and check as above.
- (6) Press the REGISTRATION CENT key, and press the ADJ G key.
- (7) Press the CUT OFF R and B keys to set GREEN only.
- (8) Adjust so that the center of the cross-hair comes to the center line of the screen using the ◀, ▶, ▲ and ▼ arrow keys.
If V.SKEW and V.BOW are not correct, adjust them to the horizontal line of the screen.
- (9) Press the ADJ R key, and adjust as above. (Adjust to GREEN.)
- (10) Press the ADJ B key, and adjust as above. (Adjust to GREEN.)
- (11) Output the three colors R, G, and B, and while looking at the two ends on the left and right of the horizontal cross-hair, if the RED and BLUE H.LINs are not coinciding with that of GREEN, adjust them so that the left and right differences become the same.
- (12) Press the MEMORY key.
- (13) Adjust LV1 (BLUE), LV2 (GREEN), and LV3 (RED) of the E board so that the H sizes of two colors (RED, GREEN, or BLUE) become the same as the color with the smallest H size.
- (14) Press the REGISTRATION SIZE key, and press the ADJ G key.
- (15) Press the CUT OFF R and B keys to set GREEN only.
- (16) Adjust so that the outer circumference line of the cross-hair is 20 to 40 mm inside the effective frame of the screen using the ◀, ▶, ▲ and ▼ arrow keys. If V.LIN is not correct, adjust by performing SIZE and LIN tracking.
- (17) Press the KEY key, and adjust so that the lengths of the top horizontal line and bottom horizontal line become the same using the ◀ and ▶ arrow keys.

- (18) Press the Pin key, and adjust so that the top, bottom, left, and right horizontal and vertical lines become straight using the ◀, ▶, ▲ and ▼ arrow keys.
- (19) Press the RGB SIZE key, and set the H.SIZE data to 220 using the ◀ and ▶ arrow keys.
- (20) Press the RGB SHIFT key and adjust the monoscope center to the screen center.
- (21) Cover RED and BLUE with a lens cap.
- (22) Look at the left and right ends of the monoscope, and if H.LIN is not correct, press the REGISTRATION LIN key again and adjust LIN.
- (23) Rotate RV101 (H SIZE) of the E board and adjust it so that the H size of the monoscope becomes 16 frames.
- (24) Adjust the H size of the monoscope to 16 frames using the ◀ and ▶ arrow keys.
- (25) Adjust the V size of the monoscope to 12 frames using the ▲ and ▼ arrow keys.
- (26) Check that the monoscope center is coinciding with the screen center.
(If it is not, adjust by RGB SHIFT again.)
- (27) Press the MEMORY key.

1-3-10. Pick up coil adjustment

- (1) Press the INPUT-A key, and input the specified signal.
Specified signal: No. 25 (all white), fH:3.5 kHz, fV:66.667 Hz
(Refer to Page 3-11.)
- (2) Press the CUT OFF R and G keys to set only BLUE.
- (3) While looking at the screen, adjust RV1 (B.C ADJ (B)) of the DA board so that the beat becomes minimum.
- (4) Press the CUT OFF R and B keys to set only GREEN.
- (5) While looking at the screen, adjust RV2 (B.C ADJ (G)) of the DA board so that the beat becomes minimum.
- (6) Set to all white using the CUT OFF B and R keys.
- (7) Switch the input signal to No. 26, No. 27, and No. 28, and check that there is no async beat.

Input signals:

No. 26 (all white) fH:37.879 kHz, fV:60.32 Hz
No. 27 (all white) fH:56.476 kHz, fV:70.069 Hz
No. 28 (all white) fH:33.75 kHz, fV:60 Hz
(Refer to 3-11.)

1-4. Registration Adjustment

1-4-1. Internal oscillation P3 mode

- (1) Press the INPUT-A key and set the NO INPUT (31.5 KHz) state.
 - (2) Press the REGISTRATION CENT key and ADJ G key, and set the GREEN adjustment mode.
 - (3) Adjust so that the vertical and horizontal lines come to the center line of the screen using the ◀, ▶, ▲ and ▼ arrow keys.
 - (4) Press the REGISTRATION SIZE key, and adjust so that the outer circumference of the cross-hair is at the approximately 30 m/m position inside the screen using the ◀, ▶, ▲ and ▼ arrow keys.
 - (5) Set the modes LIN, SKEW, BOW, KEY, KEY BALANCE, PIN, PIN BALANCE, ZONE (Do not use ZONE as much as possible. Of the 21 blocks, adjust only the No.2 and No. 9 blocks.), and adjust to the respective specified values using the arrow keys.
- (See Fig. 8.)

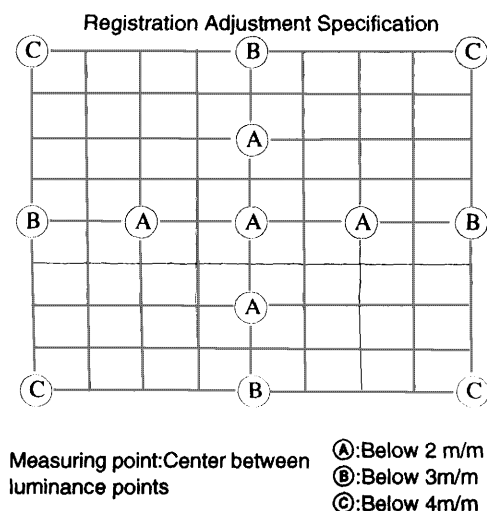


Fig. 8

* During the adjustment, adjust SIZE and CENT if they have deviated.

- (6) Press the MEMORY key.
- (7) Press the REGISTRATION CENT key and ADJ R key, and adjust the RED vertical and horizontal lines to the GREEN center line using the ◀, ▶, ▲ and ▼ keys.
- (8) Press the REGISTRATION SIZE key, and adjust so that the outer circumference of the cross-hair is at the approximately 30 m/m position inside the screen using the ◀, ▶, ▲ and ▼ arrow keys.
- (9) Set the modes LIN, SKEW, BOW, KEY, KEY BALANCE, PIN, PIN BALANCE, ZONE (For ZONE of 21 blocks, adjust only the No.2 to No.9 blocks.), and adjust to the respective specified values using the arrow keys.

* During the adjustment, adjust SIZE, CENT, etc. if they have deviated.

(10) Press the MEMORY key.

(11) Adjust in the same way for BLUE, and press the MEMORY key.

1-4-2. Standard Data Save

- (1) Continue pressing the MEMORY key and set the standard data save mode, and perform standard data save.

1-4-3. INPUT MEMORY NO. 0,1,3,4 Adjustment

- (1) Press the INPUT-A key and set the NO INPUT (31.5 KHz) state.
Next, set the internal oscillation mode to P1 by the service setting in the MENU.
- (2) Press the REGISTRATION CENT key and ADJ G key, and set the GREEN adjustment mode.
- (3) Adjust the vertical and horizontal lines to the center line of the screen using the ◀, ▶, ▲ and ▼ arrow keys.
- (4) Press the REGISTRATION SIZE key, and adjust the outer circumference of the cross-hair to the approximately 30 m/m position inside the screen using the ◀, ▶, ▲ and ▼ arrow keys.
- (5) Set the modes LIN, SKEW, BOW, KEY, KEY BALANCE, PIN, PIN BALANCE, ZONE (For ZONE of the 21 blocks, adjust only the No.2 to No.9 blocks.), and adjust to the respective specified values using the arrow keys. (See Fig. 9.)

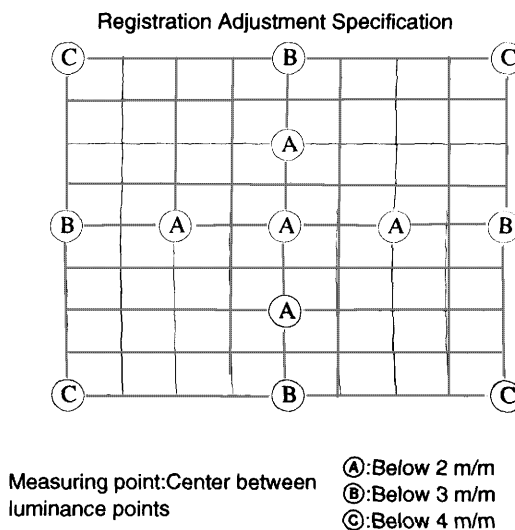


Fig. 9

* During the adjustment, adjust SIZE, CENTER, etc. if they have deviated.

- (6) Press the **MEMORY** key.
- (7) Press the **REGISTRATION CENT** key and **ADJ R** key, adjust the **RED** vertical and horizontal lines to the **GREEN** center line of the screen using the ◀, ▶, ▲ and ▼ arrow keys.
- (8) Press the **REGISTRATION SIZE** key, and adjust the outer circumference of the cross-hair to the approximately 30 m/m position inside the screen using the ◀, ▶, ▲ and ▼ arrow keys.
- (9) Set the modes **LIN**, **SKEW**, **BOW**, **KEY**, **KEY BALANCE**, **PIN**, **PIN BALANCE**, **ZONE** (For **ZONE** of 21 blocks, adjust only the No.2 to No.9 blocks.), and adjust to the respective specified values using the arrow keys.

* During the adjustment, adjust **SIZE**, **CENT**, etc. if they have deviated.

- (10) Press the **MEMORY** key.
- (11) Adjust in the same way for **BLUE**, and press the **MEMORY** key.
- (12) Adjust in the same way for internal oscillation modes **P2**, **P4**, and **P5**.

1-4-4. CENT Adjustment in Polarity Conversion

- (1) Turn OFF the power of the unit, open the polarity change cover, connect the horizontal polarity change connector, and close the polarity change cover.
Turn ON the power.

Positions of connectors: **R** CN531→CN532
G CN533→CN534
B CN535→CN536

- (2) Set **INPUT-A** to the no-signal state.
Set back the internal oscillation mode to **P3**.
- (3) Press the **REGISTRATION CENT** key, and set the center adjustment mode.
- (4) Press the **ADJ G** key, and adjust the center of the cross-hatch to the center of the screen using the ◀ and ▶ arrow keys.
- (5) Press the **ADJ R** key, and adjust the center of the cross-hatch to the center of the screen using the ◀ and ▶ arrow keys.
- (6) Press the **ADJ B** key, and adjust the center of the cross-hatch to the center of the screen using the ◀ and ▶ arrow keys.
- (7) Press the **MEMORY** key.
- (8) Turn OFF the power, open the polarity change cover, and return the horizontal polarity change connector to the original position.
- (9) Turn ON the power of the unit.

1-6. White Balance Adjustment

1-6-1. CUT OFF Check

- (1) Input the 40IRE all white signal into the **C.VIDEO** input.
- (2) Set the **MENU MODE**, and check that **ABG** is ON.
(If it is not, set it to ON.)
- (3) In the same way, check if the color temperature is 9300K and **SCREEN SEL** is **S1**.
(If they are not, set them to **S1**.)
- (4) Press the **W/B BIAS** key, and check that each **BIAS** data is as follows.

BIAS RESET values: **R**:128
G:128
B:128

- (5) Press the **W/B GAIN** key, and record each value.
- (6) Adjust the **RED** and **GREEN** values of **W/B GAIN** to “73” and “148” respectively.
- (7) Set the **CONTR** data to 80 and **BRT** data to 50.
- (8) Attach the **W/B** measuring device, and check that the **GREEN** luminance is within the specification.

W/B measuring device (Color analyzer)
 Model: PWM-801 (SONY)
 Calibration coefficients: **R/G**:1.082
B/G:0.980

Specified value: 3.0 nit

- (9) If it is not, open the **DE** bracket, and adjust it to the specified value using **RV1301** (**BKG LEVEL**) of the **A** board.

1-6-2. BLUE Defocus Adjustment

- (1) Press the **INPUT VIDEO** key, and input the 100IRE all white signal.
- (2) Set the **CONTR** data to 80 and **BRT** data to 50.
- (3) Rotate the electrical focus adjustment (**G4 VOL**) **BLUE** until the **BLUE** luminance becomes minimum, and take this value as **x**.
- (4) Rotate the electrical focus adjustment (**G4 VOL**) **BLUE** in the counterclockwise direction so that the **BLUE** luminance **Y** becomes $xX1.29 \leq Y \leq xX1.31$.

1-6-3. Color Temperature 9300K Adjustment

(Color temperature diagram: $x=0.284$, $y=0.297$)

- (1) Press the INPUT VIDEO key, and input the 100 IRE all white signal.
- (2) Press the W/B GAIN key, and select 9300 using the POSITION +/- keys.
- (3) Press the PATTERN key three times to set the external signal.
- (4) Press the ADJ R key to set the RED adjustment mode.
- (5) Set the display to 73 using the ◀ and ▶ arrow keys.
- (6) Press the ADJ G key to set the GREEN adjustment mode.
- (7) Set the display to 48 using the ◀ and ▶ arrow keys.
- (8) Press the ADJ B key to set the BLUE adjustment mode.
- (9) Check that the BLUE GAIN data is the same as that in "1-6-1. CUT OFF Check" using the ◀ and ▶ arrow keys.
- (10) Press the STATUS OFF key, turn OFF the display, and attach the sensor from the W/B measuring device.

W/B measuring device (Color analyzer)

Model: PWB-801 (SONY)

Calibration coefficients: R/G: 1.082

B/G: 0.980

- (11) Switch to the 10 IRE all white signal.
- (12) Press the BIAS key.
- (13) Press the ADJ G key, and adjust the Y value of the W/B measuring device to 1.00 using the ◀ and ▶ arrow keys.
- (14) Press the ADJ R key, and adjust the R/G value of the W/B measuring device to 1.00 using the ◀ and ▶ arrow keys.
- (15) Press the ADJ B key, and adjust the B/G value of the W/B measuring device to 1.0 using the ◀ and ▶ arrow keys.
- (16) Switch to the 100 IRE all white signal.
- (17) Press the GAIN key to set the gain adjustment mode.
- (18) Press the ADJ G key, and set the B/G value of the measuring device to 1.00 using the ◀ and ▶ arrow keys.
- (19) Press the ADJ R key, and set the R/G value of the measuring device to 1.00 using the ◀ and ▶ arrow keys.
- (20) Repeat the cutoff adjustment in steps (11) to (15) and the highlight adjustment in steps (16) to (19) several times to adjust the tracking.
- (21) When the specifications are satisfied, press the MEMORY key and memorize the 9300K data.

W/B 9300K+8MPCD specifications:

Cutoff: R/G: 1.00 ± 0.15

B/G: 1.00 ± 0.15

Y: 1.00 ± 0.10

Highlight: R/G: 1.00 ± 0.10

B/G: 1.00 ± 0.10

- (22) Remove the sensor from the lens.

1-6-4. Color Temperature 6500K Adjustment

(Color temperature diagram: $x=0.313$, $y=0.329$)

- (1) Press the INPUT VIDEO key, and input the 100 IRE all white signal.
- (2) Press the W/B GAIN key, and select 6500K using the POSITION +/- keys.
- (3) Press the PATTERN key three times to set the external signal.
- (4) Press the ADJ R key to set the RED adjustment mode.
- (5) Set the display to 143 using the ◀ and ▶ arrow keys.
- (6) Press the ADJ G key to set the GREEN adjustment mode.
- (7) Set the display to 202 using the ◀ and ▶ arrow keys.
- (8) Press the ADJ B key to set the BLUE adjustment mode.
- (9) Check that the BLUE GAIN data is the same as that in "1-6-1. CUT OFF Check" using the ◀ and ▶ arrow keys.
- (10) Press the STATUS OFF key, turn OFF the display, and attach the sensor from the W/B measuring device.

W/B measuring device (Color analyzer)

Model: PWB-801 (SONY)

Calibration coefficients: R/G: 1.082

B/G: 0.980

- (11) Switch to the 10 IRE all white signal.
- (12) Press the BIAS key, and output the 10 IRE all white signal.
- (13) Press the ADJ G key, and adjust the Y value of the W/B measuring device to 1.00 using the ◀ and ▶ arrow keys.
- (14) Press the ADJ R key, and adjust the R/G value of the W/B measuring device to 1.16 using the ◀ and ▶ arrow keys.
- (15) Press the ADJ B key, and adjust the B/G value of the W/B measuring device to 0.72 using the ◀ and ▶ arrow keys.
- (16) Switch to the 100 IRE all white signal.
- (17) Press the GAIN key to set the gain adjustment mode.
- (18) Press the ADJ G key, and set the B/G value of the measuring device to 1.16 using the ◀ and ▶ arrow keys.

* If the GREEN GAIN data exceeds the data of "1-6-1. CUT OFF Check" data, set it to the data, and adjust the RED and BLUE GAIN by decreasing the GREEN GAIN data.

- (19) Press the ADJ R key, and set the R/G value of the measuring device to 0.72 using the ◀ and ▶ arrow keys.
- (20) Repeat the cutoff adjustment in steps (11) to (15) and the highlight adjustment in steps (16) to (19) several times to adjust the tracking.

- (21) When the specifications are satisfied, press the MEMORY key and memorize the 6500K data.

W/B 9300K+8MPCD specifications:

Cutoff: R/G: 1.16 ± 1.15

B/G: 0.72 ± 0.15

Y: 1.00 ± 0.10

Highlight: R/G: 1.16 ± 1.10

B/G: 0.72 ± 0.10

- (22) Remove the sensor from the lens.

1-6-5. Color Temperature 5400K Adjustment

(Color temperature diagram: $x=0.335$, $y=0.349$)

- (1) Press the INPUT VIDEO key, and input the 100 IRE all white signal.
- (2) Press the W/B GAIN key, and select 5400K using the POSITION +/- keys.
- (3) Press the PATTERN key three times to set the external signal.
- (4) Press the ADJ R key to set the RED adjustment mode.
- (5) Set the display to 186 using the ◀ and ▶ arrow keys.
- (6) Press the ADJ G key to set the GREEN adjustment mode.
- (7) Check that the GREEN GAIN data is the same as that in "1-6-1. CUT OFF Check" using the ◀ and ▶ arrow keys.
Set the display to 48 using the ◀ and ▶ arrow keys.
- (8) Press the ADJ B key to set the BLUE adjustment mode.
- (9) Set the display to 210 using the ◀ and ▶ arrow keys.
- (10) Press the STATUS OFF key, turn OFF the display, and attach the sensor from the W/B measuring device.

W/B measuring device (Color analyzer)

Model: PWB-801 (SONY)

Calibration coefficients: R/G: 1.082

B/G: 0.980

- (11) Switch to the 10IRE all white signal.
- (12) Press the BIAS key, and output the 10IRE all white signal.
- (13) Press the ADJ G key, and adjust the Y value of the W/B measuring device to 1.00 using the ◀ and ▶ arrow keys.
- (14) Press the ADJ R key, and adjust the R/G value of the W/B measuring device to 1.28 using the ◀ and ▶ arrow keys.
- (15) Press the ADJ B key, and adjust the B/G value of the W/B measuring device to 0.56 using the ◀ and ▶ arrow keys.
- (16) Switch to the 100IRE all white signal.
- (17) Press the GAIN key to set the gain adjustment mode.
- (18) Press the ADJ G key, and set the R/G value of the W/B measuring device to 1.28 using the ◀ and ▶ arrow keys.

- (19) Press the ADJ B key, and set the B/G value of the W/B measuring device to 0.56 using the ◀ and ▶ arrow keys.

* If the BLUE GAIN data exceeds the data of "1-6-1. CUT OFF Check" data, set it to the data, and adjust the RED and GREEN GAIN by decreasing the GREEN GAIN data.

- (20) Repeat the cutoff adjustment in steps (11) to (15) and the highlight adjustment in steps (16) to (19) several times to adjust the tracking.
- (21) When the specifications are satisfied, press the MEMORY key and memorize the 5400K data.

W/B 5400K+8MPCD specifications:

Cutoff: R/G: 1.28 ± 0.15

B/G: 0.56 ± 0.15

Y: 1.00 ± 0.10

Highlight: R/G: 1.28 ± 0.10

B/G: 0.56 ± 0.10

- (22) Remove the sensor from the lens.

1-6-6. Color Temperature 3200K Adjustment

(Color temperature diagram: $x=0.427$, $y=0.408$)

- (1) Press the INPUT VIDEO key, and input the 100IRE all white signal.
- (2) Press the W/B GAIN key, and select 3200K using the POSITION +/- keys.
- (3) Press the PATTERN key to set the external signal.
- (4) Press the ADJ R key to set the RED adjustment mode.
- (5) Check that the RED GAIN data is the same as that in "1-6-1. CUT OFF Check" using the ◀ and ▶ arrow keys.
- (6) Press the ADJ G key to set the GREEN adjustment mode.
- (7) Set the display to 198 using the ◀ and ▶ arrow keys.
- (8) Press the ADJ B key to set the BLUE adjustment mode.
- (9) Set the display to 44 using the ◀ and ▶ arrow keys.
- (10) Press the STATUS OFF key, turn OFF the display, and attach the sensor from the W/B measuring device.

W/B measuring device (Color analyzer)

Model: PWB-801 (SONY)

Calibration coefficients: R/G: 1.082

B/G: 0.980

- (11) Switch to the 10 IRE all white signal.
- (12) Press the BIAS key, and output the 10 IRE all white signal.
- (13) Press the ADJ G key, and adjust the Y value of the W/B measuring device to 1.00 using the ◀ and ▶ arrow keys.
- (14) Press the ADJ R key, and adjust the R/G value of the W/B measuring device to 2.25 using the ◀ and ▶ arrow keys.

- (15) Press the ADJ B key, and adjust the B/G value of the W/B measuring device to 0.22 using the ◀ and ▶ arrow keys.
- (16) Switch to the 100 IRE all white signal.
- (17) Press the GAIN key to set the gain adjustment mode.
- (18) Press the ADJ G key, and set the R/G value of the measuring device to 2.25 using the ◀ and ▶ arrow keys.
- (19) Press the ADJ B key, and set the B/G value of the measuring device to 0.22 using the ◀ and ▶ arrow keys.
- (20) Repeat the cutoff adjustment in steps (11) to (15) and the highlight adjustment in steps (16) to (19) several times to adjust the tracking.
- (21) When the specifications are satisfied, press the MEMORY key and memorize the 3200K data.

W/B 3200K+8MPCD specifications:

Cutoff: R/G: 2.25 ± 0.15

B/G: 0.22 ± 0.15

Y: 1.00 ± 0.10

Highlight: R/G: 2.25 ± 0.10

B/G: 0.22 ± 0.10

- (22) Remove the sensor from the lens.
- (23) Press the STATUS ON key, and set the display.
- (24) Select 6500K, and press the MEMORY key.

1-6-7. Color Temperature PRESET Adjustment

- (1) Press the W/B GAIN key, and select PRESET using the POSITION +/- keys.
- (2) Input the GAIN and BIAS data of 6500K.
- (3) Press the MEMORY key.
- (4) Select 6500K using the POSITION +/- keys.
- (5) Press the MEMORY key.

1-6-8. S2 Settings

- (1) Press the MENU key, and select S2 at the SEL menu of the SET SETTING screen.
- (2) Deduct 26 from the S1 GAIN data for RED and 19 for GREEN and input to 9300K, 6500K, 5400K, 3200K, and PRESET.
The BIAS data must be inputted the same value as S1.
- (3) Set screen SEL to S1.

1-6-9. High Voltage Screen Distortion Adjustment

[1] RV adjustment

- (1) Press the INPUT-A key, and input the fH:31.5 kHz RGB stripe signal.
- (2) Continue pressing the CONTR and BRIGHT + keys until these levels are maximum.
- (3) Adjust RV102 of the E board (HV CORRECT) until the left and right vertical lines of the stripes become straight.

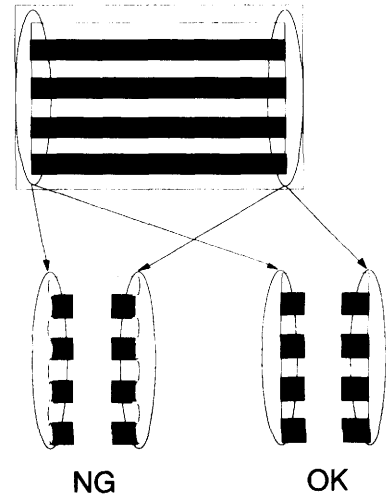


Fig. 10

Note) After completing the adjustment, open the ED bracket, and disconnect the 2P short-connector of CN932 of the M board with the power ON.


1-7. Creating the FACTORY Data



- (1) Press the POWER OFF key of the remote commander, and set the standby mode.
- (2) Open the DE bracket, disconnect the 2P short-connector inserted to CM932 of the M board, and insert into CN933 (FACTORY data is created when disconnected).



VPH-D50 ADJUSTMENT TIMING & ROM DATA


	INPUT MEM No.0	INPUT MEM No.1	INPUT MEM No.2	INPUT MEM No.3	INPUT MEM No.4	INPUT MEM No.5	INPUT MEM No.6
	VIDEO/NTSC	PC98	VESA	VESA	VESA	IDTV	HiVision
HORIZONTAL							
fH (kHz)	15.75	24.83	31.469	48.363	63.981	31.5	33.75
	μs (dot)	μs(dot)	μs(dot)	μs(dot)	μs(dot)	μs(dot)	μs(dot)
H.TOTAL	63.492(910)	40.28(848)	31.778(800)	20.677(1344)	15.630(1688)	31.746(910)	29.63(2200)
H.disp area	53.026(760)	30.40(640)	25.422(640)	15.754(1024)	11.852(1280)	26.513(760)	25.86(1920)
H.sync width	4.744(68)	3.04(64)	3.813(96)	2.092(136)	1.037(112)	2.372(68)	0.593*2(88)
H.front porch	2.562(18)	3.04(64)	0.636(16)	0.369(24)	0.444(48)	1.326(18)	0.592(44)
H.back porch	4.466(64)	3.80(80)	1.907(48)	2.462(160)	2.296(248)	2.233(64)	1.993(148)
H.sync pol	Composite Video	neg	neg	neg	neg	neg	3state
VERTICAL							
fV (Hz)	59.94	56.4	59.94	60	60.02	59.94	60
	line(ms)	line(ms)	line(ms)	line(ms)	line(ms)	line(ms)	line(ms)
V.TOTAL	262.5(16.67)	440(17.72)	525(16.683)	806(16.667)	1066(16.661)	525(16.67)	562.5(16.67)
V.disp line	244.5(15.52)	400(16.11)	480(15.253)	768(15.830)	1024(16.005)	489(15.52)	517.5(15.33)
V.sync width	3(0.19)	8(0.322)	2(0.064)	6(0.124)	3(0.047)	6(0.19)	5(0.148)
V.front porch	3(0.19)	7(0.282)	10(0.318)	3(0.062)	1(0.016)	6(0.19)	5(5.5)
V.back porch	12(0.76)	25(1.01)	33(1.048)	29(0.600)	38(0.594)	24(0.76)	35(34.5)
V.sync pol			neg	neg	neg	neg	
1 dot	14.318	21.05	25.175	65	108	28.636	74.25
resolution	720x480	640x400	640x480	1024x768	1280x1024	720x480	1920x1035
INPUT	C.VIDEO	INPUT A	INPUT A	INPUT A	INPUT A	C.VIDEO	INPUT A
						INT.IDTV	

3-2. SAFETY RELATED ADJUSTMENTS

When the following parts (marked  on schematic diagrams) have been replaced, check and adjust the HV regulation circuit, HV hold down circuit.

-  RV2 [HV Regulation] Lead wire K board
-  IC1, IC2, IC4, IC6, IC7, IC8, IC9, IC11, R54, R55, R56, R57, R63, R64, R65, R72, R73, R74, X1 K board

-  RV1 [HV Hold-down] Lead wire K board
-  IC101, D5, D101, D102, C101, R101, R102, R103, R104, R105, R106, R107, R108, R109, R110, R112, R113 K board

-  RV1, RV2: HV protector, HV regulator check

- (1) Open the DE bracket, and connect the cable from the high voltmeter to the chassis (two GNDs) and HV block. (See Fig.1.)

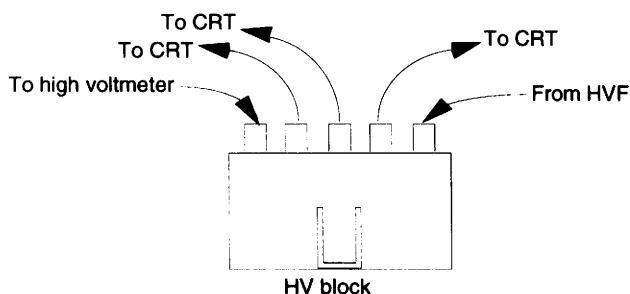


Fig. 1

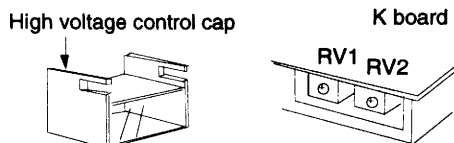
- (2) Input the monoscope signal.
- (3) Set CONT to MAX using the + CONT key of the remote commander, and set BRIGHT to MAX using the + BRIGHT key.
- (4) Rotate RV2 (REG VOL) of the K board slowly to the right (clockwise) and adjust the high voltage to 34 kV.
- (5) Rotate RV1 (PROT VOL) slowly to the right (clockwise) until the high voltage stops.
(The power goes OFF several seconds later.)
- (6) Rotate RV2 slightly in the clockwise direction so that the POWER turns ON.
- (7) Rotate RV2 slowly to the left (counterclockwise), and check that the high voltage is 34kV and the power goes OFF.
- (8) Return RV2 slightly in the clockwise direction. The power turns ON.

High voltage specification during HV-PROT adjustment:
34±0.3 kV

- (9) Press the MUTING PIC key of the control panel, and cut off.
- (10) Adjust RV2 so that the high voltage becomes 33 kV.

High voltage adjustment specification (During cutoff):
33±0.3 kV

- (11) Turn OFF the power, cover RV1 and RV2 with the high voltage control cap, and apply RTV to fix them. (See Fig. 2.)
(Also apply sufficiently to the top.)



Fill the high voltage control cap with the RTV completely before placing over the volume.

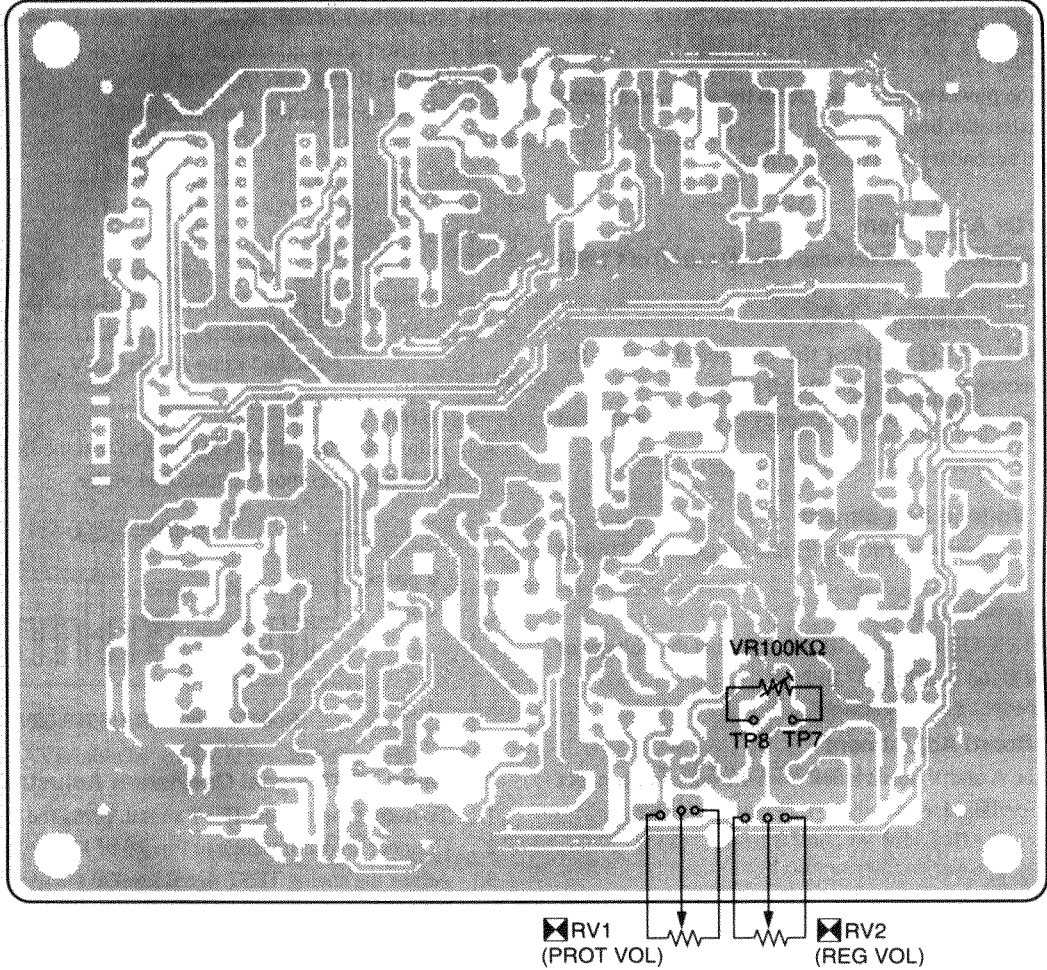
Fig. 2

- (12) Turn ON the power, and check that the high voltage is within the specification.
- (13) Attach a protector checking tool between TP7 and TP8, raise the high voltage, and check that the high voltage is within the specification, that the protector turns ON, and the power goes OFF.

High voltage adjustment specification (During cutoff):
33±0.3 kV

- * Check that the protector check tool VR is at the maximum resistance.

K BOARD



3-3. Electrical Adjustments

3-3-1. Power Supply Block Adjustment

(G, GB, GC Boards)

- * Remove the power supply block from the unit, and connect the tool extension board.
- * Check the secondary side output voltage.

1. Main Converter Adjustment

- (1) Connect a frequency counter between Pins ⑥ and ⑦ of CN861 of the G board.
- (2) Turn ON the power switch.
- (3) Adjust RV401 (FREQ ADJ) of the GC board so that the oscillation frequency becomes 65.0 ± 2.0 kHz.
- (4) In the same way, adjust also the frequency of Pins ⑥ and ⑦ of CN862.

2. Active Filter Voltage Adjustment

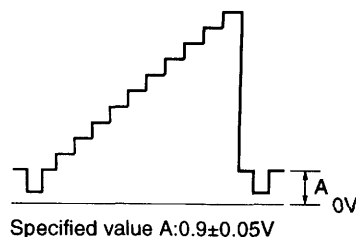
- (1) Connect a digital voltmeter to the \oplus and \ominus sides of C163 of the G board.
- (2) Turn ON the power switch.
- (3) Adjust RV60 (PF OUT) of the GB board so that the voltage of the \oplus side of C163 becomes 37.0 ± 2.0 V.

3-3-2. A and Y Board Adjustment

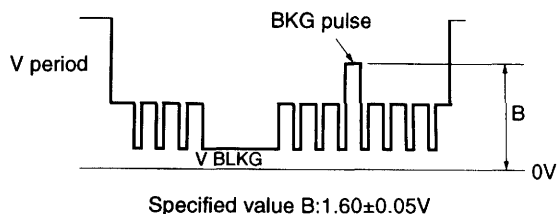
- * Remove the A and Y board block from the unit, and connect an extension board.

1. Signal Level Adjustment

1. Input the 10STEP signal. (Terminate each output at 75Ω .)
2. Connect an oscilloscope to ①A19 (GREEN OUT) of CN2.
3. Adjust RV100 (SUB BRT) so that the pedestal level of the signal becomes the specified value.

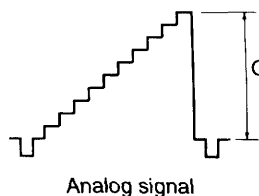


4. Adjust RV1031 (BKG LEVEL) so that the BKG pulse level of the signal becomes the specified value.



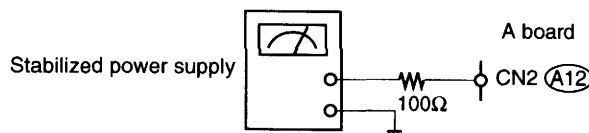
2. Analog TEST Signal Oscillation Adjustment

1. To output the analog TEST signal, press the GAIN key.
2. Connect an oscilloscope to Pin ② of IC1029.
3. Adjust the analog TEST signal level to the specified value using RV1300.



3. ABL Adjustment

1. Supply -12 ± 0.5 V to Pin ①A12 (ABL) of CN2 as follows.



2. Gradually decrease the Q1036 emitter potential.
3. Connect a digital voltmeter to the \oplus side (Q1032 base) of C1131.
4. Adjust RV1002 (ABL ADJ) so that the voltage of the \oplus side of C1131 becomes -6.05 ± 0.05 V.
5. Remove the regulated power supply.

3-3-3. DB Board Adjustment

* Remove the unit from the DB board, and connect an extension board.

* Check the input power supply voltage.

CN411 of D board

Pins ② and ③: +6V

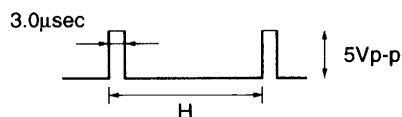
Pins ⑦ and ⑧: -6V

Pins ④, ⑤, ⑥: GND

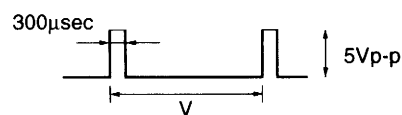
* Check the input signal

CN408 of D board

Pin ①: AD HD (15.75 kHz)

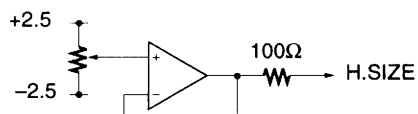


Pin ③: VD (60 Hz)



Pin ⑤: H SIZE

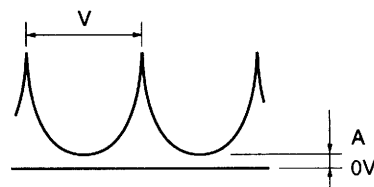
(Variable by $\pm 2.5V$ at low impedance)



Pins ② and ④: GND

1. V PARA Offset Adjustment

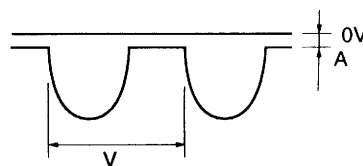
1. Connect an oscilloscope to TP405 (VP).
2. Adjust RV402 (VP:BIAS) to the specified value.



Specified value A: 0 ± 10 mV

2. V SIN 1 Offset Adjustment

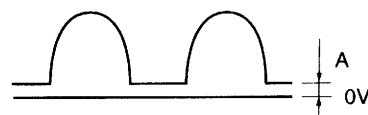
1. Connect an oscilloscope to TP411 (V SIN 1)
2. Adjust RV403 (V SIN 1 BIAS) to the specified value.



Specified value A: 10 ± 10 mV

3. V SIN 2 Offset Adjustment

- (1) Connect an oscilloscope to TP412 (V SIN 2).
- (2) Adjust RV401 (V SIN 2 BIAS) to the specified value.



Specified value A: 0 ± 10 mV

3-3-4. EA Board Adjustment

- * Remove the EA board from the unit, and connect an extension board.
- * Check the input power supply voltage.

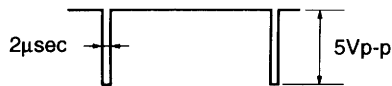
CN522 of EA board

Pin ⑧: $15 \pm 0.1V$
Pin ⑮: $-12V \pm 0.2V$
Pin ⑯: $-6V \pm 0.2V$
Pin ⑰: GND
Pin ⑱: GND
Pin ⑲: $6V \pm 0.2V$
Pin ⑳: $12V \pm 0.2V$

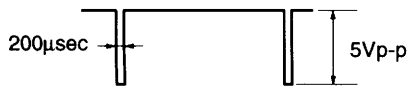
- * Check the input signal.

CN521 of EA board

Pin ⑩: H SYNC (fH: 15.7 to 64 ± 0.2 kHz)



Pin ⑳: V SYNC (fV: 60 ± 1 Hz)



1. FV Voltage Adjustment

1. Connect a jumper wire between Pins ⑰ and ⑲ of CN521.
2. Set H SYNC and V SYNC to fH: 35 kHz and fV: 60 Hz respectively.
3. Connect a digital voltmeter to TP16 (F/V CHECK).
4. Adjust RV2 (F/V CONT) so that the voltage becomes $2 \pm 0.05V$.
5. Disconnect the jumper wire.

2. RGB AFC Adjustment

1. Turn OFF S2 (AFC).
2. Connect an oscilloscope to TP1 (12V HD), and connect a trigger to TP9 (H SYNC).
3. Adjust RV3 so that 12V HD locks.
4. Turn ON SW2 (AFC), and check that AFC is fetched.

3. VIDEO AFC Adjustment

1. Set Pin ⑩ of CN521 to High.
2. Set H SYNC and V SYNC to fH: 15.7 kHz and fV: 60 Hz respectively. (TP9 and TP8)
3. Turn OFF S2 (AFC).
4. Connect an oscilloscope to TP1 (12V HD), and connect a trigger to TP9 (H SYNC).
5. Adjust RV4 so that 12V HD locks.
6. Turn ON S2 (AFC), and check that AFC is fetched.

4. V HOLD Adjustment

1. Turn OFF S1 (V HOLD).
2. Connect an oscilloscope to TP6 (VD).
3. Adjust RV1 so that the CD output becomes 50 Hz.
4. Turn ON S1 (V HOLD) just before adjustment.
5. Check that TP6 (VD) is 60 Hz.