

SERVICE MANUAL

RA-6 CHASSIS

<u>MODEL NAME</u>	<u>REMOTE COMMANDER</u>	<u>DESTINATION</u>	<u>CHASSIS NO.</u>
KP-51WS500	RM-Y909	US/CND	SCC-P65HA
KP-57WS500	RM-Y909	US/CND	SCC-P65JA
KP-65WS500	RM-Y909	US/CND	SCC-P65KA



KP-65WS500



RM-Y909

COLOR REAR VIDEO PROJECTOR

SONY®

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SPECIFICATIONS

Power Requirements 120V AC, 60Hz

Power Consumption (W)

In Use (Max) 230W
In Standby Under 1 W

Inputs/Outputs DVI-HDTV

1 terminal, 3.3V T.M.D.S., 50 ohms
 The DVI-HDTV input terminal is compliant with the EIA-861 standard and is not intended for use with personal computers.

Video (IN)

4 total (1 on front panel)
 1Vp-p, 75ohms unbalanced, sync negative

S Video (IN)

3 total (1 on front panel)
 Y: 1Vp-p, 75ohms unbalanced, sync negative
 C: 0.286Vp-p (Burst signal), 75ohms

Audio (IN)

6 total (1 on front panel)
 500 mVrms (100% modulation)
 Impedance:47 kilo ohms

Audio (VAR/RIX)

1 total
 500 mVrms at the maximum volume setting (Variable)
 500 mVrms (Fixed)
 Impedance (Output):1 kilo ohm

TV Out

1 total
 Video: 1 Vp-p 75 ohms unbalanced, Sync negative
 Audio: 500 m Vrms (100% modulation)
 Impedance (output): 1 kilo ohms

Control S (IN/OUT)

1 total
 Minijacks

Component Video Input

2 (Y, P_B, P_R)
 Y: 1.0 Vp-p, 75 ohms unbalanced, sync negative
 P_B: 0.7 Vp-p, 75 ohms;
 P_R: 0.7 Vp-p, 75 ohms

RF Inputs

2 total

Converter

1 total

	KP-51WS500	KP-57WS500	KP-65WS500
Speaker Output (W)	20W x 2		
Dimensions (W x H x D)			
mm	1194 x 1310 x 630 mm	1326 x 1377 x 690 mm	1542 x 1452 x 735 mm
in	47 ^{1/8} x 51 ^{5/8} x 24 ^{7/8} in	52 ^{1/4} x 54 ^{1/4} x 27 ^{1/4} in	61 x 57 x 29 in
Mass			
kg	76 kg	89 kg	125 kg
lbs	167 lbs 9 oz	196 lbs 3 oz	275 lbs 8 oz

Projection System

3 picture tubes, 3 lenses, horizontal in-line system

Picture Tube

7-inch high-brightness monochrome tubes (6.3 raster size), with optical coupling and liquid cooling system.

Projection Lenses

High performance, large diameter hybrid lens F1.1

Antenna

75 ohm external terminal for VHF/UHF

Television System

NTSC, American TV Standard

Channel Coverage

VHF: 2-13/ VHF: 14-69/ CATV: 1-125

Screen Size (measured diagonally)

51 inches (KP-51WS500)
57 inches (KP-57WS500)
65 inches (KP-65WS500)

Supplied Accessories

Remote Control RM-Y909
 Batteries (2) size AA (R6)

Optional Accessories

A/V Cable (VMC-810/820/830 HG)
 Audio Cable (RKC-515HG)
 Component Video Cable (VMC-10/30 HG)
 Control S Cable (RK-G69HG)
 AV Receiver (STR-V555ES or equivalent)

WARNINGS AND CAUTIONS


CAUTION

Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield, or carbon painted on the CRT, after removing the anode.

WARNING!!

An isolation transformer should be used during any service to avoid possible shock hazard, because of live chassis. The chassis of this receiver is directly connected to the ac power line.

SAFETY-RELATED COMPONENT WARNING!!


Components identified by shading and  mark on the schematic diagrams, exploded views, and in the parts list are critical for safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in supplements published by Sony. Circuit adjustments that are critical for safe operation are identified in this manual. Follow these procedures whenever critical components are replaced or improper operation is suspected.

ATTENTION!!

Après avoir déconnecté le cap de l'anode, court-circuiter l'anode du tube cathodique et celui de l'anode du cap au châssis métallique de l'appareil, ou la couche de carbone peinte sur le tube cathodique ou au blindage du tube cathodique.

Afin d'éviter tout risque d'électrocution provenant d'un châssis sous tension, un transformateur d'isolement doit être utilisé lors de tout dépannage. Le châssis de ce récepteur est directement raccordé à l'alimentation du secteur.

ATTENTION AUX COMPOSANTS RELATIFS A LA SECURITE!!

Les composants identifiés par une trame et par une marque  sur les schémas de principe, les vues explosées et les listes de pièces sont d'une importance critique pour la sécurité du fonctionnement. Ne les remplacer que par des composants Sony dont le numéro de pièce est indiqué dans le présent manuel ou dans des suppléments publiés par Sony. Les réglages de circuit dont l'importance est critique pour la sécurité du fonctionnement sont identifiés dans le présent manuel. Suivre ces procédures lors de chaque remplacement de composants critiques, ou lorsqu'un mauvais fonctionnement suspecte.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or touching high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the B+ and HV to see if they are specified values. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
8. Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

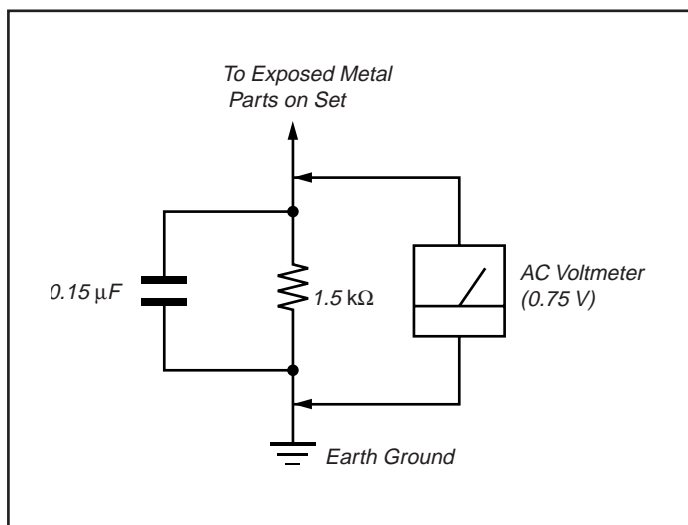


Figure A. Using an AC voltmeter to check AC leakage.

Leakage Test

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instructions.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low voltage scale. The Simpson’s 250 and Sanwa SH-63TRD are examples of passive VOMs that are suitable. Nearly all battery-operated digital multimeters that have a 2 VAC range are suitable (see Figure A).

How to Find a Good Earth Ground

A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms.

If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble-light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure B).

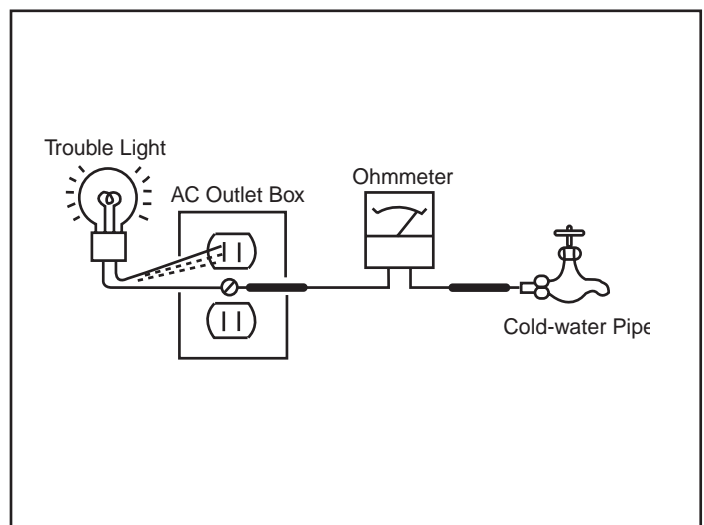


Figure B. Checking for earth ground.

SELF-DIAGNOSTIC FUNCTION



The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER LED will automatically begin to flash. The number of times the LED flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER LED flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the Remote Commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

Diagnostic Test Indicators

When an error occurs, the STANDBY/TIMER LED will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the LED will identify the first of the problem areas.

Results for all of the following diagnostic items are displayed on screen. If the screen displays a "0", no error has occurred.

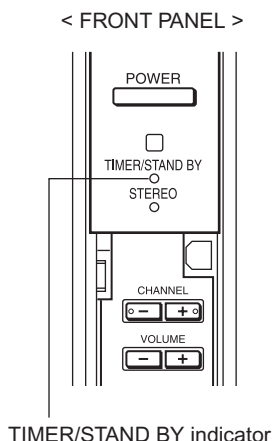
Diagnostic Item	No. of times STAND BY / TIMER lamp flashes	Probable Cause Location	Detected Symptoms
Power does not turn on	Does not light	<ul style="list-style-type: none"> Power cord is not plugged in. Fuse is burned out (F6001). (G Board) 	<ul style="list-style-type: none"> Power does not come on. No power is supplied to the TV. AC Power supply is faulty.
+B overcurrent (OCP)*	2 times	<ul style="list-style-type: none"> H.OUT (Q8024) is shorted. (D Board) +B PWM (Q8035, Q8038) is shorted. (D Board) 	<ul style="list-style-type: none"> Power does not come on. Load on power line shorted.
+B overvoltage (OVP)	3 times	<ul style="list-style-type: none"> IC501 is faulty. (G Board) IC5002 is faulty. (G Board) 	<ul style="list-style-type: none"> Has entered standby mode.
Vertical deflection stopped	4 times	<ul style="list-style-type: none"> ±15V is not supplied. (D Board) IC8003 is faulty. (A Board) 	<ul style="list-style-type: none"> Has entered standby state after horizontal raster. Vertical deflection pulse is stopped. Power line is shorted, or power supply is stopped.
White Balance Failure (Not Balanced)	5 times	<ul style="list-style-type: none"> Video OUT (IC7101, IC7201, IC7301) is faulty. (CR, CG, CB Boards) CRT drive (IC309) is faulty. (A Board) Screen (G2) is improperly adjusted. ** 	<ul style="list-style-type: none"> No raster is generated. CRT Cathode current detection reference pulse output is small.
Low B OCP/OVP (Overcurrent/Overvoltage) ***	6 times	<ul style="list-style-type: none"> +5 line is overloaded. (A, B Boards) +5 line is shorted. (A, B Boards) 	<ul style="list-style-type: none"> No picture
Horizontal deflection stopped	7 times	<ul style="list-style-type: none"> Q8035, Q8038 is shorted. (D Board) 	
High-voltage error	8 times	<ul style="list-style-type: none"> T8005 is faulty. (D Board) 	
Audio error	9 times	<ul style="list-style-type: none"> ± 19V line is shorted. (A, B Boards) IC708 is faulty. (A Board) PS701 or PS702 is opened. (A Board) 	<ul style="list-style-type: none"> No sound

* If a +B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously. The symptom that is diagnosed first by the microcontroller is displayed on the screen.

** Refer to Screen (G2) Adjustments in Section 2-2 of this manual

*** If TIMER or STAND BY indicator blinks six (6) times, unplug the unit and wait 10 minutes before performing the adjustment.

Display of Standby/Timer LED Flash Count

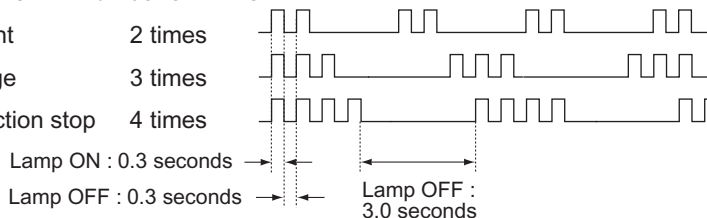


* One blink is not used for self-diagnosis.

• EXAMPLE

<Diagnosis Items> <Number of Blinks>

- +B overcurrent 2 times
- +B overvoltage 3 times
- Vertical deflection stop 4 times



Release of TIMER STAND BY indicator blinking

The TIMER/STANDBY indicator blinking display is released by turning OFF the power switch on the TV main unit or removing the plug from the power.

Self-Diagnosis Screen Displays

In cases of malfunctions where it is not possible to determine the symptom such as when the power goes off occasionally or when the screen disappears occasionally, there is a screen display on whether the malfunction occurred or not in the past (and whether the detection circuit operated or not) in order to allow confirmation.

Screen Display Method

Quickly press the remote command button in the following order from the standby state.

Display → Channel **5** → Sound Volume* **+** → Power ON

*Note that this differs from entering the service mode (sound volume **+**)

SELF DIAGNOSIS	
2 : +B OCP	N/A
3 : +B OVP	N/A
4 : V STOP	0
5 : AKB	1
10 : WDT	24

Numeral "0" means that no fault was detected.

Numeral "1" means a fault was detected one time or more

Self-Diagnosis Screen Display

The results display is not automatically cleared. In case of repairs and after repairs, check the self-diagnosis screen and be sure to return the results display to "0".

If the results display is not returned to "0" it will not be possible to judge a new malfunction after completing repairs.

Method of Clearing Results Display

1. Power off (Set to the standby mode.)
2. **Display** → Channel **5** → Sound Volume **+** → Power ON (Service Mode)
3. Channel **8** → **ENTER** (Test reset = Factory preset condition)

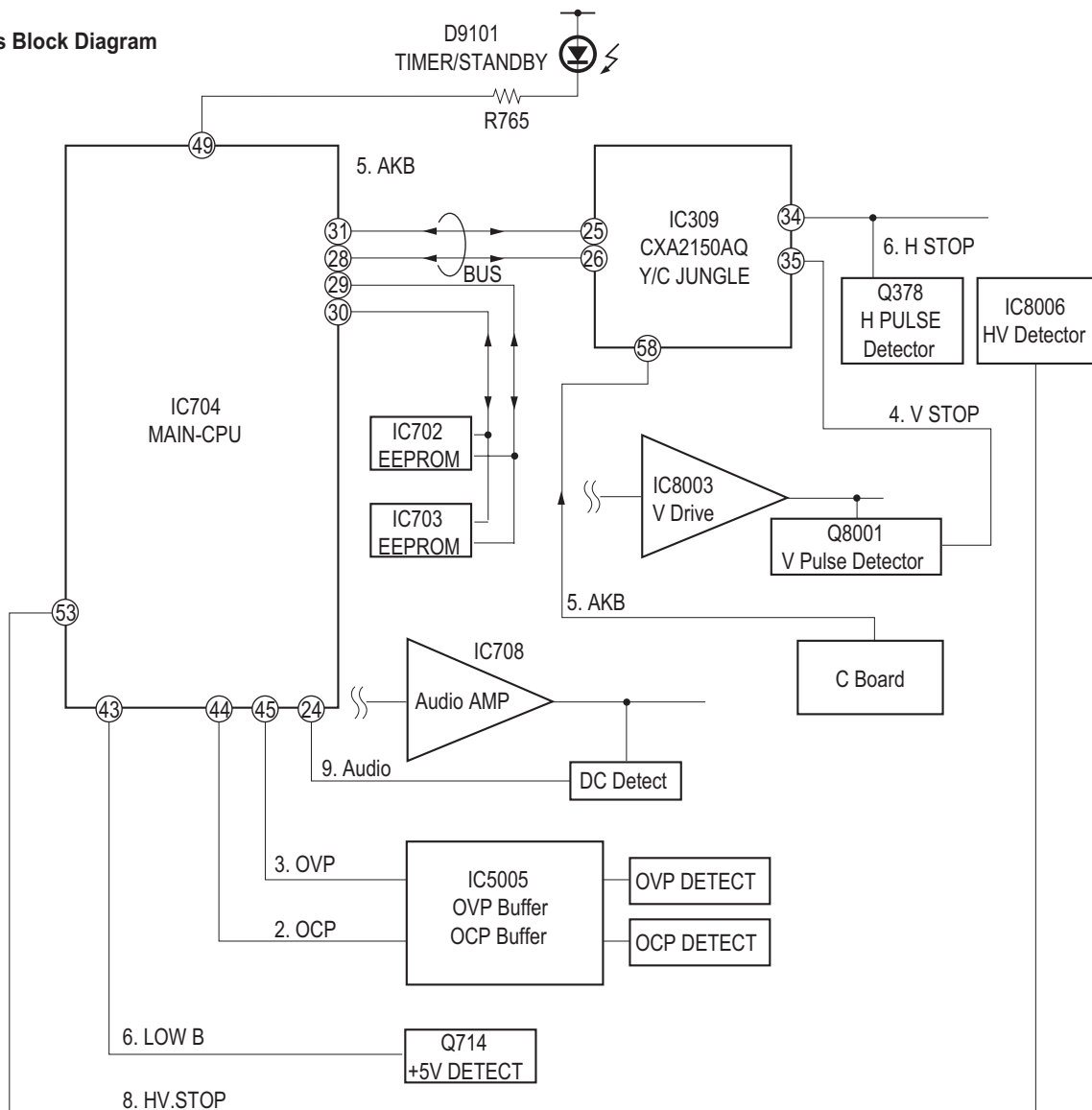
Method of Ending Self Diagnosis Screen

When ending the self-diagnosis screen completely, turn the power switch OFF on the remote commander or the main unit.

Self-Diagnosis Function Operation

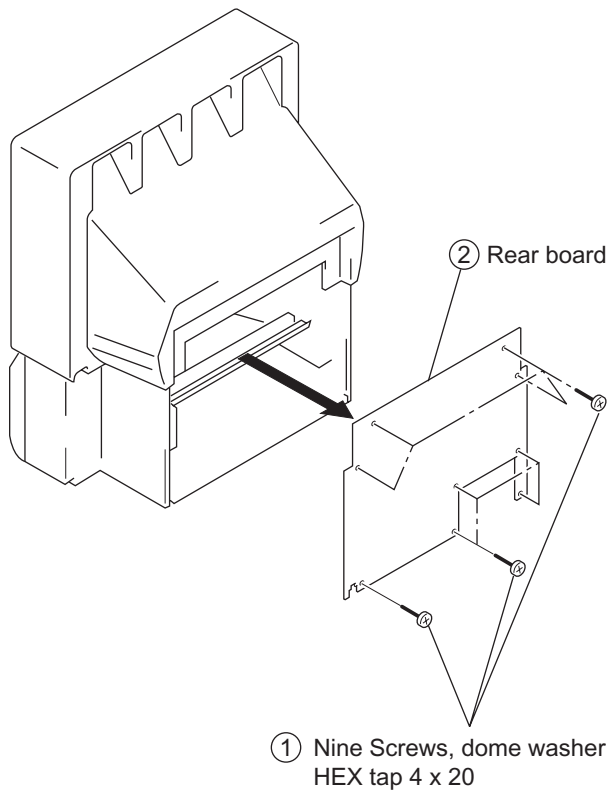
- OCP Low B and +B line detect DET SHORT, and shut-down POWER ON RELAY.
Reset by turning power on/off. In case of +B is loaded approx. 1.5A or more, microcomputer detects it via **IC5005**.
- OVP In case of +B becomes approx. 150V or more, POWER ON RELAY shuts down and microcomputer detects it via **IC5005**.
Reset by turning power on/off just the same as OCP.
- Low B Occurs when set +5V is out
- V Stop In the case of the V Drive disappearing, **Q8001** detects it and shuts-down the POWER ON RELAY. The microcomputer detects it and causes the LED to blink.
- AKB IK detection. Makes LED blink when microcomputer doesn't detect IK, returns of **IC309 (CXA2150AQ)** 20 seconds or more.
- H Stop In case H DRIVE disappears, **Q378** detects it and shuts-down POWER ON RELAY. Microcomputer receives H Stop data from **Q378** and makes the LED blink.
- HV Stop In case HV becomes 33kV or more, **IC8006** detects it and shuts-down POWER ON RELAY. The microcomputer makes the LED blink.
- Audio In case of DC component overlaps the output of Audio Amp., the microcomputer detects it and shuts-down POWER ON RELAY. The microcomputer makes the LED blink.

Self-Diagnosis Block Diagram

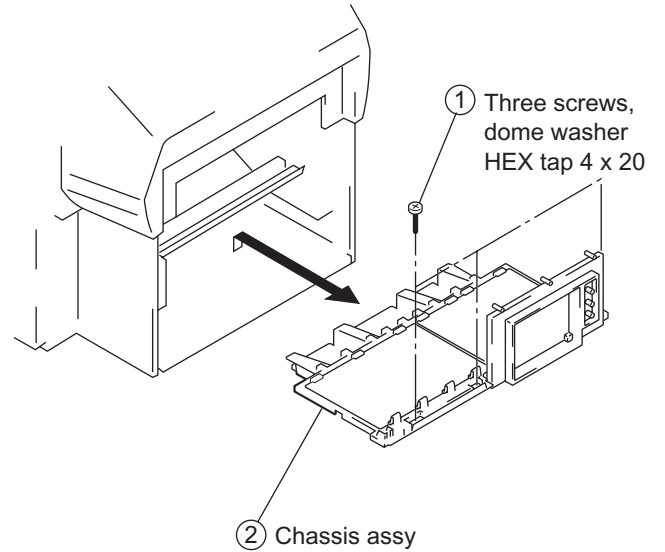


SECTION 1: DISASSEMBLY

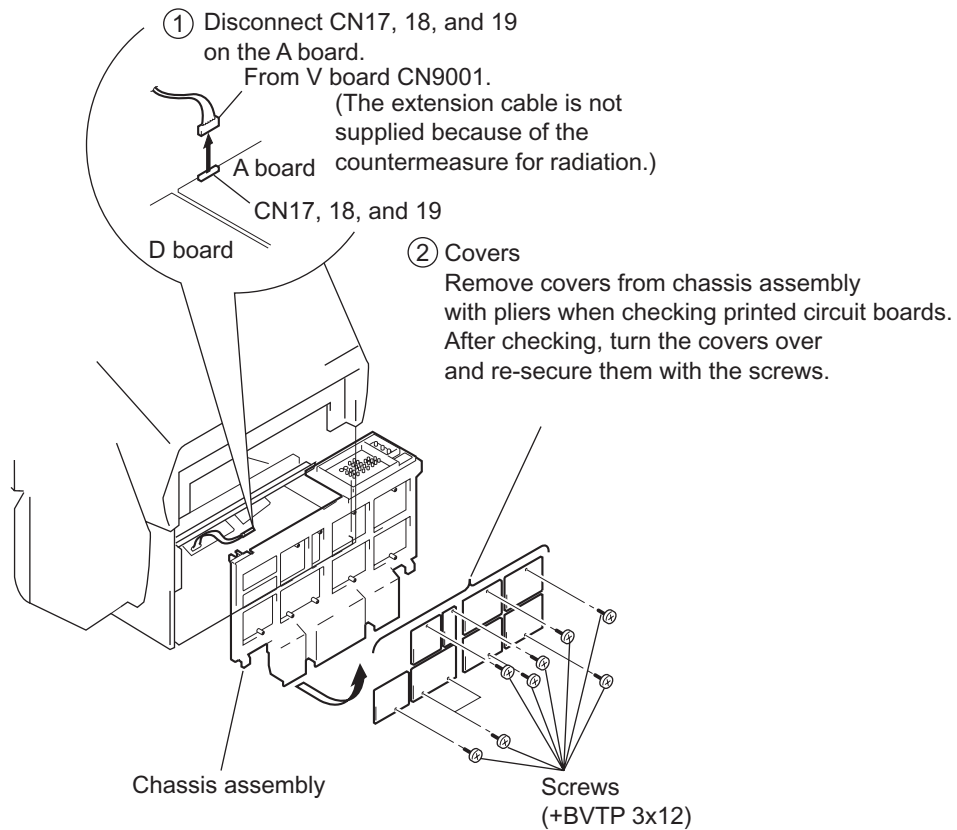
1-1. REAR BOARD REMOVAL



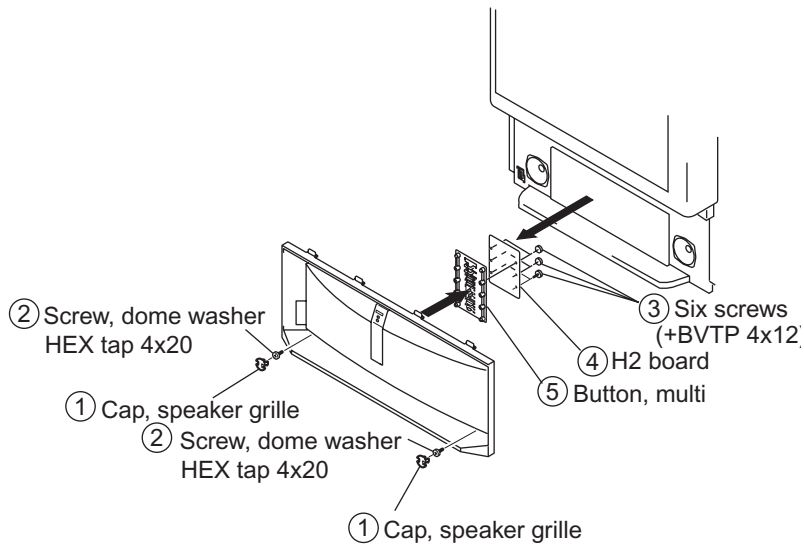
1-2. CHASSIS ASSEMBLY REMOVAL



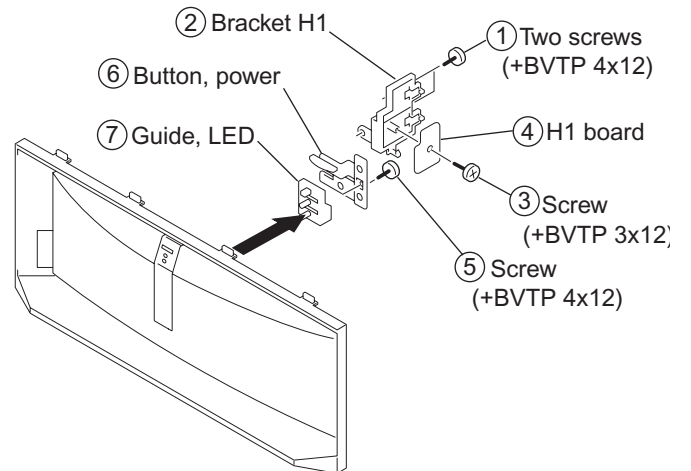
1-3. SERVICE POSITION



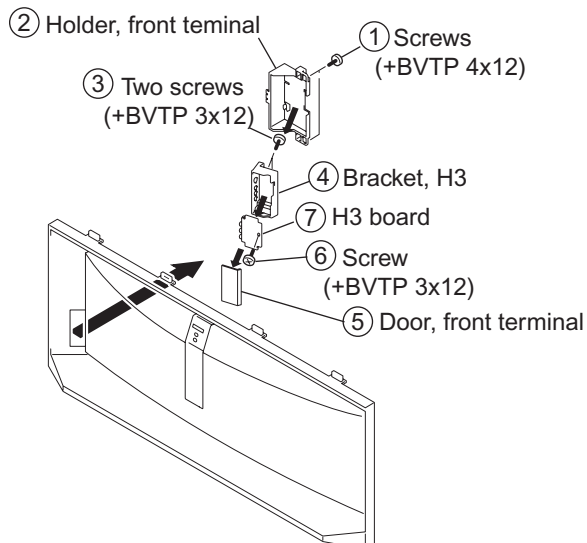
1-4. H2 BOARD REMOVAL



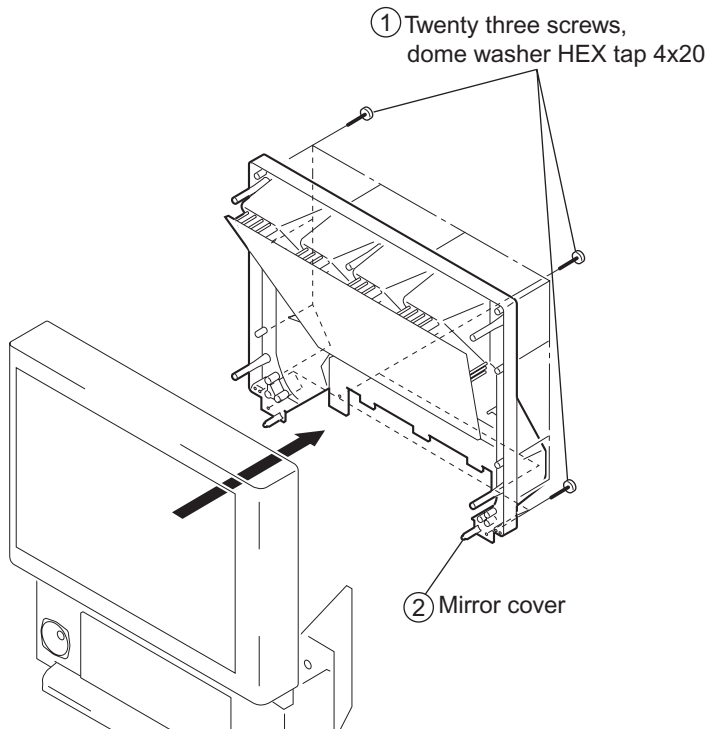
1-5. H1 BOARD REMOVAL



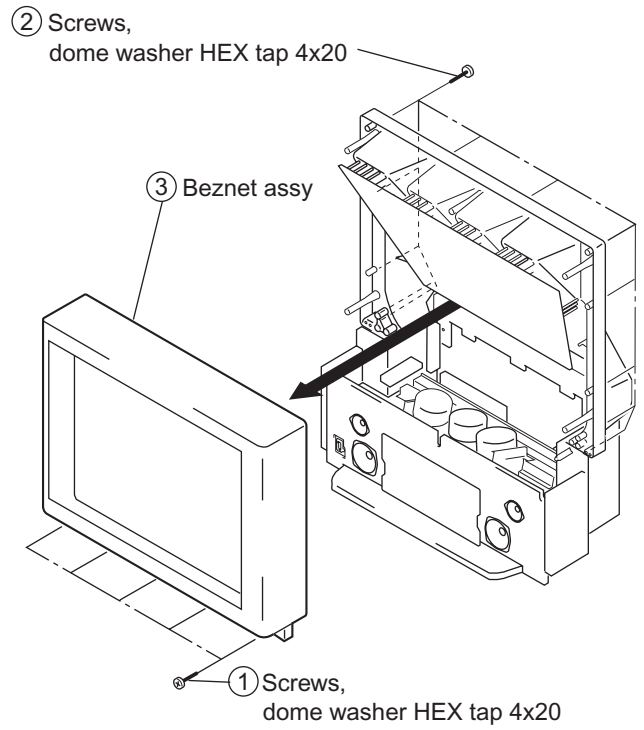
1-6. H3 BOARD REMOVAL



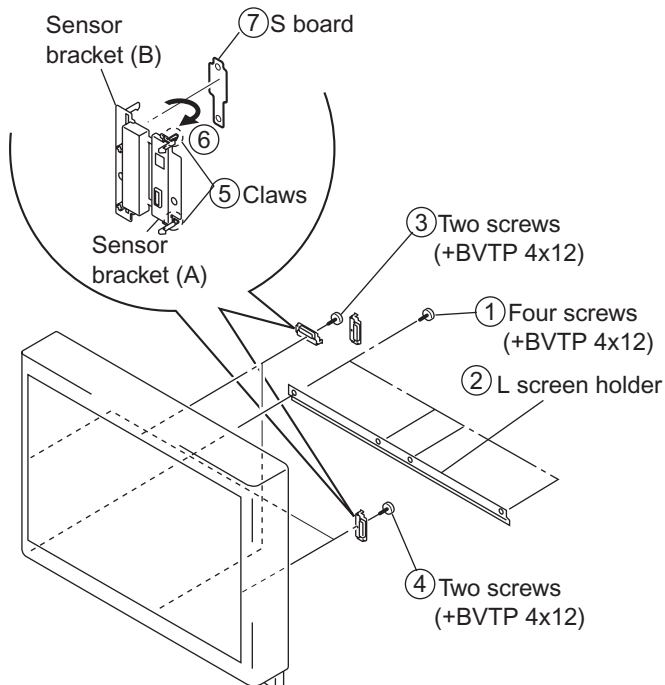
1-7. MIRROR COVER REMOVAL



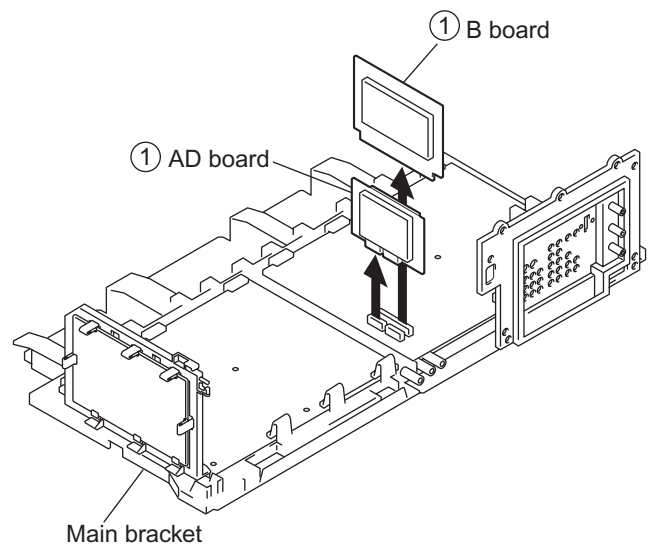
1-8. BEZNET ASSEMBLY REMOVAL



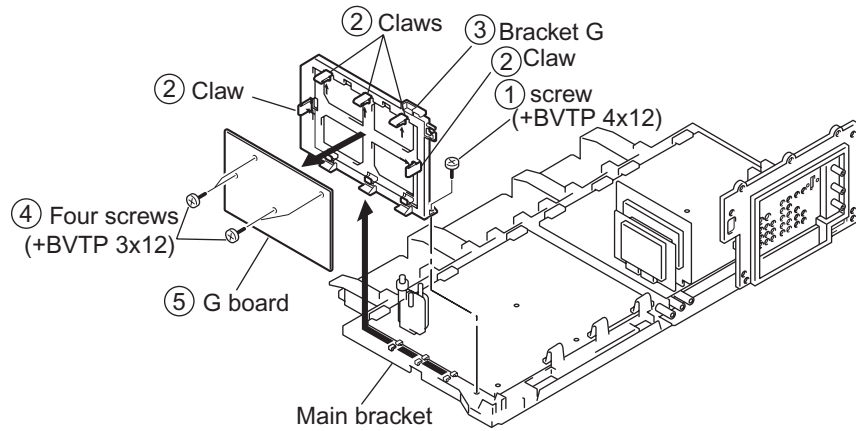
1-9. S BOARD REMOVAL



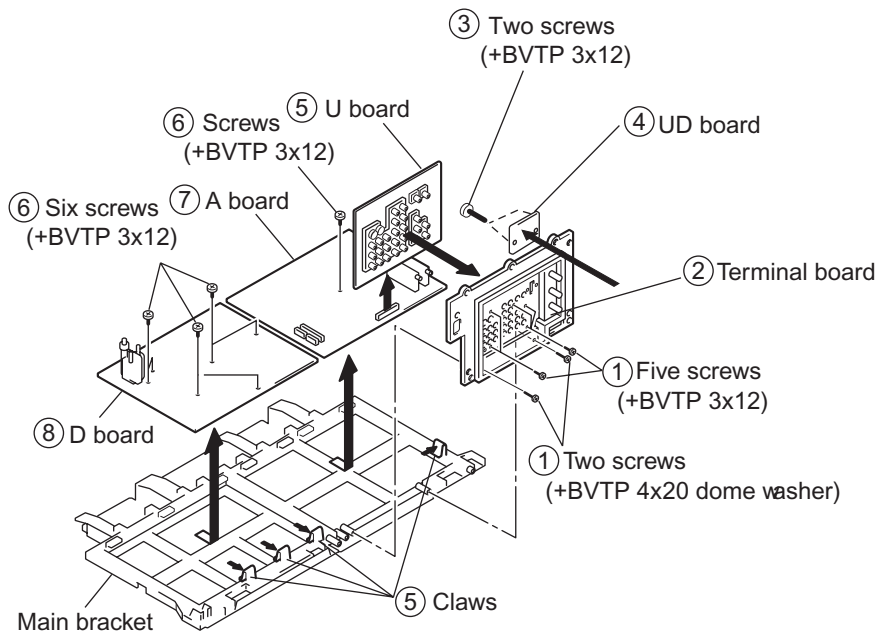
1-10. AD BOARD AND B BOARD REMOVAL



1-11.G BOARD REMOVAL

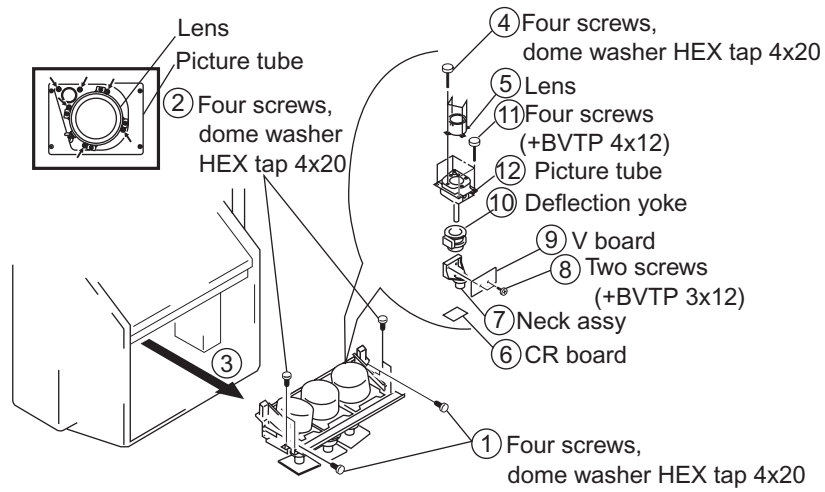


1-12.TERMINAL BOARD, A BOARD, D BOARD, U BOARD, AND UD BOARD REMOVAL



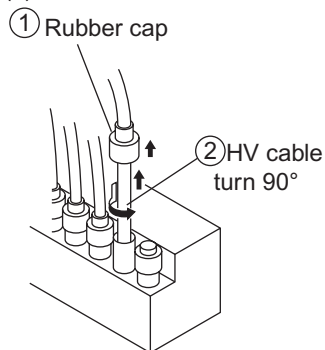
1-13. PICTURE TUBE REMOVAL

CAUTION Removing the arrow-marked screws is strictly prohibited. If removed, it may cause liquid spill.

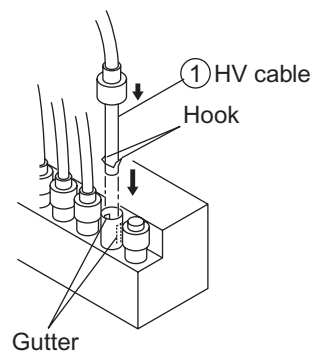


1-14. HIGH-VOLTAGE CABLE INSTALLATION AND REMOVAL

(1) Removal



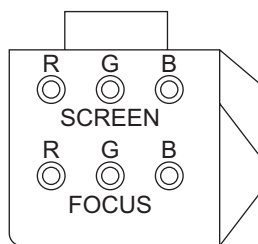
(2) Installation



SECTION 2: SET-UP ADJUSTMENTS

2-1. SCREEN VOLTAGE ADJUSTMENT (COARSE ADJUSTMENT)

1. Receive the Monoscope signal..
2. Set BRIGHTNESS to 50% and PICTURE to minimum.
3. Turn the red VR on the focus block all the way to the left and then gradually turn it to the right until the retrace line is barely visible.
4. Gradually turn the control to the left until the retrace line disappears.

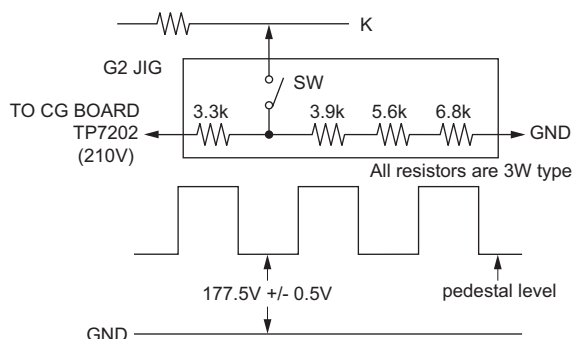


FOCUS Block

2-2. SCREEN (G2) ADJUSTMENT (FINE ADJUSTMENT)

If the jig described below is available, it is recommended that the G2 Fine Mode Adjustment be performed to set the screen controls to their optimal condition. If desired, you can build the jig illustrated below, using 3-watt resistors. Please note that if the proper voltage is not obtained with the listed resistor's values, then increase or decrease one of the values in the resistor network to obtain the correct voltage.

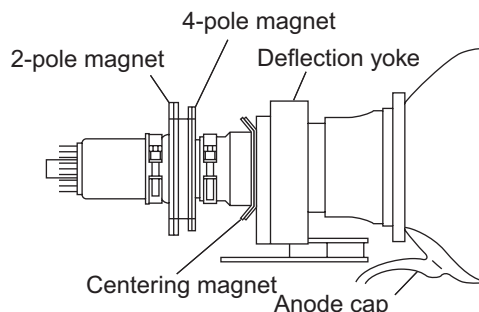
1. Select VIDEO-1 mode no signal applied (the screen must be black).
2. Connect the G2 JIG.
3. SW on JIG.
4. Connect an oscilloscope to the TP7101(KR), TP7202(KG) and TP7301(KB) of CR board, CG board, and CB board.
5. Adjust red, green, and blue screen voltage to 177.5+/-0.5V with screen VR on the focus block.



2-3. DEFLECTION YOKE TILT ADJUSTMENT

1. Connect the color bar generator monoscope pattern to Video 1 input.
2. Cover the red and blue CRT lenses with lens caps to allow only green to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
3. Loosen the CRT's deflection yoke set screw and align the tilt of the deflection yoke so that the horizontal bars at the center of the monoscope pattern are horizontal.
4. After aligning the deflection yoke fasten it securely to the funnel-shaped portion (neck) of the CRT.
The tilt of the deflection yoke is aligned in the mode.
5. Cover the green and blue CRT lenses with lens caps to allow only green to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps), then repeat steps 3 and 4 for the red CRT.
Cover the green and red CRT lenses with lens caps to allow only green to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps), then repeat steps 3 and 4 for the blue CRT.

Note: If lens caps are unavailable, you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.



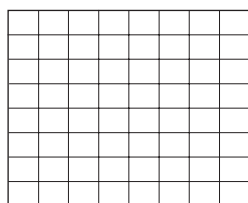
2-4. FOCUS LENS ADJUSTMENT

In this adjustment, use the remote commander while in service mode. For details on the usage of the service mode and the remote commander, please refer to section

2-10. ELECTRICAL ADJUSTMENTS BY REMOTE COMMANDER.

1. Loosen the lens screw.
2. Cover the red and blue CRT lenses with lens caps to allow only green to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
3. Turn the green lens to adjust to the optimum focus point with the crosshatch signal.
4. Tighten the lens screw.
5. Cover the green and blue CRT lenses with the lens caps to allow only red to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
6. Turn the red lens to adjust to the optimum focus point with the crosshatch signal.
7. Tighten the lens screw.
8. Cover the green and red CRT lenses with the lens caps to allow only blue to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
9. Turn the blue lens to adjust to the optimum focus point with the crosshatch signal.
10. Tighten the lens screw.
11. After adjusting the items:
 - 2-5. FOCUS VR ADJUSTMENT,
 - 2-6. 2-POLE MAGNET ADJUSTMENT,
 - 2-8. 4-POLE MAGNET ADJUSTMENT,
 reconfirm the optimum focus point and adjust again if necessary.

* Every time 6 is pressed, the test signal changes to:
 "crosshatch+video signal" → "crosshatch+borderline(black)" →
 "crosshatch(black)" → "dots(black)" → off



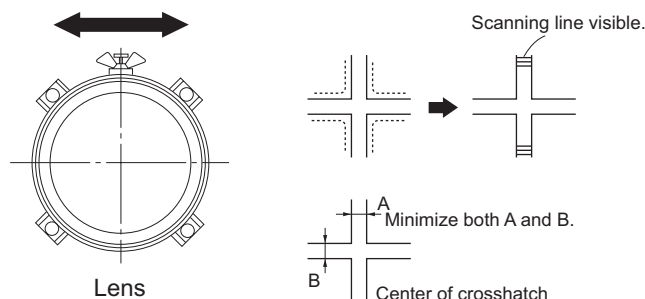
Test Signal

Note: If lens caps are unavailable, you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

2-5. FOCUS VR ADJUSTMENT

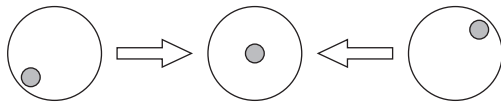
1. Set generator to crosshatch.
2. Cover the red and blue CRT lenses with lens caps to allow only green to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
3. Turn the green focus VR on the focus block to adjust to the optimum focus point with the crosshatch signal.
4. Cover the green and blue picture lenses with lens caps to allow only red to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
5. Turn the red focus VR on the focus block to adjust to the optimum focus point with the crosshatch signal.
6. Cover the green and red picture lenses with lens caps to allow only blue to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
7. Turn the blue focus VR on the focus block to adjust to the optimum focus point with the crosshatch signal.
8. After adjusting the items:
 - 2-4. FOCUS LENS ADJUSTMENT,
 - 2-6. 2-POLE MAGNET ADJUSTMENT,
 - 2-8. 4-POLE MAGNET ADJUSTMENT,
 reconfirm the optimum focus point and adjust again if necessary.

Note: If lens caps are unavailable, you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.



2-6. 2-POLE MAGNET AND CENTERING MAGNET ADJUSTMENT

1. Set the picture mode to PRO and picture to MAX.
2. Either select the PJED Test Pattern dot hatch signal or apply an external dot signal.
3. Cover the red and blue CRT lenses with lens caps to allow only green to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
4. Turn the focus VR on the focus block to the left (counter clockwise) and set it to overfocus to enlarge the spot.
5. Adjust the CRT's 2-pole magnet so that the small bright spot is in the center.
6. Align the focus VR on the focus block and set it for the best focus.
7. Apply a Monoscope signal to the set.
8. Adjust the H-CENTERING and V-CENTERING roughly by the centering magnets.
9. Check 2-pole magnet adjustment. If necessary repeat steps 1-6.
10. Repeat steps 1 through 9 for the red CRT covering the green and blue CRT lenses with lens caps to allow only red to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps) and adjust the red focus control on the focus block.
11. Repeat steps 1 through 9 for the blue CRT covering the red and green CRT lenses with lens caps to allow only blue to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps) and adjust the blue focus control on the focus block.



Note: If lens caps are unavailable, you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

2-7. CENTERING MAGNET ADJUSTMENT

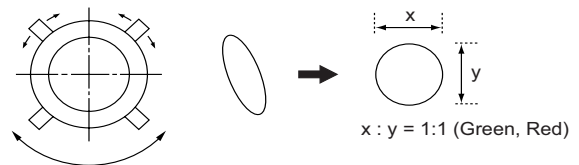
Not required - Combined with 2-6 2-Pole And Centering Magnet Adjustment.

2-8. 4-POLE MAGNET ADJUSTMENT

1. Set the picture mode to PRO and picture to MAX.
2. Receive the Dot signal.
3. Cover the red and blue CRT lenses with lens caps to allow only green to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
4. Turn the (green) focus VR on the focus block to the right (clockwise) and set it to under-focus to reduce the spot.
5. Adjust the 4-pole magnet so that the small spot in the center of the screen becomes round for green and red.
6. Adjust the blue spot to an oval shape X:Y=1:1.2

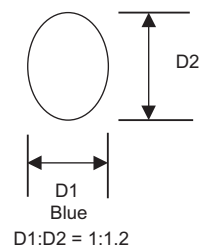
Note: If lens caps are unavailable, you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

Use the center dot



2-9. BLUE DEFOCUS ADJUSTMENT

1. Setup: Apply a Dot Hatch Signal and set the mode to Pro Mode. Change the color temperature to Cool in the user's menu.
2. Cover the red and green CRT lenses with lens caps to allow only blue to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
4. Turn the blue focus VR on the focus block to the right (clockwise) to make the round dot oval.



5. Check the flare with a high luminance signal to make sure the flare is minimal while the bright spot is located in the center, If not, readjust the 2 and 4-pole magnets.
6. Check for uniformity on a 100% IRE to an all white signal.

Note: If lens caps are unavailable, you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

2-10.ELECTRICAL ADJUSTMENTS BY REMOTE COMMANDER

All of the circuit adjustments can be made by using the remote commander (RM-Y909).

NOTE : The following test equipment is required:

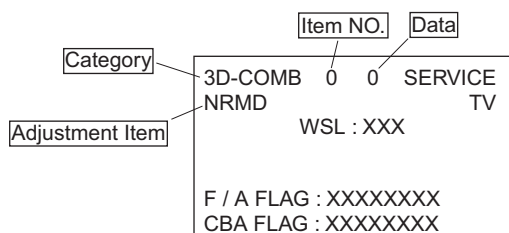
1. Pattern Generator (with component outputs)
2. Frequency counter
3. Digital multimeter
4. Audio oscillator

2-10-1.METHOD OF ENTERING THE SERVICE ADJUSTMENT MODE

SERVICE MODE PROCEDURE

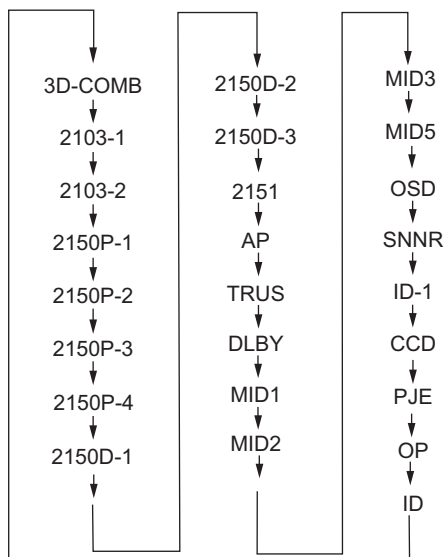
1. TV must be in Standby mode. (Power off)
2. Press "DISPLAY", "5", "VOL +", then "POWER" on the remote commander.
(Press each button within 1 second of pressing the previous button.)

SERVICE MODE ADJUSTMENT



3. The screen displays the item being adjusted within that category.
4. Press 1 or 4 on the remote commander to select the adjustment item.
5. Press 3 or 6 on the remote commander to change the data.
6. Press 2 or 5 on the remote commander to select the adjustment category.

Every time you press 2 (Category up), service mode changes in the order shown below:



7. If you want to go back to the most recently saved value, press "0" then "ENTER" to read the memory.
8. Press "MUTING" then "ENTER" to write the new adjustment data into memory.
9. When you want to exit the service mode, turn the power off.

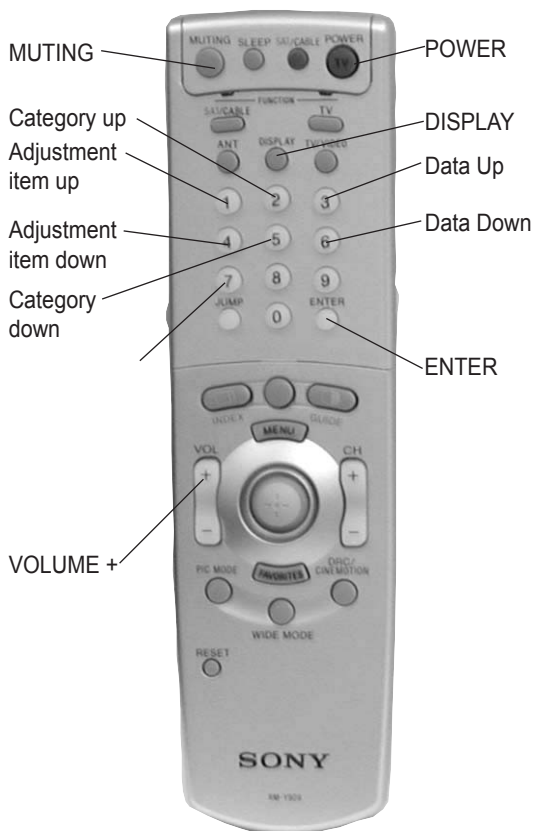
Note: Press "8" then "ENTER" on the remote commander to restore the factory settings for user controls and channel memories (this will also turn set off and then on to exit the service mode).

2-10-2.MEMORY WRITE CONFIRMATION METHOD

1. After adjustment, turn the power off with the remote commander.
2. Turn the power ON and set to service mode.
3. Cycle through the adjusted items again and confirm that the adjustments were saved.

2-10-3.ADJUSTING BUTTONS AND INDICATOR

Note: When the PJE mode (which displays an internally generated signal) is activated, several buttons on the remote commander will have different functions than the ones listed below. Therefore, when in the PJE mode, refer to section 2-12-3 for button functions.



2-11 SERVICE DATA LISTS

11. APPENDIX

3D-COMB uPD64082

Reg.No &Name		FUNCTION	RF/Video1-4		Svideo		
			Standard	Non-standard	Standard	Non-standard	
0	NRMD	Operation mode setting	0	1	3	3	
1	YAPS	Y-output correction	3				
2	CLKS	System clock setting	1				
			RF/Video1-4		Svideo		
			Standard	Non-standard	Standard	Non-standard	
3	NSDS	Selection for standard/non-standard signal processing	0	0	0	0	
4	MSS	Selection for inter-frame/inter-line processing	0				
5	KILS	Killer processing selection	1				
			RF	Video1-4			
6	CDL	C-signal phase with respect to the Y-signal	3	3			
			NRMD=0	NRMD=1	NRMD=2	NRMD=3	
7	DYCO	DY detection coring level	2	2	2	2	
8	DYGA	DY detection gain	10	10	10	10	
9	DCCO	DC detection coring level	5	5	5	5	
10	DCGA	DC detection gain	5	5	5	5	
11	YNRL	Frame recursive YNR nonlinear filter limit level	1 (
12	CNRL	Frame recursive CNR nonlinear filter limit level	1				
			RF	Video1-4	Video5,6,7		
13	VTRH	Hysteresis for Hsysnc non-standard signal detection	1	1	1		
14	VTRR	Sensitivity for Hsysnc non-standard signal detection	1	1	1		
15	LDSR	Sensitivity for frame non-standard signal detection	2	2	2		
			VM=off	VM=Low	VM=Mid	VM=High	
16	VAPG	V-aperture compensation gain	0	0	0	0	
17	VAPI	V-aperture compensation convergence point	0	0	0	0	
				SNNR=0	SNNR=1	SNNR=2	SNNR=3
18	YPET	Y peaking filter center frequency	3	0	0	0	0
19	YPFG	Y peaking filter gain	8	0	1	2	3
			SNNR=0	SNNR=1	SNNR=2	SNNR=3	
20	YHCO	Y output high frequency component coring	0	1	1	1	
21	YHCG	Y output high frequency component coring gain	1	1	1	1	
22	HSSL	Hsync slice level	12				
23	VSSL	Vsync slice level	8				
24	ADCL	ADC clock delay	3				
			NRMD=0	NRMD=1	NRMD=2	NRMD=3	
25	D2GA	Moving detection gain	4	4	4	4	
26	KILR	Killer detection reference	3				

Note: YHCO & YHCG are defined directly by SNNR data.

SERVICE DATA LISTS

3D-COMB uPD64082										
Reg.No &Name		FUNCTION								
27	OP	Option:Selection of comb filter&recursive n.reduction types.	1							
			RF	CVideo1	SVideo1	CVideo2	SVideo2	CVideo3	SVideo3	CVideo4
28	NR1	Noise reduction on/off	0	0	1	0	1	0	1	0
29	NR2	SNNR control on/off	0							
30	WSL	Noise level detection level data	0	Read data						
31	HPLL	H-PLL filter	1							
32	BPLL	Burst PLL filter	1							
33	FSCF	Burst extraction gain	0							
34	PLLF	PLL loop gain	1							
			RF	Video1-4	Video5,6,7					
35	CC3N	Selection if a line-comb filter C separation filter characteristic	0	0	0					
36	HDP	Fine adjustment of the system H-phase	5							
37	BGPS	Internal burst gate start position	4							
38	BGPW		10							
39	TEST	Test bit * forbidden setting	0							
40	WSC	Amount of noise detection coring	1							
			RF	Video1-4	Video5,6,7					
41	LIND	DRC-M line-doubling setting for non-standard signals	0	0	2					
42	PFGO	* Not used	3							
			SNNR=0	SNNR=1	SNNR=2	SNNR=3				
#16	VAPG		0	0	0	0				
NTSC-YCT CXA2103-1										
Reg.No &Name		FUNCTION								
			RF/Video1-4	Video5,6-480i	Video7-480i					
			P&P Left -DRC	P&P Left -DRC	P&P Left -DRC					
0	YLEV	Y-Out gain	34	40	40					
1	CLEV	Cb&Cr-Out gain	27	46	46					
			RF	Video1-4						
2	SCON	Sub contrast								
3	SCOL	Sub color								
4	SHUE	Sub hue								
5	YDLY	Y/C delay time	0	0						
			RF	Video1-4	Svideo	Video 5,6-480i	Video7-480i	SNNR=0	SNNR=1	SNNR=2
6	SHAP	Sharpness	5	4	4	4	8	0	1	2
7	SHF0	Sharpness f0 selector	3	3	3	3	0			
8	PREO	Sharpness pre/over-shoot ratio	3	0	0	0	3			
9	BPF0	Chroma band filter f0 setting	3	0	0	0	0			
10	BPFO	Chroma band filter O setting	0	3	3	3	3			
11	BPSW	Chroma band filter on/off	1	0	0	0	0			
12	TRAP	Y block chroma trap filter on/off	0	0	0	0	0			
13	LPF	Y Cb Cr-Output LPF on/off	1	1	1	1	1			
			RF	Video1-4	Video5,6	Video7				
14	AFCG	AFC Loop gain	1	0	0	0				
15	CDMD	V countdown system mode selector	3	3	3	3				
16	SSMD	H&Vsync slide level setting	0	0	0	0				
17	HMSK	Masking of macrovision signal on/off	1	1	1	0				
18	HALI	H automatic adjustment on/off	0	0	0	0				
19	PPHA	H TIM phase adjustment video	7	7	7	7				

SERVICE DATA LISTS

NTSC-YCT CXA2103-1

			RF/Video1-4		Video5,6-480i		Video7-480i				
			P&P Left -DRC	P&P Left -DRC	P&P Left -DRC	P&P Left -DRC	P&P Left -DRC				
20	CBOF	Cb Offset Adjustment					34		Note: CBOF adjustment does not affect Video 7		
21	CROF	Cr Offset Adjustment					32		Note: CROF adjustment does not affect Video 7		
22	CB02	Cb Offset Adjustment	0	0					Note: CB02 adjustment only affects Video 7		
23	CRO2	Cr Offset Adjustment	0	0					Note: CRO2 adjustment only affects Video 7		
			P&P & Favorite				P&P & Favorite				
		Single Picture	UBLK-0	UBLK-1	UBLK-2	UBLK-3	UBLK-4	UBLK-5	UBLK-6	UBLK-7	
24	ATPD	Auto-pedestal Inflection Point	0	0	2	0	0	2	3	2	
25	DCTR	DC Transmission Ratio	0	0	1	0	0	2	2	3	

NTSC-YCT CXA2103-2

Reg.No &Name	FUNCTION		RF/Video1-4		Video5,6,7-480						
			P&P Right	P&P Right , DRC			Note: Data in the right column is used when main signal is NOT 480i				
					RF	Video1-4	Note: Sub signal goes through DRC, when main signal is 480p, 1080i, or 720p				
0	YLEV	Y-Out gain	34	38							
1	CLEV	Cb&Cr-Out gain	27	31							
2	SCON	Sub contrast									
3	SCOL	Sub color									
4	SHUE	Sub hue									
5	YDLY	Y/C delay time	0	0							
			RF	Cvideo	Svideo	SNNR=0	SNNR=1	SNNR=2	SNNR=3		
6	SHAP	Sharpness	4	4	4	0	1	2	3		
7	SHF0	Sharpness f0 selector	3	3	3						
8	PREO	Sharpness pre/over-shoot ratio	0	0	0						
9	BPFO	Chroma band filter f0 setting	0	0	0						
10	BPFO	Chroma band filter O setting	0	0	0						
11	BPSW	Chroma band filter on/off	0	0	0						
12	TRAP	Y block chroma trap filter on/off	0	0	0						
13	LPF	Y Cb Cr-Output LPF on/off	0	0	0						
			RF	Video1-4							
14	AFCG	AFC Loop gain	1	0							
15	CDMD	V countdown system mode selector	3	3							
16	SSMD	H&Vsync slide level setting	0	0							
17	HMSK	Masking of macrovision signal on/off	1	1							
18	HALI	H automatic adjustment on/off	0	0							
19	PPHA	H TIM phase adjustment video	7	7							
			RF/Video1-4	Video5,6,7-480							
			P&P Right	P&P Right , DRC							
20	CBOF	Cb Offset Adjustment									
21	CROF	Cr Offset Adjustment									
			P&P & Favorite				P&P & Favorite				
		Single Picture	UBLK-0	UBLK-1	UBLK-2	UBLK-3	UBLK-4	UBLK-5	UBLK-6	UBLK-7	
22	ATPD	Auto-pedestal Inflection Point P&P & Favorite	0	0	2	0	0	2	3	2	
23	DCTR	DC Transmission Ratio P&P & Favorite	0	0	1	0	0	2	2	3	

Note: Reg.No 14 to 19 are the same data as CXA2103-1.

Note: Reg.No 22 and 23 are the same data as CXA2103-1.

SERVICE DATA LISTS

Reg.No &Name	FUNCTION	RF	Cvideo	Svideo	Video5,6 480i	Video5,6 480P	Video5,6 1080i	P&P	Video7 vga	Video7 480i	Video7 480p	Video7 1080i		
0	SBOT	Offset for SBRT	0	0	0	5	7	7	7	7	0	5	15	
1	YOF	DC-offset for Y	0	0	0	0	0	0	0	7	5	7	7	
2	CBOF	DC-offset for Cb	35	35	35	37	40	31	35	49	32	49	49	
3	CROF	DC-offset for Cr	36	36	36	39	41	31	36	49	31	49	49	
4	SBRT	Sub Bright												
5	RDRV	R output drive												
6	GDRV	G output drive	31											
7	BDRV	B output drive												
8	RCUT	R output cutoff												
9	GCUT	G output cutoff	31											
10	BCUT	B output cutoff												
			51WS500				57WS500				65WS500			
			Vivid	Std	Movie	Pro	Vivid	Std	Movie	Pro	Vivid	Std	Movie	Pro
11	WBSW	WB_S	0 (no memory)	0 (no memory)	0 (no memory)	0 (no memory)	0 (no memory)	0 (no memory)	0 (no memory)	0 (no memory)	0 (no memory)	0 (no memory)	0 (no memory)	0 (no memory)
12	SBOF	Offset for SBRT	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)
13	RDOF	Offset for RDRV	64	63 (no memory)	67	63 (no memory)	65	63 (no memory)	67	63 (no memory)	65	63 (no memory)	67	63 (no memory)
14	GDOF	Offset for GDRV	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)
15	BDOF	Offset for BDRV	69	63 (no memory)	56	63 (no memory)	69	63 (no memory)	56	63 (no memory)	70	63 (no memory)	56	63 (no memory)
16	RCOF	Offset for RCUT	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	64	63 (no memory)	63	63 (no memory)	64	63 (no memory)
17	GCOF	Offset for GCUT	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)	63	63 (no memory)
18	BCOF	Offset for BCUT	65	63 (no memory)	61	63 (no memory)	66	63 (no memory)	62	63 (no memory)	65	63 (no memory)	61	63 (no memory)

CRT Driver CXA2150P-2 settings for Vivid mode

Reg.No &Name	FUNCTION				
0	ALBK	PIC_ON:RGB output including AKB reference pulse on/off	1		
1	RGBS	R_ON/G_ON/B_ON : R/G/B outputs on/off	7		
2	BLKB	BLK_BTM:RGB output bottom limit level	3		
3	LIML	PLIMIT_LEV:Threshold level for excessively high inputs	0		
4	PABL	P_ABL:DC-level in RGB output detection for PEAK ABL	15		
5	SABL	S_ABL:S ABL gain	0		
6	AGNG	AGING_W/AGING_B:AGING_W/AGING_B modes on/off	0		
7	AKBO	AKBOFF:Automatic/Manual =Cut off setting	0		
			RF/Video1-4	Video5,6 480i	Video5,6 480P
8	SYPH	SYNC_PHASE:Hsync delay with respect to Videc	0	0	0
9	CLPH	CLP_PHASE:Internal clamp pulse phase	3	3	3
10	CLGA	CLP_GATE:Switch for the gated internal clamp pulse with Hsync	0	0	0
11	JAXS	JAXIS:color axis switch	0		
12	BLKO	BLKO:Blanking switch	0		

SERVICE DATA LISTS

CRT Driver CXA2150P-3			Vivid						
Reg.No	Name	FUNCTION	RF	Cvideo	Svideo	Video5,6 480i	Video5,6 480P	Video5,6 1080i	P&P
0	SYSM	SYSTEM:Signal bandwidth setting	1	1	1	1	1	2	2
1	UVML	VM_LEV:VM_OUT level	3	3	3	2	2	3	3
2	VMMO	System Micro pin#40	1	1	1	1	1	1	0
3	VMCR	VM_COR:VM_OUT coring level	0	0	0	1	1	3	3
4	VMLM	VM_LMT:VM_OUT limit level	3	3	3	3	3	3	3
5	VMF0	VM F0: VM f0	2	2	2	2	2	2	2
6	VMDL	VM_DLY:VM_OUT phase	1	2	2	2	2	0	1
7	SHOF	Offset for USHP=SHOF x 4	0	1	1	2	3	3	3
8	SHF0	SHP_F0:Sharpness circuit f0	1	1	1	1	1	0	1
9	PROV	PRE/OVER:Y signal pre/over-shoot ratio	0	0	0	3	3	3	3
10	F1LV	SHP_F1:Sharpness for higher f0	0	0	0	0	1	3	3
11	CDSP	SHP_CD:Sharpness in part of high color saturation	3	3	3	3	3	3	3
12	LTLV	LTI_LEV:Luminance transient improvement	3	3	3	3	3	3	3
13	LTMD	LTI_MODE:LTI mode setting	1	1	1	1	0	0	1
14	CTLV	CTI_LEV:Chrominance transient improvement	0	0	0	0	0	0	0
15	CTMD	CTI_MODE:CTI mode setting	0	0	0	0	0	0	0
16	UBOF	Offset for UBRT	0	0	0	0	7	9	7
17	UCOF	Offset for UCOL=UCOF x 2	3	3	3	3	3	0	2
18	UHOF	Offset for UHUE	0	0	0	0	0	0	0
19	MIDE	MID enhancement setting	3	15	15	7	11		
CRT Driver CXA2150P-2 Video7 Settings for Vivid Mode									
Reg.No	Name	FUNCTION							
0	ALBK		-						
1	RGBS		-						
2	BLKB		-						
3	LIML		-						
4	PABL		-						
5	SABL		-						
6	AGNG		-						
7	AKBO		-						
			Video7 VGA	Video7 480i	Video7 480P	Video7 1080i			
8	SYPH	SYNC_PHASE:Hsync delay with respect to Video	0	0	0	0			
9	CLPH	CLP_PHASE:Internal clamp pulse phase	3	3	3	3			
10	CLGA	CLP_GATE:Switch for the gated internal clamp pulse with Hsync	0	0	0	0			
11	JAXS		-						
12	BLKO		-						

SERVICE DATA LISTS

CRT Driver CXA2150P-3 DVI Settings			Vivid			
Reg.No &Name	FUNCTION		Video7 VGA	Video7 480i	Video7 480p	Video7 1080i
0	SYSM	SYSTEM:Signal bandwidth setting	2	1	1	3
1	UVML	VM_LEV:VM_OUT level	2	2	2	3
2	VMMO	System Micro pin#40	1	1	1	1
3	VMCR	VM_COR:VM_OUT coring level	0	0	0	0
4	VMLM	VM_LMT:VM_OUT limit level	3	3	3	3
5	VMF0	VM F0: VM f0	0	1	1	0
6	VMDL	VM_DLY:VM_OUT phase	2	1	1	2
7	SHOF	Offset for USHP=SHOF x 4	0	2	2	3
8	SHF0	SHP_F0:Sharpness circuit f0	1	1	1	1
9	PROV	PRE/OVER:Y signal pre/over-shoot ratio	3	3	3	3
10	F1LV	SHP_F1:Sharpness for higher f0	0	0	0	0
11	CDSP	SHP_CD:Sharpness in part of high color saturation	3	3	3	3
12	LTLV	LTI_LEV:Luminance transient improvement	0	3	3	3
13	LTMD	LTI_MODE:LTI mode setting	1	0	0	1
14	CTLV	CTI_LEV:Chrominance transient improvement	0	0	0	3
15	CTMD	CTI_MODE:CTI mode setting	0	0	0	0
16	UBOF	Offset for UBRT	2	2	2	2
17	UCOF	Offset for UCOL=UCOF x 2	0	1	0	0
18	UHOF	Offset for UHUE	0	0	0	0
19	MIDE	MID enhancement setting	8	7	11	0

CRT Driver CXA2150P-3 settings for standard, movie and pro

Reg.No &Name	Standard								Movie								Pro							
	RF	CV	SV	V5,6 480i	V5,6 480P	V5,6 1080i	P&P		RF	CV	SV	V5,6 480i	V5,6 480P	V5,6 1080i	P&P		RF	CV	SV	V5,6 480i	V5,6 480P	V5,6 1080i	P&P	
#0	SYSM	1	1	1	1	1	2	2	1	1	1	1	1	2	2		1	1	1	1	1	2	2	
#1	UVML	2	2	2	2	2	2	3	1	1	1	1	1	1	1		0	0	0	0	0	0	0	
#2	VMMO	1	1	1	1	1	1	1	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
#3	VMCR	1	0	0	1	1	3	3	1	1	1	1	1	3	3		3	3	3	3	3	3	3	
#4	VMLM	3	3	3	3	3	3	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	
#5	VMF0	2	2	2	2	2	2	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2	
#6	VMDL	0	2	2	2	2	1	1	1	2	2	2	1	1		2	2	2	2	2	1	1		
#7	SHOF	1	0	0	0	2	3	3	1	1	1	1	1	1	1		0	0	0	0	0	0	0	
#8	SHF0	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	
#9	PROV	0	3	0	0	0	0	0	3	3	3	3	2	2	3		3	3	3	2	3	2	2	
#10	F1LV	0	0	0	0	1	3	3	0	0	0	1	2	3	3		0	0	0	1	2	3	3	
#11	CDSP	3	3	3	3	3	3	3	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
#12	LTLV	2	2	2	2	2	2	2	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
#13	LTMD	1	1	1	1	1	0	1	1	1	1	1	0	1		1	1	1	1	1	0	1		
#14	CTLV	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
#15	CTMD	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
#16	UBOF	7	7	7	7	7	9	7	7	7	7	7	7	7	7		7	7	7	7	7	7	7	
#17	UCOF	1	1	1	1	1	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
#18	UHOF	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
#19	MIDE	2	14	14	6	10	--	--	1	13	13	5	9	--	--		0	12	12	4	8	--	--	

NVM ADDRESS: see the next page

SERVICE DATA LISTS

CRT Driver CXA2150P-3					
Reg.No &Name	FUNCTION	SNNR=0	SNNR=1	SNNR=2	SNNR=3
#1	UVML	0	0	0	0
#3	VMCR	0	+1	+2	+3
#10	F1LV	0	-1	-2	-3
#11	CDSP	0	0	0	0
#12	LTLV	0	0	0	0
#14	CTLV	0	0	0	0
#19	MIDE	0	0	0	0

CRT Driver CXA2150P-3 Video7 settings for standard, movie and pro													
Reg.No &Name		Standard				Movie				Pro			
		Video7 VGA	Video7 480i	Video7 480p	Video7 1080i	Video7 VGA	Video7 480i	Video7 480p	Video7 1080i	Video7 VGA	Video7 480i	Video7 480p	Video7 1080i
#0	SYSM	2	1	1	3	2	1	1	3	2	2	2	3
#1	UVML	2	2	2	2	2	1	1	1	2	0	0	0
#2	VMMO	1	1	1	1	1	0	0	0	1	0	0	0
#3	VMCR	0	0	0	0	0	0	0	0	0	0	0	0
#4	VMLM	3	3	3	3	3	3	3	3	3	3	3	3
#5	VMF0	0	1	1	0	0	1	1	0	0	0	0	0
#6	VMDL	2	1	1	2	2	1	1	2	2	2	2	2
#7	SHOF	0	3	3	3	0	1	1	1	0	0	0	2
#8	SHF0	1	1	1	1	1	1	1	1	1	1	1	1
#9	PROV	3	3	3	3	3	3	3	3	3	3	3	3
#10	F1LV	0	0	0	0	0	0	0	0	0	0	0	0
#11	CDSP	3	3	3	3	0	0	0	0	0	0	0	0
#12	LTLV	0	2	3	3	0	1	2	2	0	0	0	0
#13	LTMD	1	1	0	1	1	1	1	1	1	1	1	1
#14	CTLV	0	0	0	3	0	0	0	2	0	0	0	0
#15	CTMD	0	0	0	0	0	0	0	0	0	0	0	0
#16	UBOF	2	4	4	4	2	2	2	2	2	2	2	2
#17	UCOF	0	0	0	0	0	0	0	0	0	0	0	0
#18	UHOF	0	0	0	0	0	0	0	0	0	0	0	0
#19	MIDE	8	6	10	0	8	5	9	0	8	4	8	0

NVM ADDRESS: see the next page

CRT Driver CXA2150P-3					
Reg.No &Name	FUNCTION	SNNR=0	SNNR=1	SNNR=2	SNNR=3
#1	UVML	0	0	0	0
#3	VMCR	0	+1	+2	+3
#10	F1LV	0	-1	-2	-3
#11	CDSP	0	0	0	0
#12	LTLV	0	0	0	0
#14	CTLV	0	0	0	0
#19	MIDE	0	0	0	0

SERVICE DATA LISTS

CRT Driver CXA2150P-4											
Reg.No &Name	FUNCTION	Vivid	Standard	Movie	Pro						
0	UPIC	PICTURE:Picture	63	44	31	31					
1	UBRT	BRIGHT: Brightness	26	31	31	31					
2	UCOL	COLOR:Color	31	31	31	31					
3	UHUE	HUE:Hue	31	31	31	31					
4	USHP	SHARPNESS:Sharpness	32	40	31	31					
5	UTMP	Color Temperature	2	1	0	1					
6	UDCL	DCOL:Dynamic color setting	2	2	0	0					
			RF/Video1-4	Video5,6 480i	Video5,6 480P	Video5,6 1080i	P&P	Video7 vga	Video7 480i	Video7 480p	Video7 1080i
7	AXIS	COL_AXIS:color matrix setting	0	0	0	0	0	0	0	0	0
Picture Mode Vivid											
			RF/Video1-4	Video5,6 480i	Video5,6 480P	Video5,6 1080i	P&P	Video7 vga	Video7 480i	Video7 480p	Video7 1080i
8	UGAM	GAMMA_L:RGB output GAMMA correction	5	4	4	1	5	0	4	4	1
9	AGAM	GAMMA_L---Void Data	---								
			UGAM-0	UGAM-1	UGAM-2	UGAM-3	UGAM-4	UGAM-5	UGAM-6	UGAM-7	
10	GSBO	Offset for SBRT	0	0	0	0	0	0	0	0	
11	GCOO	Offset for UCOL	0	0	0	0	0	0	0	0	
12	GHUO	Offset for UHUE	0	0	0	0	0	0	0	0	
Picture Mode Vivid											
			RF/Video1-4	Video5,6 480i	Video5,6 480P	Video5,6 1080i	P&P	Video7 vga	Video7 480i	Video7 480p	Video7 1080i
13	UBLK	Initial Black Level	6	6	6	6	4	0	6	6	6
14	ABLK	--- Void Data	---								
			UBLK0	UBLK1	UBLK2	UBLK3	UBLK4	UBLK5	UBLK6	UBLK7	
15	DCTR	DC_TRAN:Y signal DC transmission	1	1	1	2	3	2	3	3	
16	DPIC	DPIC_LEV:Y signal AUTO PEDESTAL level	0	1	2	1	1	2	1	2	
17	DSBO	Offset for SBRT	7	7	7	7	7	7	7	7	
18	ABLM	ABL MODE:ABL mode	0	0	0	0	0	0	1	1	
			Full								
19	ABLT	ABL_TH:ABL current detection Vth control	0								
20	EPOF	Offset for UPIC=EPOF x - void Data	{A6 E9 1F}								
21	SPOF	Offset for UPIC=SPOF x - Not used	15	<< Only available at Vcomp1&2.							
			RF/Video1-4	Video5,6 480i	Video5,6 480P	Video5,6 1080i	P&P	Video7 vga	Video7 480i	Video7 480p	Video7 1080i
22	SCON	SUB_CONTRAST:SUB PICTURE	8	5	5	4	4	5	5	5	4
23	CLOF	Offset for UCOL	8	8	8	8	8	8	8	8	8
24	HUOF	Offset for UHUE	4	4	4	4	4	4	4	4	4
25	IDSW	Not used									
26	DATA	Display of vertical compression modes. Not use	0								

SERVICE DATA LISTS

CRT Driver CXA2150P-4																	
Reg.No &Name		FUNCTION															
		SNNR =0	SNNR =1	SNNR =2	SNNR =3												
#4	USHP	SHARPNESS:Sharpness															
		0	1	3	4												
		Picture Mode : Standard					Picture Mode : Movie					Picture Mode : Pro					
		RF & V1-4	V5,6 480i	V5,6 480P	V5,6 1080i	P&P	RF & V1-4	V5,6 480i	V5,6 480P	V5,6 1080i	P&P	RF & V1-4	V5,6 480i	V5,6 480P	V5,6 1080i	P&P	
#8	UGAM	GAMMA_L:RGB output GAMMA correction															
		2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0
		A6 22 07	A6 23 07	A6 24 07	A6 25 07	A6 26 07	A6 27 07	A6 28 07	A6 29 07	A6 2A 07	A6 2B 07	A6 2C 07	A6 2D 07	A6 2E 07	A6 2F 07	A6 30 07	
		Video7 VGA	Video7 480i	Video7 480P	Video7 1080i		Video7 VGA	Video7 480i	Video7 480P	Video7 1080i		Video7 VGA	Video7 480i	Video7 480P	Video7 1080i		
#8	UGAM DVI	GAMMA_L:RGB output GAMMA correction															
		0	2	2	1		0	0	0	0		0	0	0	0		
		A6 35 07	A6 36 07	A6 37 07	A6 38 07		A6 39 07	A6 3A 07	A6 3B 07	A6 3C 07		A6 3D 07	A6 3E 07	A6 3F 07	A6 40 07		
		Picture Mode : Standard					Picture Mode : Movie					Picture Mode : Pro					
		RF & V1-4	V5,6 480i	V5,6 480P	V5,6 1080i	P&P	RF & V1-4	V5,6 480i	V5,6 480P	V5,6 1080i	P&P	RF & V1-4	V5,6 480i	V5,6 480P	V5,6 1080i	P&P	
#13	UBLK	Initial Black Level															
		3	3	3	3	3	1	1	1	1	1	0	0	0	0	0	
		A6 22 38	A6 23 38	A6 24 38	A6 25 38	A6 26 38	A6 27 38	A6 28 38	A6 29 38	A6 2A 38	A6 2B 38	A6 2C 38	A6 2D 38	A6 2E 38	A6 2F 38	A6 30 38	
		Video7 VGA	Video7 480i	Video7 480P	Video7 1080i		Video7 VGA	Video7 480i	Video7 480P	Video7 1080i		Video7 VGA	Video7 480i	Video7 480P	Video7 1080i		
#13	UBLK DVI	Initial Black Level															
		0	3	3	3		0	1	1	1		0	0	0	0		
		A6 35 38	A6 36 38	A6 37 38	A6 38 38		A6 39 38	A6 3A 38	A6 3B 38	A6 3C 38		A6 3D 38	A6 3E 38	A6 3F 38	A6 40 38		
CRT Driver CXA2150D-1																	
Reg.No &Name		FUNCTION															
0	VPOS	V_POSITION:Vertical position															
1	VSIZ	V_SIZE:Vertical size															
2	VSZO	V_SIZE OFFSET															
3	VLIN	V_LINEARITY:Vertical linearity															
4	VSCO	S_CORRECTION:Vertical S-correction															
5	VCEN	VSAW0 DCH/VSAW0 DCL:Vertical center adjustment															
6	VPIN	VSAW0_AMP:Vertical PIN adjustment															
7	NSCO	VSAW1_DC:Rotation															
8	HTPZ	VSAW1_AMP:Horizontal trapezoid															
9	ZOOM	ZOOM_SW:Zoom switch															
10	APSW	ASP_SW:Aspect switch															
11	ASPT	V_ASPECT:Aspect ratio															
12	SCRL	V_SCROLL:Vertical scroll															
13	UVLN	UP_VLIN:Upper vertical linearity															
14	LVLN	LO_VLIN:lower vertical linearity															

SERVICE DATA LISTS

CRT Driver CXA2150D-2						
Reg.No	Name	FUNCTION	1080i	FULL/NORM	ZOOM	WIDE ZOOM
0	HCNT	HC_PARA_DC:Horizontal center				19
1	HPOS	H_POSITION:Horizontal position				25
2	HSIZ	H_SIZE:Horizontal size				
3	SLIN	MP_PARA_DC:Horizontal S-correction				
4	MPIN	MP_PARA_AMP:Horizontal middle pin		0		0
5	PIN	PIN_AMP:Horizontal pin		10		10
6	PIN0	PIN_AMP offset	7	7	7	7
7	UCP	UP_CPIN:Upper corner pin		31		31
8	LCP	LO_CPIN:Lower corner pin		31		31
9	UXCG	UP_UCG:Upper extra corner pin gain		0		0
10	LXCG	LO_UCG:Lower extra corner pin gain		0		0
11	UXCP	UP_UCP:Upper extra corner pin position		2		2
12	LXCP	LO_UCP:Lower extra corner pin position		2		2
13	XCPP	UC_POL:Extra corner pin polarity		0		0
14	PPHA	PIN_PHASE:Pin phase			31	
15	VANG	AFC_ANGLE:AFC angle			31	
16	LANG	HC_PARA_PHASE:Linearity angle			33	
17	VBOW	AFC_BOW:AFC bow			31	
18	LBOW	HC_PARA_AMP:Linearity bow			48	
19	CPY1	Copy function 1: * Not used			0	

CRT Driver CXA2150D-3							
Reg.No	Name	FUNCTION	1080i	Full	NORMAL	Zoom	WideZoom
0	HBLK	HBLK_SW:Horizontal blanking switch					1
1	LBLK	LEFT_BLK:Left blanking	56				58
2	RBLK	RIGHT_BLK:Right blanking	25				23
3	VBLK	VBLK_SW:Vertical blanking switch	1		1	0	0
4	TBLK	UP_BLK:Top blanking	4	15	15	15	15
5	BBLK	LO_BLK:Bottom blanking	5	15	15	15	15
6	VCMP	V_COMP:Vertical compensation	0	0	0	0	0
7	HCMP	H_COMP:Horizontal compensation	0		0	0	0
8	ACMP	AFC_COMP:AFC compensation	0		0	0	0
9	PCMP	PIN_COMP:Pin compensation	0		0	0	0
10	AFCM	AFC_MODE:AFC compensation	2			3	
11	VFRQ	V_FREQ:Vertical frequency					1
12	VON	V_ON:Vertical drive on					1
13	JUMP	JMP_SW:Reference pulse jump switch					0
14	VDJP	VDRV_SW:Vertical drive switch	1	1	1	1	1
15	VDST	RST_SW:Vertical drive start switch	0	0	0	0	0
16	EWDC	EW_DC:Pin DC level shift					0
17	AKBT	AKBTIM:AKB timing	9	9	9	9	9

SERVICE DATA LISTS

Component I/F & Sync Separation CXA2171										
Reg.No &Name	FUNCTION		Video5,6 480i	Video5,6 480P	Video5,6 1080i	Video5,6 720P	Video7 480i	Video7 480P	Video7 1080i	Video7 720P
0	MTRX	MAT_OUT	15.75khz	31.50khz	33.75khz	45khz	15.75khz	31.50khz	33.75khz	45khz
1	GAIN	GAIN_SEL	0	0	1	1	0	0	1	1
2	CBGN	CBGAIN	9							
3	VTC	V_TC	1							
4	HWID	H_WIDTH	1							
			Video5,6	Video7	Sub					
5	HSEP	HSEP_SEL	1	1	0					
6	TEST	TEST	0							
7	FRGB	No used	0							
			V5,6,7 1080i	ELSE						
8	HMSK	Hsync masking in vertical retrace	0	1						

Audio Processor BH3868FS		
Reg.No &Name	FUNCTION	
0	SVOL	Volume:Offset for Volume
1	SBAL	Balance Offset for Balance
2	SBAS	Bass:Offset for Bass
3	STRE	Treble:Offset for Treble
4	BBLP	BBE low pass filter
5	BBHP	BBE high pass filter
6	SREF	Surround effect
7	AGC	Auto gain control
8	BBE	BBE on/off

TruSurround NJM2180		
Reg.No &Name	FUNCTION	
0	TSMD	Trusurround effect selection
1	ATT	No used for Wide model

DLBY NJW1106		
Reg.No &Name	FUNCTION	
0	DBMD	
1	SCH	
2	ADSW	
3	CECH	
4	DELY	
5	SSEL	

SERVICE DATA LISTS

MID-1					
Reg.No &Name		FUNCTION			
Display Data					
0	DHPH	H active display area phase	110		
1	DVPH	V active display area phase	20		
2	DHAR	H active display area size	240		
3	DVAR	V active display area size	135		
4	DHPW	display H pulse width	55		
5	DVPW	display V pulse width	5		
22	DPSW	display PLL switch	1		
23	MDL	model select	0		
Misc. Common Data			Data		
6	DYCD	display output Y-C delay correction	2		
7	DYSD	display output YS signal delay select	1		
Favorite / Other			Normal	Favorite	Others
8	MDHP	main display picture H position	154	9	0
10	MDHS	main display picture H size	162	149	240
Single / Favorite			Single 480i/480i	Single 720P	Favorite
9	MDVP	main display picture V position	30	30	20
11	MDVS	main display picture V size	120	120	97
Index / Others			Index	Others	
12	MLHP	multi picture mode H position	36	36	
13	MLVP	multi picture mode V position	31	31	
Favorite			Favorite		
14	SDHP	sub display picture H position	166		
15	SDVP	sub display picture V position	20		
Favorite			Favorite		
16	SDHS	sub display picture H size	44		
17	SDVS	sub display picture V size	29		
PinP Position					
18	PDHP		-		
19	PDVS		-		
PinP Size					
20	PDHS		-		
21	PDVS		-		
Single / Others			Single	Others	
24	BCOL	Background Y level	5	5	
MID-2					
Reg.No &Name		FUNCTION			
MID Mode, Wide mode, Input Signal Format		Single		Single	
		RF,Video, YC	YPbPr	RF,Video, YC	YPbPr
0	DRHP	DRC H active area position	142	141	111
1	DRHS	DRC H active area size	162	162	178
2	DRVV	DRC V active area position	37	37	37
3	DRVS	DRC V active area size	120	120	120

SERVICE DATA LISTS

MID-2 (Continued)							
			Twin, Favorite		Memo		
			RF,Video, YC	YPbPr	RF,Video, YC	YPbPr	
0	DRHP	DRC H active area position	132	131	142	141	
1	DRHS	DRC H active area size	166	166	162	162	
2	DRVP	DRC V active area position	54	54	58	58	
3	DRVS	DRC V active area size	112	112	110	110	
			Index		Twin-Right	Scroll-Small	
			RF,Video, YC	YPbPr	RF,Video, YC	RF	
0	DRHP	DRC H active area position	139	138	138	143	
1	DRHS	DRC H active area size	164	164	166	162	
2	DRVP	DRC V active area position	50	50	54	54	
3	DRVS	DRC V active area size	114	114	112	112	
MID-3 : INPUT)							
Reg.No &Name		FUNCTION					
		MID mode, Wide mode, Input Signal Format	Single				
			480P	720P	YPbPr No Sig.		
0	VDHP	VDO H active area position	109	95	205		
1	VDHS	VDO H active area pixel size	166	108	226		
2	VDVE	VDO V active area even position	37	24	37		
3	VDVS	VDO V active area line size	120	180	56		
			Twin, Favorite			Twin-Right	
			480P	1080i	720P	YPbPr No Sig.	RF,Video, SV
0	VDHP	VDO H active area position	128	94	111	179	197
1	VDHS	VDO H active area pixel size	155	150	99	199	215
2	VDVE	VDO V active area even position	53	37	50	24	26
3	VDVS	VDO V active area line size	112	126	168	56	56
			Memo				
			480P	1080i	720P	YPbPr No Sig.	
0	VDHP	VDO H active area position	136	102	115	179	
1	VDHS	VDO H active area pixel size	152	147	98	199	
2	VDVE	VDO V active area even position	57	44	58	24	
3	VDVS	VDO V active area line size	110	123	164	56	
			Index				Index-Small
			480P	1080i	720P	YPbPr No Sig.	RF
0	VDHP	VDO H active area position	132	99	112	166	204
1	VDHS	VDO H active area pixel size	154	149	99	187	211
2	VDVE	VDO V active area even position	51	34	48	24	26
3	VDVS	VDO V active area line size	113	128	169	56	56
Input Signal Format			RF,Video, S-Video, YPbPr 480	480P	1080i	720P	
4	VDVO	VDO V active area line size	0	0	0	0	
5	VCPO	VDO V active area odd position	95	70	40	40	
6	VCWD	VDO clamp pulse output timing	3	3	3	3	
7	VYCD	VDO clamp pulse width	0	0	0	0	
8	VSTP	VDO PLL phase detect stop line count	-	119	160	146	
9	VSTT	VDO PLL phase detect start line count	-	4	0	0	
10	VHSC	VDO H sync cycle	130	-	-	-	

SERVICE DATA LISTS

MID-5 Enhance Table Data Setting										
			RF				YPbPr-480i			
0	P-OP	Table select	0	1	2	3	4	5	6	7
1	MHLY	Main H LPF Y Coefficient select	1	1	1	1	1	1	1	1
2	MHLC	Main H LPF C Coefficient select	3	3	3	3	3	3	3	3
3	MVLY	Main V LPF Y Coefficient select	0	0	0	0	0	0	0	0
4	MVLC	Main V LPF C Coefficient select	0	0	0	0	0	0	0	0
5	MHYR	Main H Enhance. Y Coreing level	1	1	2	1	0	0	0	1
6	MHYL	Main H Enhance. Y Clip level	1	1	1	1	1	1	1	1
7	MHYE	Main H Enhance. Y Enhancement level	7	7	3	3	3	3	3	5
8	MHYC	Main H Enhance. Y Coefficient select	1	1	1	1	1	1	1	1
9	MHCR	Main H Enhance. C Coreing level	0	0	0	0	0	0	0	0
10	MHCL	Main H Enhance. C Clip level	1	1	1	1	1	1	1	1
11	MHCE	Main H Enhance. C Enhancement level	0	0	0	0	0	0	0	0
12	MHCC	Main H Enhance. C Coefficient select	1	1	1	1	1	1	1	1
13	MVYR	Main V Enhance. Y Coreing level	0	0	2	2	0	0	2	2
14	MVYL	Main V Enhance. Y Clip level	1	1	1	0	1	1	1	1
15	MVYE	Main V Enhance. Y Enhancement level	0	0	2	5	0	0	2	5
16	MVCR	Main V Enhance. C Coreing level	0	0	0	0	0	0	0	0
17	MVCL	Main V Enhance. C Clip level	1	1	1	1	1	1	1	1
18	MVCE	Main V Enhance. C Enhancement level	0	0	0	0	0	0	0	0
			YPbPr-480p				Cvideo/Svideo			
0	P-OP	Table select	8	9	10	11	12	13	14	15
1	MHLY	Main H LPF Y Coefficient select	0	0	0	0	1	1	1	1
2	MHLC	Main H LPF C Coefficient select	3	3	3	3	3	3	3	3
3	MVLY	Main V LPF Y Coefficient select	0	0	0	0	0	0	0	0
4	MVLC	Main V LPF C Coefficient select	0	0	0	0	0	0	0	0
5	MHYR	Main H Enhance. Y Coreing level	0	0	0	1	0	0	0	1
6	MHYL	Main H Enhance. Y Clip level	1	1	1	1	1	1	1	1
7	MHYE	Main H Enhance. Y Enhancement level	7	7	3	5	7	7	3	3
8	MHYC	Main H Enhance. Y Coefficient select	1	1	1	1	1	1	1	1
9	MHCR	Main H Enhance. C Coreing level	0	0	0	0	0	0	0	0
10	MHCL	Main H Enhance. C Clip level	1	1	1	1	1	1	1	1
11	MHCE	Main H Enhance. C Enhancement level	0	0	0	0	0	0	0	0
12	MHCC	Main H Enhance. C Coefficient select	1	1	1	1	1	1	1	1
13	MVYR	Main V Enhance. Y Coreing level	0	0	2	2	0	0	2	2
14	MVYL	Main V Enhance. Y Clip level	1	1	1	1	1	1	1	1
15	MVYE	Main V Enhance. Y Enhancement level	0	0	2	5	0	0	2	5
16	MVCR	Main V Enhance. C Coreing level	0	0	0	0	0	0	0	0
17	MVCL	Main V Enhance. C Clip level	1	1	1	1	1	1	1	1
18	MVCE	Main V Enhance. C Enhancement level	0	0	0	0	0	0	0	0

On-Screen Display		
Reg.No &Name	FUNCTION	
0	HPOS	OSD horizontal position
1	HPOF	Horizontal position for Favorite mode
2	VPOS	OSD vertical position
3	VPOT	Vertical position for P&Pmode

SERVICE DATA LISTS

SNNR						
Reg.No &Name	FUNCTION					
0	SNNR	SNNR data setting	0	1	2	3
1	SNFX	Selection of SNNR data setting	0			
2	WSLT	Noise level detection data thresholds for SNNR data	0 ~ 30	31 ~ 62	63 ~ 126	127 ~ 255
SNNR Settings based on WSL Data						
	SNNR=0/1/2/3		0	1	2	3
3	CPFG	Related to 3D-COMB / #19 YPFG settings	0	1	2	3
4	CPFT	Related to 3D-COMB / #18 YPFT settings	0	0	0	0
5	CCOR	Related to 3D-COMB / #20 VHCO settings	0	1	1	1
6	CHCG	Related to 3D-COMB / #21 VHCG settings	1	1	1	1
7	CAPG	Related to 3D-COMB / #16 VAPG settings	0	0	0	0
8	3SHP	Related to CXA2103 / #6 SHAP settings	0	1	2	3
9	MIDD	Related to CXA2150P-3 / #19 MIDE settings	0	0	0	0
10	5SHP	Related to CXA2150P-4 / #4 USHP settings	0	1	3	4
11	5YF1	Related to CXA2150P-3 / #10 F1LV settings	0	1	2	3
12	5CDS	Related to CXA2150P-3 / #11 CDSP settings	0	0	0	0
13	5LTI	Related to CXA2150P-3 / #12 LTLV settings	0	0	0	0
14	5CTI	Related to CXA2150P-3 / #14 CTLV settings	0	0	0	0
15	5VML	Related to CXA2150P-3 / #1 UVML settings	0	0	0	0
16	5YMC	Related to CXA2150P-3 / #3 VMCR settings	0	1	2	3

ID-1 Detection			
Reg.No &Name	FUNCTION		
0	XJGL	XJGLK:Setting for memorizing or not the ID-1 detection status	0
1	LNJI	LNJI:Setting for the multi/single-line ID-1 detection	0

Closed Caption Display & Parental Control			
Reg.No &Name	FUNCTION		
0	HPRM	Horizontal position of CCD	
1	HPRS	Horizontal position of CCD	
2	RND	OSD rounding control	1
3	CCDI	Interruption control	3
4	CRIP	CRI count & parity count	4
5	CRIT	Charge/Discharge timing control for slice voltage level	0
6	CHMK	Horizontal mask width	42
7	FPOL	Field polarity selection	1
8	LANG		0
9	DATA	Switch for CCD service/test data	0
10	VCHIP	Selection of Vchip controls	1

OPTIONS			
Reg.No &Name	FUNCTION		
0	DLY1	Power-On to RLY timing = DLY1 x 50ms	2
1	DLY2	Power-On Mute timing =DLY2 x 50ms	12
2	DLY3	Relay-On to start Bus communication	12
3	AGC		255
4	PCMX		63
5	BRMX		63
6	RAMW		0
7	SOFF		0

SNNR data is used for the (-) offset setting.

SNNR data is used for the direct setting.

SNNR data is used for the (-) offset setting.

SNNR data is used for the (+) offset setting.

]

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SERVICE DATA LISTS

PJ Engine								
ITEM No.	ITEM Name	Contents	min	max	Normal	Zoom	W Zoom	HD
0	FDIS	Switch of display for fine adjustment data	0	1				
1	COPY	Service copy adjustment	0	1				
2	ALCP	Service all copy adjustment	0	1				
3	OSDH	Osd horizontal position of PJED service menu	1	255			22	
4	OSDV	Osd vertical position of PJED service menu	1	255	100	120	100	60
5	FVSL	Start position of fine adjustment	0	15	0	14	15	0
6	FVSP	Start line of fine adjustment	0	255	3	21	25	53
7	V1DL	Value of V1 delay	0	255	1	139	60	1
8	V1CU	Value of V1 count up	0	4095	454	598	506	387
9	V1OH	Value of V1 offset upper data	0	255	5	5	5	79
10	V1OL	Value of V1 offset lower data	0	255	0	0	0	0
11	OEVP	Odd/Even select positioin	0	4095			1056	
12	COHP	Horizontal phase for rough adjustment	0	4095			0	
13	34CS	Start center clamp positioin of H3 and H4 pulse	0	31			14	
14	34CW	Width center clamp position of H3 and H4 pulse	0	31			0	
15	FIHP	Horizontal phase for fine adjustment	0	4095			1104	
16	TPHP	Horizontal phase for test pattern	0	4095			69	
17	TPVP	Vertical phase for test pattern	0	255	55	111	79	15
18	DFHP	Horizontal phase for dynamic focus	0	4095			250	
19	DFHG	Value of horizontal parabola wave for dynamic focus	-128	127	-70	-70	-70	-70
20	DFVG	Value of vertical parabola wave for dynamic focus	-128	127	-65	-65	-65	-65
21	DFDC	Value of center for dynamic focus	-128	127	127	127	127	127
22	DFV1	Value of V1 saw wave for dynamic focus	-128	127	-50	-50	-50	-50
23	SDHP	Compensation of horizontal phase for shading	0	4095			422	
24	SDH1	Value of horizontal saw wave for dynamic focus	-128	127	127	127	127	127
25	RVCS	Start positioin of Red vertical clamp	0	31			0	
26	RVCW	Width of Red vertical clamp	0	31			0	
27	GVCS	Start position of Green vertical clamp	0	31			0	
28	GVCW	Width of Green vertical clamp	0	31			0	
29	BVCS	Start position of Blue vertical clamp	0	31			0	
30	BVCW	Width of Blue vertical clamp	0	31			0	
31	RHCS	Start position of Red horizontal clamp	0	31			0	
32	RHCW	Width of Red horizontal clamp	0	31			0	

SERVICE DATA LISTS

PJ Engine								
ITEM No.	ITEM Name	Contents	min	max	Normal	Zoom	W Zoom	HD
33	GHCS	Start position of Green horizontal clamp	0	31			0	
34	GHCW	Width of Green horizontal clamp	0	31			0	
35	BHCS	Start position of Blue horizontal clamp	0	31			0	
36	BHCW	Width of Blue horizontal clamp	0	31			0	
37	BDVU	Vertical position for border line 1	0	2047	28	21	12	49
38	BDVL	Vertical position for border line 2	0	2047	900	683	820	1039
39	BDHL	Horizontal position for border line 1	0	2047			148	
40	BDHR	Horizontal position for border line 2	0	2047			1262	
41	HBLD	Horizontal phase for output of H.Blank out	0	4095			0	
42	HBLW	Width for output of H.Blank out	0	4095			0	
43	PWM2	PWM2 output width setting of Regi IC	0	4095			730	
44	COGV	Green vertical center offset data for Auto Regi.	-128	127			0	
45	CORV	Red vertical center offset data for Auto Regi.	-128	127			0	
46	COBV	Blue vertical center offset data for Auto Regi.	-128	127			0	
47	COGH	Green horizontal center offset data for Auto Regi.	-128	127			0	
48	CORH	Red horizontal center offset data for Auto Regi.	-128	127			0	
49	COBH	Blue horizontal center offset data for Auto Regi.	-128	127			0	
50	SOGV	Green vertical skew offset data for Auto Regi.	-128	127			0	
51	SORV	Red vertical skew offset data for Auto Regi.	-128	127			0	
52	SOBV	Blue vertical skew offset data for Auto Regi.	-128	127			0	
53	SOGH	Green horizontal skew offset data for Auto Regi.	-128	127			0	
54	SORH	Red horizontal skew offset data for Auto Regi.	-128	127			0	
55	SOBH	Blue horizontal skew offset data for Auto Regi.	-128	127			0	
56	ZOGH	Green horizontal size offset data for Auto Regi.	-128	127			0	
57	ZORH	Red horizontal size offset data for Auto Regi.	-128	127			0	
58	ZOBH	Blue horizontal size offset data for Auto Regi.	-128	127			0	
59	LOGH	Green horizontal linearity offset data for Auto Regi.	-128	127			0	
60	LORH	Red horizontal linearity offset data for Auto Regi.	-128	127			0	
61	LOBH	Blue horizontal linearity offset data for Auto Regi.	-128	127			0	
62	ERR	Auto Regi. Error code	0	-			0	
63	ADTM	A/D data input timing of Auto Regi.	0	127			144	
64	VUP	Auto Regi. Pattern Upper vertical position	0	2047			50	
65	VUPM	Auto Regi. Pattern Upper middle vertical position	0	2047			0	
66	VMID	Auto Regi. Pattern Middle vertical position	0	2047			512	

SERVICE DATA LISTS

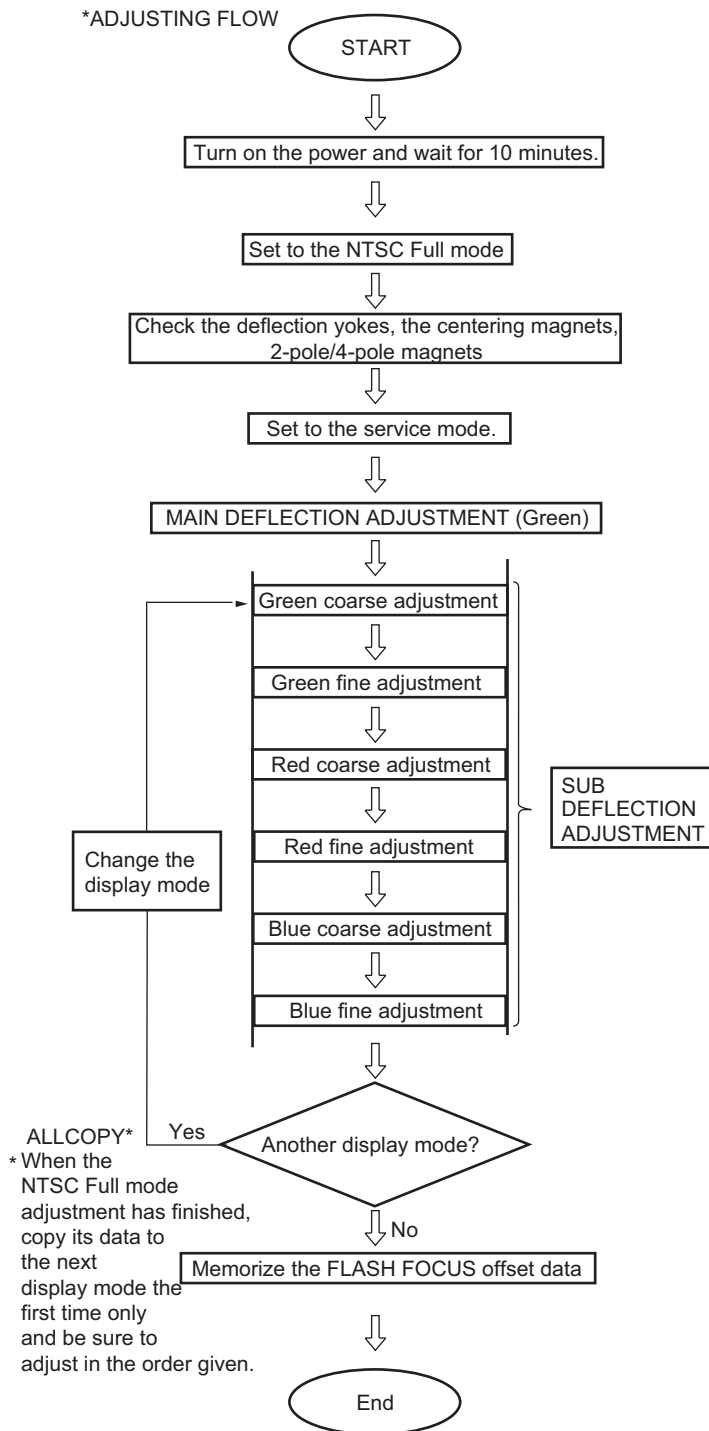
PJ Engine										
ITEM No.	ITEM Name	Contents	min	max	16:9					
					Normal	Zoom	W Zoom	HD		
67	VLOM	Auto Regi. Pattern Lower middle vertical position	0	2047			0			
68	VLOW	Auto Regi. Pattern Lower vertical position	0	2047			975			
69	HLE	Auto Regi. Pattern left horizontal position	0	4095			90			
70	HLEM	Auto Regi. Pattern left middle horizontal position	0	4095			0			
71	HMID	Auto Regi. Pattern middle horizontal position	0	4095			655			
72	HRIM	Auto Regi. Pattern right middle horizontal position	0	4095			0			
73	HRIV	Auto Regi. Pattern right horizontal position	0	4095			1215			
74	SFTF	Switch of shift fast	0	1			0			
75	ACTL	Account timer counter lower byte	0	-			0			
76	ACTH	Account timer counter upper byte	0	-			0			
77	SLSW	Auto Regi adjustment item select	0	3			3			
78	VB2S		0	1023	0	0	0	0		
79	VB2W		0	1023	49	106	68	9		
80	VB3S		0	1023	521	464	502	561		
81	VB3W		0	1023	42	99	61	1		
ITEM No.	ITEM Name	Contents	min	max	16:9					
					Green H	Green V	Blue H	Blue V	Red H	Red V
82	CENT	Normal/Full Coarse Center Adjustment	-512	511						
83	SKEW	Normal/Full Coarse Skew Adjustment	-512	511						
84	SIZE	Normal/Full Coarse Size Adjustment	-512	511						
85	LIN	Normal/Full Coarse Linearity Adjustment	-512	511						
86	KEY	Normal/Full Coarse Key Adjustment	-512	511	-		-		-	
87	PIN	Normal/Full Coarse Pin Adjustment	-512	511						
88	MLIN	Normal/Full Coarse Middle Linearity Adjustment	-512	511		-		-		-
89	MSIZ	Normal/Full Coarse Middle Size Adjustment	-512	511		-		-		-
82	CENT	Zoom Coarse Center Adjustment	-512	511						
83	SKEW	Zoom Coarse Skew Adjustment	-512	511						
84	SIZE	Zoom Coarse Size Adjustment	-512	511						
85	LIN	Zoom Coarse Linearity Adjustment	-512	511						
86	KEY	Zoom Coarse Key Adjustment	-512	511	-		-		-	
87	PIN	Zoom Coarse Pin Adjustment	-512	511						
88	MLIN	Zoom Coarse Middle Linearity Adjustment	-512	511		-		-		-
89	MSIZ	Zoom Coarse Middle Size Adjustment	-512	511		-		-		-
82	CENT	Wide Zoom Coarse Center Adjustment	-512	511						
83	SKEW	Wide Zoom Coarse Skew Adjustment	-512	511						
84	SIZE	Wide Zoom Coarse Size Adjustment	-512	511						
85	LIN	Wide Zoom Coarse Linearity Adjustment	-512	511						
86	KEY	Wide Zoom Coarse Key Adjustment	-512	511	-		-		-	
87	PIN	Wide Zoom Coarse Pin Adjustment	-512	511						
88	MLIN	Wide Zoom Coarse Middle Linearity Adjustment	-512	511		-		-		-
89	MSIZ	Wide Zoom Coarse Middle Size Adjustment	-512	511		-		-		-
82	CENT	HD Coarse Center Adjustment	-512	511						
83	SKEW	HD Coarse Skew Adjustment	-512	511						
84	SIZE	HD Coarse Size Adjustment	-512	511						
85	LIN	HD Coarse Linearity Adjustment	-512	511						
86	KEY	HD Coarse Key Adjustment	-512	511	-		-		-	
87	PIN	HD Coarse Pin Adjustment	-512	511						
88	MLIN	HD Coarse Middle Linearity Adjustment	-512	511		-		-		-
89	MSIZ	HD Coarse Middle Size Adjustment	-512	511		-		-		-

SERVICE DATA LISTS

PJ Engine			
Contents	min	max	data
Normal/Full Red Horizontal Fine Data	-128	127	0
Normal/Full Red Vertical Fine Data	-128	127	0
Normal/Full Green Horizontal Fine Data	-128	127	0
Normal/Full Green Vertical Fine Data	-128	127	0
Normal/Full Blue Horizontal Fine Data	-128	127	0
Normal/Full Blue Vertical Fine Data	-128	127	0
Normal/Full Zoom Red Horizontal Fine Data	-128	127	0
Zoom Red Vertical Fine Data	-128	127	0
Zoom Green Horizontal Fine Data	-128	127	0
Zoom Green Vertical Fine Data	-128	127	0
Zoom Blue Horizontal Fine Data	-128	127	0
Zoom Blue Vertical Fine Data	-128	127	0
Wide Zoom Red Horizontal Fine Data	-128	127	0
Wide Zoom Red Vertical Fine Data	-128	127	0
Wide Zoom Green Horizontal Fine Data	-128	127	0
Wide Zoom Green Vertical Fine Data	-128	127	0
Wide Zoom Blue Horizontal Fine Data	-128	127	0
Wide Zoom Blue Vertical Fine Data	-128	127	0
HD Red Horizontal Fine Data	-128	127	0
HD Red Vertical Fine Data	-128	127	0
HD Green Horizontal Fine Data	-128	127	0
HD Green Vertical Fine Data	-128	127	0
HD Blue Horizontal Fine Data	-128	127	0
HD Blue Vertical Fine Data	-128	127	0

ID			
Reg.No	Name	FUNCTION	
0	ID0	Selection of OSD languages & color systems	89
1	ID1	Selection of composite & s-video inputs	127
2	ID2	Selection of audio-related controls	239
3	ID3	Selection of basic system settings	98
4	ID4	Selection of basic system settings	203
5	ID5	Selection of advanced system settings	177
6	ID6	Selection of sub picture related settings	54
7	ID7	Selection of some reserved settings	24

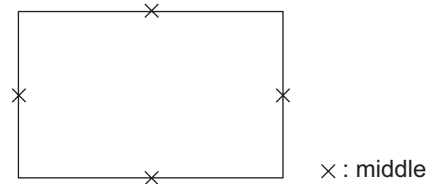
2-12.REGISTRATION ADJUSTMENT



2-12-1.SETUP FOR ADJUSTMENT

MARKING

- At the 4 sides of the screen, use a tape measure to locate the middle.



DATA SETTING

- Set NTSC Full mode.
- Enter the service mode, and select "PJE".

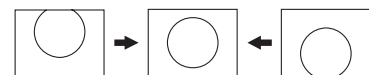
NOTE: When you replace printed circuit boards, devices, or CRTs, and when correction is drastically necessary, press the "7" + ENTER on the remote commander to initialize the data in the Projector Engine mode. Press MUTING + ENTER on the remote commander to write the data.

2-12-2.MAIN DEFLECTION ADJUSTMENT

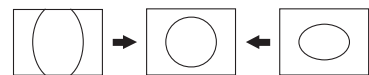
NOTE: Before this adjustment, refer to section 2-11 for PJE input data items #78-85.

- Cover the red and blue CRT lenses with lens caps to allow only green to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
- Enter the monoscope signal and set to NTSC Full mode.
- Enter the service mode, and select "2150D-1".
- Adjust "0 VPOS" and "1 VSIZ" so that the picture is displayed in the center of the screen.
- Adjust "2VSZ0" for 1080i vertical size adjustment.

0 VPOS



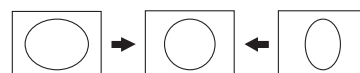
1 V-Size



- Select "2150D-2" and adjust "2 H-Size" so that the picture size is within the specification.

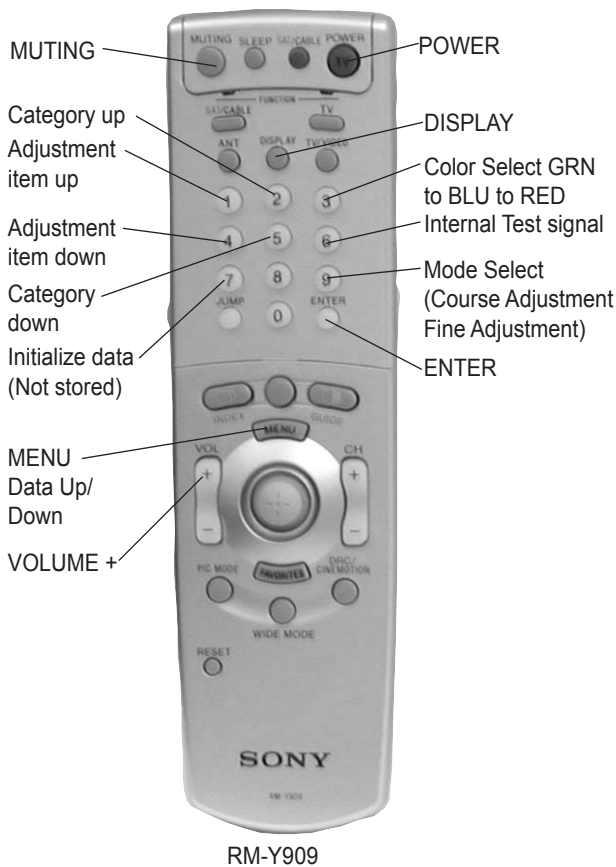
SPEC	Overscan Spec. = 9%	
	H SIZE	V SIZE
Input Signal		
Monoscope	15.6 ± 0.2 sq.	11.5 ± 0.2 sq.

2 H-Size



- Copy the data of the NTSC Full mode to the other display mode and, if necessary, adjust in the other mode.

2-12-3. OPERATION METHOD FOR PROJECTOR ENGINE MODE



RM-Y909

1. FUNCTION OF KEYS ON COMMANDER

- ① Changes adjustment item. (Item # moves up)
Marker moves clockwise from center to outside.
(In Fine Adjustment mode)
- ④ Changes adjustment item. (Item # moves down)
Marker moves counter clockwise from outside to center.
(In Fine Adjustment mode)
- ② Changes adjustment category.
(Category # moves up)
- ⑤ Changes adjustment category.
(Category # moves down)

Joystick Changes data value. (Up or down)
Marker moves clockwise from center (up, down, right, and then left) to outside.
(In Fine Adjustment mode)

- ③ Changes adjustment color.
GRN →BLU →RED
- ⑥ Displays or changes internal test signals.
crosshatch + external signal →
crosshatch + borderline →
crosshatch only →
dot only → off
- ⑨ Switches adjustment mode.
Coarse adjustment model →
Fine adjustment mode

Press Switches marker moving method.

Joystick (In Fine Adjustment mode)

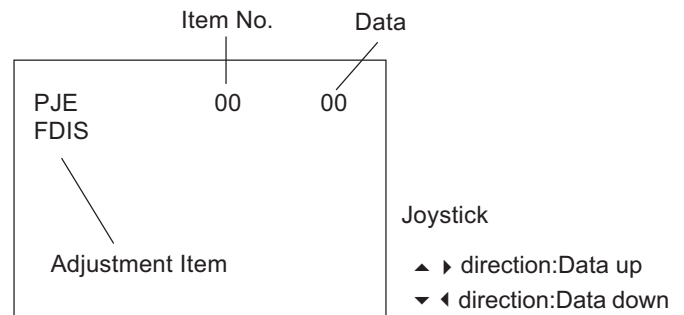
Joystick ▲ ▼ ◀ ▶ keys → 1 and 4 buttons

Commander Function

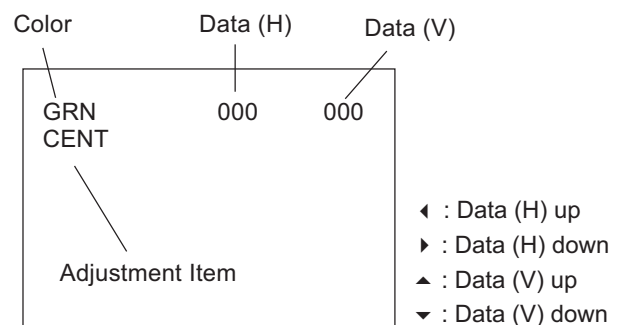
Buttons	Mode	Description
0 + ENTER	READ	Reads data to NVM.
MUTING+ENTER	WRITE	Writes data from NVM.
7 + ENTER	PJE INITIAL	Service data initialization. Not stored. (Be sure not to use usually)

2. OPERATION METHOD FOR COARSE ADJUSTMENT

1. Enter the service mode and select "PJE".
2. Press the "1" or "4" button on the remote commander to select the item, and then use the joystick to change the data.



3. Select "GRN CENT". When BLU or RED is displayed, press the "3" button on the remote commander to change the adjustment color in the order of GRN →BLU →RED.
4. In GRN, BLU, or RED mode, move the joystick ▲ or ▼ to change the data in vertical direction, or ◀ or ▶ to change the data in a horizontal direction.



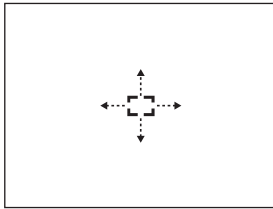
5. Before returning to the service mode, press the "MUTING" + "ENTER" buttons on the remote commander to write the data. (You must complete step 5 to write the data. If you omit step 5 the set data is returned to the data prior to the adjustment.)

3. OPERATION METHOD FOR FINE ADJUSTMENT

1. Enter the service mode and select "PJE".
2. Select FDIS and set the data to "01" so that the data at each position can be displayed in fine adjustment mode.

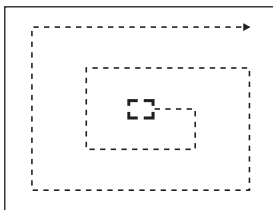
3. Press the "9" button on the remote commander and fine adjustment mode will be active where a green marker appears in the center of the screen. (In the case of GRN mode)
4. Press down on the joystick, and the marker color will be alternately switched between green (GRN mode) and white.
5. Press the "1" or "4" button on the remote commander, or use the joystick to move the marker to the position to be adjusted, where fine adjustment can be made.

* When the marker color is white:
(in this case, fine adjustment is disabled)



Use the joystick to move the marker up, down, left, or right.

* When the marker color is green:
(GRN mode)

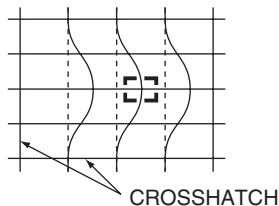
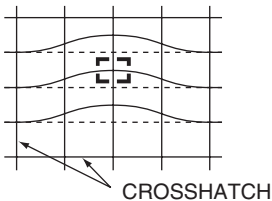


- ① : Moves the marker clockwise from the center to the outside.
- ④ : Moves the marker counter clockwise from the outside to the center.

* Fine adjustment can be made on the basis of a marker position using the joystick to move \blacktriangle \blacktriangledown \blacktriangleleft or \blacktriangleright .

Move joystick \blacktriangle direction

Move joystick \blacktriangleright direction



6. Press the "9" button on the remote commander to return to coarse adjustment mode.

2-13.PJE ADJUSTMENT (SUB DEFLECTION ADJUSTMENT)

Adjustment item	Adjustment type		
	G	R	B
	H/V*	H/V*	H/V*
CENT	O/O	O/O	O/O
SKEW	O/O	O/O	O/O
SIZE	O/O	O/O	O/O
LIN	O/O	O/O	O/O
KEY	-/O	-/O	-/O
PIN	O/O	O/O	O/O
MLIN	O/-	O/-	O/-
MSIZ	O/-	O/-	O/-

* H = Horizontal V = Vertical O = Yes -- = No

Note: If the value is over the limit value, adjust these in the fine adjustment mode.

Coarse Data Limit Value:

CENT H	35 ± 170V
CENT V	20 ± 170V
SIZE H	-75 MAX
BLUE H LIN	-425 MIN
RED H LIN	425 MAX

2-13-1.ADJUSTMENT FOR NTSC FULL MODE

- The adjustment should be done in the numerical order given.

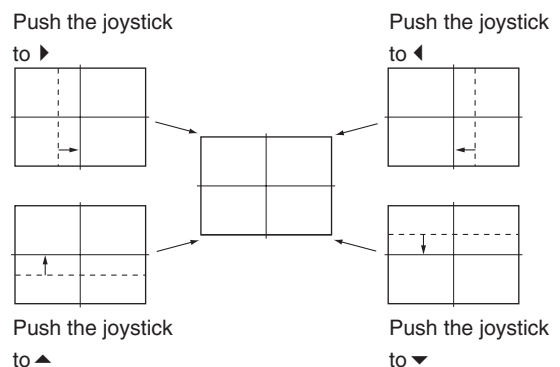
1) GREEN ADJUSTMENT

1. Cover the red and blue CRT lenses with lens caps to allow only green to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).

Note: If lens caps are unavailable, you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

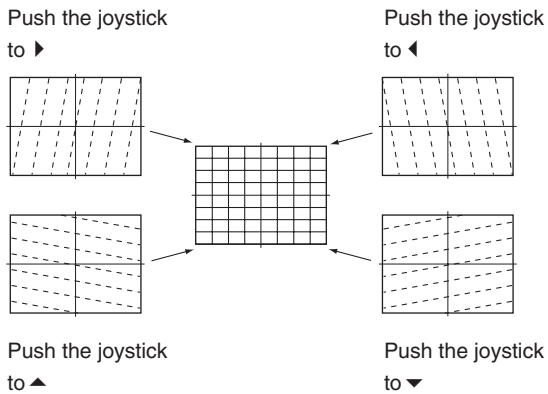
2. Enter the monoscope signal to set.
3. Select the PJE mode.
4. Press the "6" button on the remote commander to display the internal test signal (crosshatch).
5. Select "GRN CENT", and adjust so that the pictures coincide in the center of screen.

GRN CENT (Horizontally/Vertically)



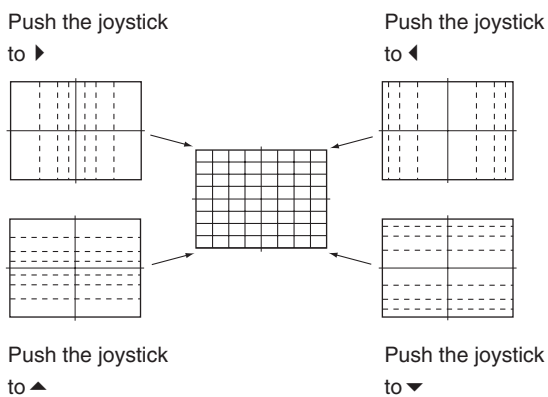
7. Select "GRN SKEW", and correct the tilt of horizontal lines and vertical lines.

GRN SKEW (Horizontally/Vertically)



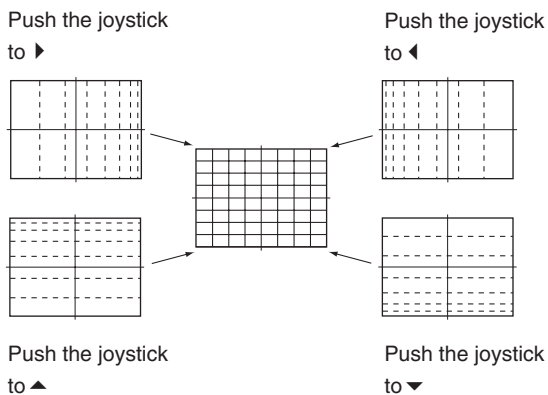
8. Select "GRN SIZE", and adjust so that each distance from center to left end and to right end is equal. Adjust so that each distance from center to top and to bottom is equal.

GRN SIZE (Horizontally/Vertically)



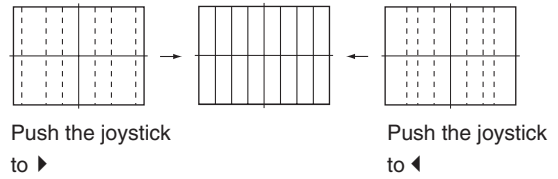
9. Select "GRN LIN", and adjust so that each space at the right end and at the left end of screen is equal. Adjust so that each space at the top and at the bottom of screen is equal.

GRN LIN (Horizontally/Vertically)



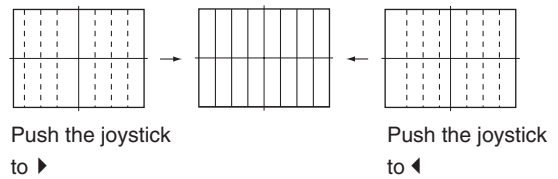
10. Select "GRN MSIZ", and correct the space intervals for the horizontal section so the screen is equal.

GRN MSIZ (Horizontally)



11. Select "GRN MLIN", and correct the sizes of the horizontal line so the center of the screen is symmetrical left and right.

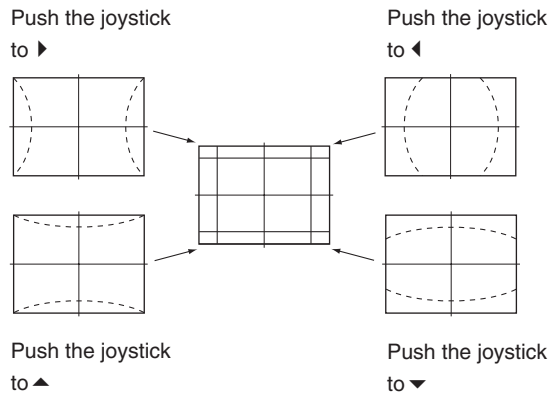
GRN MLIN (Horizontally)



Note: The SIZE and LIN, MSIZ and MLIN adjustments affect each other. If necessary, adjust these mutually.

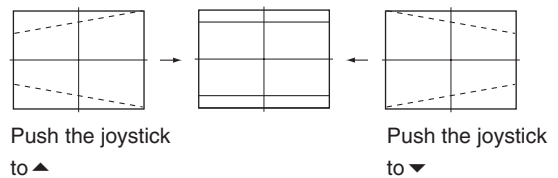
12. Select "GRN PIN", and adjust so that right and left vertical lines on the screen become straight. Adjust so that upper and lower horizontal lines on the screen become straight.

GRN PIN (Horizontally/Vertically)



13. Select "GRN KEY", and adjust so that upper and lower horizontal lines on the screen become parallel.

GRN KEY (Vertically)



Note: The VPIN and KEY adjustments affect each other. If necessary, adjust these mutually.

14. Press the "9" button on the remote commander to enter fine adjustment mode.

15. Make the fine adjustment so that horizontal lines and vertical lines become straight.
16. Press the “9” button on the remote commander to return to coarse adjustment mode.

2) RED ADJUSTMENT

1. Cover the blue CRT lens with a lens caps to allow only the green and red to show (or use the method shown in the note below for turning off the CRTs individually without using lens caps).
2. Press the “3” button on the remote commander to select RED mode.
3. Adjust the following items so that red lines overlap with green lines.
 - RED CENT (horizontally/vertically)
 - RED SKEW (horizontally/vertically)
 - RED SIZE (horizontally/vertically)
 - RED LIN (horizontally/vertically)
 - RED MSIZ (horizontally)
 - RED MLIN (horizontally)
 - RED PIN (horizontally/vertically)
 - RED KEY (vertically)
4. Press the “9” button on the remote commander to enter fine adjustment mode.
5. Make the fine adjustment so that horizontal lines and vertical lines overlap with green lines.
6. Press the “9” button on the remote commander to return to coarse adjustment mode.

Note: If lens caps are unavailable, you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

3) BLUE ADJUSTMENT

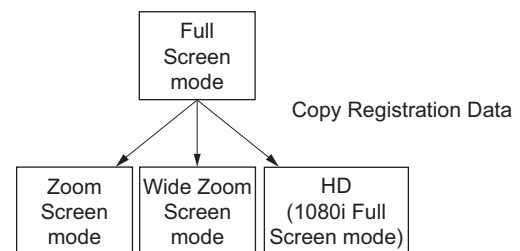
1. Remove the lens cap from the blue picture lens to display all colors.
2. Press the “3” button on the remote commander to select BLU mode.
3. Adjust the following items so that blue lines overlap with green and red lines.
 - BLU CENT (horizontally/vertically)
 - BLU SKEW (horizontally/vertically)
 - BLU SIZE (horizontally/vertically)
 - BLU LIN (horizontally/vertically)
 - BLU MSIZ (horizontally)
 - BLU MLIN (horizontally)
 - BLU PIN (horizontally/vertically)
 - BLU KEY (vertically)
4. Press the “9” button on the remote commander to enter fine adjustment mode.
5. Make the fine adjustment so that horizontal lines and vertical lines overlap with green and red lines.
6. Press the “9” button on the remote commander to return to coarse adjustment mode.

4) REGISTRATION DATA WRITING

1. After completing each adjustment of green, blue, and red for the NTSC Full mode press the “MUTING”+ “ENTER” buttons on the remote commander to write the registration data to the NVM.

2-13-2.COPYING ALL REGISTRATION DATA TO OTHER MODES

1. Make sure that the adjustment for NTSC Full mode are complete and the data has already been written.
2. Select the PJE mode.
3. Select ALCP and set the data to “01”, and press the “MUTING”+“ENTER” buttons on the remote commander.
4. The data from the NTSC Full mode is copied to all other modes.



5. Check in the other modes and adjust as demands.
Be sure to write data in each mode.

2-14.AUTO CONVERGENCE OFFSETS

IMPORTANT

This adjustment must be performed after registration adjustment or after readjustment for any reason!

Once registration in all modes is satisfactory, do the following:

1. Darken the room environment near the set.
2. Enter the monoscope signal to set the NTSC Full mode.
3. Select the PJE mode.
4. To automatically store the offset values, press the “FLASH FOCUS” button on the front panel of the set.
(The offset value is now stored)
5. Select “ERR” of PJE mode.
Confirm ERR is “00”.
If ERR is not “00”, recheck. (Refer to section 2-15)
6. Exit the service mode.

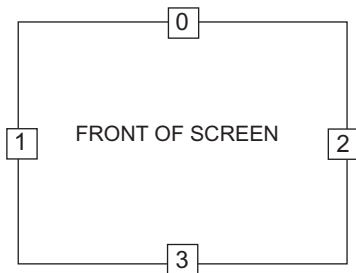
2-15.AUTO REGISTRATION ERROR CODES

If an error code is displayed after the set has been correctly adjusted, check the following items: position, tilt and sizing. If any of these adjustments are off, even slightly, the auto-registration pattern will not hit the four sensors properly. This occurs when the internal generator patterns are being flashed on the screen for the sensors to read. Therefore, auto registration (called auto convergence) cannot operate properly, causing an error code to be displayed. In order for this function to operate properly correct position, tilt, and size must be adjusted properly.

ERROR CODE LIST

ERROR CODE	DESCRIPTION	NOTE
00	No Error	
10	Sensor 0 low output	Check sensor 0, connection/wiring, circuit, and pattern position (are patterns hitting sensor?) adjust "64 VUP" if necessary.
11	Sensor 1 low output	Check sensor 1, connection/wiring, circuit, and pattern position (are patterns hitting sensor?) adjust "69 HLE" if necessary.
12	Sensor 2 low output	Check sensor 2, connection/wiring, circuit, and pattern position (are patterns hitting sensor?) adjust "73 HRIV" if necessary.
13	Sensor 3 low output	Check sensor 3, connection/wiring, circuit, and pattern position (are patterns hitting sensor?) adjust "68 VLOW" if necessary.
20	Sensor 0 high output	Check sensor 0 and circuit.
21	Sensor 1 high output	Check sensor 1 and circuit.
22	Sensor 2 high output	Check sensor 2 and circuit.
23	Sensor 3 high output	Check sensor 3 and circuit.
30	V CENT or SKEW adjustment loop overflow	Check "66 VMID" data and check registration condition.
31	H CENT or SKEW adjustment loop overflow	Check "71 HMID" data and check registration condition.
32	H LIN or SIZE adjustment loop overflow	Check "71 HMID" data and check registration condition.
40	V CENT regi data overflow	Check "66 VMID" data and confirm V CENT data (all modes) is not near 511.
41	H CENT regi data overflow	Check "71 HMID" data and confirm H CENT data (all modes) is not near 511.
42	V SKEW regi data overflow	Check "66 VMID" data and confirm V SKEW data (all modes) is not near 511.
43	H SKEW regi data overflow	Check "71 HMID" data and confirm H SKEW data (all modes) is not near 511.
44	H LIN regi data overflow	Check "71 HMID" data and confirm H CENT data (all modes) is not near 511.
45	H SIZE regi data overflow	Check "71 HMID" data and confirm H CENT data (all modes) is not near 511.
50	V CENT regi data overdraw	Check "66 VMID" data and confirm V CENT data (all modes) is not near -512.
51	H CENT regi data overdraw	Check "71 HMID" data and confirm H CENT data (all modes) is not near -512.
52	V SKEW regi data overdraw	Check "66 VMID" data and confirm V SKEW data (all modes) is not near -512.
53	H SKEW regi data overdraw	Check "71 HMID" data and confirm H SKEW data (all modes) is not near -512.
54	H LIN regi data overdraw	Check "71 HMID" data and confirm H CENT data (all modes) is not near -512.
55	H SIZE regi data overdraw	Check "71 HMID" data and confirm V CENT data (all modes) is not near -512.
60	H or V CENT offset overflow	Check "71 HMID" and "66 VMID" data and check registration condition.
61	H or V SKEW offset overflow	Check SKEW adjustment.
62	H SIZE or LIN offset overflow	Check "71 HMID" data, check "66 VMID" data, and check SIZE and LIN adjustment.
70	H or V CENT offset overdraw	Check "71" HMID" data and check "66 VMID" data.
71	H or V SKEW offset overdraw	Check SKEW adjustment.
72	H SIZE or LIN offset overdraw	Check "69 HLB" data, check "73 HRIV" data, and check SIZE and LIN adjustment.
80	SIZE Limit Error	Check that H SIZE data is negative and not near zero.

SENSOR POSITIONS

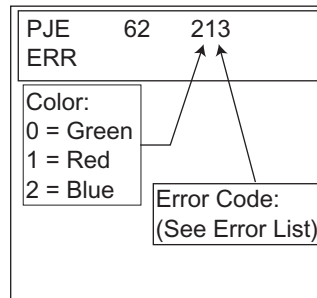


- 0: UPPER SENSOR
- 1: LEFT SENSOR
- 2: RIGHT SENSOR
- 3: LOWER SENSOR

• ERROR CODE SCREEN DISPLAY

Error codes in normal (customer) mode are not displayed. You must enter PJED service mode to see the error code.

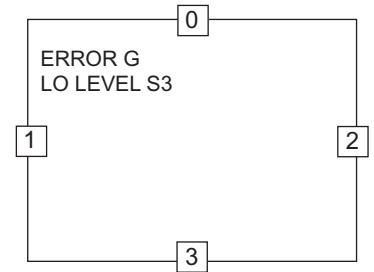
**AUTO REGI ERROR CODE FORMAT
ERROR EXAMPLE**



Example Blue Low Level Sensor 3

- 0 = Green
- 1 = Red
- 2 = Blue


When executing flash focus in service mode, the error will be displayed in text format.





SECTION 3: SAFETY-RELATED ADJUSTMENTS

D BOARD

3-1. HV REGULATION CIRCUIT CHECK AND ADJUSTMENT

When replacing the following components marked with a  on the schematic diagram always check the HV regulation, and if necessary re-adjust.

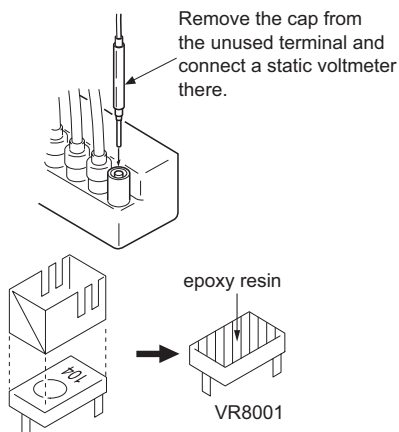
Part Replaced ()	Adjustment ()
A BOARD: C8079, C8083, C8090, C8129, D8013, D8015, D8038, D8043, IC8006, Q8021, R8055, R8099, R8102, R8128, R8129, R8131, R8139, R8140, R8142, R8153, R8163, R8223, R8230, T8004 (LOT), T8005 (FBT), HV Block, D Board	HV REGULATOR VR8001

OPERATION CHECK


1. Receive the all white signal.
2. Set PIC MAX/BRT CENT.
3. Confirm that the voltage between CN8015 ① PIN and GND is less than 7.80VDC.



HV REGULATION ADJUSTMENT

1. Connect a HV static voltmeter to the unconnected plug of the high-voltage block.
2. Power on the set.
3. Receive the all white signal.
4. Set PIC MAX/BRT CENT.
5. Confirm that the static voltmeter reading is $31.0 \pm 0.4V$. If not, adjust with VR8001 to the specified value.
6. After adjustment, put the VR cover on VR8001 (as shown below) and apply sufficient amount of epoxy resin around VR8001.



3-2. HV HOLD DOWN CIRCUIT OPERATION CHECK AND ADJUSTMENT

When replacing the following components marked with a  on the schematic diagram always check the hold-down voltage and re-adjust when necessary.

Part Replaced ()	Adjustment ()
A BOARD: C8054, C8086, C8088, C8100, C8104, C8188, C8123, C8124, D8019, D8020, D8022, D8028, D8036, FB8001, IC8008, Q8035, Q8038, R8035, R8043, R8159, R8166, R8171, R8196, R8201, T8004 (LOT), T8005 (FBT), HV Block, D Board	HV HOLD DOWN VR8002

OPERATION CHECK

1. Receive the dot signal.
2. Set PIC MIN/BRT MIN.
3. Confirm that the voltage between cathode of D8038 (JW171) and GND is more than 23.0V DC.
4. Using an external DC Power supply, apply the voltage shown below between cathode of D8038 (JW171) on "D" and GND, then confirm that the HV-Prot circuit works. (Raster disappears)
Apply DC voltage: Less than 29.05V DC.

HV HOLD-DOWN ADJUSTMENT

1. Connect a HV static voltmeter to the unconnected plug of the high-voltage block.
2. Power on the set.
3. Connect an external 10kΩ VR at CN8015 and adjust this VR so that the high voltage is 34.50kV.
4. Adjust VR8002 to the point that the HV-Prot circuit works (Raster disappears) at $34.50 \pm 0.50kV$ reading on the static voltmeter.
5. After adjustment, put the VR cover on VR8002 and apply sufficient amount of epoxy resin around VR8002 as the same manner for VR8001.

G BOARD

3-3. +B MAX VOLTAGE CONFIRMATION

The following adjustments should always be performed when replacing IC501, R5032.

1. Supply 130VAC to variable autotransformer.
2. Receive dot signal pattern and set the PICTURE and BRIGHTNESS settings to their minimum.
3. Confirm the voltage of TP +B 135V is less than 137.0Vdc.
4. If step 3 is not satisfied, replace IC501 and repeat steps 1-3.

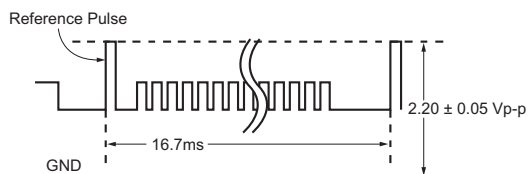
3-4. +B OVP CONFIRMATION

1. Add to low voltage power supply between to TP5001 and ground.
2. Supply 120VAC to variable autotransformer.
3. Power on the Set and receive dot signal pattern.
4. Set the PICTURE and BRIGHTNESS settings.
5. Check the OVP is activated.
Operate :less than 2.50V

SECTION 4: CIRCUIT ADJUSTMENTS

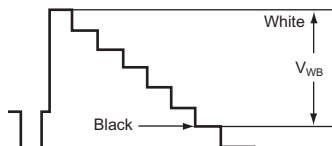
4-1. BLUE OFFSET ADJUSTMENT

1. Receive the all black (1080i, component) signal with VIDEO 5 input, and set PICTURE to maximum.
2. Connect an oscilloscope between CN5 ⑦ pin (B) on the (A board) and ground.
3. Set in the service mode and select the category "2150D-2".
4. Adjust "SLIN" so that the waveform level is $2.20 \pm 0.05V_{p-p}$.
5. After completing the adjustments, write the data into memory by pressing "MUTING" → "ENTER" on the remote commander.
6. Receive the RF signal and change the wide screen mode to "Wide Zoom". Copy the same data to "SLIN".



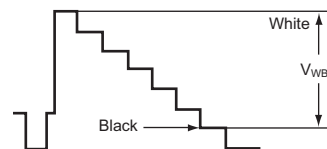
4-2. P & P SUB CONTRAST ADJUSTMENT (VIDEO) (SCON)

1. Receive the signal.
TV terminal (sub) : Color-bar (white-75%, 7.5% setup)
VIDEO terminal (main) : Color-bar (white-75%, 7.5% setup)
2. VIDEO MODE : Pro
PICTURE : Maximum
COLOR : Minimum
2150P-2 1 RGBS : 2
3. Set to P & P mode, and set to service mode.
4. Connect an oscilloscope between the check point and ground.
Check points : CN5 pin ⑥
A Board : CN5 pin ⑥
5. Select "2103-1-02" (Main scon), and adjust so that the waveform level of V_{WB} is $1.55 \pm 0.04V_{p-p}$.
6. Select "2103-2-02" (Sub scon), and adjust so that the waveform level of V_{WB} is $1.55 \pm 0.04V_{p-p}$.
7. After completing the adjustments, write the data into memory by pressing "MUTING" → "ENTER" on the remote commander.



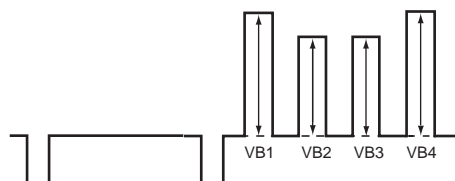
4-3. P & P SUB CONTRAST ADJUSTMENT (RF) (SCON)

1. Receive the signal.
TV terminal (sub) : Color-bar (white-75%, 7.5% setup)
VIDEO terminal (main) : Color-bar (white-75%, 7.5% setup)
2. VIDEO MODE : Pro
PICTURE : Maximum
COLOR : Minimum
2150P-2 1 RGBS : 2
3. Set to P & P mode, and set to service mode.
4. Connect an oscilloscope between the check point and ground.
Check points : CN5 ⑥
A Board : CN5 ⑥
5. Select "2103-1-02" (Main scon), and adjust so that the waveform level of V_{WB} is $1.55 \pm 0.04V_{p-p}$.
6. Select "2103-2-02" (Sub scon), and adjust so that the waveform level of V_{WB} is $1.55 \pm 0.04V_{p-p}$.
7. After completing the adjustments, write the data into memory by pressing "MUTING" → "ENTER" on the remote commander.



4-4. P & P SUB-HUE AND SUB-COLOR ADJUSTMENT (VIDEO) (SHUE, SCOL)

1. Receive the signal.
TV terminal (sub) : Color-bar (white-75%, 7.5% setup)
VIDEO terminal (main) : Color-bar (white-75%, 7.5% setup)
2. VIDEO MODE : Pro
PICTURE : Maximum
COLOR : Center
2150P-2 1 RGBS : 7
3. Set to P & P mode, and set to service mode.
4. Connect an oscilloscope between pin ⑦ of CN5 (A board) connector and ground.
5. Select "2103-1-03 SCOL, -04 SHUE" (Main), and adjust them to have $VB1 \leq VB4$ and $VB2 \leq VB3$ in the waveform levels.
6. Select "2103-2-03 SCOL, -04 SHUE" (Sub), and adjust them to have $VB1 \leq VB4$ and $VB2 \leq VB3$ in the waveform levels.
7. After completing the adjustments, write the data into memory by pressing "MUTING" → "ENTER" on the remote commander.



4-5. P & P SUB-HUE AND SUB-COLOR ADJUSTMENT (RF) (SHUE, SCOL)

1. Receive the signal.
 TV terminal (main) : Color-bar (white-75%, 7.5% setup)
 VIDEO terminal (sub) : Color-bar (white-75%, 7.5% setup)
2. VIDEO MODE : Pro
 PICTURE : Maximum
 COLOR : Center
 2150P-2 1 RGBS : 7
3. Set to P & P mode, and set to service mode.
4. Connect an oscilloscope between pin ⑦ of CN5 (A board) connector and ground.
5. Select "2103-1-03 SCOL, -04 SHUE" (Main), and adjust them to have $VB1 \leq VB4$ and $VB2 \leq VB3$ in the waveform levels.
6. Select "2103-2-03 SCOL, -04 SHUE" (Sub), and adjust them to have $VB1 \leq VB4$ and $VB2 \leq VB3$ in the waveform levels.
7. After completing the adjustments, write the data into memory by pressing "MUTING" → "ENTER" on the remote commander.

