

JVC

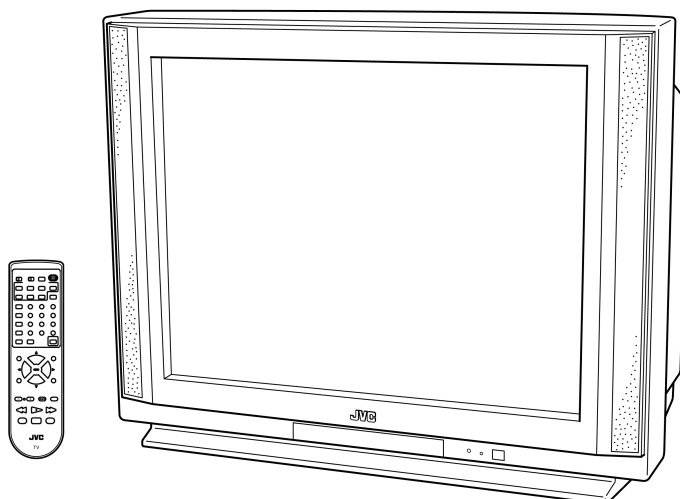
SERVICE MANUAL

COLOR TELEVISION

AV-36P902_Y

BASIC CHASSIS

SB II
(No.A103)



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SPECIFICATIONS

Items	Contents
Dimensions (W x H x D)	38-1/8" x 30-3/8" x 24-1/8" inch (967mm x 770mm x 610mm)
Mass	187.0 lbs (85.0 kg)
TV RF System	CCIR(M)
Color Sound System	NTSC / BTSC System (Multi Channel Sound)
TV Receiving Channels and Frequency	
VL Band	(02~06) 54MHz~88MHz
VH Band	(07~13) 174MHz~216MHz
UHF Band	(14~69) 470MHz~806MHz
CATV Receiving Channels and Frequency	
Low Band	(02~06, A-8) by (02~06&01)
High Band	(07~13) by (07~13)
Mid Band	(A~1) by (14~22)
Super Band	(J~W) by (23~36)
Hyper Band	(W+1~W+28) by (37~64)
Ultra Band	(W+29~W+84) by (65~125)
Sub Mid Band	(A8, A4~A1) by (01, 96~99)
	(54MHz~804MHz)
TV/CATV Total Channel	181 Channels
Antenna terminal	75Ω (VHF/UHF) Terminal, F-Type Connector
Intermediate Frequency	
Video IF Carrier	45.75MHz
Sound IF Carrier	41.25MHz (4.5MHz)
Color Sub Carrier	3.58MHz
Power Input	120V AC, 60Hz
Power Consumption	215W
Picture Tube	36" (90cm) Measured Diagonally
High Voltage	32kV ± 1.0kV (at zero beam current)
Speaker	2" x 4-3/4" (5cm x 12cm) Oval type x 2
Audio Power Output	5W+5W
External Input	
Video Input	1Vp-p, 75Ω (RCA pin jack)
Audio Input (R/L)	500mVrms (-4dBs), High Impedance
S-Video / component input	Y: 1Vp-p Positive (negative sync provided, when terminated with 75Ω) C: 0.286Vp-p (burst signal, when terminated with 75Ω) P _B / P _R : 0.7Vp-p, 75Ω
Audio Output	VARI : More then 0~1000mVrms (+2.2dBs) FIX : 500mVrms(-4dBs) Low Impedance (1000Hz when modulated 100%)
Digital-In	DVI 25pin connector Digital-In terminal is not compatible with computer signal.
Remote Control Unit	RM-C321G (AA/R6/UM-3 battery x 2)

Design & specifications are subject to change without notice.

SAFETY PRECAUTIONS

- The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
- Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
- Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (Δ) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.
- Use isolation transformer when hot chassis.**
The chassis and any sub-chassis contained in some products are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some products when the HOT chassis is exposed.
- Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (⊥) side GND, the ISOLATED(NEUTRAL) : (↷) side GND and EARTH : (⊕) side GND. Don't short between the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND and never measure with a measuring apparatus (oscilloscope etc.) the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND at the same time.
If above note will not be kept, a fuse or any parts will be broken.
- If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B1 POWER SUPPLY).
- The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
- Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10kΩ 2W resistor to the anode button.
- When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

10. Isolation Check

(Safety for Electrical Shock Hazard)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

(1) Dielectric Strength Test

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 1100V AC (r.m.s.) for a period of one second.

(. . . Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)

This method of test requires a test equipment not generally found in the service trade.

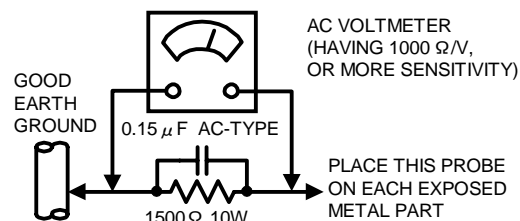
(2) Leakage Current Check

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

● Alternate Check Method

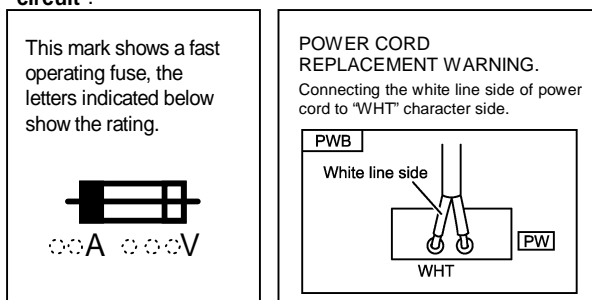
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner. Connect a 1500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.). However, in tropical area, this must not exceed 0.3V AC (r.m.s.). This corresponds to 0.2mA AC (r.m.s.).



11. High voltage hold down circuit check.

After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly.

See item "How to check the high voltage hold down circuit".



FEATURES

■ Multi screen function

- Dual screen (P&P)····Two programs can be seen at once.
- Contents index. ·····A favorable program can be selected from the nine preview P / Ps on the screen.

■ Provided with twin tuner / twin mode (16:9&4:3mode).

■ Multifunctional remote control permits picture adjustment.

■ Adoption of the CH.GUARD function prevents the specific channels from being selected, unless the "ID number" is key in.

■ I²C bus control utilizes single chip ICs.

■ Adoption of the VIDEO STATUS function.

- The VIDEO STATUS key gives you a choice of 3 TV

Picture display settings.

Including a display of your own preferences.

→ STANDARD → DYNAMIC → THEATER →

■ Digital-In

To receive digital broadcasts.

Digital-In will display when the 480p (or 1080i) picture signal in Digital-In is displayed.

■ Natural Cinema

When you watch the movie or animator, press the Natural Cinema to adjust the out line of the images to make them more sharp.

■ Built-in V-CHIP system.

- TV is equipped with V-CHIP technology which enables TV parental guidelines and movie guideline controls.

■ Closed-caption broadcasts can be viewed.

■ Built-in MTS (Multi-channel Television Sound) system. In addition to mono or stereo sound, an MTS broadcast may also include a Second Audio Program (SAP).

■ Built-in HYPER-SURROUND system & BBE sound system.

■ S-VIDEO input terminal for taking best advantage of Super VHS.

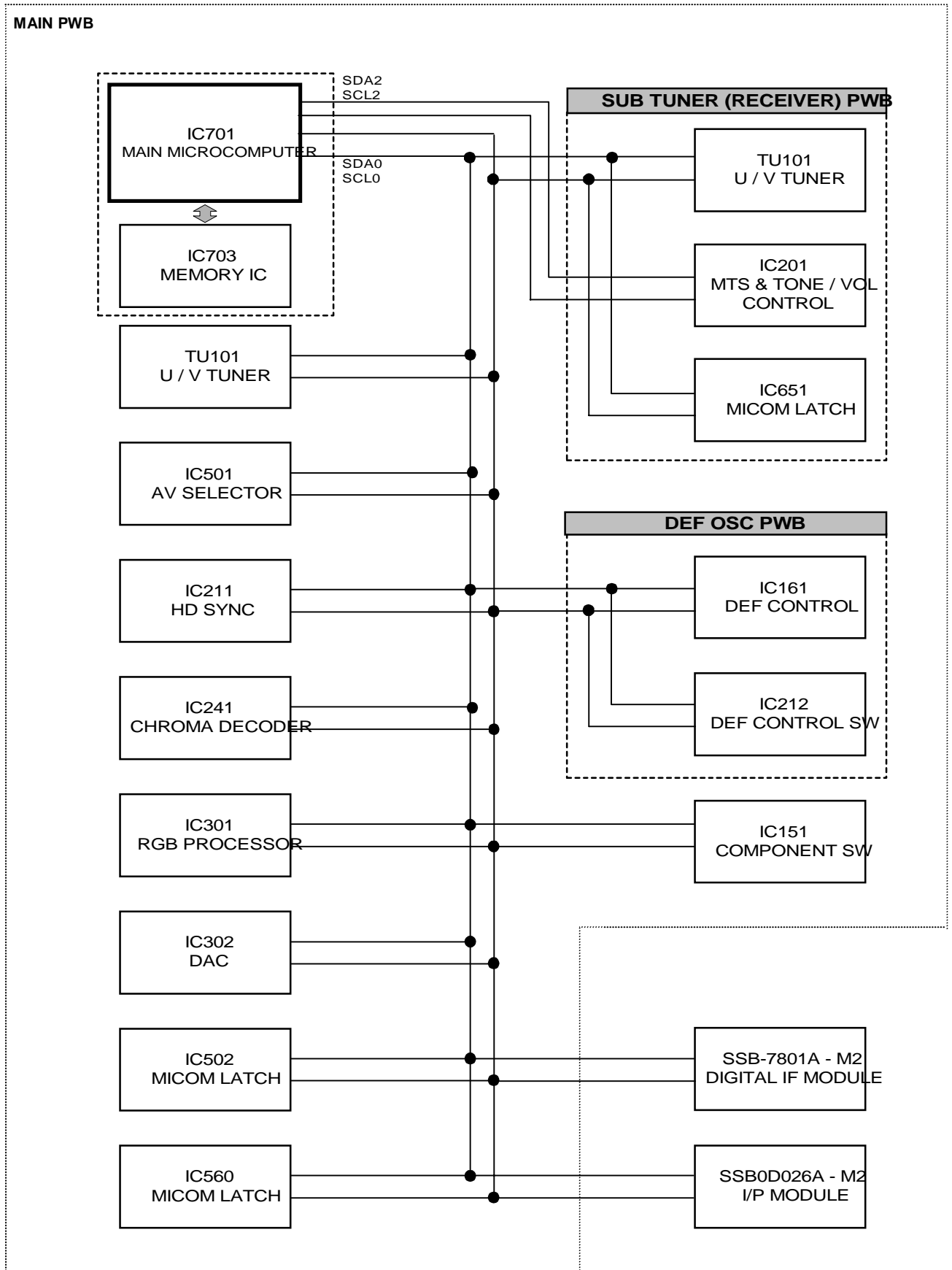
■ Digital Comb filter Improved picture quality.

- Theater mode ···· Optimizes the screen size and picture quality of your TV to maximize your enjoyment of movie watching.

■ Plug In menu

The plug in menu comes up automatically when you first turn on the TV after plugging it in.

SYSTEM BLOCK DIAGRAM



■ MAIN MICON (CPU) FUNCTION

(MIN102H57K)

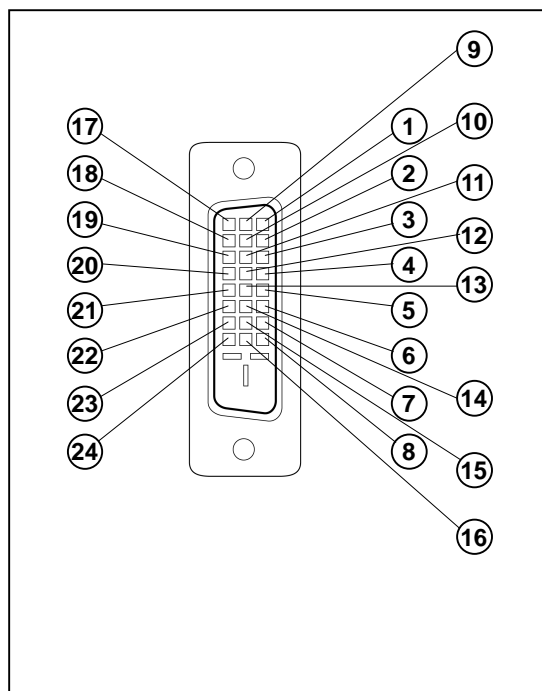
PIN No.	PIN NAME	I/O	FUNCTION
1	NC	0	NC
2	/VSYNC	I	V.SYNC IN for OSD
3	LB PRO	I	LOW B Protection
4	NC	—	NC
5	/RST	I	Micon Reset input
6	NC	0	NC
7	/TEST	I	+3.3V
8	YS	0	OSD YS OUT
9	NC	0	Micon test pin
10	NC	0	NC
11	A_MUTE	0	TV Sound Muting
12	/HSYNC	I	H.sync input for OSD
13	M_MUTE	0	Monitor Out Muting
14	OSDXI	—	—————
15	OSDXO	—	—————
16	NC	0	NC
17	AC_IN	I	AC 50/60Hz in
18	NC	0	NC
19	TU_POW	0	Tuner Power Control
20	VCOI	I	LPF input
21	PDO	0	LPF output
22	/IP_RESET	0	—————
23	YM	0	OSD YM out
24	B	0	OSD Blue out
25	LED_POWER	0	LED for Power
26	G	0	OSD Green Out
27	R	0	OSD Red Out
28	VREF	I	—————
29	IP_ERR	I	AMDP program load det.
30	IREF	I	—————
31	COMP	I	—————
32	AVDD	I	+3.3V
33	CLL	I	For Sub CCD
34	VREFLS	I	STD VOL in for Sub CCD
35	SUB_CCD	I	For Sub CCD
36	NC	—	NC
37	VSS	I	GND
38	MAIN_CCD	I	For main CCD
39	VREFHS	I	STD VOL in for CCD
40	CLH	I	For main CCD
41	VDD	0	+3.3V
42	LED_DATA	0	Front control Data

PIN No.	PIN NAME	I/O	FUNCTION
43	LED_CLOCK	0	F. LED CLK
44	LED_ON_TIMER	0	LED on timer
45	SB01	0	—————
46	SBD1	I	Use for
47	SBT1	I	Use for ON board Writing
48	INC	I	NC
49	ECO.RST	0	Eco Rest
50	ROT COIL L	0	Picture rotation
51	ROT COIL R	0	Picture rotation
52	H BLK	0	H.BLK
53	SN. Coil_R	0	Terrestrial Magnetism Sensor
54	SN. Coil_L	0	↑
55	NC	0	NC
56	I ² C.STOP	0	I ² C BUS STOP
57	TU2-A/D(AFC2)	I	Tuner2 gain input
58	/LOB_POW	0	LOB power control
59	NC	I	AV CompulinkIII Input
60	/POWERGOOD	I	Power Condition Check
61	/MECA_ON	I	Machine SW Interrupt
62	/MAIN_POW	0	MAIN POWER CONTROL
63	NC	—	NC
64	/B1 POW	0	B1 POWER CONTROL
65	AFC1	I	AFC main in
66	X-RAY	I	X-ray detection
67	—————	0	—————
68	KEY2	I	Front Key input 2
69	KEY1	I	Front Key input 1
70	SCL1	0	I ² C BUS (CLK) for E ² PROM
71	SDA1	I/O	I ² C BUS (SDA) for E ² PROM
72	REMO	I	Remocon IN
73	—————	0	—————
74	VSS	I	GND
75	OSC2	0	4MHz OSC
76	OSC1	I	4MHz OSC
77	VDD	I	+3.3V
78	SCL0	0	I ² C BUS (CLK) for General
79	NC	0	NC
80	SDA0	I/O	I ² C BUS (SDA) for General
81	SCL2	0	I ² C BUS (CLK) for MTS
82	SDA1	I	I ² C BUS (SDA) for MTS
83	NC	—	NC
84	P MUTE	0	Picture muting

■ DIGITAL-IN TERMINAL FUNCTIONS

PIN No.	PIN NAME	PIN No.	PIN NAME
1	RX2-	13	RX3+
2	RX2+	14	5V
3	GND2/ 4	15	GND
4	RX4-	16	HTPLG
5	RX4+	17	RX0-
6	SCL	18	RX0+
7	SDA	19	GND0/5
8	NC	20	RX5-
9	RX1-	21	RX5+
10	RX1+	22	GNDC
11	GND1/3	23	TXC+
12	RX3-	24	TXC-

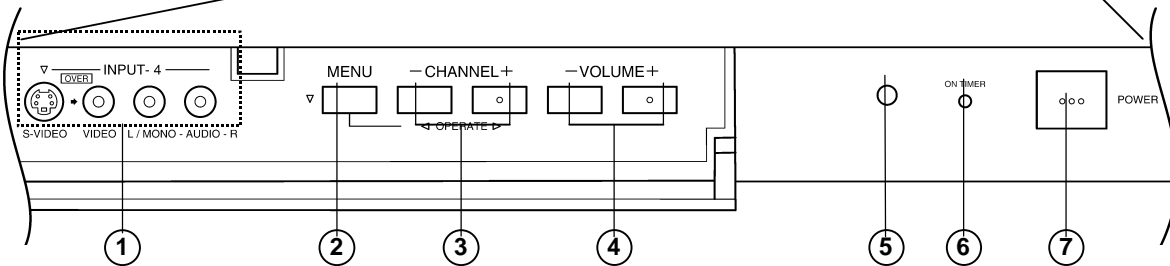
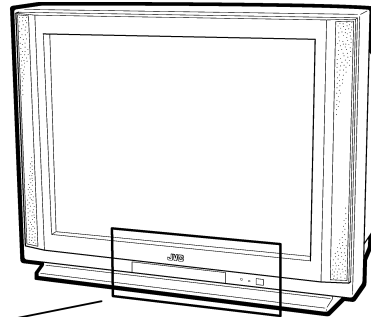
PIN ASSIGNMENT



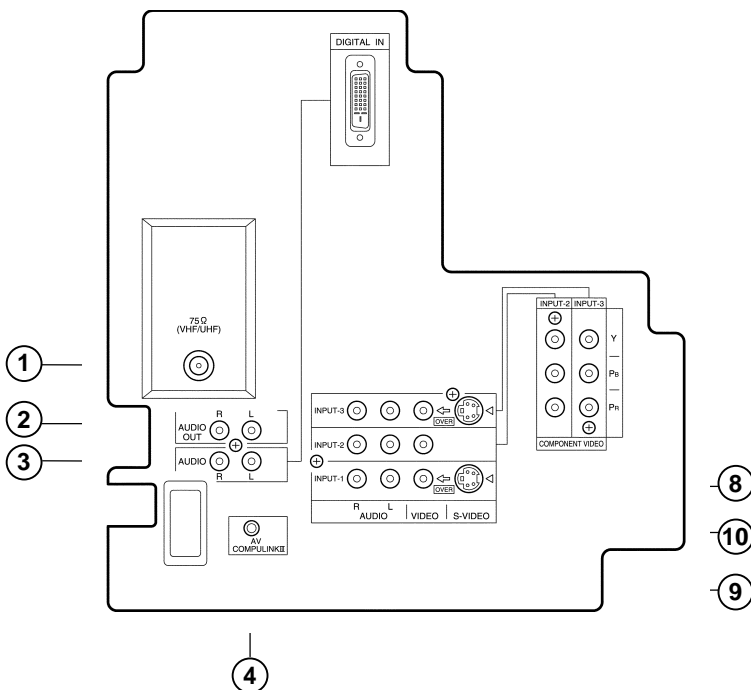
FUNCTIONS

● FRONT PANEL

- ① INPUT-4 terminals (S-Video, Video, Audio L/R)
- ② MENU button
- ③ CHANNEL $-/+$ button or OPERATE button
- ④ VOLUME $-/+$ button
- ⑤ SENSOR Remote control
- ⑥ POWER & ON TIMER lamp
- ⑦ POWER(Main) button

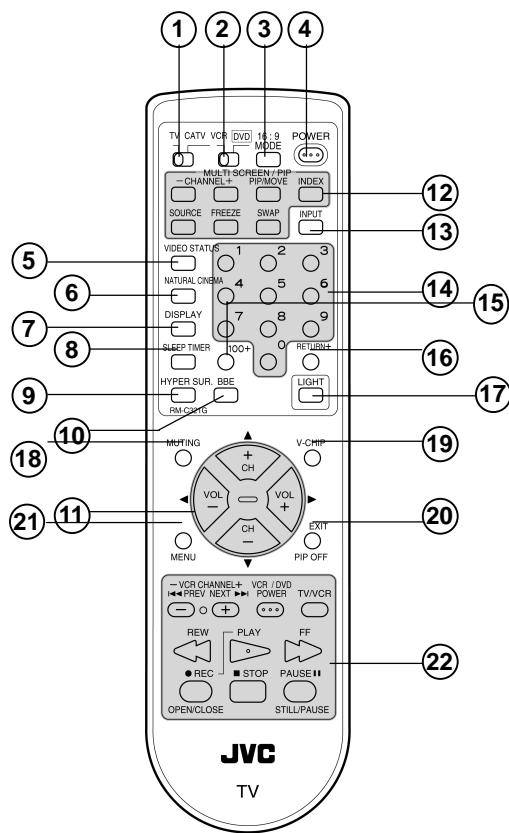


● AV TERMINAL (REAR)



- ① ANT 75Ω (VHF/UHF) Terminal
- ② AUDIO OUTPUT (L/R) terminal
- ③ AUDIO INPUT (L/R) Terminal
- ④ AV COMPULINK III Jack
- ⑤ DIGITAL-IN Terminal
- ⑥ INPUT-2 (Y/Pb/Pr) Terminal (Component Video)
- ⑦ INPUT-3 (Y/Pb/Pr) Terminal (Component Video)
- ⑧ INPUT-1 Terminal (S-Video / Video /Audio L/R)
- ⑨ INPUT-2 Terminal (Video/Audio L/R)
- ⑩ INPUT-3 Terminal (S-Video / Video /Audio L/R)

● REMOTE CONTROL



- ① TV / CATV Key
- ② VCR / DVD Key
- ③ 16 : 9 MODE Key
- ④ POWER Key
- ⑤ VIDEO STATUS Key
- ⑥ NATURAL CINEMA Key
- ⑦ DISPLAY Key
- ⑧ SLEEP TIMER Key
- ⑨ HYPER SURROUND Key
- ⑩ BBE Key
- ⑪ FUNCTION Key (CH +/- / VOL +/-)
- ⑫ MULTI SCREEN / PIP Key
- ⑬ INPUT Key
- ⑭ NUMBERS Key
- ⑮ 100+ Key
- ⑯ RETURN+ Key
- ⑰ LIGHT Key
- ⑱ MUTING Key (memory Key)
- ⑲ V-CHIP Key
- ⑳ EXIT / PIP OFF Key
- ㉑ MENU Key
- ㉒ VCR / DVDKey

SPECIFIC SERVICE INSTRUCTIONS

DISASSEMBLY PROCEDURE

REMOVING THE REAR COVER

- Unplug the power supply cord.
1. Remove the 15 screws marked (A) as shown in Fig.2.
 2. Remove the rear cover toward you.
- * When reinstalling the rear cover, carefully push it inward after inserting the chassis into the rear cover groove.

REMOVING THE CHASSIS

- After removing the rear cover.
1. Slightly raise the both sides of the chassis by hand and remove the 2 claws under the both sides of the chassis from the front cabinet.
 2. Draw the chassis backward along the rail in the arrow direction marked (B) as shown in the Fig.2.
(If necessary, take off the wire clamp, connector's etc.)
- * When conducting a check with power supplied, be sure to confirm that the CRT earth wire is connected to the CRT SOCKET PWB and the MAIN PWB or DEF.POWER PWB.

REMOVING THE TERMINAL BOARD

- After removing the rear cover.
1. Remove the 5 screws marked (C) as shown in Fig.2.
 2. When you pull out the TERMINAL BOARD in the direction of arrow marked (B) as shown in Fig.2, it can be removed.

REMOVING THE CONTROL BASE

- After removing the rear cover and the chassis.
1. As shown in Fig.1. while pushing down the claws marked (D) .
 2. Remove the CONTROL BASE in the arrow direction marked (E) .
(If necessary, take off the wire clamp, connectors etc.)

REMOVING THE SPEAKER / SPEAKER HOLDER

- After removing the rear cover and the chassis.
1. Remove the 2 screws marked (F) as shown in Fig.2, then remove the speaker holder toward you.
 2. Remove the 2 screws marked (G) as shown in Fig.2.
 3. Draw the speaker toward you.
 4. Follow the same steps when removing the other hand speaker.

REMOVING THE DIGITAL IF PWB (MODULE)

- After removing the rear cover and terminal board.
1. Remove the 2 screws marked (H) as shown in Fig.2.
 2. Remove the DIGITAL IF PWB in the arrow direction marked (I)
* If necessary, take off the wire clamp, connectors etc.

CHECKING THE PW BOARD

1. To check the backside of the circuit Board.
(1) Pull out the chassis. (Refer to REMOVING THE CHASSIS).
(2) Erect the chassis vertically so that you can easily check the backside of the PW Board.

[CAUTION]

- When erecting the chassis, be careful so that there will be no contacting with other PWB.
- Before turning on power, make sure that the CRT earth wire and other connectors are properly connected.

WIRE CLAMPING AND CABLE TYING

1. Be sure to clamp the wire.
2. Never remove the cable tie used for tying the wires together. Should it be inadvertently removed, be sure to tie the wires with a new cable tie.

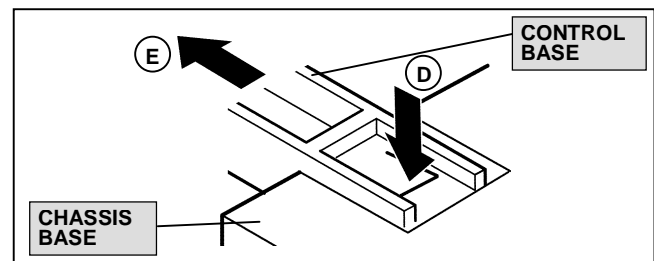
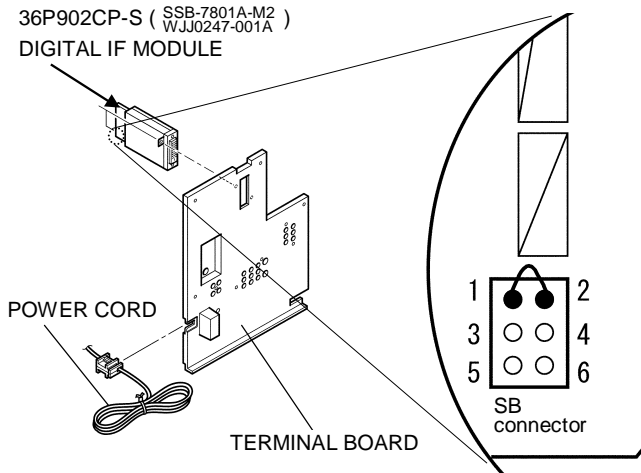


Fig. 1

CAUTION AT DISASSEMBLY

36P902CP-S (SSB-7801A-M2
WJJ0247-001A)
DIGITAL IF MODULE



- Prior to disassembly, unplug the power cord from the AC outlet without fail.(Turn the power "off".)
 - Short the SB connector (1) pin and (2) pin of the digital input unit. (At the time of assembling)
 - Before the rear cover is inserted into the cabinet, release the short-circuit between the SB connector (1) pin and (2) pin of the digital input unit.
 - After releasing the short-circuit between the SB connectors, do not turn the power on until the rear cover is inserted into the cabinet.
- * Negligence in carrying out the above steps may cause the inactivation of the TV.

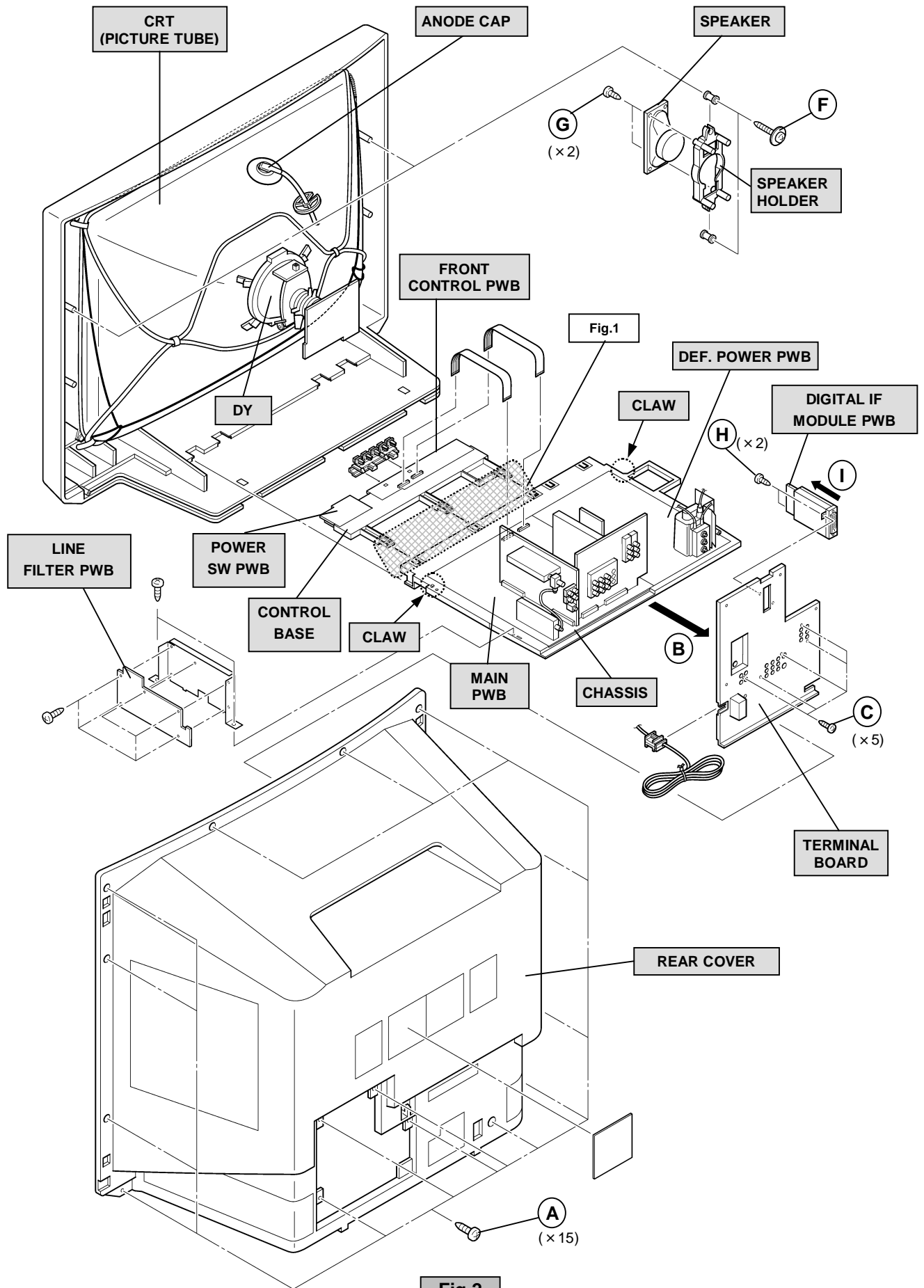


Fig.2

REMOVING THE CRT (Picture Tube)

*Replacement of the CRT should be performed by 2 or more persons.

- After removing the rear cover, chassis etc.,
 - 1. Putting the CRT change table on soft cloth, the CRT change table should also be covered with such soft cloth (shown in Fig.3).
 - 2. While keeping the surface of CRT down, mount the TV set on the CRT change table balanced will as shown in Fig.4.
 - 3. Remove 4 screws marked by arrows with a box type screwdriver as shown in Fig.4.
 - Since the cabinet will drop when screws have been removed, be sure to support the cabinet with hands.
 - 4. After 4 screws have been removed, put the cabinet slowly on cloth (At this time, be carefully so as not to damage the front surface of the cabinet) shown in Fig.5.
 - The CRT should be assembled according to the opposite sequence of its dismantling steps.
- * The CRT change table should preferably be smaller than the CRT surface, and its height be about 35cm.

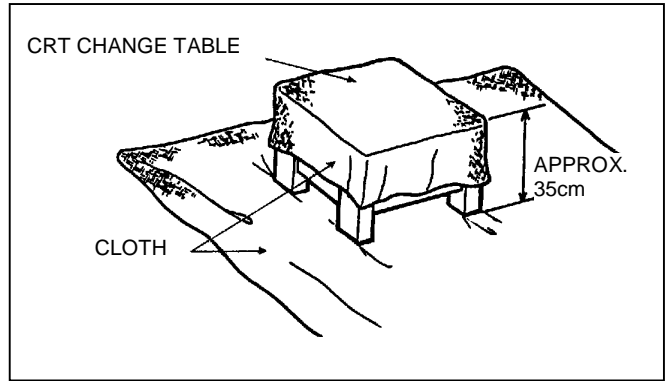


Fig. 3

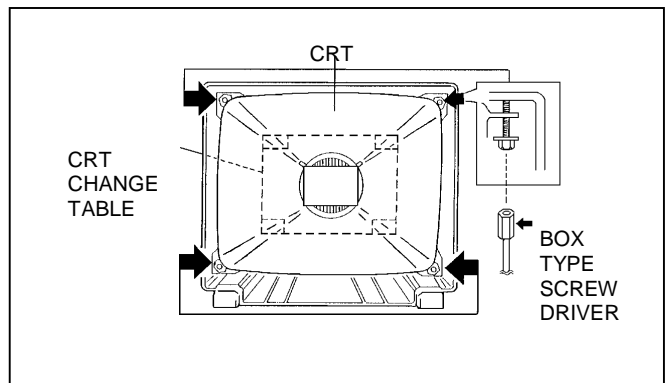


Fig. 4

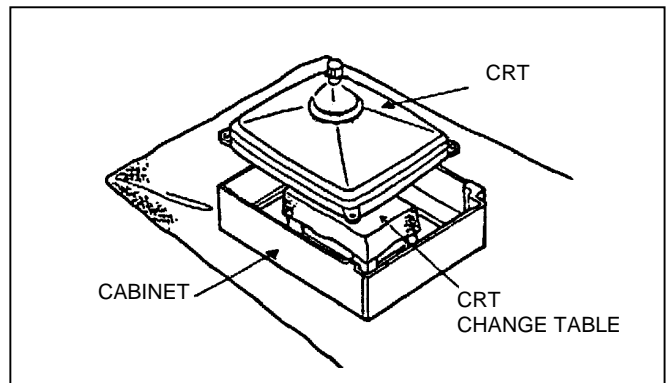


Fig. 5

COATING OF SILICON GREASE FOR ELECTRICAL INSULATION ON THE CRT ANODE CAP SECTION.

- Subsequent to replacement of the CRT and HV transformer or repair of the anode cap, etc. by dismantling them, be sure to coat silicon grease for electrical insulation as shown in Fig.6. Wipe around the anode button with clean and dry cloth. (Fig.6) Coat silicon grease on the section around the anode button. At this time, take care so that any silicon greases dose not sticks to the anode button. (Fig.7)

★ Silicon grease product No. KS - 650N

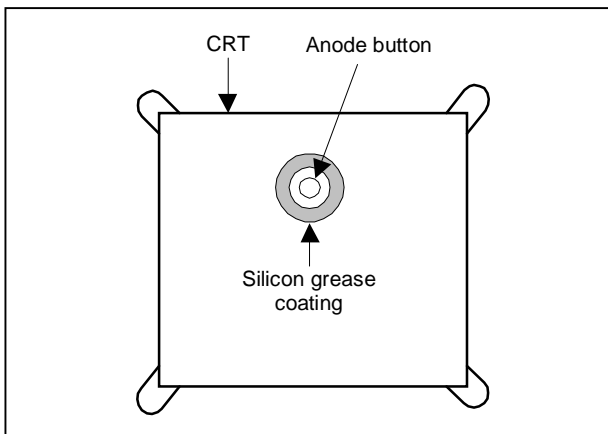


Fig. 6

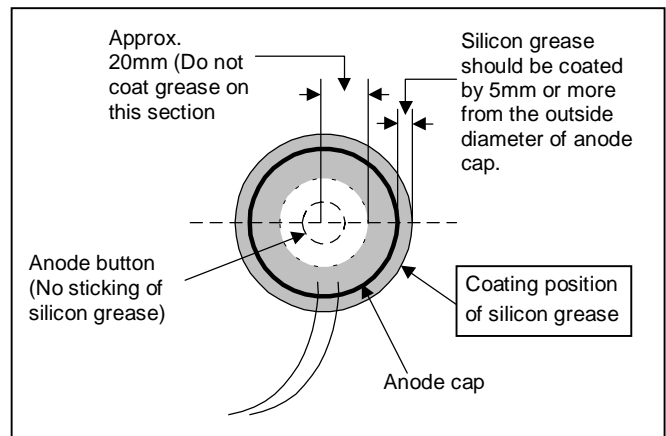


Fig. 7

REPLACEMENT OF CHIP COMPONENT

■ CAUTIONS

1. Avoid heating for more than 3 seconds.
2. Do not rub the electrodes and the resist parts of the pattern.
3. When removing a chip part, melt the solder adequately.
4. Do not reuse a chip part after removing it.

■ SOLDERING IRON

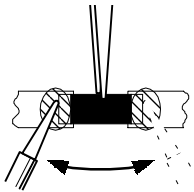
1. Use a high insulation soldering iron with a thin pointed end of it.
2. A 30w soldering iron is recommended for easily removing parts.

■ REPLACEMENT STEPS

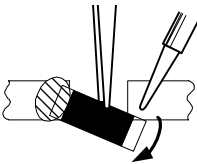
1. How to remove Chip parts

◆ Resistors, capacitors, etc

- (1) As shown in the figure, push the part with tweezers and alternately melt the solder at each end.

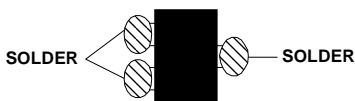


- (2) Shift with tweezers and remove the chip part.

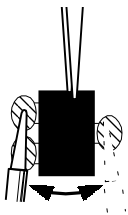


◆ Transistors, diodes, variable resistors, etc

- (1) Apply extra solder to each lead.



- (2) As shown in the figure, push the part with tweezers and alternately melt the solder at each lead. Shift and remove the chip part.

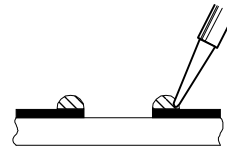


Note : After removing the part, remove remaining solder from the pattern.

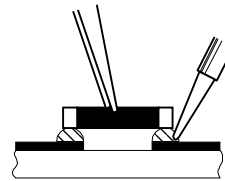
2. How to install Chip parts

◆ Resistors, capacitors, etc

- (1) Apply solder to the pattern as indicated in the figure.

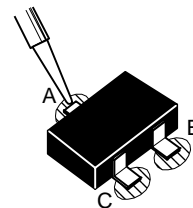


- (2) Grasp the chip part with tweezers and place it on the solder. Then heat and melt the solder at both ends of the chip part.

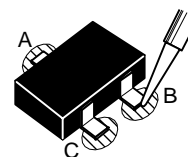


◆ Transistors, diodes, variable resistors, etc

- (1) Apply solder to the pattern as indicated in the figure.
- (2) Grasp the chip part with tweezers and place it on the solder.
- (3) First solder lead **A** as indicated in the figure.



- (4) Then solder leads **B** and **C**.



MEMORY IC REPLACEMENT

1. Memory IC

This model use a memory IC.
 This memory IC stores data for proper operation of the video and deflection circuits.
 When replacing, be sure to use an IC containing this (initial value) data.

2. Memory IC replacement procedure

(1) Power off
 Switch off the power and disconnect the power cord from the wall outlet.

(2) Replace the memory IC
 Initial value must be entered into the new IC.

(3) Power on
 Connect the power cord to the wall outlet and switch on the power.

(4) SERVICE MENU setting

- 1) Press **SLEEP TIMER** key and, while the indication of **SLEEP TIMER 0 MIN** is being displayed, press **DISPLAY** key and **VIDEO STATUS** key on the remote control unit (Fig.2) simultaneously.
- 2) The SERVICE MENU screen of Fig.1 is displayed.
- 3) Verify what to set in the SERVICE MENU, and set whatever is necessary (Fig.1).
 Refer to the SERVICE ADJUSTMENT for setting.
- 4) Press the EXIT key twice to return normal screen.

(5) Receive channel setting
 Refer to the OPERATING INSTRUCTIONS (USER'S GUIDE) and set the receive channels (Channels Preset) as described.

(6) User settings
 Check the user setting items according to after page.
 Where these do not agree, refer to the OPERATING INSTRUCTIONS (USER'S GUIDE) and set the items as described.

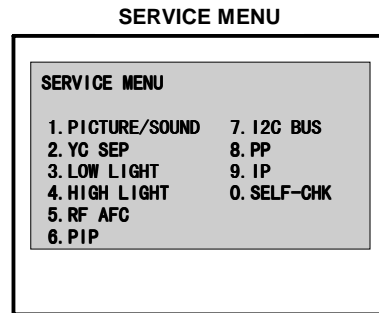


Fig.1

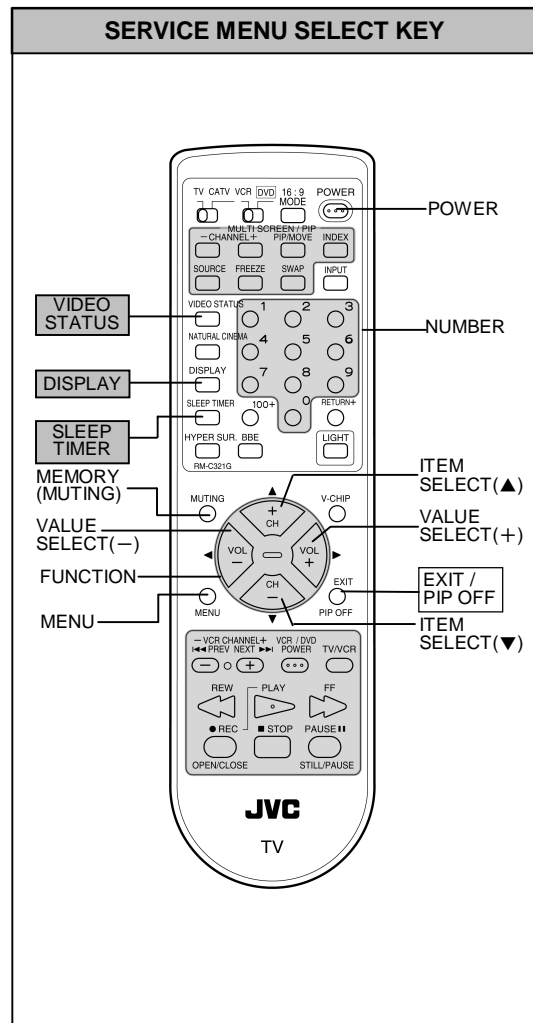


Fig.2

LAST MEMORY OF FACTORY

NTSC / 525p system

Item	SETTING VALUE				
	TINT	COLOR	PICTURE	BRIGHT	DETAIL
STANDARD	00	00	00	00	00
THATER	00	00	00	00	00
DYNAMIC	00	00	+10	00	+1

HD system

Item	SETTING VALUE				
	TINT	COLOR	PICTURE	BRIGHT	DETAIL
STANDARD	00	00	00	00	00
THATER	00	00	00	00	00
DYNAMIC	00	00	+2	00	00

CH. SETTING (CHANNEL SUMMARY)

BAND	Ch Display		Setting	BAND	Ch Display		Setting
VHF _L	02		○	SUPER	N	27	
	03				O	28	○
	04		○		P	29	
	05		○		Q	30	
	06		○		R	31	○
VHF _H	07		○		S	32	○
	08				T	33	
	09		○		U	34	
	10				V	35	
	11		○		W	36	○
UHF	12			SUBMID	A-7	93	
	13		○		A-6	394	
	14		○		A-5	95	
	36		○		A-4	96	○
	41				A-3	97	○
	46				A-2	98	○
63		○	A-1		99		
69		○	A-8		01		
MID	A	○		HYPER	W+11	47	○
	B	○			W+12	48	○
	C	○			W+17	53	○
	D	○			W+23	59	○
	E	○			W+29		
	F			ULTRA	W+51		
	G				W+78		
	H	○			W+84		
I	22						
J	23						
SUPER	K	24	○				
	L	25					
	M	26					

**LAST MEMORY OF FACTORY
(USER SETTING)**

Setting item	Setting value	Setting item	Setting value
POWER	OFF	TINT / COLOR / PICTURE	Refer to setting of Video status memory at packing
CHANNEL	AIR-02	/BRIGHT / DETAIL	
BBE	ON	COLOR TEMPATURE	HIGH
VOLUME	10	DIG. NOISE CLEAR	CENTER
INPUT	TV	NOISE MUTING	ON
DISPLAY	OFF	AUDIO OUT	FIX
NATURAL CINEMA	OFF	BASS / TREBLE / BALANCE	CENTER
SLEEP TIMER	0	MTS	STEREO
16 : 9 MODE	4 : 3	TV SPEAKER	ON
VIDEO STATUS	DYNAMIC	SET CLOCK	Unnecessary to set
HYPER SURROUND	OFF	ON / OFF TIMER	NO
PIP SOURCE	CH-04	LANGUAGE	ENG
PIP POSITION	BOTTOM (LEFT SIDE)	CLOSED CAPTION	OFF (CC1 / T1)
		FRONT PANEL LOCK	OFF
		AUTO SHUT OFF	OFF
		AUTO TUNER SET UP	Unnecessary to set
		DIGITAL-IN (at 480p signal input)	SIZE 1
		CHANNEL SUMMARY	Refer to Last memory (CH.summary)
		V-CHIP	OFF
		SET LOCK CODE	Unnecessary to set
		AUTO DEMO	OFF

SERVICE ADJUSTMENTS

ADJUSTMENT PREPARATION

1. You can make the necessary adjustments for this unit with either the Remote Control Unit or With the adjustment tools and parts as given below.
2. Adjustment with the Remote Control Unit is made on the basis of the initial setting values, however, the new setting values which set the screen to its optimum condition may differ from the initial settings.
3. Make sure that AC power is turned on correctly.
4. Turn on the power for set and test equipment before use, and start the adjustment procedures after waiting at least 30 minutes.
5. Unless otherwise specified, prepare the most suitable reception or input signal for adjustment.
6. **Never touch any adjustment setting value which are not specified in the list for this adjustment.**
7. Presetting before adjustment.
Unless otherwise specified in the adjustment instructions, preset the following functions with the remote control unit:

- Setting position

VIDEO STATUS	STANDARD
BASS, TREBLE, BALANCE	CENTER
HYPER SURROUND	OFF
TINT, COLOR, PICTURE, BRIGHT, DETAIL	CENTER

ADJUSTMENT EQUIPMENT

1. DC voltmeter (or digital voltmeter)
2. Oscilloscope
3. Signal generator (Pattern generator) [NTSC / HD / ED / HDCP]
* [HD (1080i) / ED (480p=525p) / DVD (525i=480i)]
4. Remote control unit
5. TV audio multiplex signal generator.
6. Frequency counter

ADJUSTMENT ITEMS

Adjustment items	Adjustment items
B1 POWER SUPPLY Check	(PIP adjustment)
X-RAY check	(NTSC / 525p / HD adjustment)
FOCUS adjustment	(HDCP adjustment)
DEF. adjustment	(DVD / 525p adjustment)
V/C adjustment (white Balance)	MTS adjustment

CAUTION

Never change the initial setting value any adjustments **except** for those that are designated in the adjustment procedures.

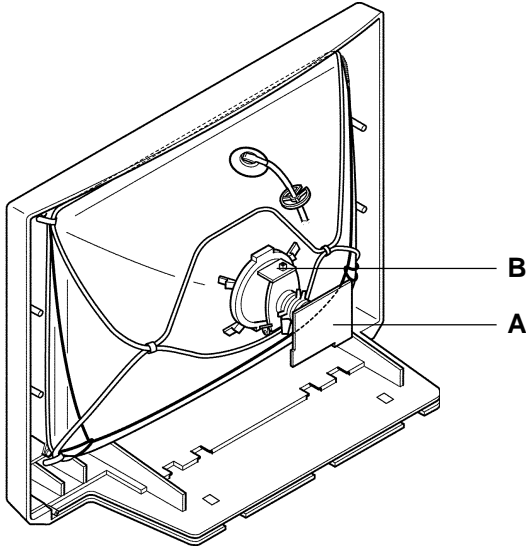
In case where you have made undesignated adjustments by mistake, **never press the MUTING** key on the remote control unit.

Whenever you had **not pressed** the **MUTING** key, you would be able to recover the initial value by switching the **POWER SW** (on/off) key.

MAIN PARTS (PWB) LOCATION

A : CRT SOCKET PWB

B : DY PWB (Within DY)



C : MAIN PWB

D : POWER / DEF PWB

E : LINE FILTER PWB

F : JACK PWB

G : DEF OSC PWB

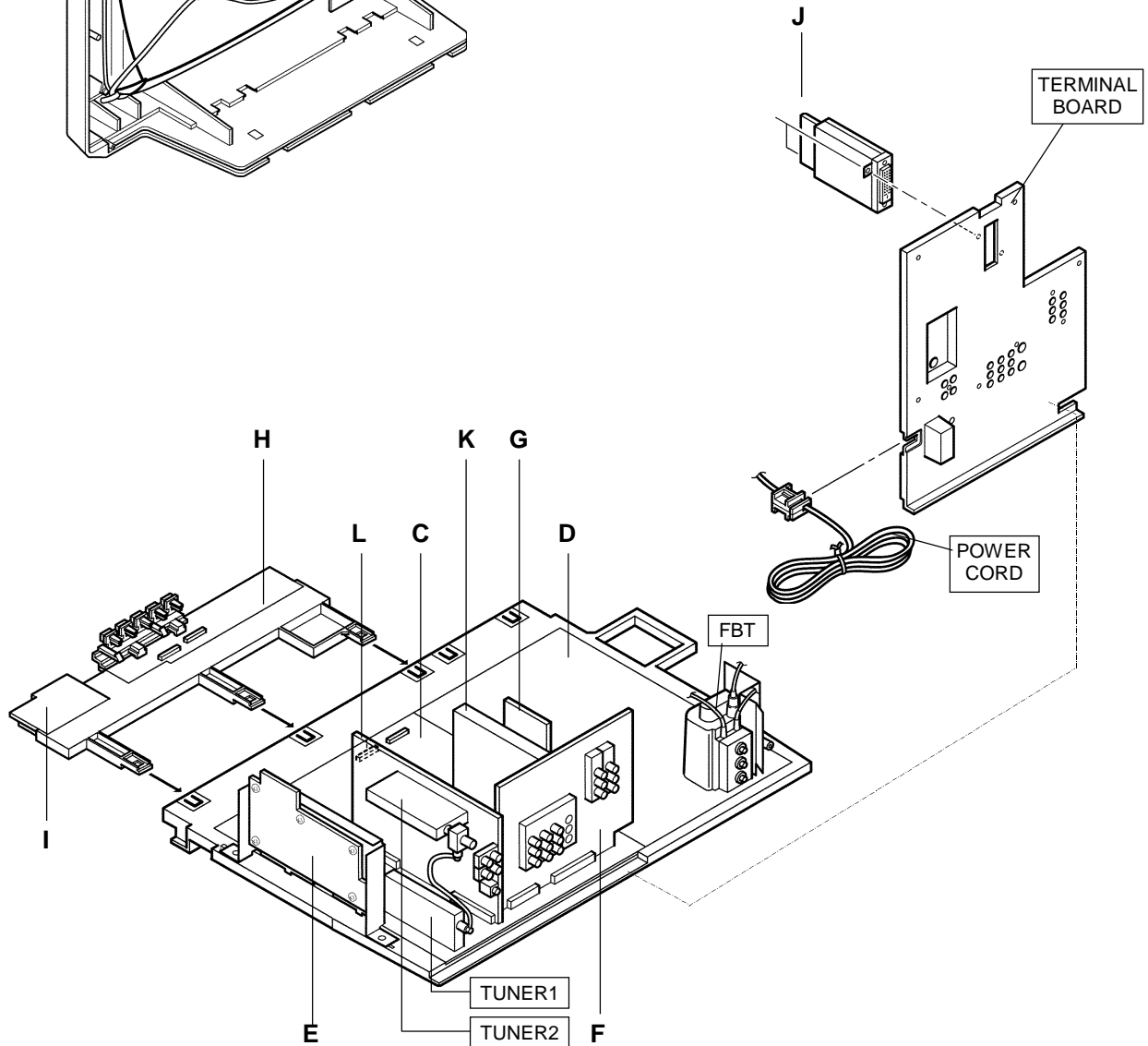
H : FRONT CONTROL PWB

I : POWER SW PWB

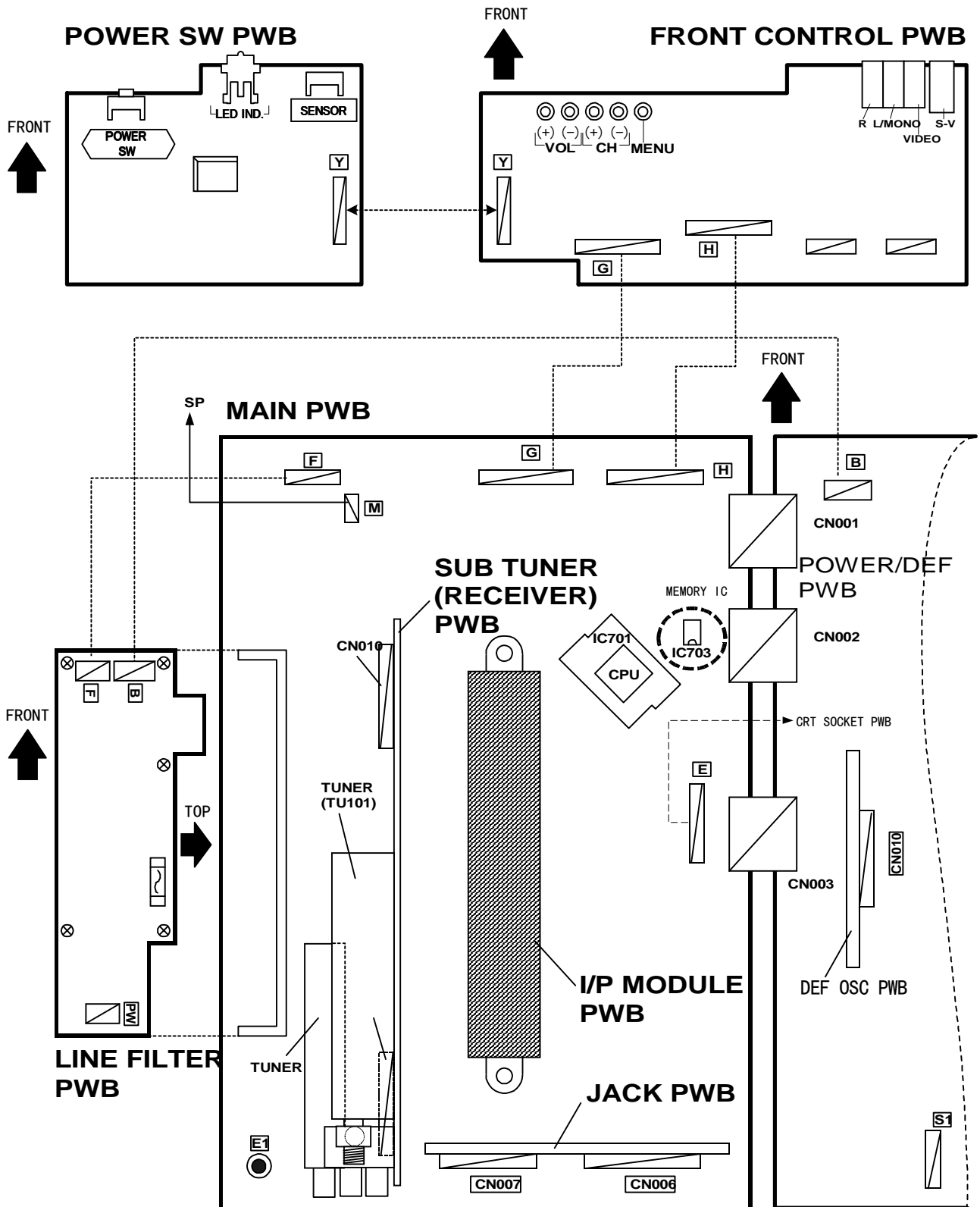
J : DIGITAL IF MODULE PWB

K : I/P MODULE PWB

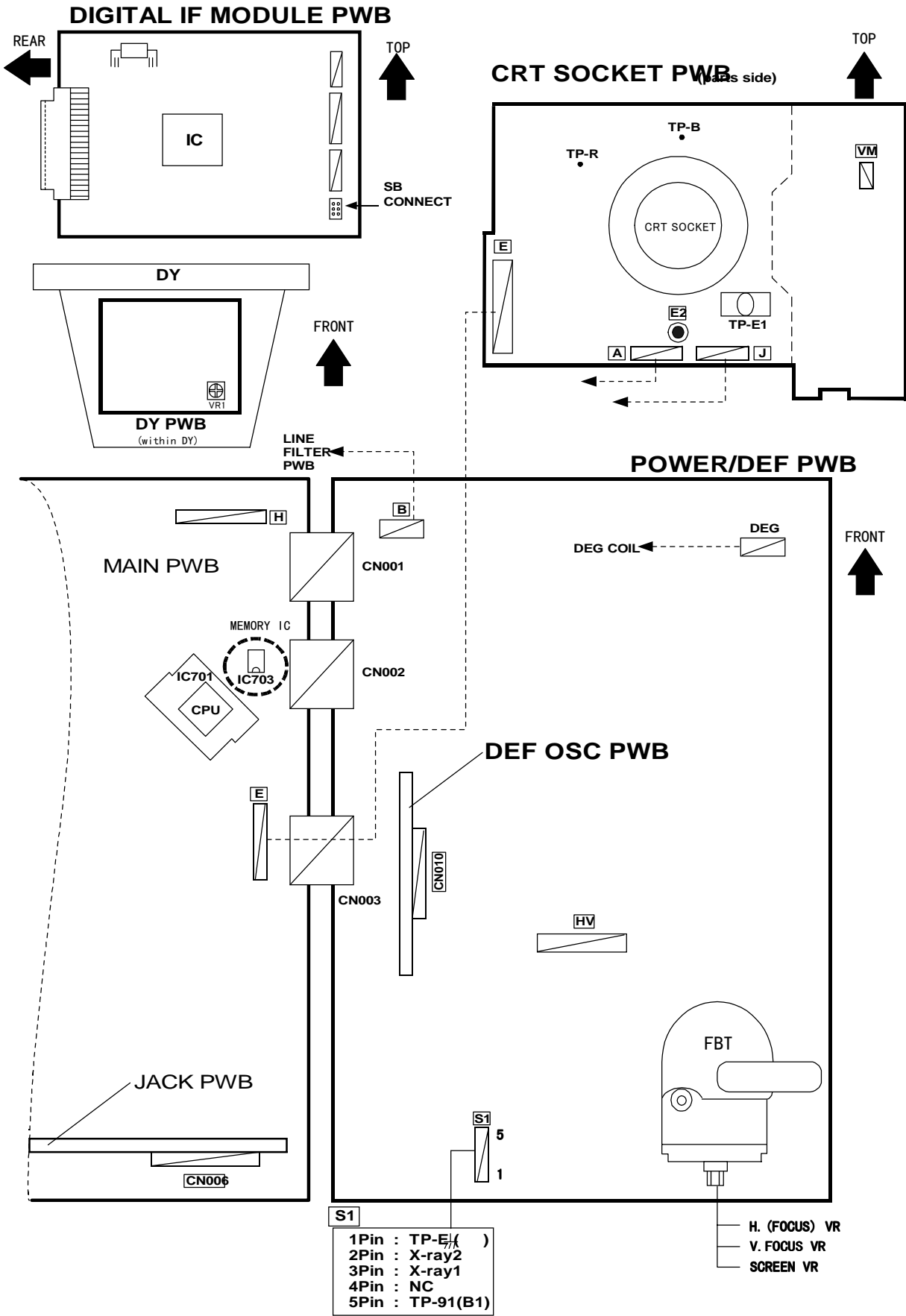
L : SUB TUNER (RECEIVER) PWB



ADJUSTMENT LOCATION (1/2)



ADJUSTMENT LOCATION (2/2)



BASIC OPERATION OF SERVICE MENU

1. TOOL OF SERVICE MENU OPERATION

Operate the SERVICE MENU with the REMOTE CONTROL UNIT.

2. SERVICE MENU ITEMS

In general, basic setting (adjustments) items or verifications are performed in the SERVICE MENU.

1. PICTURE / SOUND This sets the setting values of the VIDEO/CHROMA /AUDIO and DEFLECTION circuits.
2. YC SEP This is used when the YC mode is adjusted. **[Do not adjust]**
3. LOW LIGHT This sets the setting values of the WHITE BALANCE circuit.
4. HIGH LIGHT This sets the setting values of the WHITE BALANCE circuit.
5. RF AFC CHK This is used when the IF VCO is adjusted. **[Do not adjust]**
6. PIP This is used when the OUTPUT of PIP data is adjusted. **[Do not adjust]**
7. I²C BUS This is used when ON/OFF if the I²C BUS control is stop. **[Do not adjust]**
8. PP This sets the setting value of the output of P&P data. **[Do not adjust]**
9. IP This sets the setting value of the the IP circuit. **[Do not adjust]**
0. SELF-CHK This sets the self checking of the TV circuit.

3. Basic Operations of the SERVICE MENU

(1) How to enter the SERVICE MENU.

Press **SLEEP TIMER** key and, while the indication of "SLEEP TIMER 0 MIN." is being displayed, press **DISPLAY** key and **VIDEO STATUS** key on the remote control unit simultaneously to enter the **SERVICE MENU** screen as shown in the fig.1.

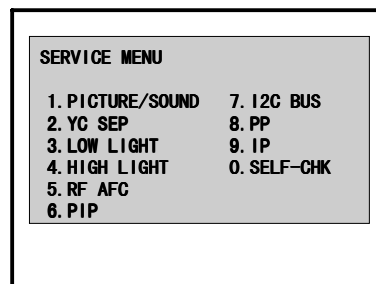


Fig. 1

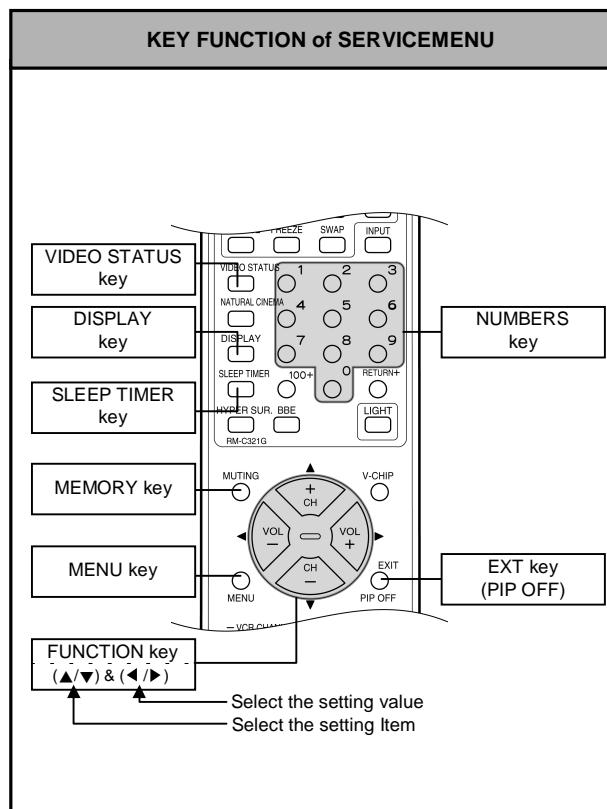
(2) SERVICE MENU screen selection

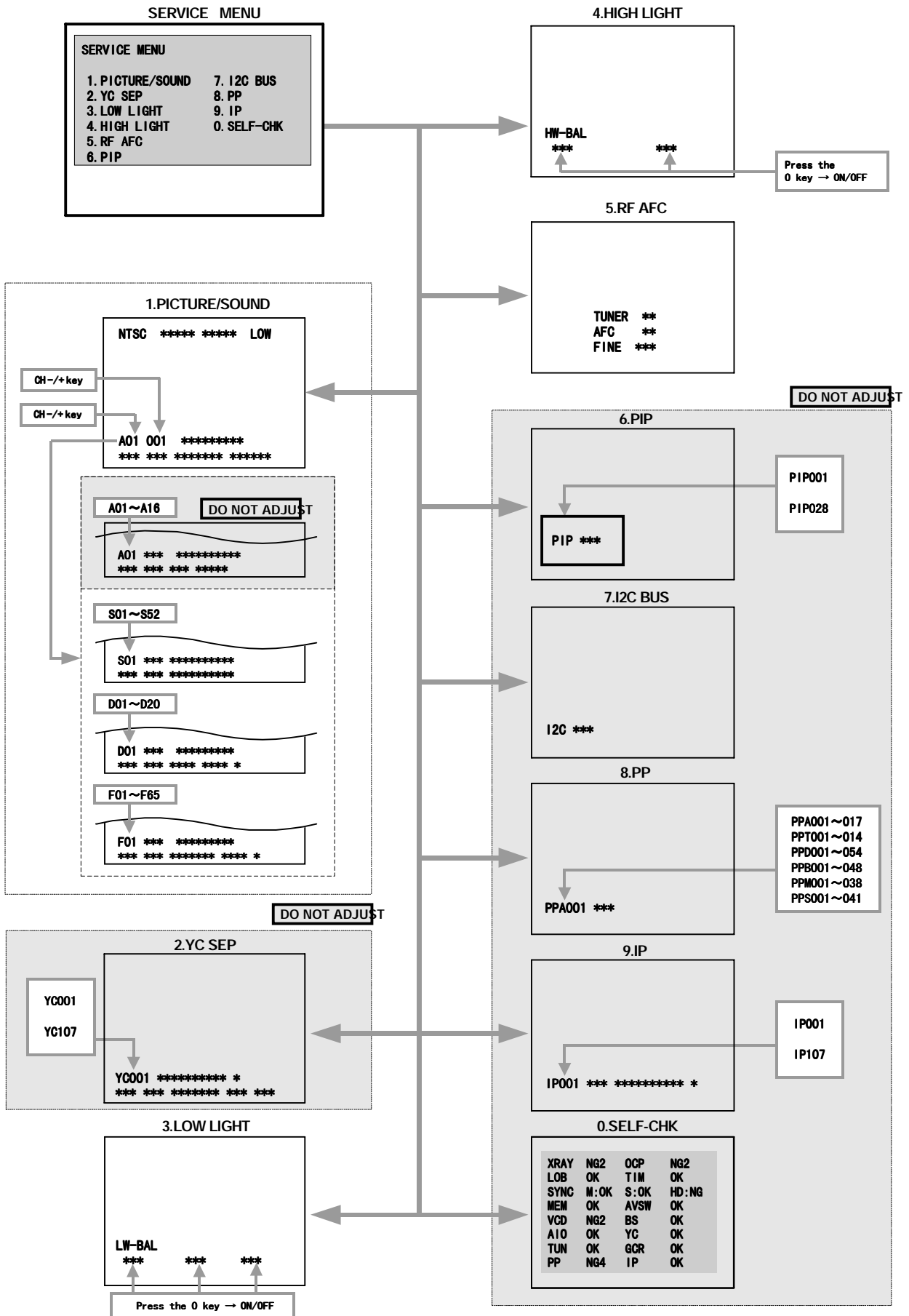
Press the ten key to select any of the following items.

- | | |
|-----------------|------------|
| 1.PICTURE/SOUND | 7.I2C BUS |
| 2.YC SEP | 8.PP |
| 3.LOW LIGHT | 9.IP |
| 4.HIGH LIGHT | 0.SELF-CHK |
| 5.RF AFC | |
| 6.PIP | |

(3) Enter the any setting mode

- **1. PICTURE / SOUND mode**
 - 1) Select the 1. PICTURE / SOUND items with the Number key, and the function (▲/▼) key is pressed the 1. PICTURE / SOUND mode, the screen will be displayed as shown in figure page later.
 - 2) Then the settings or verifications can be performed.
- **2.YC SEP, 3.LOW LIGHT, 4.HIGH LIGHT, 5.RF AFC, 6.PIP, 7.I²C BUS, 8.PP, 9.IP and 0.SELF-CHK mode**
 - 1) If you select any of 2.YC SEP 3.LOW LIGHT 4.HIGH-LIGHT 5.RF AFC 6.PIP, 7.I²C BUS, 8.PP, 9.IP and 0.SELF-CHK mode items, and the numbers key is pressed from SERVICE MENU, the each screens will be displayed as shown in figure page later.
 - 2) Then the settings or verifications can be performed.



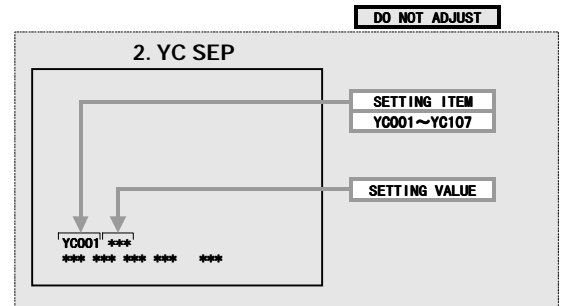
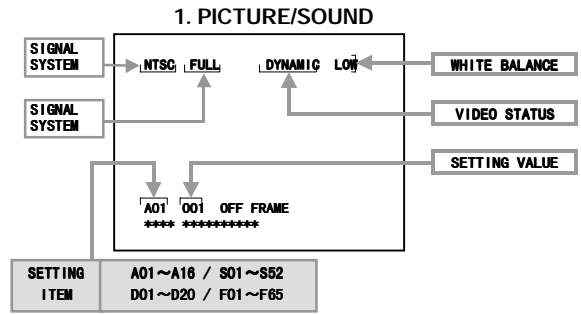


(4) Setting method

- 1) UP / DOWN (▲/▼) function key on remote control unit.
Select the SETTING ITEM.
- 2) LEFT / RIGHT (◀/▶) function key on remote control unit
Setting (adjust) the setting value of the SETTING ITEM.
When the MUTING key is pressed the setting value will be stored (memorized).
- 3) EXIT key
Returns to the previous screen.

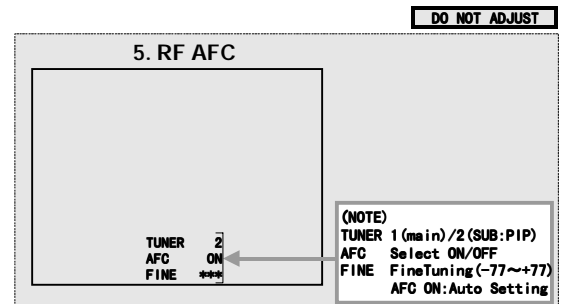
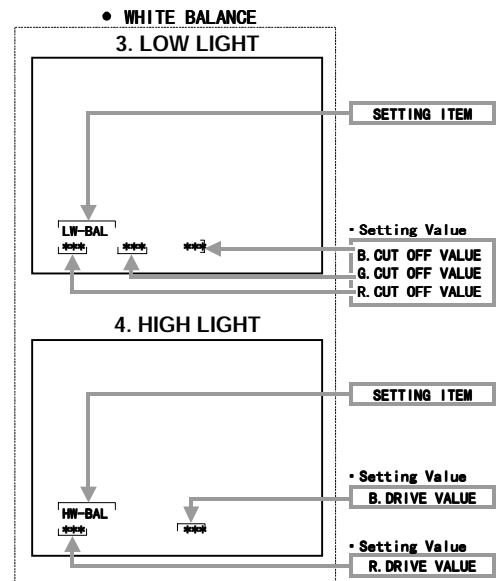
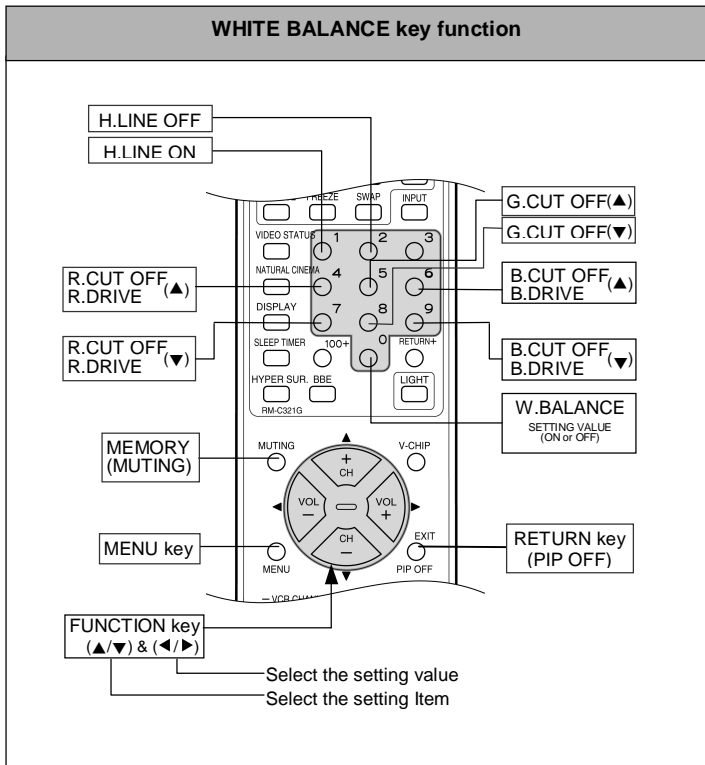
(5) Releasing SERVICE MENU

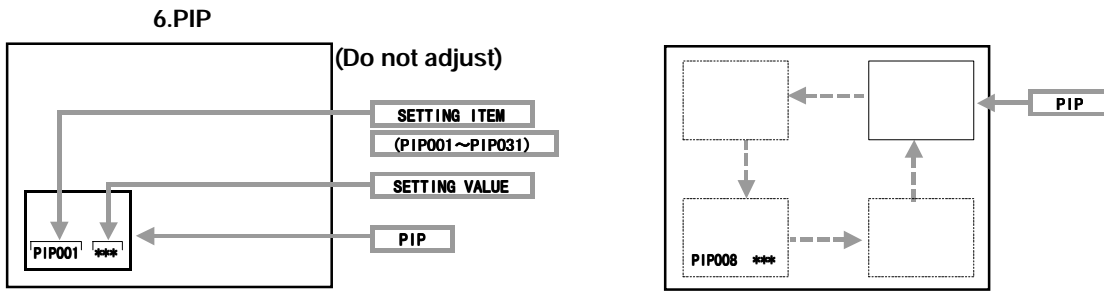
- 1) After returning to the SERVICE MENU upon completion of the setting work, press the EXIT key again.



• WHITE BALANCE setting

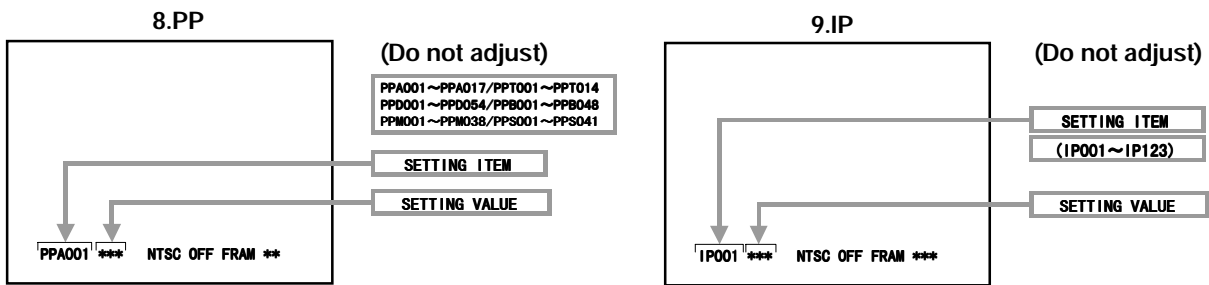
The setting for 3.LOW LIGHT and 4.HIGH LIGHT are described in the WHITE BALANCE page of ADJUSTMENT.





6.PIP setting

- 0) FUNCTION (▲/▼) key..... Select the setting Item.
- 2) FUNCTION (◀/▶) key Select the setting value.
- 3) MUTING Key..... Setting value will be stored.
- 4) EXIT key..... Returns to the service menu.
- 5) MENU key Releasing the service menu.



8.PP / 9.IP setting

- 1) FUNCTION(▲/▼) key Select the setting Item
- 2) FUNCTION (◀ ▶) key Select the setting value.
- 3) SLEEP TIMER key..... Skip the each setting Item.
- 4) MUTING Key..... Setting value will be stored.
- 5) EXIT key..... Returns to the service menu.
- 6) MENU key Releasing the service menu.

0.SELF-CHK DISPLAY

Press 0 key of remote control that checks the circuit operating status and in event of malfunction displays stores the data in memory. (as shown in figure)

0.SELF-CHK

XRAY	NG2	OCP	NG2
LOB	OK	TIM	OK
SYNC	M:OK	S:OK	HD:NG
MEM	OK	AVSW	OK
VCD	NG2	BS	OK
A10	OK	YC	OK
TUN	OK	GCR	OK
PP	NG4	IP	OK

INITIAL SETTING VALUE OF SERVICE MENU

1. Adjustment of the SERVICE MENU is made on the basis of the initial setting values; however, the new setting values which set the screen in its optimum condition may differ from the initial setting.
2. Do not change the initial setting values of the setting items NOT LISTED IN ADJUSTMENT.
3. The (*1 or *2)marked items in following table, it is NO REQUIREMENT for adjustment. If values had change by the missing, set the initial values in the following table.

■ SOUND MODE

Item No.	Item name	Variable range	initial setting value	Item No.	Item name	Variable Range	initial setting value
A01	NOISE DET.	0 / 1	001	A09	5FH MON	0 / 1	000
A02	INPUT LEVEL	0 ~ 63	032	A10	SAP VCO	0 ~ 63	034
A03	FH MONITOR	0 / 1	000	A11	INPUT GAIN	0 / 1	000
A04	STEREO VCO	0 ~ 63	035	A12	FIL OFFSET	-128 ~ +127	000
A05	PILOT CAN	0 / 1	000	A13	BBE BASS	-128 ~ +127	000
A06	FILTER	0 ~ 63	029	A14	BBE TREBLE	-128 ~ +127	000
A07	LOW SEP	0 ~ 63	027	A15	BASS	-128 ~ +127	-005
A08	HI SEP	0 ~ 63	028	A16	TREBLE	-128 ~ +127	-008

■ DEFLECTION MODE(1/4) (*1:Fixed value / *2:Offset (-107) value for HD D15 value)

Item No.	Item name	Variable range	NTS C			
			4 : 3	PIP	INDEX	16:9
D01	V-HEIGHT	0~127	STANDARD	0	0	-43
D02	EW PARABORA	0~63	STANDARD	0	0	0
D03	H-WIDTH	0~63	STANDARD	0	+1	0
D04*1	V S-CORRECTION	0~63	STANDARD 35	*1 +35	*1 +35	*1 +35
D05	V-LINEARITY	0~63	STANDARD	0	-3	0
D06	V CENTER	0~63	STANDARD	+4	-3	-2
D07	TRAPEZIUM	0~63	STANDARD	0	+1	-2
D08	EW CORNER LOWER	0~15	STANDARD	0	0	8
D09	EW CORNER UPPER	0~15	STANDARD	0	0	8
D10*1	V EHT	0~7	STANDARD 3	*1 +3	*1 +3	*1 +3
D11*1	H EHT	0~7	STANDARD 1	*1 +1	*1 +1	*1 +1
D12*1	EHT GAIN	0~7	STANDARD 5	*1 +5	*1 +5	*1 +5
D13*1	TEXT CONTROL	0~15	STANDARD 0	*1 0	*1 0	*1 0
D14	H CENTER	0~255	STANDARD	+3	+30	0
D15*2	HORIZONTAL FREQUENCY	0~255	STANDARD	*2 —	*2 —	*2 —
D16	H.BLK	0~63	STANDARD	0	0	0
D17*1	OSD OFFSET	-127~28	STANDARD	*1 0	*1 0	*1 0
D18*1	COMPULSION TWIN SCREEN	0~6	STANDARD 0	*1 0	*1 0	*1 0
D19*1	COMPULSION DEF RST OUTPUT	0 / 1	STANDARD 0	*1 0	*1 0	*1 0
D20*1	COMPULSION 1080i	0 / 1	STANDARD 0	*1 0	*1 0	*1 0

■ DEFLECTION MODE (2/4)

Item No.	Item name	Variable range	NTS C 4 : 3	ED		720Progre	
				4 : 3	16 : 9	16 : 9	16 : 9
D01	V-HEIGHT	0~127	STANDARD	0	-43		-40
D02	EW PARABORA	0~63	STANDARD	0	0		-1
D03	H-WIDTH	0~63	STANDARD	0	0		0
D04*1	V S-CORRECTION	0~63	STANDARD 35	*1 +35	*1 +35	*1	+35
D05	V-LINEARITY	0~63	STANDARD	-2	0		0
D06	V CENTER	0~63	STANDARD	-3	-5		-3
D07	TRAPEZIUM	0~63	STANDARD	-1	-3		-2
D08	EW CORNER LOWER	0~15	STANDARD	0	8		8
D09	EW CORNER UPPER	0~15	STANDARD	0	8		8
D10*1	V EHT	0~7	STANDARD 3	*1 +3	*1 +3	*1	+3
D11*1	H EHT	0~7	STANDARD 1	*1 +1	*1 +1	*1	+1
D12*1	EHT GAIN	0~7	STANDARD 5	*1 +5	*1 +5	*1	+5
D13*1	ADJUSTMENT	0~15	STANDARD 0	*1 0	*1 0	*1	0
D14	H CENTER	0~255	STANDARD	-30	-30		+5
D15*2	HORI FREQ ADJUSTMENT	0~255	STANDARD	*2 —	*2 —	*2	0
D16	H. BLK	0~63	STANDARD	0	0		0
D17*1	OSD OFFSET	-127~128	STANDARD	*1 0	*1 0	*1	0
D18*1	COMPULSION TWIN SCREEN	0~6	STANDARD 0	*1 0	*1 0	*1	0
D19*1	COMPULSION DEF RST OUTPUT	0 / 1	STANDARD 0	*1 0	*1 0	*1	0
D20*1	COMPULSION 1080i	0 / 1	STANDARD 0	*1 0	*1 0	*1	0

■ DEFLECTION MODE (3/4)

Item No.	Item name	Variable range	NTS C 4 : 3	HDCP			
				4 : 3	16 : 9	4 : 3	16 : 9
D01	V-HEIGHT	0~127	STANDARD	0	-43	0	-43
D02	EW PARABORA	0~63	STANDARD	0	0	0	0
D03	H-WIDTH	0~63	STANDARD	0	0	0	0
D04*1	V S-CORRECTION	0~63	STANDARD 35	*1 +35	*1 +35	*1 +35	*1 +35
D05	V-LINEARITY	0~63	STANDARD	-2	0	-2	0
D06	V CENTER	0~63	STANDARD	-3	-5	-3	-5
D07	TRAPEZIUM	0~63	STANDARD	-1	-3	-1	-3
D08	EW CORNER LOWER	0~15	STANDARD	0	+8	0	+8
D09	EW CORNER UPPER	0~15	STANDARD	0	+8	0	+8
D10*1	V EHT	0~7	STANDARD 3	*1 +3	*1 +3	*1 +3	*1 +2
D11*1	H EHT	0~7	STANDARD 1	*1 +1	*1 +1	*1 +1	*1 +1
D12*1	EHT GAIN	0~7	STANDARD 5	*1 +5	*1 +5	*1 +5	*1 +5
D13*1	ADJUSTMENT	0~15	STANDARD 0	*1 0	*1 0	*1 0	*1 0
D14	H CENTER	0~255	STANDARD	1	1	-52	-52
D15*2	HORI FREQ ADJUSTMENT	0~255	STANDARD	*2 —	*2 —	*2 —	*2 —
D16	H. BLK	0~63	STANDARD	0	0	0	0
D17*1	OSD OFFSET	-127~128	STANDARD	*1 0	*1 0	*1 0	*1 0
D18*1	COMPULSION TWIN SCREEN	0~6	STANDARD 0	*1 0	*1 0	*1 0	*1 0
D19*1	COMPULSION DEF RST OUTPUT	0 / 1	STANDARD 0	*1 0	*1 0	*1 0	*1 0
D20*1	COMPULSION 1080i	0 / 1	STANDARD 0	*1 0	*1 0	*1 0	*1 0

■ DEFLECTION MODE (4/4)

Item No.	Item name	Variable range	HD 1080i	HDCP HD1080i	Item No.	Item name	Variable range	HD 1080i	HDCP HD1080i
D01*1	V.HEIGHT	0~127	STANDARD	*1 0	D11*1	H EHT	0~7	STANDARD 1	*1 +1
D02	EW PARABORA	0~63	STANDARD	0	D12*1	EHT GAIN	0~7	STANDARD 5	*1 +5
D03	H.WIDTH	0~63	STANDARD	0	D13*1	ADJUSTMENT	0~15	STANDARD 0	*1 0
D04*1	V.S-CORR	0~63	STANDARD 35	*1 +35	D14	H CENTER	0~255	STANDARD	0
D05	V.LINEARITY	0~63	STANDARD	0	D15*2	HORI FREQ ADJUSTMENT	0~255	STANDARD	*2 -
D06	V.CENTER	0~63	STANDARD	0	D16	H. BLK	0~63	STANDARD	0
D07	TRAPEZIUM	0~63	STANDARD	0	D17*1	OSD OFFSET	-127~128	STANDARD	*1 0
D08	EW CORNER LOWER	0~15	STANDARD	0	D18*1	COMPULSION TWIN SCREEN	0~6	STANDARD 0	*1 0
D09	EW CORNER UPPER	0~15	STANDARD	0	D19*1	COMPULSION DEF RST OUTPUT	0 / 1	STANDARD 0	*1 0
D10*1	V.EHT	0~7	STANDARD 3	*1 +3	D20*1	COMPULSION 1080i	0 / 1	STANDARD 0	*1 0

■ PICTURE MODE (NTSC / DVD / ED)

(1/2)

Item No.	Item name	Variable range	NTSC		DVD		ED	
			Standard	Theater	Standard	Theater	Standard	Theater
S01	SUB COLOR	0~127	075	074	074	071	073	072
S02	SUB TINT	0~127	070	073	070	074	073	080

(HD / 720p / HDCP)

(2/2)

Item No.	Item name	Variable range	HD / 720p		HDCP			
			Standard	Theater	480p (525p)		1080i	
					Standard	Theater	Standard	Theater
S01	SUB BRIGHT	0~255	068	063	073	072	068	063
S02	SUB CONTRAST	0~127	071	070	076	080	070	069

(NTSC / DVD)

(1/4)

Item No.	Item name	Variable range	NTSC				DVD			
			4 : 3		16 : 9		4 : 3		16 : 9	
			Standard	Theater	Standard	Theater	Standard	Theater	Standard	Theater
S03	SUB BRIGHT	0~255	119	124	-	-	113	120	-	-
S04	SUB CONTRAST	0~127	085	054	-	-	090	057	-	-
S05	SUB BRIGHT OFFSET	-128~127	-	-	000	000	-	-	000	000
S06	CUB CONTRAST OFFSET	-128~127	-	-	-015	-007	-	-	-015	-009

(ED / HD)

(2/4)

Item No.	Item name	Variable range	ED				HD	
			4 : 3		16 : 9		A / D (16 : 9)	
			Standard	Theater	Standard	Theater	Standard	Theater
S03	SUB BRIGHT	0~255	110	116	-	-	114	118
S04	SUB CONTRAST	0~127	084	056	-	-	075	055
S05	SUB BRIGHT OFFSET	-128~127	-	-	000	000	-	-
S06	CUB CONTRAST OFFSET	-128~127	-	-	-015	-007	-	-

(720p / MULTI) (3/4)

Item No.	Item name	Variable range	720p		MULTI	
			16 : 9		9 PICTURES	
			Standard	Theater	Standard	Theater
S03	SUB BRIGHT	0~255	—	—	—	—
S04	SUB CONTRAST	0~127	—	—	—	—
S05	SUB BRIGHT OFFSET	-128~127	-006	-10	000	000
S06	CUB CONTRAST OFFSET	-128~127	-006	000	000	000

(HDCP) (4/4)

Item No.	Item name	Variable range	HDCP						
			480p (525p)				1080i		
			4 : 3		16 : 9		16 : 9		
			Standard	Theater	Standard	Theater	Standard	Theater	
S03	SUB BRIGHT	0~255	—	—	—	—	—	—	—
S04	SUB CONTRAST	0~127	—	—	—	—	—	—	—
S05	SUB BRIGHT OFFSET	-128~127	000	000	000	000	000	000	000
S06	CUB CONTRAST OFFSET	-128~127	000	000	000	000	000	000	000

(NTSC / DVD / ED / HD) (1/2)

Item No.	Item name	Variable range	NTSC		DVD		ED		HD	
			Standard	Theater	Standard	Theater	Standard	Theater	Standard	Theater
S07	B-Y DEMODURATION	0~63	028	032	021	030	007	021	012	023
S08	R-Y DEMODULATION	0~7	007	000	007	002	007	002	003	003
S09	G-Y MATRIX SW	0~3	001	003	001	003	001	003	002	002

(HDCP) (2/2)

Item No.	Item name	Variable range	HDCP			
			480p (525p)		1080i	
			Standard	Theater	Standard	Theater
S07	B-Y DEMODURATION	0~63	014	021	006	023
S08	R-Y DEMODULATION	0~7	007	002	002	002
S09	G-Y MATRIX SW	0~3	001	003	003	003

(NTSC / DVD) (1/3)

Item No.	Item name	Variable range	NTSC				DVD			
			Standard		Theater		Standard		Theater	
			High	Low	High	Low	High	Low	High	Low
S10	R Drive	0~255	—	149	—	—	—	146	—	—
S11	R Drive OFFSET	-128~127	+006	000	+10	000	+007	000	+103	-012
S12	B Drive	0~255	—	163	—	—	—	104	—	000
S13	B Drive OFFSET	-128~127	+007	000	-011	000	+010	000	-012	000

(ED / HD)			(2/3)							
Item No.	Item name	Variable range	ED				HD			
			Standard		Theater		Standard		Theater	
			High	Low	High	Low	High	Low	High	Low
S10	R Drive	0~255	—	—	—	—	—	145	—	—
S11	R Drive OFFSET	-128~127	+002	+009	+012	+013	+002	000	+002	+013
S12	B Drive	0~255	—	—	—	—	—	150	—	—
S13	B Drive OFFSET	-128~127	+011	+005	-009	-030	+011	000	-009	-030

(HDCP)			(3/3)							
Item No.	Item name	Variable range	HDCP							
			480p (525p)				1080i			
			Standard		Theater		Standard		Theater	
High	Low	High	Low	High	Low	High	Low			
S10	R Drive	0~255	—	154	—	—	—	152	—	—
S11	R Drive OFFSET	-128~127	+002	000	+012	+013	+002	000	+012	+013
S12	B Drive	0~255	—	168	—	—	—	168	—	—
S13	B Drive OFFSET	-128~127	+011	000	-009	-030	+011	000	-009	-030

(NTSC / DVD / ED / HD720p)			(1/2)							
Item No.	Item name	Variable range	NTSC		DVD		ED		HD 720p	
			Standard	Theater	Standard	Theater	Standard	Theater	Standard	Theater
S14	R CUT OFF	0~255	070	—	070	—	—	—	070	—
S15	R CUT OFF OFFSET	-128~127	000	000	000	000	000	000	000	000
S16	G CUT OFF	0~255	041	—	041	—	—	—	041	—
S17	G CUT OFF OFFSET	-128~127	000	000	000	000	000	-005	000	-005
S18	B CUT OFF	0~255	000	—	000	—	—	—	000	—
S19	B CUT OFF OFFSET	-128~127	000	000	000	000	+014	000	000	000
S20	R CUT OFF SW	0~3	001	001	001	001	001	001	001	001
S21	B CUT OFF SW	0~3	001	001	001	001	000	001	001	001

(HDCP)			(2/2)			
Item No.	Item name	Variable range	HDCP			
			480p (525p)		1080i	
			Standard	Theater	Standard	Theater
S14	R CUT OFF	0~255	070	—	070	—
S15	R CUT OFF OFFSET	-128~127	000	000	000	000
S16	G CUT OFF	0~255	098	—	103	—
S17	G CUT OFF OFFSET	-128~127	000	000	000	000
S18	B CUT OFF	0~255	044	—	044	—
S19	B CUT OFF OFFSET	-128~127	000	000	000	000
S20	R CUT OFF SW	0~3	001	001	001	001
S21	B CUT OFF SW	0~3	001	001	001	001

(NTSC / DVD / ED / HD / HDCP)

Item No.	Item name	Variable range	NTSC	DVD	ED	HD	HDCP	
							480p (525p)	1080i
S22	BLACK GRAD CORR START LEVEL	0~15	015	015	015	015	015	015
S23	BLACK GRAD CORR GAIN	0~15	006	001	006	006	006	006
S24	WHITE GRAD CORR START LEVEL	0~15	000	000	000	000	000	000
S25	WHITE GRAD CORR GAIN	0~15	015	015	015	015	015	015
S26	WHITE CHARA CORR START LEVEL	0~15	002	001	000	001	000	001
S27	WHITE CHARA CORR GAIN	0~15	003	002	002	001	002	001

(THEATER / HDCP)

Item No.	Item name	Variable range	Standard	Theater	HDCP			
					480p (525p)		1080i	
					Standard	Theater	Standard	Theater
S28	ABL GAIN	0~15	015	015	015	015	015	015
S29	ABL START	0~15	015	015	015	015	015	015
S30	ACL GAIN	0~15	015	015	015	015	015	015
S31	ACL START	0~15	000	000	000	000	000	000
S32	CONTRAST LINK	0 / 1	000	000	000	000	000	000
S33	BLACK GRDIATION CORRECTION OFF	0 / 1	000	001	000	001	000	001
S34	WHITE GRDIATION CORRECTION OFF	0 / 1	000	000	000	000	000	000

(NTSC / DVD / HD / ED / HDCP)

Item No.	Item name	Variable range	NTSC / DVD	HD	ED	HDCP	
						480p (525p)	1080i
S35	TINT HD / NTSC	0 / 1	001	001	001	001	000

(THEATER / HDCP)

Item No.	Item name	Variable Range	Standard	Theater	HDCP			
					480p (525p)		1080i	
					Standard	Theater	Standard	Theater
S36	ABL OFF	0 / 1	000	000	000	000	000	000
S37	ABL OFF	0 / 1	000	000	000	000	000	000
S38	DC TRANSMIT POLARITY	0 / 1	001	001	001	001	001	001
S39	DC TRANSMIT CORR	0 / 1	000	000	000	000	000	000
S40	BLAKING ON / OFF	0 / 1	000	000	000	000	000	000

(NTSC / DVD / ED / HD)

(1/2)

Item No.	Item name	Variable range	NTSC		DVD		ED		HD	
			Standard	Theater	Standard	Theater	Standard	Theater	Standard	Theater
S41	DC RIBIRTH	0~255	160	120	160	120	150	140	150	95

(HDCP)

(2/2)

Item No.	Item name	Variable range	HDCP			
			480p (525p)		1080i	
			Standard	Theater	Standard	Theater
S41	DC RIBIRTH	0~255	130	160	150	044

(16 : 9 / THEATER / PIP / OTHER)

Item No.	Item name	Variable range	16 : 9	Theater	PIP	OTHER
S42	ACL CONTROL	0~255	160	050	—	000

(NTSC / DVD / ED / HDCP 480p / HD / 720p)

Item No.	Item name	Variable Range	NTSC		DVD		ED / HDCP480p		HD / 720p	
			4 : 3 / 16 : 9		4 : 3 / 16 : 9		4 : 3 / 16 : 9		/ HDCP1080i	
			Standard	Theater	Standard	Theater	Standard	Theater	Standard	Theater
S43	CONT. LOWER LIMIT	-128~127	-045	-015	-045	-015	-045	-015	-045	-015

(NTSC / DVD / ED / HDCP 480p(525p) / HD / 720p / HDCP 1080i)

Item No.	Item name	Variable range	Setting Value			
			NTSC 4 : 3 / 16 : 9	DVD 4 : 3 / 16 : 9	ED/ HDCP480p (525p) 4 : 3 / 16 : 9	HD / 720p / HDCP1080i
S44	CONT. UPPER LIMIT	-128~127	+017	+017	+012	+017
S45	BRI. LOWER LIMIT	-128~127	-020	-020	-020	-020
S46	EE THEATER BRIGHT	-128~127	000	000	000	000
S47	EE THEATER CONTRAST	-128~127	+020	+020	+020	+020

(ALL SIGNAL)

Item No.	Item name	Variable range	Setting Value
S48	BRIGHT EE CONT. CORRECTION	0~31	007
S49	REFRAIN EE CONT. CORRECTION	0~31	027
S50	REFRAIN EE BRIGH OFFSET CORR (max)	0~127	004
S51	BRIGHT EE ACL CORR. COEFF.	0~255	055
S52	REFRAIN EE ACL CORR. COEFF.	0~255	140

■ OTHERS MODE

Item No.	Item name	Variable Range	Setting Value	Item No.	Item name	Variable Range	Setting Value
F01	E ² PROM Ver 1	0~255	026	F32	DIRECT SELECT 2 PIC.	0 / 1	000
F02	E ² PROM Ver 2	0~255	002	F33	CAPTION OSD OSCSELECT	0~7	002
F03	H.LINE ON (BRIGHT)	0~255	133	F34	CH.PROGRAM SEARCH WAIT TIME	0~255	040
F04	H.LINE OFF (BRIGHT)	0~255	125	F35	VSM SHIPPING MODE	0 / 1	000
F05	H.LINE CONTRAST	0~127	095	F36	DNR SET	0~3	000
F06	C38 / C41 SW	0 / 1	001	F37	2PICTURE 16:9MODE	0 / 1	000
F07	MODEL SELECT	0~255	040	F38	V/C DECODE H.MASK SETTING	0 / 3	000
F08	_____	_____	_____	F39	LOUDNESS SW	0 / 1	000
F09	Auto Scroll Adjust 1	0~15	002	F40	POWER OFF WHITE	0 / 1	000
F10	Auto Scroll Adjust 2	0~15	004	F41	WHITE BACK ON/OFF	0 / 1	000
F11	Auto Scroll Adjust 3	0~15	004	F42	_____	_____	_____
F12	Auto Scroll Adjust 4	0~15	005	F43	_____	_____	_____
F13	Auto Scroll Adjust 5	0~15	006	F44	_____	_____	_____
F14	Auto Scroll Adjust 6	0~15	007	F45	_____	_____	_____
F15	Auto Scroll Adjust 7	0~15	007	F46	_____	_____	_____
F16	V Scroll MAX (VARI)	-128~127	-001	F50	_____	_____	_____
F17	V Scroll MIN (VARI)	-128~127	+001	F51	_____	_____	_____
F18	V Scroll MAX (CORR.)	-128~127	000	F52	_____	_____	_____
F19	V Scroll MIN (CORR.)	-128~127	000	F53	S / N (RF) CORR.WIDTH	0~255	004
F20	V LIN. MAX (CORR.)	-128~127	000	F54	S / N (RF) CORR.START	0~255	006
F21	V LIN. MIN (CORR.)	-128~127	000	F55	S / N (BS) CORR.WIDTH	0~255	005
F22	V Scroll MAX (VARI)	0~255	000	F56	S / N (BS) CORR.START	0~255	006
F23	V Scroll MIN (VARI)	0~255	000	F57	S / N (Comp.) CORR.WIDTH	0~255	005
F24	V-CHIP ON/OFF (CANADA)	0 / 1	001	F58	S / N (Comp.) CORR.START	0~255	006
F25	EARTH MAGNETIC CORR. PICTURE	0~127	127	F59	S / N (S) CORR.WIDTH	0~255	005
F26	OSD OFFSET (480p / 720p) (HDCP / 480p)	0~63	033	F60	S / N (S) START	0~255	006
F27	OSD OFFSET (1080i / HDCP1080i)	0~63	018	F61	OCD OFFSET (HORI.)	0~63	045
F28	CH.PROGRAM SEARCH CYCLE	0~255	010	F62	ATT GAIN	0 / 1	000
F29	PIP FUNCTION ON / OFF	0 / 1	001	F63	V.HEIGHT OFFSET	-128~127	-006
F30	PIP 2 PICTURE	0 / 1	000	F64	TEXT MODE CONT.CORR.	-128~127	000
F31	V.CHIP ON OFF	0 / 1	001	F65	_____	-128~127	_____

Item No.	Item name	Variable Range	Setting Value						
			NTSC	DVD	ED	HD	720p	HDCP480p	HDCP1080i
F47	SEP.LEVEL	0~3	000	002	002	002	002	—	—
F48	CLAMP PLUS	0 / 1	000	000	000	001	001	—	—
F49	HD PHASE	0~63	063	027	030	030	028	—	—

■ ADJUSTMENT

B1 POWER SUPPLY check

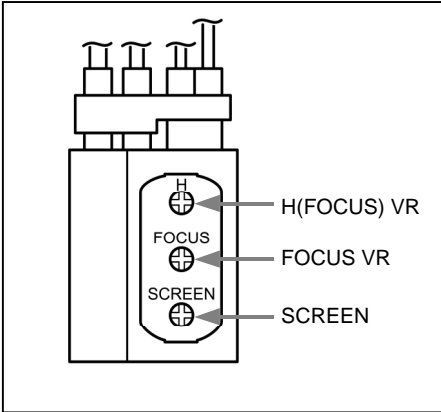
Item	Measuring Instrument	Test point	Adjustment Item	Description
Check of B1 Power supply	Signal generator DC Voltmeter	S1 connector 5 pin (TP-91) S1 connector 1 pin (TP-E) (TP)		<ol style="list-style-type: none"> 1. Input a black and white signal (color off). 2. Connect the DC voltmeter to S1 connector 5 pin (TP-91) and TP-E(TP) (S1 connector 1 pin). 3. Confirm that the voltage is DC140V±2V.

X-RAY protector check

Item	Measuring Instrument	Test point	Adjustment Item	Description
Check of X-Ray protector circuit	Resistor 12kΩ 1/6W ±5%	S1 connector 2 pin(X-Ray2) 3 pin(X-Ray1)		<ol style="list-style-type: none"> 1. Connect resistor 12kΩ (1/6W, ±5%) between ② pin & ③ pin of the connector S1. 2. Confirm that the X-RAY protector functions operated.

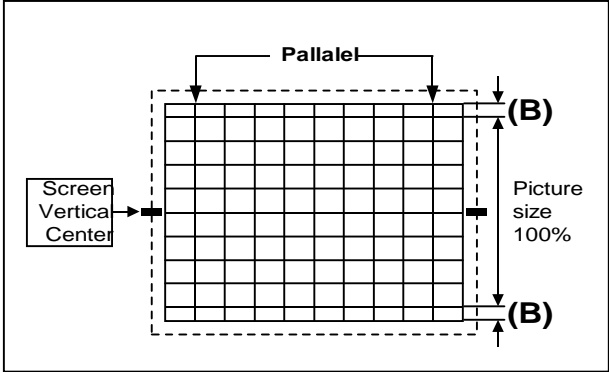
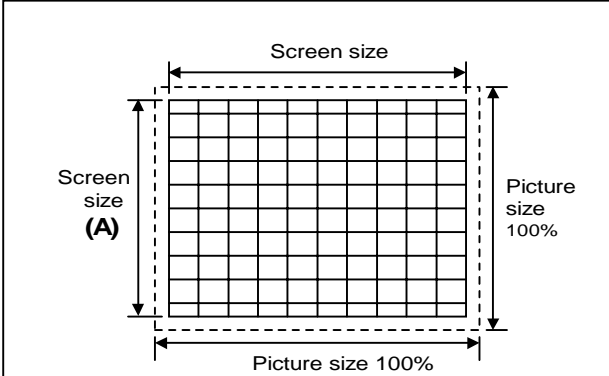
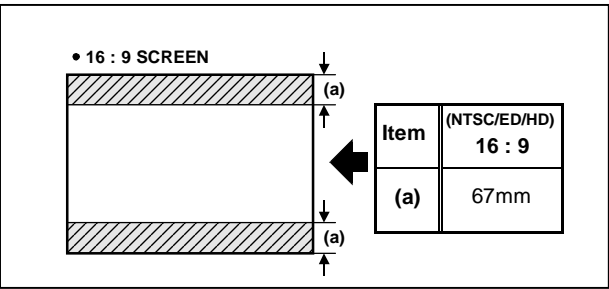
FOCUS adjustment

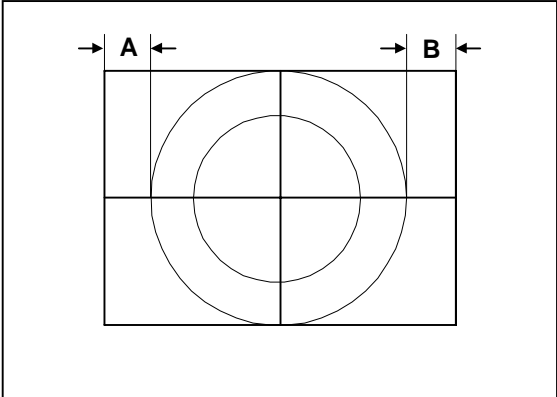
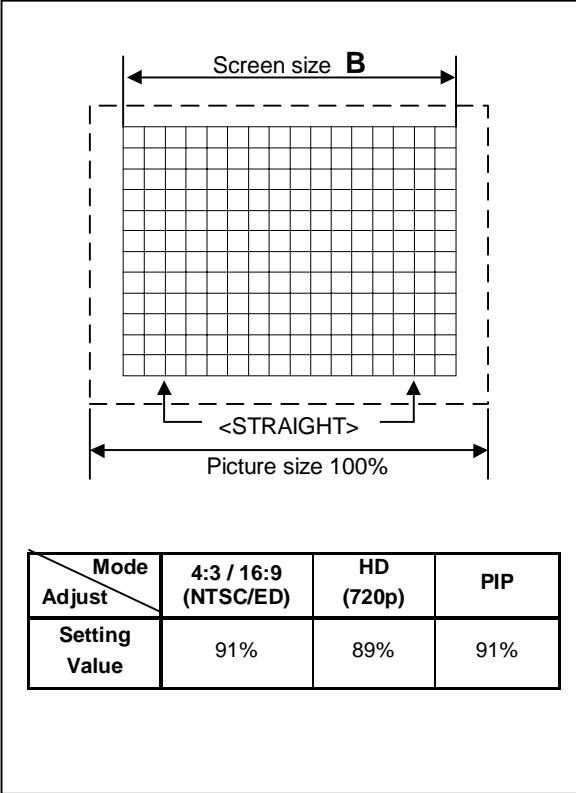
Item	Measuring Instrument	Test point	Adjustment Item	Description
FOCUS adjustment	Signal generator		H (FOCUS) (UPPER in FBT) FOCUS (CENTER in FBT)	<ol style="list-style-type: none"> 1. Input a crosshatch signal. 2. Select FULL(4:3) mode. 3. While watching at the screen, adjust the H (FOCUS) VR to make the horizontal lines as fine and sharp as possible. 4. Then adjust the FOCUS VR to make the vertical lines as fine and sharp as position. 5. Makes sure that when the screen is darkened, the lines remain in good focus.



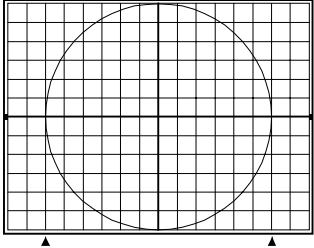
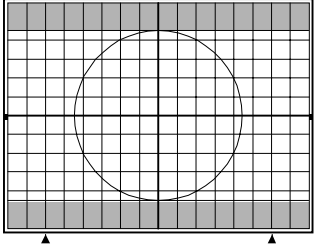
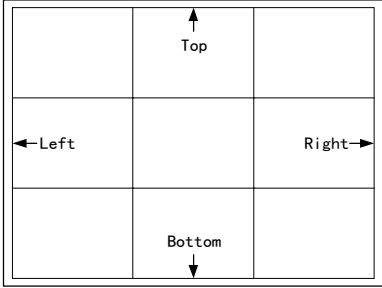
The diagram shows a control panel with three potentiometers. The top one is labeled 'H(FOCUS) VR', the middle one 'FOCUS VR', and the bottom one 'SCREEN'. Each potentiometer has a circular dial with a crosshair symbol. Arrows point from the text labels to the corresponding potentiometers.

DEFLECTION adjustment

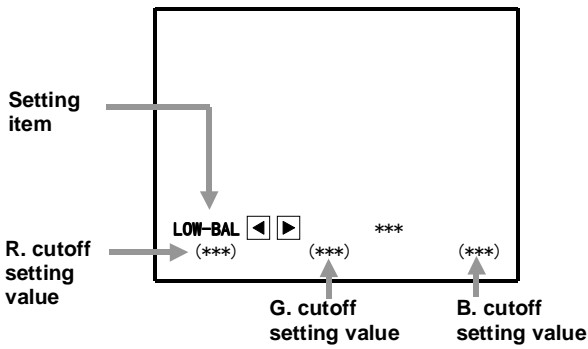
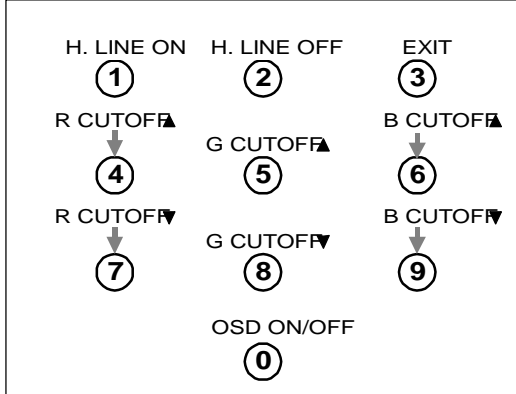
Item	Measuring Instrument	Test point	Adjustment Item	Description												
<p>V. CENTER & TRAPEZ V.HEIGHT &V. LIN Adjustment</p>	<p>Signal generator</p>		<p>D06 : V.CENTER D07 : TRAPEZ D01 : V. HEIGHT D05 : V. LIN</p>	<ol style="list-style-type: none"> 1. Receive the Full mode cross-hatch signal. 2. Select D07:TRAPEZ of the 1.PICTURE/SOUND mode in SERVICE MENU with the FUNCTION (▼ / ▲) key and adjust DO7:TRAPEZ to vertical lines straight with the FUNCTION (◀ / ▶) key. 3. Select D06: V.CENTER with the FUNCTION (▲ / ▼) key. 4. Adjust the D06:V.CENTER so that the horizontal line of the vertical center on the cross-hatch screen is agreement with the screen center marker. The screen center markers (Fig.1) positioned at both side of the screen vertical center. 5. Readjust D07: TRAPEZ and bring the each vertical lines to be equally (pallalel) of the screen (Fig.1). <ul style="list-style-type: none"> * Reconfirm the V. CENTER after adjustment of the TRAPEZ distortion. 6. Select the D01: V. HEIGHT of the 1. PICTURE / SOUND mode in service menu. 7. Adjust V. Height to squeeze the laster. 8. Adjust the vertical screen size to (A) by D01: V. HEIGHT with the FUNCTION (◀ / ▶) key(Fig.2). 9. Then select the D05: V. LIN. with the function (▲ / ▼) key, and adjust the linearity of the top (B) and bottom (B) part of the screen to correct (Fig.1). 10. To adjust the setting value that is added offset value of addendum and then confirm adjustment point each mode on each NTSC 16 : 9, ED (4:3 / 16:9), 9 screen, PIP, 720p. 11. If adjustment is different, to adjust again each mode, and then memorize with MUTING key of the remote control unit. 12. Receive the HD cross-hatch and monoscope signal. 13. HD adjust same as upper way. 												
<div style="text-align: center;">  <p>Fig.1</p> </div>																
<div style="text-align: center;">  <table border="1" data-bbox="161 1442 683 1592" style="margin: 10px auto;"> <thead> <tr> <th>Mode</th> <th>4 : 3 (NTSC / ED)</th> <th>HD (720p)</th> <th>PIP</th> </tr> </thead> <tbody> <tr> <td>Adjust</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Setting Value</td> <td>88%</td> <td>92%</td> <td>89%</td> </tr> </tbody> </table> <p>Fig.2</p> </div>				Mode	4 : 3 (NTSC / ED)	HD (720p)	PIP	Adjust				Setting Value	88%	92%	89%	
Mode	4 : 3 (NTSC / ED)	HD (720p)	PIP													
Adjust																
Setting Value	88%	92%	89%													
<div style="text-align: center;">  <p>Fig.3</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>(NOTE)</p> <ul style="list-style-type: none"> * Do not adjust D04: V.S-R. * If it is different V.position after adjust V.LIN. to adjust the V.position (D01, D05, D06) again. * To memorize every time after finish adjustment on each mode. </div>																

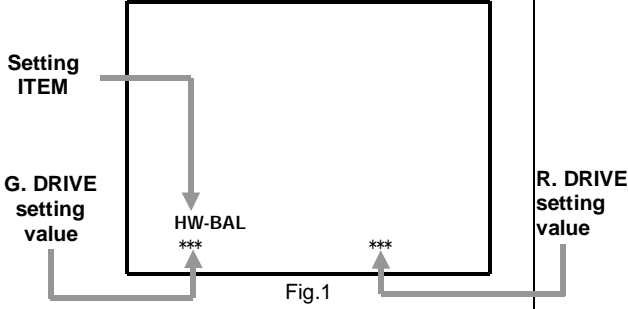
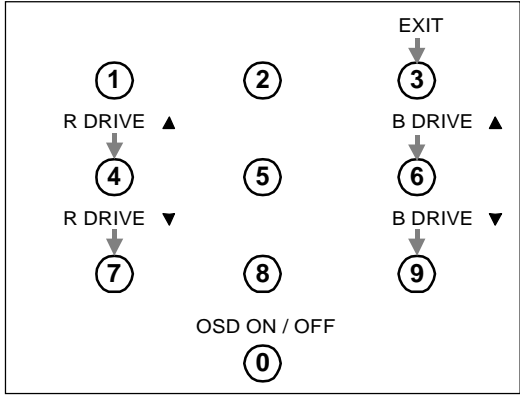
Item	Measuring Instrument	Test point	Adjustment Item	Description								
<p>H. WIDTH / H. POSITION / EW.CORNER UPPER/LOWER& TRAPEZIUM adjustment</p>	<p>Signal generator</p>		<p>D03 : H. WIDTH D14 : H. POSITION D02 : EW.PARABORA D09: EW.CORNER UPPER D08: EW.CORNER LOWER D07: TRAPEZIUM</p>	<ol style="list-style-type: none"> 1. Receive the circle pattern (Fig.1). 2. Select the D03: H. WIDTH of the 1.PICTURE / SOUND mode in SERVICE MENU with function (▲/▼) key. 3. Adjust the D14: H. POSITION to make the A=B as shown in Fig. 1. 4. Receive the cross-hatch pattern signal (Fig.2). 5. Adjust the D03: H. WIDTH to make the horizontal size to C of the picture size as shown in Fig. 2. 6. Adjust the vertical line to straight by D02: EW.PARABORA with the function (◀/▶) key. 7. If the CORNER PINCUSHION are too bad, adjust D09: EW.CORNER UPPER / D08:EW.CORNER LOWER and D07: TRAPEZIUM to get exact corner pincushion of cross-hatch pattern. 8. As required repeat above steps 2~8. 9. To adjust the setting value that is added offset value of addendum and then confirm adjustment point each NTSC16:9, ED (4:3/16:9), PIP, 720p (Fig.2). 10. If adjustment is different, to adjust again each mode, and then memorize with MUTING key of the remote control unit. 11. Receive the HD monoscope & cross-hatch signal. 12. Adjust the HD mode same as upper way. <p>(NOTE)</p> <ul style="list-style-type: none"> * To memorize every time after finish adjustment on each time. * To confirm H.position by monoscope, if it is different, to adjust H.position again. * To repeat to adjust H.SIZE and SIDEPIN cushion. 								
 <p style="text-align: center;">Fig.1</p>												
 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Mode Adjust</th> <th style="text-align: center;">4:3 / 16:9 (NTSC/ED)</th> <th style="text-align: center;">HD (720p)</th> <th style="text-align: center;">PIP</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Setting Value</td> <td style="text-align: center;">91%</td> <td style="text-align: center;">89%</td> <td style="text-align: center;">91%</td> </tr> </tbody> </table> <p style="text-align: center;">Fig.2</p>					Mode Adjust	4:3 / 16:9 (NTSC/ED)	HD (720p)	PIP	Setting Value	91%	89%	91%
Mode Adjust	4:3 / 16:9 (NTSC/ED)	HD (720p)	PIP									
Setting Value	91%	89%	91%									

(DISPLAY POSITION adjustment)

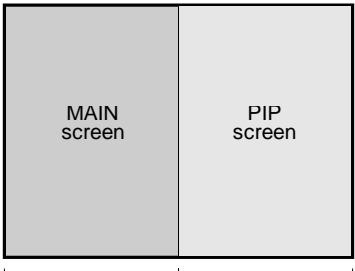
Item	Measuring Instrument	Test point	Adjustment Item	Description										
<p>HDCP DISPLAY POSITION adjustment</p>	<p>DVI Signal Generator Remote Control unit</p>	<p>DIGITAL-IN Terminal</p>	<p>D14 : H. CENTER</p>	<ol style="list-style-type: none"> 1. Input the 480p × 640 signal to DIGITAL-IN terminal. 2. Confirm the aspect ratio 4:3 mode. 3. Select SIZE 2 in DIGITAL-IN menu. 4. Enter to SERVICE MENU. 5. Adjust D14: H.CENTER as picture in center. 6. Press the MUTING key and then memorize. 7. Press the EXIT key to cancel the SERVICE mode. 8. Input the 1034i × 1920 signal (1080i). 9. Enter to SERVICE MENU. 10. Adjust D14: H.CENTER as left side of picture is fit to 2nd vertical line of cross-hatch signal. 11. Press the EXIT key to cancel the SERVICE mode. 										
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="text-align: center;"> <p>4:3 mode</p>  </div> <div style="text-align: center; margin-top: 20px;"> <p>16:9 mode</p>  </div> </div>														
<p>CH.PROGRAM LIST/ CH.PROGRAM AREA DISPLAY POSITION Adjustment</p>	<p>Signal Generator Remote Control unit</p>		<p>D01 : V.HEIGHT D03 : H.WIDTH D06 : V.CENTER D14 : H.CENTER</p>	<ol style="list-style-type: none"> 1. To set up 9 screen mode. 2. Enter to SERVICE MENU. 3. Select the 1.PICTURE / SOUND item. 4. ADJUST following value Top & Bottom direction in left screen by D1 : V.HEIGHT and D06 : V.CENTER. 5. Adjust following value Right and Left direction by D03: H.WIDTH and D14: H.CENTER. 6. To press the MUTING key and memorize with remote control unit. 										
														
<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>PICTURE</th> <th>TOP</th> <th>BOTTOM</th> <th>LEFT</th> <th>RIGHT</th> </tr> </thead> <tbody> <tr> <td>9 Screen</td> <td>90%</td> <td>65%</td> <td>80%</td> <td>75%</td> </tr> </tbody> </table>					PICTURE	TOP	BOTTOM	LEFT	RIGHT	9 Screen	90%	65%	80%	75%
PICTURE	TOP	BOTTOM	LEFT	RIGHT										
9 Screen	90%	65%	80%	75%										

V / C adjustment
(White Balance)

Item	Measuring Instrument	Test point	Adjustment Item	Description											
<p>WHITE BALANCE (Low Light) adjustment</p>  <p>Setting item</p> <p>R. cutoff setting value</p> <p>G. cutoff setting value</p> <p>B. cutoff setting value</p>	<p>Signal Generator</p> <p>Remote CONTROL unit</p>		<p>S20 : R CUTOFF SW</p> <p>S14 : R CUTOFF</p> <p>S16 : G CUTOFF</p> <p>S21 : B CUTOFF SW</p> <p>S18 : B CUTOFF</p> <p>SCREEN VR</p>	<p>* Select the STANDARD mode (all "000") for the VIDEOSTATUS.</p> <hr/> <ol style="list-style-type: none"> Input the black and white pattern signal (color off). Confirm that COLOR TEMP is set at the LOW mode. Set the initial setting values of the white balance (S14, S16, S18, S20, & S21 of Low Light) on the SERVICE MENU. Select the LOW -BAL mode on the SERVICE MENU. Display a horizontal line by pressing the ① key of the remote control unit. Turn the SCREEN VR all the way to the left. Then turn it gradually clockwise until either one of the red, blue or green color is faintly visible. Use the ④~⑨ keys of the remote control unit and adjust the other 2 colors to where the a horizontal line appears white. And then press MUTING key for memorize. Press ② key to release the a horizontal line mode. Switch the input signal to RASTER patter signal from black and white pattern signal. Confirm the WHITE BALANCE in the LOW LIGHT mode. If there is a gap with the setting values, repeat step 4.~ 8. for readjustment. For S14, S16, S18, S20, & S21 of the LOW LIGHT mode of the WHITE BALANCE and the LOW and HIGH modes of the THEATER mode, refer to the attached initial setting values. Input the DVD (or HD) video signal to the VIDEO-3 terminal and select the VIDEO-3 with remote control unit. Repeat steps 7.~8. above on the SERVICE MODE. Confirm that the WHITE BALANCE in the LOW LIGHT mode has been adjusted properly. For S14, S16, S18, S20, & S21 of the LOW LIGHT mode of the WHITE BALANCE and the LOW LIGHT and HIGH LIGHT modes of the THEATER mode, refer to the listed setting values. If there is a gap with the initial setting values, repeat step 7. ~ 8. for readjustment. <p>(NOTE)</p> <p>* If white balance of low brightness is different from a horizontal line, to adjust by low-light signal. Be care not to be green especially.</p>											
<p>REMOTE CONTROL UNIT</p> 															
<table border="1"> <thead> <tr> <th>Setting Item</th> <th>Setting Value</th> </tr> </thead> <tbody> <tr> <td>S14</td> <td>70</td> </tr> <tr> <td>S16</td> <td>41</td> </tr> <tr> <td>S18</td> <td>00</td> </tr> <tr> <td>S20</td> <td>01</td> </tr> <tr> <td>S21</td> <td>01</td> </tr> </tbody> </table>				Setting Item	Setting Value	S14	70	S16	41	S18	00	S20	01	S21	01
Setting Item	Setting Value														
S14	70														
S16	41														
S18	00														
S20	01														
S21	01														

Item	Measuring Instrument	Test point	Adjustment Item	Description
<p>WHITE BALANCE (High Light) adjustment</p>  <p>Setting ITEM</p> <p>G. DRIVE setting value</p> <p>HW-BAL ***</p> <p>R. DRIVE setting value</p> <p>Fig.1</p>	<p>Signal generator</p> <p>Remote Control unit</p>		<p>S10 : R DRIVE S12 : B DRIVE</p>	<p>* Select the STANDARD mode (all "000") on the VIDEO STATUS.</p> <hr/> <ol style="list-style-type: none"> 1. Select the STANDARD mode. 2. Receive the black and white signal (color off). 3. Confirm that COLOR TEMP is set at the LOW mode. 4. Select the HIGH-LIGHT, and set the initial setting values of the WHITE BALANCE (S10 & S12 of HIGH LIGHT) on the SERVICE MENU. 5. Adjust S10: R. DRIVE and S12: B. DRIVE so that the WHITE BALANCE falls within the same values of the standard setting value. 6. Make sure that the WHITE BALANCE tracking from the LOW-LIGHT through the HIGH-LIGHT has been properly done. (When the black and white signal (color off) is received, the natural white should be visible.) 7. For the WHITE BALANCE (High-Light) of the THEATER HIGH and LOW modes, tune in exactly by adding the offset values in the adjustment value (A) and (B) to the values in the STANDARD mode. 8. For S10 & S12 (R. & B. DRIVE) of the HIGH-LIGHT mode of the WHITE BALANCE, refer to the attached offset values. If there is a gap with the initial setting values, repeat step 1.~ 8. for readjustment. 9. Input the DVD (or HD) video signal to the VIDEO-3 terminal and select the VIDEO-3 with remote control unit. 10. Repeat steps 3.~6. above. 11. For the WHITE BALANCE (High-Light) of the DVD's (or HDs) THEATER HIGH and LOW modes, tune in exactly by adding the offset values in the adjustment value (A) and (B) to the values in the STANDARD mode. 12. For S10 & S12 (R. & B. DRIVE) of the HIGH mode of the WHITE BALANCE, refer to the attached offset values. If there is a gap with the initial setting values, repeat step 3.~6. for readjustment.
<p style="text-align: center;">REMOTE CONTROL UNIT</p>  <p style="text-align: center;">EXIT</p> <p>① R DRIVE ▲</p> <p>②</p> <p>③</p> <p>④ R DRIVE ▼</p> <p>⑤</p> <p>⑥ B DRIVE ▲</p> <p>⑦</p> <p>⑧</p> <p>⑨ B DRIVE ▼</p> <p style="text-align: center;">OSD ON / OFF</p> <p>⑩</p> <p style="text-align: center;">Fig.2</p>				

PIP ADJUSTMENT

Item	Measuring Instrument	Test point	Adjustment Item	Description																
PIP White Balance (High Light) adjustment	Signal Generator Remote Control unit		F30 : TWIN MODE (NTSC / NTSC) PPA01 : PIP BLUE BACK PPA13 : R-Y (Main High-Light) PPA14 : B-Y (Main High-Light)	<ol style="list-style-type: none"> Select the PIP mode and them to receive (Input) the black & White signal both the MAIN & PIP SCREEN. Preset to 1 for F30: NTSC/NTSC TWIN SCREEN in SERVICE MENU (Fig.1). Preset to 00 for PPA01: PIP BLUE BACK ON / OFF in SERVICE MENU. At first to adjust PPA14: MAIN HIGH LIGHT B-Y and PPA13:MAIN HIGH LIGHT R-Y, next to adjust the white level on left screen (Fig.2). At first to adjust PPD42: SUB HIGH-LIGHT R-Y and PPD039:SUB HIGH-LIGHT B-Y, next to adjust white level on right screen same as left screen (Fig.2). Press MUTING key for memorize. Preset (return) to 0 for F30: NTSC/NTSC twin screen in SERVICE MENU. Select the PIP mode, and preset to 40 (Initial value) for PPA01: PIP BLUE BACK ON / OFF in SERVICE MENU. <p>(NOTE)</p> <div style="border: 1px solid black; padding: 2px;"> * After adjustment, to memorized value. * Press MUTING key on remote control unit. </div>																
					<div style="text-align: center;"> <p>TWIN SCREEN</p>  <p>Fig.1</p> </div>															
				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Item No.</th> <th rowspan="2">Item name</th> <th>Difference Value</th> </tr> <tr> <th>Twin Screen</th> </tr> </thead> <tbody> <tr> <td>PPA14</td> <td>MAIN HIGH-LIGHT B-Y</td> <td>Standard</td> </tr> <tr> <td>PPA13</td> <td>MAIN HIGH-LIGHT R-Y</td> <td>Standard</td> </tr> <tr> <td>PPD42</td> <td>SUB HIGH-LIGHT R-Y</td> <td>Standard</td> </tr> <tr> <td>PPD39</td> <td>SUB HIGH-LIGHT B-Y</td> <td>Standard</td> </tr> </tbody> </table> <p style="text-align: center;">Fig.2</p>	Item No.	Item name	Difference Value	Twin Screen	PPA14	MAIN HIGH-LIGHT B-Y	Standard	PPA13	MAIN HIGH-LIGHT R-Y	Standard	PPD42	SUB HIGH-LIGHT R-Y	Standard	PPD39	SUB HIGH-LIGHT B-Y	Standard
Item No.	Item name	Difference Value																		
		Twin Screen																		
PPA14	MAIN HIGH-LIGHT B-Y	Standard																		
PPA13	MAIN HIGH-LIGHT R-Y	Standard																		
PPD42	SUB HIGH-LIGHT R-Y	Standard																		
PPD39	SUB HIGH-LIGHT B-Y	Standard																		
BRIGHT/CONT. In SUB SCREEN adjustment	Remote Control unit		F30 : NTSC / NTSC TWIN SCREEN PPA01 : PIP BLUE BACK LEVEL PPD036 : SUB BRIGHT PPD037 : SUB CONT.	<ol style="list-style-type: none"> Select PIP screen and then receive to MAIN screen. Enter the SERVICE MENU of 1.PICTURE/SOUND Item. Preset 1 for F30: NTSC/NTSC TWIN SCREEN in SERVICE MENU. Preset 00 for PPA01: PIP BLUE BACK ON / OFF in SERVICE MENU. Adjust PPD036: SUB BRIGHT to right screen is same as left screen (Fig.1). Check wave of TP-G by using osilloscope. Adjust PPD037: SUB CONTRAST like as it is fit following setting value to white. If bright was changed, to adjust one more time. Preset 0 for F30: NTSC/NTSC twin screen in SERVICE MENU. Select PIP mode, and preset 40 (initial data) for PPA01: PIP BLUE BACK ON / OFF in SERVICE MENU. <p>(NOTE)</p> <div style="border: 1px solid black; padding: 2px;"> * To memorize adjustment value after finishing adjustment and press muting key. </div>																
					<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Item No.</th> <th>Item Name</th> <th>Setting Value (voltage)</th> </tr> </thead> <tbody> <tr> <td>PPD37</td> <td>SUB CONTRAST</td> <td>+72</td> </tr> </tbody> </table>	Item No.	Item Name	Setting Value (voltage)	PPD37	SUB CONTRAST	+72									
Item No.	Item Name	Setting Value (voltage)																		
PPD37	SUB CONTRAST	+72																		

(NTSC / 525p / HD Adjustment)

Item	Measuring Instrument	Test point	Adjustment Item	Description																							
SUB BRIGHT adjustment	Remote Control unit		S03 : SUB BRIGHT	<ol style="list-style-type: none"> 1. Receive the Black & White. 2. Select STANDARD, white balance to low. 3. Select 1.PICTURE/SOUND from SERVICE MENU. 4. Select S03: SUB BRIGHT with FUNCTION (▲/▼) key. 5. Set the initial setting value with the FUNCTION (◀/▶) key. 6. Memorize value that is added (Fig.1) offset value to S03 : SUB BRIGHT value which is adjusted at item 5. 7. Select THEATER low white balance, and then repeat from item 3 to item 6. 8. Receive HD black level pattern and select STANDARD, and then repeat from item 3 to item 6. 9. Receive HD black level pattern and select THEATER mode, and then repeat from item 3 to item 6. 10. Input DVD black level pattern to INPUT 3, and select STANDARD, and then repeat from item 3 to item 6. 11. Input DVD black level pattern to INPUT 3, and select THEATER, and then repeat from item 3 to item 6. 12. Input 525p black level pattern, and select STANDARD mode, and then repeat from item 3 to item 6. 13. And then select THEATER mode, repeat from item 3 to item 6. 																							
					<p>S03:SUB BRIGHT</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="text-align: left;">mode Item</th> <th colspan="2">NTSC STANDARD</th> <th colspan="2">HD STANDARD</th> <th colspan="2">DVD STANDARD</th> <th colspan="2">525p (480p)</th> </tr> </thead> <tbody> <tr> <td>Setting value</td> <td>+1</td><td>0</td> <td>+1</td><td>0</td> <td>+1</td><td>0</td> <td>+1</td><td>0</td> </tr> <tr> <td>Offset</td> <td>0</td><td>0</td> <td>0</td><td>0</td> <td>0</td><td>0</td> <td>0</td><td>0</td> </tr> </tbody> </table> <p style="text-align: center;">Fig.1</p>	mode Item	NTSC STANDARD		HD STANDARD		DVD STANDARD		525p (480p)		Setting value	+1	0	+1	0	+1	0	+1	0	Offset	0	0	0
mode Item	NTSC STANDARD		HD STANDARD		DVD STANDARD		525p (480p)																				
Setting value	+1	0	+1	0	+1	0	+1	0																			
Offset	0	0	0	0	0	0	0	0																			
SUB CONT. adjustment	Remote Control unit		S04 : SUB CONT.	<ol style="list-style-type: none"> 1. Select STANDARD and then confirm that white balance is low. 2. Enter the SERVICE MENU of 1.PICTURE/SOUND Item. 3. Select S04:SUB CONT with FUNCTION (▲/▼) key. 4. Adjust S04: SUB CONT like as it is fit following (Fig.2) setting value to white with the FUNCTION (◀/▶) key. 5. Select THEATER, and adjust like as following (Fig.2) setting value with the FUNCTION (◀/▶) key. 6. Select DVD, and then repeat from item 3 to item 5. 7. Select HD pedestal pattern and then repeat from item 3 to item 5. 8. Select 525p and then repeat from item 3 to item 5. 																							
					<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="text-align: left;">mode Item</th> <th>NTSC</th> <th>HD</th> <th>DVD FULL</th> <th>525p (480p)</th> </tr> </thead> <tbody> <tr> <td>Setting Value (STANDARD)</td> <td>+78</td> <td>+69</td> <td>+83</td> <td>+74</td> </tr> <tr> <td>Setting Value (THEATER)</td> <td>+50</td> <td>+50</td> <td>+52</td> <td>+51</td> </tr> </tbody> </table> <p style="text-align: center;">Fig.2</p>	mode Item	NTSC	HD	DVD FULL	525p (480p)	Setting Value (STANDARD)	+78	+69	+83	+74	Setting Value (THEATER)	+50	+50	+52	+51							
mode Item	NTSC	HD	DVD FULL	525p (480p)																							
Setting Value (STANDARD)	+78	+69	+83	+74																							
Setting Value (THEATER)	+50	+50	+52	+51																							

(NTSC / 525p / HD Adjustment)

Item	Measuring Instrument	Test point	Adjustment Item	Description
<p>COLOR / TINT in SUB SCREEN adjustment</p>	<p>Signal Generator OSILLOSCOPE</p>	<p>TP-R</p>	<p>F30 : NTSC / NTSC TWIN SCREEN PPA01 : PIP BLUE / BACK LEVEL PPS01 : SUB DECODER TINT PPS04 : SUB DECODER COLOR</p>	<ol style="list-style-type: none"> 1. Select twin screen and then receive COLOR BAR signal to sub screen and PEDESTAL signal to main screen (Fig.1). 2. Enter the SERVICE MENU of 1.PICTURE/SOUND Item. 3. Preset 1 for F30: NTSC/NTSC TWIN SCREEN in SERVICE MENU. 4. Preset 00 for PPA01: PIP BLUE BACK ON / OFF in SERVICE MENU. 5. Check TP-R by osilloscope. 6. Adjust PPS04: SUB DECODER COLOR, PPS01 : SUB DECODER TINT to adjustment point (A) [V](Fig.2). 7. Preset 0 for F30: NTSC/NTSC twin screen in SERVICE MENU. 8. Select PIP mode, and preset 40 (initial data) for PPA01: PIP BLUE BACK ON / OFF. <p>(NOTE)</p> <div style="border: 1px solid black; padding: 5px;"> Memorize adjustment value after finishing adjustment. (To Press muting key.) </div>

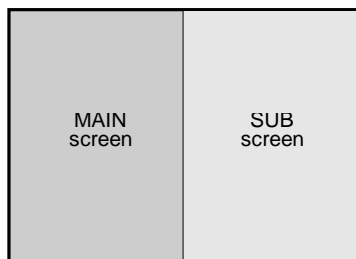


Fig.1

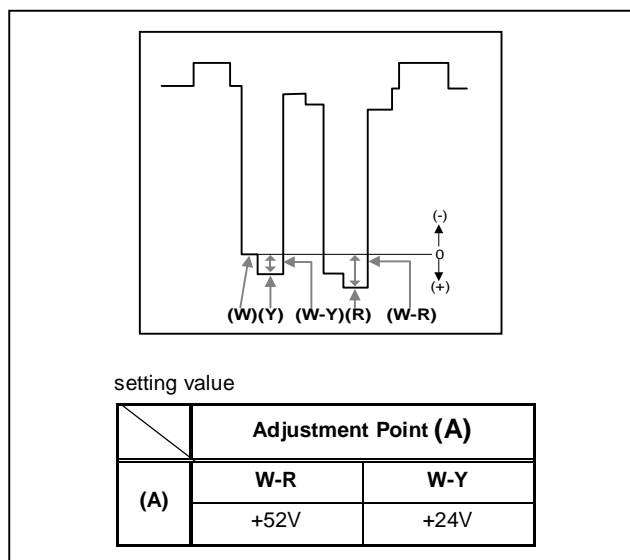


Fig.2

(DVD / 525p Adjustment)

Item	Measuring Instrument	Test point	Adjustment Item	Description
COLOR / TINT B-Y GAIN Adjustment	Signal generator Oscilloscope Remote control unit	TP-R TP-B TP-E(↘)	S01 : SUB COLOR S02 : SUB TINT	<ol style="list-style-type: none"> 1. Receive the DVD color bar and then select standard mode. 2. Enter the SERVICE mode of 1.PICTURE/SOUND Item. 3. Check TP-R by using oscilloscope. 4. Adjust S01: SUB COLOR and S02: SUB TINT to be following Setting Value A[V] 5. Select theater and then adjust S01: SUB COLOR and S02: SUB TINT to be following Setting Value B[V] same as above. 6. Check TP-B by using oscilloscope. 7. Select standard and then adjust S07: B-Y GAIN to be Setting Value C[V]. 8. Select theater and then adjust S07: B-Y GAIN to be Setting Value D[V] 9. Receive HD color bar and then repeat from item 3 to item 8. 10. Receive 525p color bar and then repeat from item 3 to item 8. 11. Confirm that low-light is not different after adjusting color, Tint and B-Y Gain. If it is green or magenta, to adjust low-light again. If adjust again, to set offset value again.
				<ol style="list-style-type: none"> 1. Input NTSC COLOR / TINT data is DVD COLOR / TINT data offset value (Standard and theater). 2. Receive the COLOR BAR and then select standard mode. 3. Check TP-R by using oscilloscope. 4. Enter the SERVICE MODE of 1. PICTURE / SOUND Item. 5. Adjust PPM04 : SUB COLOR and PPM01 : SUB TINT to be following Setting Value A[V] 6. Select theater status and then adjust S01: SUB COLOR and S02: SUB TINT to be following Setting Value B[V] same as above. 7. Check TP-B by using oscilloscope. 8. Select standard and then adjust S07:B-Y GAIN to be Setting Value C[V] 9. Select theater and then adjust S07:B-Y GAIN to be Setting Value D[V] 10. Copy PPM01/PPM04 data to PIP mode. 11. Confirm that low-light is not different after adjusting color, TINT and B-Y GAIN. If it is green or magenta, to adjust low-light again. If adjust again, to set offset value again.

Fig.1

Fig.2

Setting Item	Setting Value A[V]		Setting Value B[V]		Setting Value C[V]	Setting Value D[V]
	Standard		Theater		Standard	Theater
	(W-R)	(W-Y)	(W-R)	(W-Y)	(W-B)	(W-B)
Color Bar						
NTSC	+44	+19	+26	+1	+11	+9
HD	+22	+6	+9	+9	-2	+2
DVD	+31	+23	+12	+3	-5	-3
525p	+31	+21	+18	0	-12	-4

Fig.3

(HDCP adjustment)

Item	Measuring Instrument	Test point	Adjustment Item	Description																														
WHITE BALANCE (Low / High) adjustment	Signal Generator Remote control unit		S10:R Drive S12:R Drive OFFSET S14:R CUT OFF S16:G CUT OFF S18:B CUT OFF S20:R CUT OFF SW S21:B CUT OFF SW	<ul style="list-style-type: none"> ● HDCP LOW / HIGH LIGHT ADJUSTMENT <hr/> <ol style="list-style-type: none"> 1. Input the HDCP 1080i signal. 2. Select the STANDARD mode (all "000") on the VIDEO STATUS. 3. Input the same value adjusted at the HDCP 1080i STANDARD to the setting value S10, S12, S14, S16, S18, S20 & S21. 4. Input HDCP 480p 640 × 480 dots signal. 5. Select the STANDARD on the VIDEO STATAS. 6. Input the data (The adjustment value at 1080i STANDARD plus the offset value adjusted at 525p STANDARD) to the adjustment data S10, S12, S14, S16, S18, S20 & S21. 																														
				<table border="1"> <thead> <tr> <th rowspan="2">Item No.</th> <th rowspan="2">Item Name</th> <th colspan="2">HDCP</th> </tr> <tr> <th>1080i</th> <th>480p(525p)</th> </tr> </thead> <tbody> <tr> <td>S10</td> <td>R.DRIVE</td> <td>—</td> <td>—</td> </tr> <tr> <td>S12</td> <td>B.DRIVE</td> <td>—</td> <td>—</td> </tr> <tr> <td>S14</td> <td>R.CUTOFF</td> <td>070</td> <td>070</td> </tr> <tr> <td>S16</td> <td>G.CUTOFF</td> <td>103</td> <td>098</td> </tr> <tr> <td>S18</td> <td>B.CUTOFF</td> <td>044</td> <td>044</td> </tr> <tr> <td>S20</td> <td>R.CUTOFF SW</td> <td>001</td> <td>001</td> </tr> <tr> <td>S21</td> <td>B.CUTOFF SW</td> <td>001</td> <td>001</td> </tr> </tbody> </table>	Item No.	Item Name	HDCP		1080i	480p(525p)	S10	R.DRIVE	—	—	S12	B.DRIVE	—	—	S14	R.CUTOFF	070	070	S16	G.CUTOFF	103	098	S18	B.CUTOFF	044	044	S20	R.CUTOFF SW	001	001
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S20	R.CUTOFF SW	001	001																															
S21	B.CUTOFF SW	001	001																															
HDCP COLOR / TINT B-Y GAIN Adjustment	Signal Generator Remote Control unit	TP-R TP-B TP-E(↙)	S01:SUB BRIGHT S02:SUB CONTRAST S07:B-Y DEMODURATION	<ul style="list-style-type: none"> ● COLOR, TINT,B-Y GAIN adjustment at 1080i and 525p should be finished. <hr/> <ol style="list-style-type: none"> 1. Input HDCP 1080i. 2. Select STANDARD on VIDEO STATUS. 3. Enter to SERVICE MENU. 4. Input the same value adjusted at 1080i STANDARD to the setting value S01, S02, S07. 5. Select THEATER on VIDEO STATUS. 6. Input the same value adjusted at 1080i THEATER to setting value S01, S02, S07. 7. Input HDCP 525p 640 × 480 dots signal. 8. Input STANDARD on VIDEO STATUS. 9. Input the same value adjusted at 525p STANDARD to the setting value S01, S02, S07. 10. Select THEATER on VIDEO STATUS. 11. Input the same value adjusted at 525p THEATER to the setting value S01, S02, S07. <p>(NOTE)</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> After adjustment, to memorize an adjustment value before changing the input source with a muting key. </div>																														

MTS adjustment

Item	Measuring Instrument	Test point	Adjustment Item	Description
MTS INPUT LEVEL check	MPX Signal generator Remote Control unit		A02 : IN LEVEL	<ol style="list-style-type: none"> Select the A02: IN LEVEL of the SOUND MODE. Verify that the A02: IN LEVEL is set at its initial setting value.
MTS STEREO VCO adjustment	MPX Signal generator Frequency counter Remote Control unit	R OUT	A03 : FH MONITOR A04 :STEREO VCO	<ol style="list-style-type: none"> Receive the RF signal (non-modulated sound signal) from the antenna terminal. Select the A03: FH MONITOR of SOUND MODE, and change the setting value from 0 to 1. Connect the frequency counter to R out pin of the AUDIO OUT. Select the A04: STEREO VCO with (▲/▼) function key. Set the initial setting value of the No.4 STEREO VCO with the (◀/▶) key of the function key. Adjust the A04: STEREO VCO so that the frequency counter will display $15.73\text{kHz} \pm 0.1\text{kHz}$. * <i>The frequency counter indication should be stable.</i> Select the A03: FH MONITOR of the SOUND MODE, and reset the setting value from 1 to 0.
MTS SAP VCO adjustment	MPX Signal Generator Freq.counter	S2 (③&④) Connector R. OUT	A09 : 5FH MON. A10 : SAP VCO	<ol style="list-style-type: none"> Receive the RF signal (non-modulated sound signal) from the antenna terminal. Connect between pin ④ of S2 connector and GND (Pin③ of S2 connector) through $1\text{M}\Omega$ resistor. Select the A09: 5FH MON. of the SOUND MODE, and reset the setting value from 0 to 1. Connect the frequency counter to R out pin of the AUDIO OUT. Select the A10: SAP VCO with (▲/▼) function key. Set the initial setting value of A10: SAP VCO with the (◀/▶) key of function key. Adjust the A10: SAP VCO so that the frequency counter will display $78.67\text{Khz} \pm 0.5\text{kHz}$. * <i>The frequency counter indication should be stable.</i> Select the A09: 5FH MON. of the SOUND MODE, and reset the setting value from 1 to 0.
MTS FILTER check	MPX Signal Generator Oscilloscope	S2 (②) connector	A05 : PILOT A06 : FILTER	<ol style="list-style-type: none"> Receive the RF signal (MTS pilot signal) from the antenna terminal. Select the A05: PILOT of the sound mode, and reset the setting value from 1 to 0. Connect the oscilloscope to ② pin of S2 connector. Select the A06: FILTER of the SOUND MODE. Adjust the A06: FILTER so that the wave form will be minimum. Select the A05: PILOT of the sound mode, and reset the setting value from 1 to 0.

Item	Measuring Instrument	Test point	Adjustment Item	Description
<p>MTS SEPARATION adjustment</p>	<p>TV audio multiplex signal generator</p> <p>Oscilloscope</p> <p>Remote Control unit</p>	<p>L OUT R OUT</p>	<p>A07 : LOW SEP. A08 : HI SEP.</p>	<ol style="list-style-type: none"> 1. Input the stereo L signal (300Hz) from the TV audio multiplex signal generator to the antenna terminal. 2. Connect an oscilloscope to L OUT RCA pin of the AUDIO OUT, and display one cycle portion of the 300Hz signal. 3. Change the connection of the oscilloscope to R OUT RCA pin of the AUDIO OUT, and enlarge the voltage axis. 4. Select the A07: LOW SEP. of the SOUND MODE. 5. Set the initial setting value of the A07: LOW SEP. with the (◀/▶) key of function key. 6. Adjust the A07: LOW SEP. so that the stroke element of the 300Hz signal will become minimum. 7. Change the signal to 3kHz, and similarly adjust the A08: HI SEP.
<p>Hor.FREQ. adjustment</p>	<p>signal generator</p> <p>Remote Control unit</p>		<p>D15 : H.FREQ. D16 : DEF.RST</p>	<ol style="list-style-type: none"> 1. Receive the monoscope signal. 2. Preset from 0 to 1 for D19: DEF RST in SERVICE MODE, to adjust D15: H.FREQ. and memorize data with MUTING key. 3. And then to receive HD monoscope, to memorize data same as Item 2. 4. After adjustment, to preset from 1 to 0 for D19: DEF RST (Compulsion DEF.RST output) and the memorize data same as Item 2.

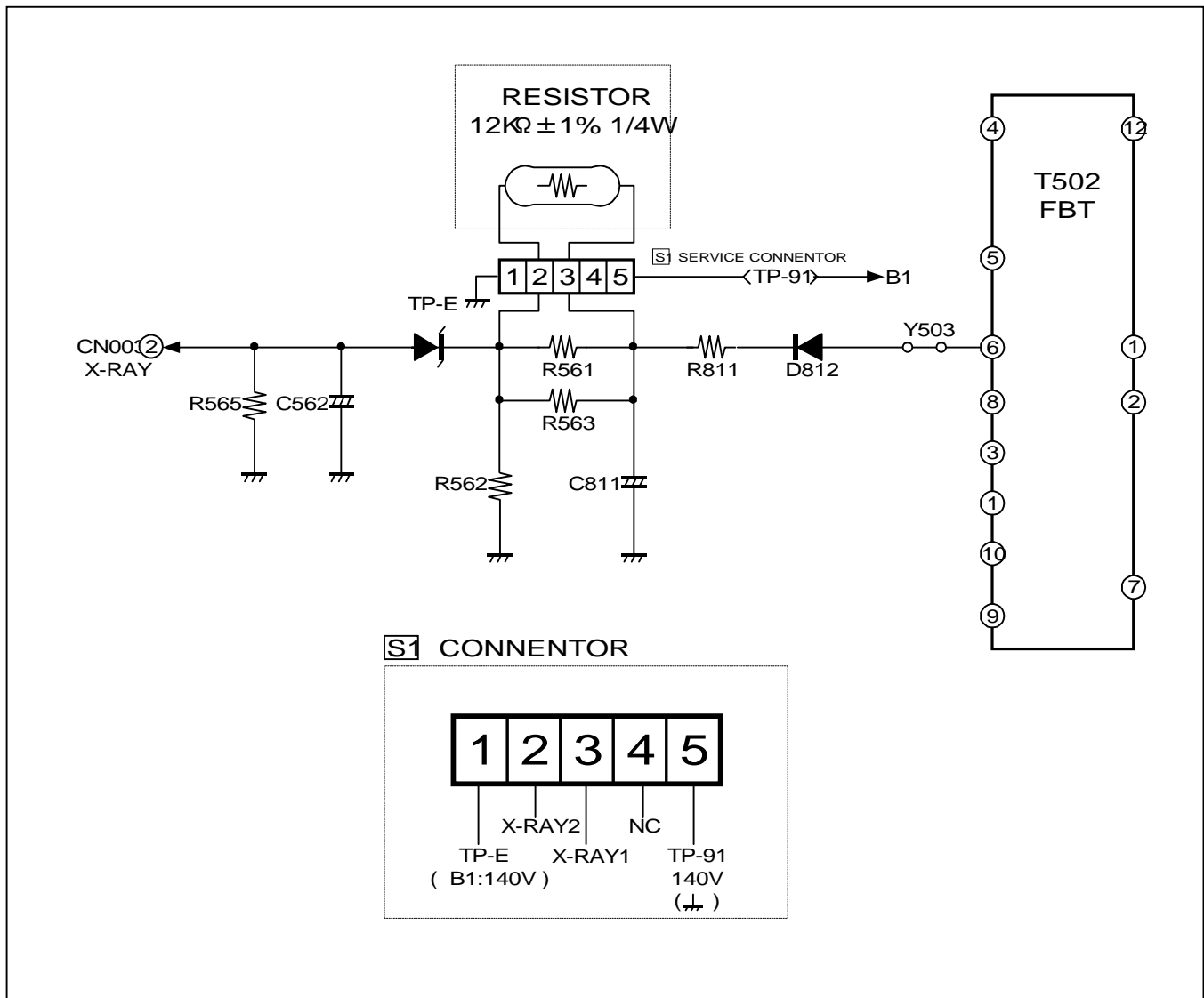
HOW TO CHECK THE HIGH VOLTAGE HOLD DOWN CIRCUIT

1. HIGH VOLTAGE HOLD DOWN CIRCUIT

After repairing the high voltage hold down circuit.
This circuit shall be checked to operate correctly.

2. CHECKING OF THE HIGH VOLTAGE HOLD DOWN CIRCUIT

- (1) Turn the power sw ON.
- (2) As shown in figure bellow, set the resistor (between **S2** connector 1 & 5).
- (3) Make sure that the screen picture disappears (no raster).
- (4) Temporarily unplug the power cord.
- (5) Remove the resistor (between **S2** connector 1 & 5).
- (6) Again plug the power cord, make sure that normal pictures is displayed on the screen.



SELF CHK FUNCTIONS

This model has self-check functions that inform of the failure of the TV by detecting abnormality. Operational state is always monitored and the identified is memorized on the record.

How to enter the self-check mode

1. During the stand-by mode, turn the power on while pressing the volume (▼) button on the TV set.

How to exit from the SELF CHK mode

1. By using the remote controller unit, turn the power off. At this time, the failure record is cleared.
2. Take off the AC plug from the wall outlet. At this time, the failure record is not cleared.

● SELF CHECK DISPLAY

The self-check results are shown on the following display.
Method of indication when the raster is not displayed (Fig.1).

Each failure is shown by turning LED on and off at specified intervals.

Item	LED ON / OFF intervals
X-ray protection	Turning on and off 0.1-second intervals
Over-current protection	Turning on and off 1-second intervals
LOB protection	Turning on and off 2-second intervals

● Explanation for activation of self-check functions

For X-ray protection, over-current protection and LOB protection, the power of the TV is turned off if NG is detected. Immediately after the power is turned off, POWER LED will be turning on and off.

When the power is turned off, you cannot turn the power on again until the AC plug is taken out and put in again.

- Because of the timing of VCC start-up and shut-down of the IC connecting to the I²C bus during which the power is turned on and off, the operation may be interpreted as an error. In order to avoid the misinterpretation, the self-check functions should be started at about 3 seconds after the power is turned on.
- The latest failure is stored on the record at the end. The failure record for each check item is counted to the number of 9 at the maximum, When more than 9 failures are stored on the record, the counter remains stopped at 9.

10.SELF-CHK

XRAY	NG2	OCF	NG2
LOB	OK	TIM	OK
SYNC	M:OK	S:OK	HD:NG
MEM	OK	AVSW	OK
VCD	NG2	BS	OK
A10	OK	YC	OK
TUN	OK	GCR	OK
PP	NG4	IP	OK

Check Item	Indication	Details of detection	Method of detection
X-ray Protection	XRAY	Operation of X-ray protection circuit.	At about 3 seconds after the power is turned on, the self-check function starts. If NG is detected for 200ms, the power is turned off automatically.
Over-current protection	OCP	An over-current is detected.	At about 3 seconds after the power is turned on, the self-check function starts. If NG is detected for 200ms, the power is turned off automatically.
LOB protection	LOB	Operation of LOB protection circuit.	At about 3 seconds after the power is turned on, the self-check function starts. If NG is detected for 200ms, the power is turned off automatically.
Presence or absence of synchronized signal	SYNC	Presence of synchronized signal. HD : HD system M : NTSC main S : NTSC sub	When entering the self-check mode, "OK" is shown. While running the mode with picture signal, if the synchronized signal is disappeared, "NG" is shown.
E ² PROM memory	MEM	ACK is returned when I2C traffin is carried out.	The state is monitored every time when I ² C traffic is carried out. Then the state is counted as a failure if ACK is not returned.
AV switch	AVSW	Ditto, MM1519 and CXA2069Q	Ditto
Video cromia	VCD	Ditto, AN5392	Ditto
BS tuner	BS	Ditto,BS tuner module	Ditto
Audio	AIO	Ditto, CXA2020 and BD3869	Ditto
3DY/C	YC	Ditto, upd64082	Ditto
RF tuner	TUN	Ditto, RF tuner	Ditto
P & P	PP	Ditto, AMDP1+	Ditto
IP	IP	Ditto, JCC5054	Ditto
GCR	GCR	Not used	Ditto
Timer	TIM	The power frequency is changed as follows : 50Hz→60Hz 60Hz→50Hz	Periodically check the power frequency by counting the AC pulse and monitor whether or not the frequency is changed except for the time immediately after resetting.