AV-14F11
AV-14F31

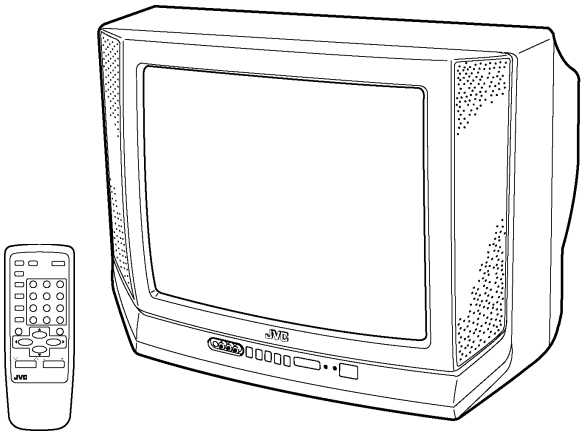
JVC

SERVICE MANUAL

COLOR TELEVISION

BASIC CHASSIS
GA2

AV-14F11/PH
AV-14F31/PH



CONTENTS

No.51845
Aug. 2001

SPECIFICATIONS

Items		Contents	
		AV-14F11	AV-14F31
Dimensions (W × H × D)		46.2cm × 34.1cm × 37.5cm	←
Mass		10kg	←
TV RF System		CCIR (M)&(N)	←
Color / Sound System		NTSC / PAL-M / PAL-N	NTSC / PAL-M / PAL-N BTSC (Multi Channel Sound)
TV Receiving Channels and Frequency	**VL Band** **VH Band** **UHF Band**	(02～06) 54MHz～88MHz (07～13) 174MHz～216MHz (14～69) 470MHz～806MHz	←
CATV Receiving Channels and Frequency	**Low Band** **High Band** **Mid Band** **Super Band** **Hyper Band** **Ultra Band** **Sub Mid Band**	(02～06) (07～13) (14～22) (23～36) (37～64) (65～94, 100～125) (01, 96～99) —(54MHz～804MHz)	←
TV/CATV Total Channel		180 Channels	←
Intermediate Frequency	**Video IF Carrier** **Sound IF Carrier**	45.75MHz 41.25MHz (4.5MHz)	←
Color Sub Carrier		NTSC : 3.579545MHz PAL-M : 3.57561149MHz PAL-N : 3.58205625MHz	←
Antenna terminal		75Ω (VHF/UHF) Terminal, F-Type Connector	←
Power Input		Rated Voltage : 120V～240V AC, 50Hz/60Hz Operating Voltage : 90V～260V AC, 50Hz/60Hz	←
Power Consumption		42W	44W
Picture Tube (measured diagonally)		Picture tube 36cm Visible aria 34cm	←
High Voltage		22.5kV±1.0kV (at zero beam current)	←
Speaker		5cm × 9cm Oval type × 2 (monaural),16Ω	5 × 9cm Oval type × 2 (Stereo), 8Ω
Audio Power Output		2W (monaural)	1.5W+1.5W (stereo)
Input	**Video input** **Audio input**	1Vp-p, 75Ω (RCA pin jack) 500mVrms (-4dBs), High impedance (RCA pin jack)	←
Output	**Video output** **Audio output**	1Vp-p, 75Ω 500mVrms (-4dBs), Low impedance	←
Headphone Jack		Stereo mini jack (dia. 3.5mm, Sound is Monaural)	Stereo mini jack (dia. 3.5mm, Sound is Stereo)
Remote Control Unit		RM-C372GY (AA/R6/UM-3 battery × 2)	RM-C373GY (AA/R6/UM-3 battery × 2)

Design & specifications are subject to change without notice.

SAFETY PRECAUTIONS

1. 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.

2. 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.

3. 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 (⚠) 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.

4. **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.

5. 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).

6. 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.

7. 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.

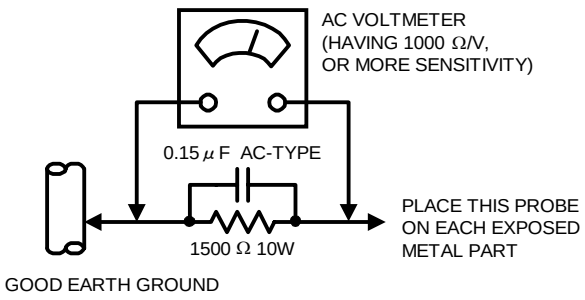
8. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

9. **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, screw heads, 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 3000V 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.).



FEATURES

- New chassis design enables use of a main board with simplified circuitry.
- Provided with miniature tuner (TV/CATV).
- PLL synthesizer system TV/CATV totaling 180 channels.
- Multifunctional remote control permits picture adjustment.
- Adoption of the VIDEO STATUS function.
- Adoption of the ON/OFF TIMER function.
- With 75Ω V/U in common (F-Type) ANT Terminal.
- SLEEP TIMER for setting in real time.
- Wide range voltage (120V～240V) AC power input.
- With AUDIO / VIDEO INPUT & OUTPUT terminal.

MAIN DIFFERENCE LIST

⚠	Symbol No.	Model / Part name	AV-14F11	AV-14F31	Remarks
		MAIN PWB ASS'Y	SGA-1058A-H2	SGA-1055A-H2	
⚠		FRONT CABINET	LC10831-019A-HK	LC10831-020A-HK	
		TERMINAL SHEET	LC40242-003A	LC40242-004A	
	SP01/02	SPEAKER	CEBSS09D-05KJ2	CEBSS09D-03KJ2	(x2)
⚠		RATING LABEL	GG20003-015A-H	GG20003-014A-H	
		PACKING CASE	GG10057-008A-P	GG10057-007A-P	
		REMOCON UNIT	RM-C372GY-1H	RM-C373GY-1H	
		POS LABEL	CP30902-060(R)	CP30902-061(R)	

SPECIFIC SERVICE INSTRUCTIONS

DISASSEMBLY PROCEDURE

REMOVING THE REAR COVER

1. Unplug the power supply cord.
2. Remove the 5 screws marked Ⓐ and 2 screws marked Ⓑ as shown in Fig.1.
3. Withdraw the REAR COVER toward you.

- When reinstalling the rear cover, carefully push it inward after inserting the MAIN PWB into the rear cover groove.

REMOVING THE MAIN PW BOARD

- After removing the rear cover.

1. Slightly raise the both sides of the MAIN PW Board by hand and remove the PWB stopper marked Ⓒ under the MAIN PW Board from the FRONT CABINET.
2. Withdraw the MAIN PW Board backward.
   (If necessary, take off the wire clamp, connector etc.)

REMOVING THE SPEAKER

- After removing the rear cover.

1. Remove the 2 screws marked Ⓓ as shown in Fig.1.
2. Follow the same steps when removing the other hand speaker.

CHECKING THE MAIN PW BOARD

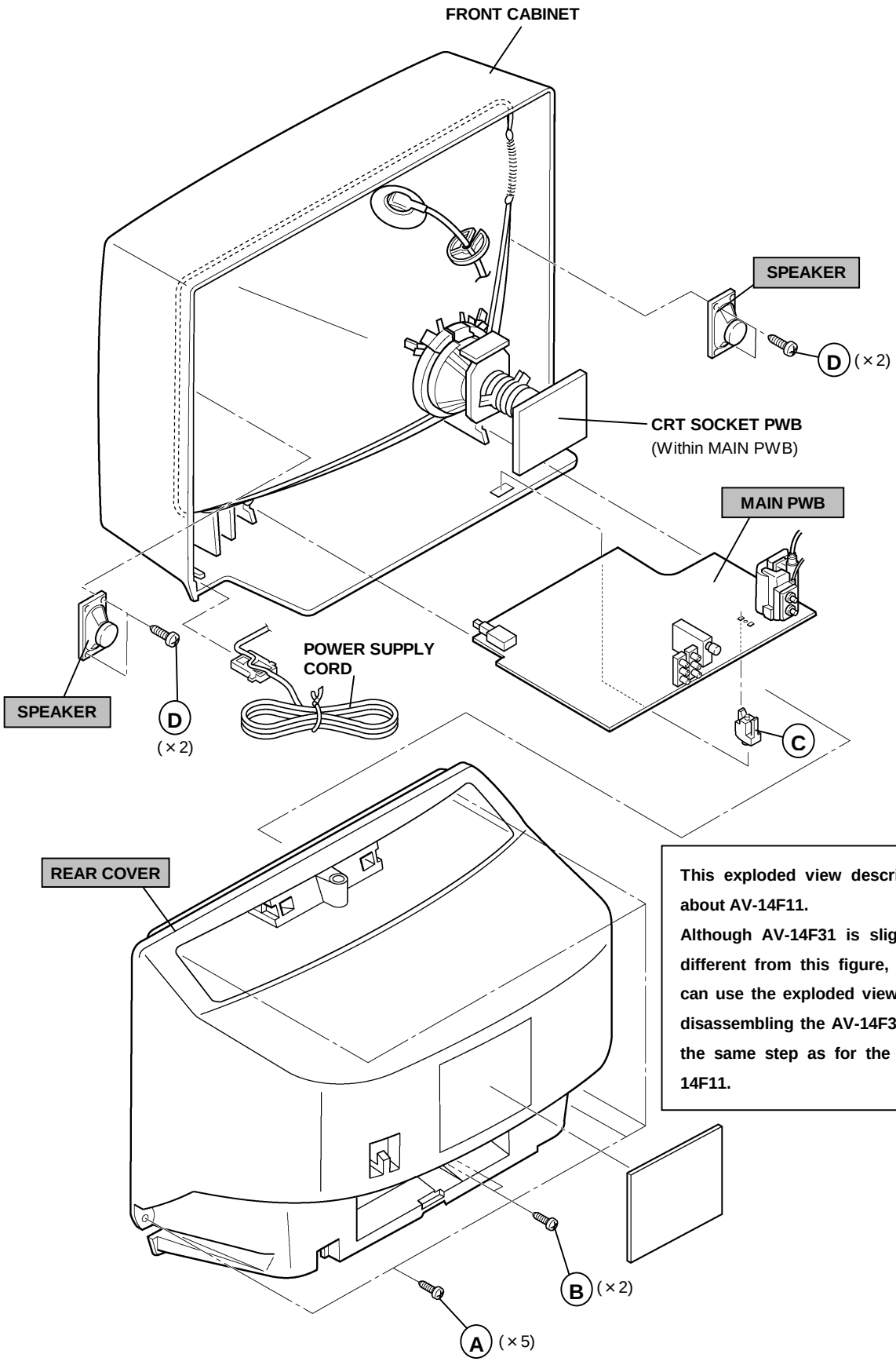
1. To check the backside of the MAIN PW Board.
   1) Pull out the MAIN PWB. (Refer to REMOVING THE MAIN PWB).
   2) Erect the chassis vertically so that you can easily check the backside of the MAIN PW Board.

[CAUTION]

- When erecting the MAIN PWB, be careful so that there will be no contacting with other PW Board.
- 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 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.



This exploded view describes about AV-14F11.
Although AV-14F31 is slightly different from this figure, you can use the exploded view for disassembling the AV-14F31 in the same step as for the AV-14F11.

Fig. 1

MEMORY IC REPLACEMENT

1. Memory IC

This model uses a memory IC.
The memory IC stores data for proper operation of 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**.

Be sure to use memory ICs written with the initial data values.

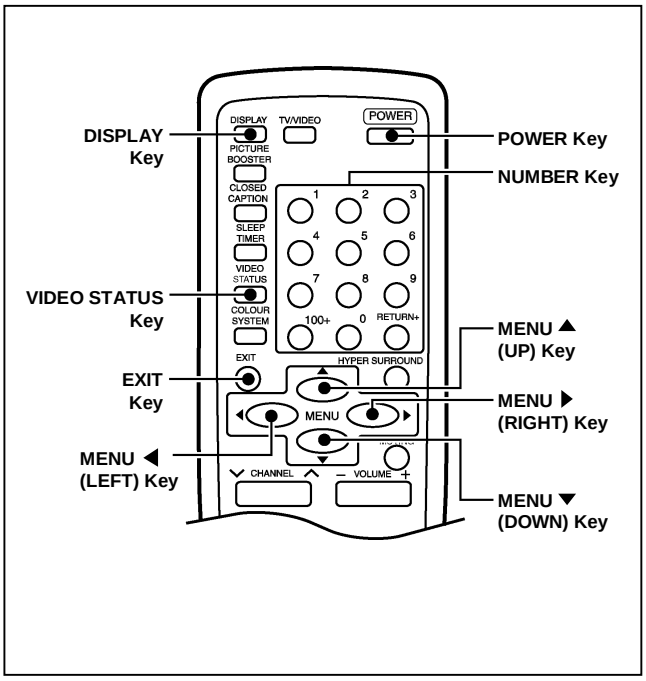
(3) **Power on**

Connect the power cord to the wall outlet and switch on the power.

(4) **System constant check and setting**

1) Simultaneously press the DISPLAY key and VIDEO STATUS key of the remote control unit.
2) The SERVICE MENU screen of Fig.1 is displayed.
3) While the SERVICE MENU is displayed, again simultaneously press the DISPLAY and VIDEO STATUS keys to display the Fig.2 SYSTEM CONSTANT screen.
4) Refer to the SYSTEM CONSTANT table and check the setting items. Where these differ, select the setting item with the MENU UP / DOWN key and adjust the setting value with the MENU LEFT / RIGHT keys.
5) After adjusting, release the MENU LEFT / RIGHT key to store the setting value.
6) Press the EXIT key twice to return the normal screen.

NAME OF REMOTE CONTROL KEYS



(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 Table 2.
Where these do not agree, refer to the OPERATING INSTRUCTIONS (USER'S GUIDE) and set the items as described.

(7) **SERVICE MENU setting**

Verify what to set in the SERVICE MENU, and set whatever is necessary. (Fig.1) Refer to the SERVISE ADJUSTMENT for setting.

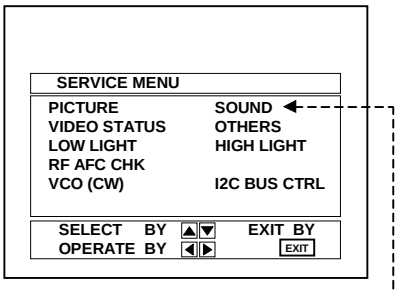


Fig.1 **[AV-14F31 Only]**

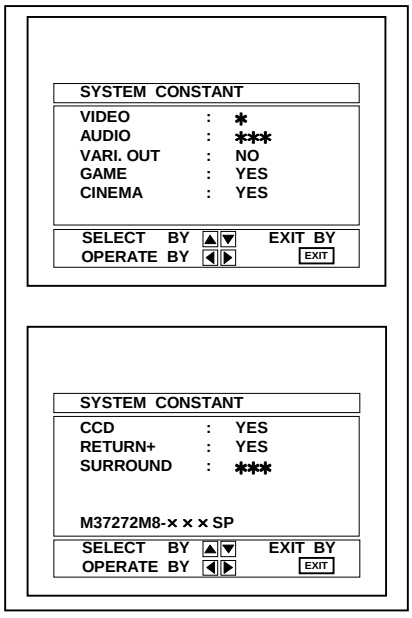


Fig.2

TABLE 1(System Constant Setting)

Setting item	Setting content	Setting value	
		AV-14F11	AV-14F31
VIDEO	1 → 2	1	2
AUDIO	MONO → MONO → MTS	MONO	MTS
VARI. OUT	YES → NO	NO	NO
GAME	YES → NO	YES	YES
CINEMA	YES → NO	YES	YES
CCD	YES → NO	YES	YES
RETURN+	YES → NO	YES	YES
SURROUND	YES → NO	NO	YES

TABLE 2 (User setting value)

Setting item	Setting value
● Setting of FUNCTION	
MAIN POWER	OFF
SUB POWER	ON
CHANNEL	CH 02 (AIR)
PICTURE BOOSTER	OFF
VOLUME	10
TV/VIDEO	TV
CAPTION	OFF (CC1/T1)
DISPLAY	POSITION INDICATION
SLEEP TIMER	0
VIDEO STATUS	STANDARD
HYPER SURROUND	OFF **[AV-14F31 Only]**
COLOUR SYSTEM	AUTO PAL
● Setting of MENU	
TINT COLOR PICTURE BRIGHT DETAIL	STANDARD
BASS TREBLE BALANCE MTS	CENTER CENTER **[AV-14F31 Only]** CENTER STEREO
SET CLOCK	Unnecessary to set : (000)
ON/OFF TIMER	NO
CHANNEL SUMMARY	necessary to set
NOISE MUTING	OFF
BACK GROUND	BLACK
CLOSED CAPTION	CC1 / T1 (OFF at shipping)
LANGUAGE	ENG.

TABLE 3 (Service menu setting items)

Service menu	Setting item	Service menu	Setting item
PICTURE	1. PICTURE 2. BRIGHT 3. COL.PALM 4. COL.PALN 5. COL.NTSC 6. TINT 7. TV DTL 8. EXT PIC. 9. EXT BRI 10. EXT COL. 11. EXT TINT 12. EXT DTL 13. PIN KILL 14. YS CONT 15. TV Y-DL 16. EXT Y-DL 17. WPL SW 18. Y GAMMA 19. P/N GP. 20. COL. L SW 21. COL. LMT. 22. PN C. ATT 23. OFST. SW 24. OFST. B-Y 25. OFST. R-Y 26. C-TOF SW 27. TV T FO 28. TV T Q 29. EXT T FO 30. EXT T Q 31. C-TRAP 32. C-TR. FO 33. C-TRAP Q 34. FIX B/W 35. APA P. FO 36. DC TRAN. 37. B. ST. SW 38. B. ST. PO. 39. ABL GAIN 40. ABL PO. 41. HALF T. 42. DRV G SW 43. NT. COMB 44. COIN DET 45. NOISE L. 46. VCD MODE 47. V AGC SP 48. H POS. 50 49. H BLK. 50 50. V POS. 50 51. V SIZE50 52. V S CR50 53. V LIN. 50		54. H POS. 60 55. H BLK. 60 56. V POS. 60 57. V SIZE60 58. V S CR60 59. V LIN. 60 60. RF AGC
		SOUND **(AV-14F31 ONLY)**	1. NOISE 2. IN LEVEL 3. FH MON. 4. ST VCO 5. PILOT 6. FILTER 7. LOW SEP. 8. HI SEP. 9. 5FH MON. 10. SAP VCO 11. IN GAIN 12. FIL. OFF.
		VIDEO STATUS	TINT COLOR PICTURE BRIGHT DETAIL G DRIVE B DRIVE R CUT. G CUT. B CUT.
		OTHERS	1. OSD HP 2. OSD VP 3. H-CK SW
		LOW LIGHT	R CUT OFF G CUT OFF B CUT OFF
		HIGH LIGHT	G DRIVE B DRIVE
		RF AFC CHK	RF AFC FINE
		VCO (CW)	IF VCO (CW) (adjustment mode)
		I²C BUS CTRL	I²C BUS (Fixed to ON state.)

Do not adjust.

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

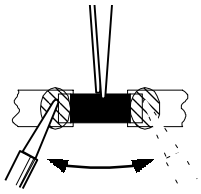
1. Use a high insulation soldering iron with a thin pointed end of it.
2. A 30w soldering iron is recommended for easily removing parts.

■ REPLACEMENT STEPS

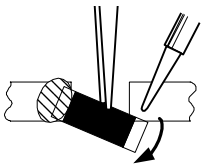
1. How to remove Chip parts

◆ **Resistors, capacitors, etc.**

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

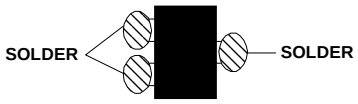


(2) Shift with tweezers and remove the chip part.

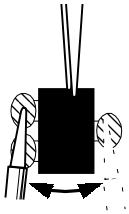


◆ **Transistors, diodes, variable resistors, etc.**

(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.

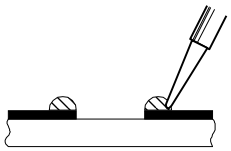


Note : After removing the part, remove remaining solder from the pattern.

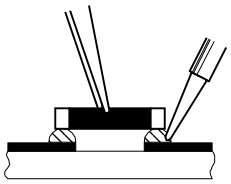
2. How to install Chip parts

◆ **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.

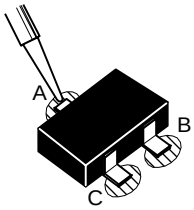


◆ **Transistors, diodes, variable resistors, etc.**

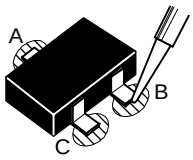
(1) Apply solder to the pattern as indicated in the figure.

(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**.



SERVICE ADJUSTMENTS

ADJUSTMENT PREPARATION:

1. **You can make the necessary adjustments for this unit with either the remote control unit or with the adjustment equipment 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 the 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 parts, which are not specified in the list for this adjustment-variable resistors, transformers, condensers, etc.
7. Presetting before adjustment.
   Unless otherwise specified in the adjustment instructions, preset the following functions with the remote control unit.

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

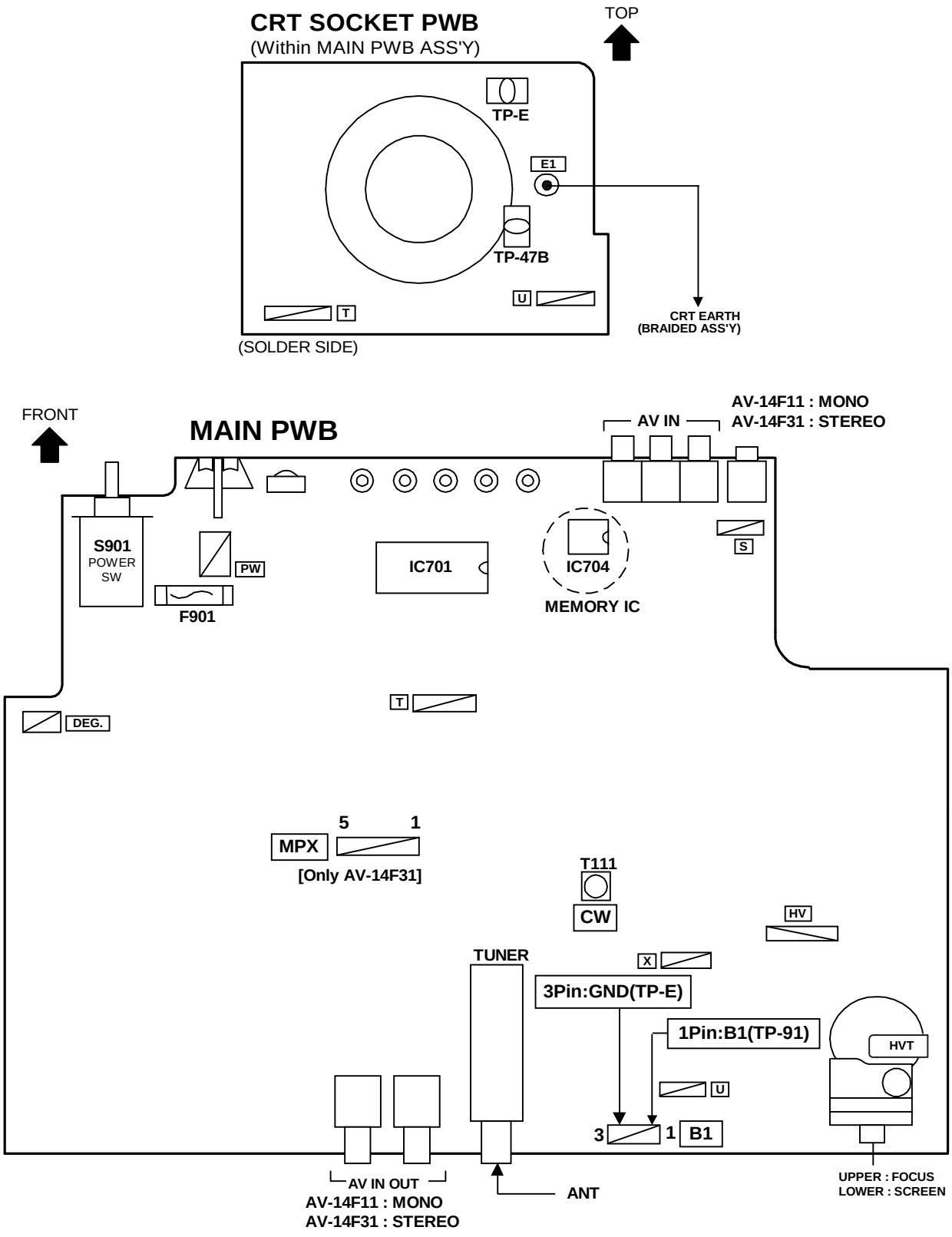
ADJUSTMENT EQUIPMENT

1. DC voltmeter(or digital voltmeter)
2. Oscilloscope
3. Signal generator (Pattern generator) [NTSC] [PAL-M] [PAL-N]
4. Remote control unit
5. TV audio multiplex signal generator
6. Frequency counter

ADJUSTMENT ITEMS

- ●B1 POWER SUPPLY
- ●IF VCO adjustment
- ●RF AGC adjustment
- ●FOCUS adjustment
- ●DEFLECTION adjustment
  - V. HEIGHT, V. POSITION, V. LIN., V S CR adjustment
  - H. POSITION adjustment
- ●VIDEO / CHROMA adjustment
  - WHITE BALANCE (Low light) adjustment
  - WHITE BALANCE (High light) adjustment
  - SUB BRIGHT adjustment
  - SUB CONTRAST adjustment
  - SUB COLOR adjustment
  - SUB TINT adjustment
- ●MTS circuit adjustment (AV-14F31 ONLY)
  - INPUT LEVEL adjustment
  - STEREO VCO adjustment
  - SAP VCO adjustment
  - FILTER check
  - SEPARATION adjustment
- ●PURITY / CONVERGENCE adjustment.
  - PURITY adjustment
  - STATIC CONVERGENCE adjustment
  - DYNAMIC CONVERGENCE adjustment.
- ●HOW TO CHECK THE HIGH VOLTAGE
  - HOLD DOWN CIRCUIT
- ●SELF CHECK FUNCTIONS

ADJUSTMENT LOCATIONS



BASIC OPERATION IN 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 ····· This set the setting values (adjustment values) of the VIDEO/CHROMA and DEFLECTION circuits.
(2) SOUND **[AV-14F31]** ····· This set the setting values (adjustment values) of the AUDIO circuit.
(3) VIDEO STATUS ····· This is used when the THEATER and GAME MODE is adjusted.
(4) OTHERS ····· This is used when the OTHERS MODE is adjusted.
(5) LOW LIGHT····· This sets the setting values (adjustment values) of the WHITE BALANCE circuit.
(6) HIGH LIGHT ····· This sets the setting values (adjustment values) of the WHITE BALANCE circuit.
(7) RF AFC CHK····· This is used when the RF AFC CHK MODE is verified. **[Do not adjust]**
(8) VCO (CW) ····· This is used when the IF VCO is adjusted.
(9) I^2C BUS CTRL····· This is used when ON/OFF of the I^2C BUS CTRL is set. **[Fixed ON]**

3. Basic Operations of the SERVICE MENU

(1) How to enter the SERVICE MENU.

Press the DISPLAY key and VIDEO STATUS key of the remote control unit at the same time to enter the SERVICE MENU screen ① shown in figure page later.

(2) SERVICE MENU screen selection

Press the UP / DOWN key of the MENU to select any of the following items.
(The letters of the selected items are displayed in yellow.)

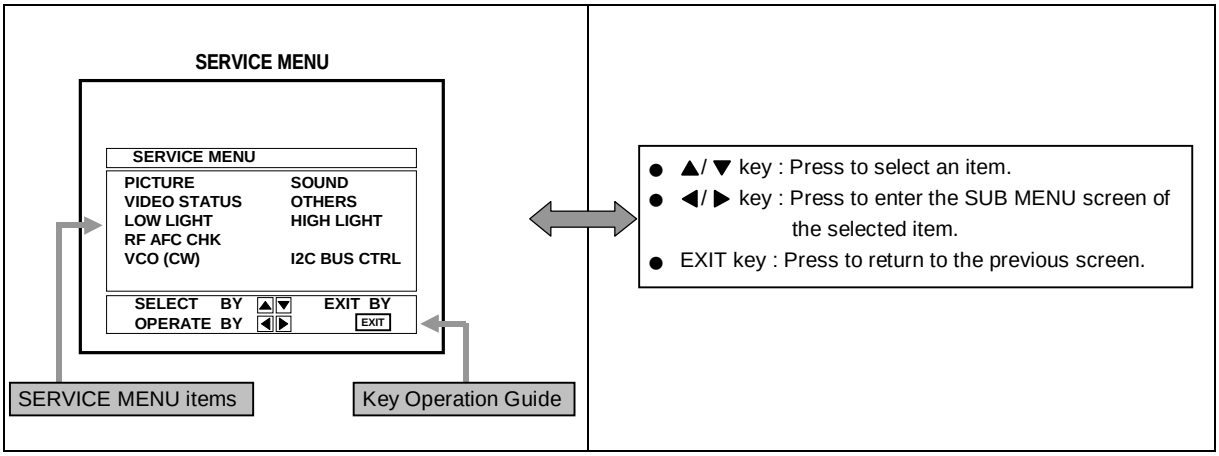
● PICTURE	● SOUND **[AV- 14F31 Only]**
● VIDEO STATUS	● OTHERS
● LOW LIGHT	● HIGH LIGHT
● RF AFC CHK	
● VCO (CW)	● I^2C BUS CTRL

(3) Enter the any setting (adjustment) mode

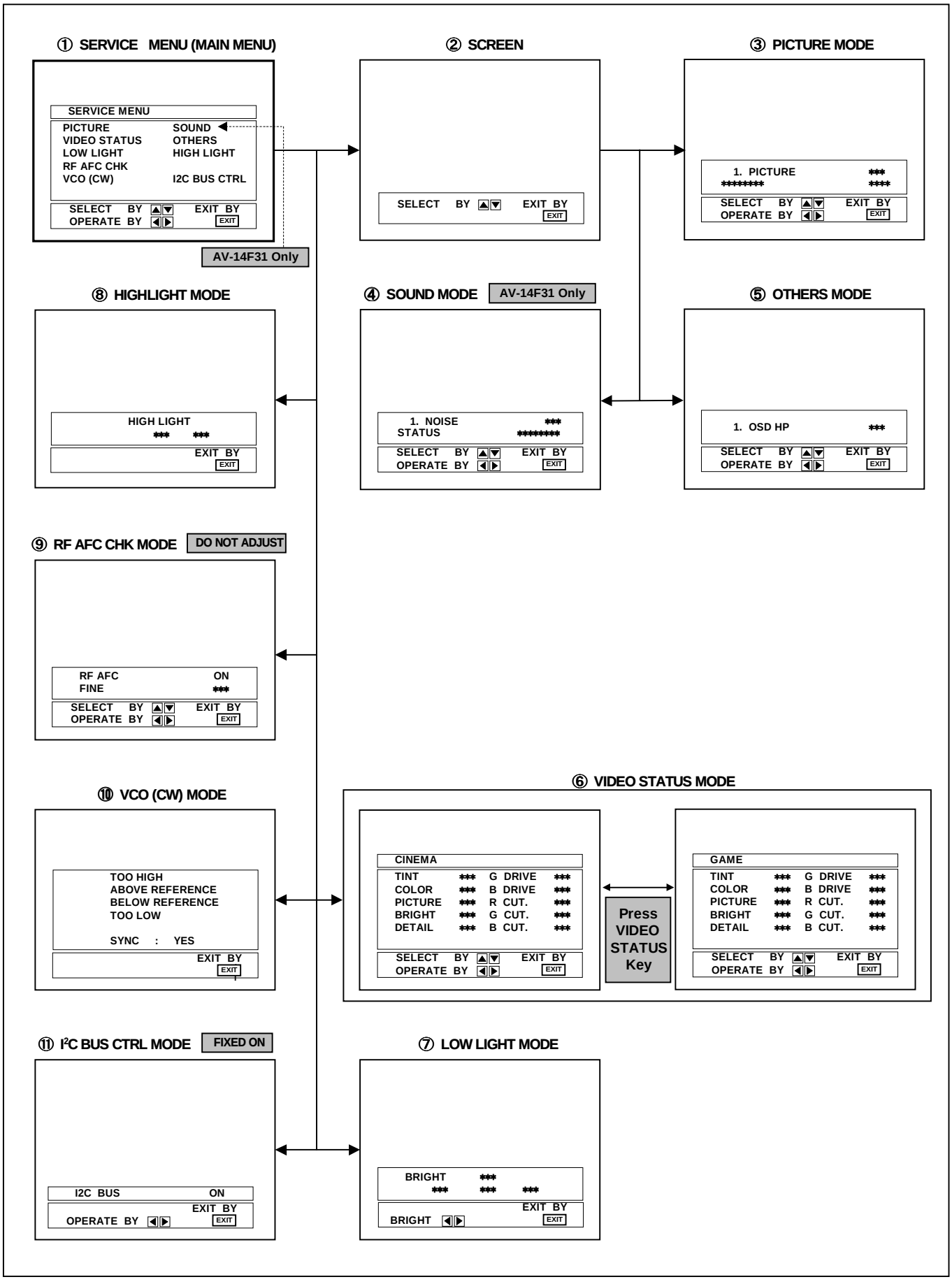
- **PICTURE, SOUND and OTHERS mode**
  1) If select any of PICTURE, SOUND or OTHERS items, and the LEFT / RIGHT key is pressed from SERVICE MENU (MAIN MENU), the screen ② will be displayed as shown in figure page later.
  2) Then the UP / DOWN key is pressed, the PICTURE mode screen ③ or the SOUND mode screen ④ or the OTHERS mode screen ⑤ is displayed, and the PICTURE, SOUND or OTHERS setting can be performed.

- **VIDEO STATUS, LOW LIGHT, HIGH LIGHT, RF AFC CHK, VCO (CW) and I^2C BUS CTRL mode**
  1) If select any of VIDEO STATUS / LOW LIGHT / HIGH LIGHT / RF AFC CHK / VCO (CW) / I^2C BUS CTRL items, and the LEFT / RIGHT key is pressed from SERVICE MENU (MAIN MENU), the screens ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ will be displayed as shown in figure page later.
  2) Then the settings or verifications can be performed.

NOTE : In each menu screen , key operation guide will appear at the bottom, which will help your menu operation.



SERVICE MENU CHART

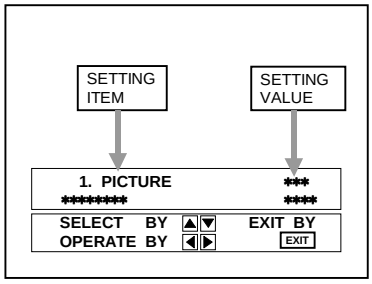


(4) Setting method

1) UP / DOWN key of the MENU
   Select the SETTING ITEM.

2) LEFT / RIGHT key of the MENU
   Setting (adjust) the SETTING VALUE of the SETTING ITEM.
   When the key is released the SETTING VALUE will be stored (memorized).

3) EXIT key
   Returns to the previous screen.

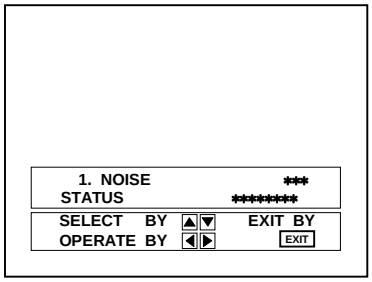


PICTURE MODE

[NOTE] (PICTURE MODE ONLY)
When the INITIAL SETTING VALUE is turned to yellow, you can adjust the values but you cannot adjust the values when it is turned to red.
(Because the signal conditions, etc. are not met.)

(5) Releasing SERVICE MENU

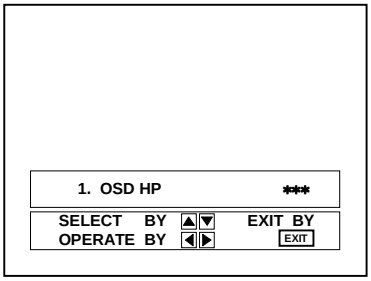
1) After returning to the SERVICE MENU upon completion of the setting (adjustment) work, press the EXIT key again.



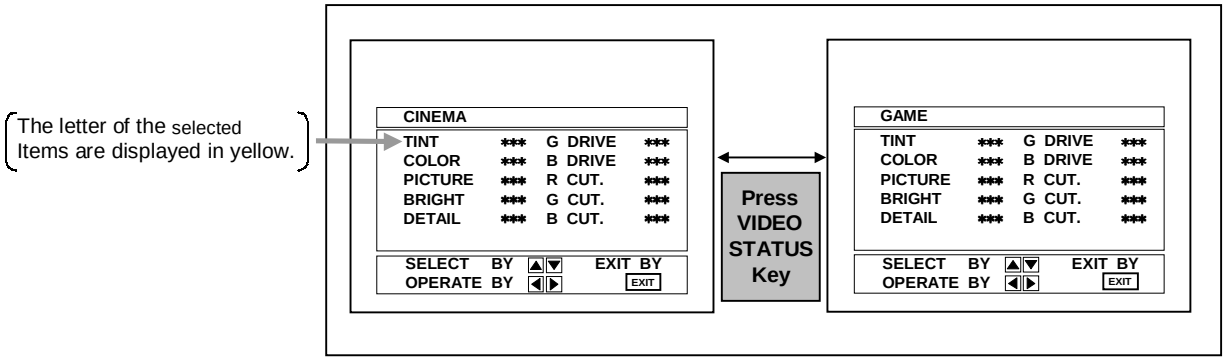
SOUND MODE
[AV-14F31 Only]

★ The settings for LOW LIGHT and HIGH LIGHT are described in the WHITE BALANCE page of ADJUSTMENT.

★ The setting for VCO (CW) are described in the IF VCO page of ADJUSTMENT.



OTHERS MODE



VIDEO STATUS MODE

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 (Adjustment) items not listed In "ADJUSTMENT".**
3. **: Do not adjust in this area.**

● PICTURE MODE (1/2)

- The four setting items in the video mode No.8 EXT PIC., No.9 EXT BRI., No.10 EXT COL. and No.11 EXT TINT are linked to the items in the TV MODE No.1 PICTURE, No.2 BRIGHT, No.5 COL. NTSC and No.6 TINT, respectively. When the setting items in the TV mode are adjusted, the values in the setting items in the video mode are revised automatically to the same values in the TV mode.(The initial setting values given in ( ) are off-set values.)
- When the four items (No.8, 9, 10 and 11) are adjusted in the video mode, the setting values in each item are revised independently.

No.	Setting (Adjustment) item	Variable range	Initial setting value	
			AV-14F11	AV-14F31
1.	PICTURE	000～127	040	
2.	BRIGHT	000～127	064	
3.	COL. PALM	000～127	070	←
4.	COL. PALN	000～127	070	
5.	COL. NTSC	000～127	072	
6.	TINT	000～127	065	←
7.	TV DTL	000～063	028	
8.	EXT PIC.	±025	(±000)	
9.	EXT BRI.	±025	(±000)	←
10.	EXT COL.	±025	(±000)	
11.	EXT TINT	±025	(+001)	
12.	EXT DTL	000～063	030	
13.	P/N KILL	000 / 001	001	←
14.	Y S CONT	000～031	031	
15.	TV Y-DL	000～007	001	
16.	EXT Y-DL	000～007	002	
17.	WPL SW	000 / 001	000	
18.	Y GAMMA	000 / 001	000	←
19.	P/N G P.	000 / 001	000	
20.	COL. L SW	000 / 001	001	
21.	COL. LMT.	000～003	001	
22.	PN C. ATT	000～003	001	
23.	OFST. SW	000 / 001	000	←
24.	OFST. B-Y	000～015	008	
25.	OFST. R-Y	000～015	008	
26.	C-TOF SW	000 / 001	001	
27.	TV T FO	000～003	001	
28.	TV T Q	000～003	000	←
29.	EXT T FO	000～003	000	
30.	EXT T Q	000～003	000	
31.	C-TRAP	000 / 001	000	
32.	C-TR. FO	000～003	002	
33.	C-TRAP Q	000～003	000	←
34.	FIX B/W	000 / 001	000	
35.	APA P. FO	000～003	001	
36.	DC TRAN.	000～007	006	
37.	B. ST. SW	000 / 001	000	
38.	B. ST. PO.	000～001	000	←
39.	ABL GAIN	000～007	004	
40.	ABL PO.	000～007	000	

● PICTURE MODE (2/2)

No.	Setting (Adjustment) item	Variable range	Initial setting value	
			AV-14F11	AV-14F31
41.	HALF T.	000～002	001	
42.	DRV G SW	000 / 001	000	
43.	NT. COMB	000 / 001	001	←
44.	COIN DET	000～003	001	
45.	NOISE L.	000～003	003	
46.	VCD MODE	000 / 001	000	
47.	V AGC SP	000 / 001	000	
48.	H POS. 50	000～031	007	←
49.	H BLK. 50	000～007	000	
50.	V POS. 50	000～007	000	
51.	V SIZE50	000～127	024	
52.	V S CR50	000～127	018	←
53.	V LIN. 50	000～031	004	
54.	H POS. 60	000～031	012	
55.	H BLK. 60	000～007	000	
56.	V POS. 60	000～007	000	
57.	V SIZE60	000～127	028	
58.	V S CR60	000～127	046	←
59.	V LIN. 60	000～031	004	
60.	RF AGC	000～255	183	

● SOUND MODE [AV-14F31 Only]

No.	Setting (Adjustment) item	Variable range	Initial setting value
1.	NOISE	000 / 001	001
2.	IN LEVEL	000～063	020
3.	FH MON.	000 / 001	000
4.	ST VCO	000～063	025
5.	PILOT	000 / 001	000
6.	FILTER	000～063	030
7.	LOW SEP.	000～063	022
8.	HI SEP.	000～063	023
9.	5FH MON.	000 / 001	000
10.	SAP VCO	000～063	026
11.	IN GAIN	000 / 001	000
12.	FIL. OFF.	±010	(±000)

● VIDEO STATUS MODE

Setting (Adjustment) item	Variable range	Initial setting value	
		CINEMA	GAME
TINT	±20	(±0)	(±0)
COLOR	±20	−3	−3
PICTURE	±20	−10	−10
BRIGHT	±20	(±0)	(±0)
DETAIL	±15	(±0)	−5
G DRIVE	−99～+50	−22	(±0)
B DRIVE	−99～+50	−54	(±0)
R CUT.	±10	(±0)	(±0)
G CUT.	±10	(±0)	(±0)
B CUT.	±10	(±0)	(±0)

● OTHERS MODE

No.	Setting (Adjustment) item	Variable range	Initial setting value
1.	OSD HP	000～031	023
2.	OSD VP	000～015	012
3.	H-CK SW	000 / 001	000

● LOW LIGHT MODE

Setting (Adjustment) item	Variable range	Initial setting value
R CUTOFF	000～255	020
G CUTOFF	000～255	020
B CUTOFF	000～255	020

● HIGH LIGHT MODE

Setting (Adjustment) item	Variable range	Initial setting value
G DRIVE	000～255	128
B DRIVE	000～255	128

● RF AFC CHK MODE

Setting (Adjustment) item	Variable range	Initial setting value
RF AFC	ON / OFF	ON
FINE	－77～+77	± ＊＊ **(DO NOT ADJUST)**

● I^2C BUS CTRL MODE

Setting (Adjustment) item	Variable range	Initial setting value
I^2C BUS	ON / OFF	**[Fixed ON]**

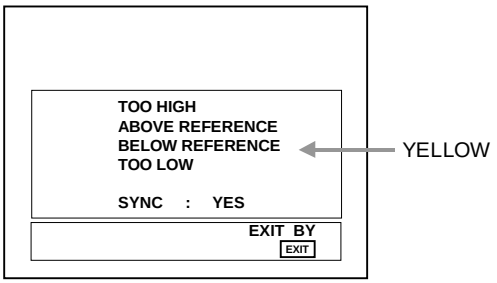
■ ADJUSTMENTS

B1 POWER SUPPLY

Item	Measuring instrument	Test point	Adjustment item	Description
Check of B1 POWER SUPPLY	**DC Voltmeter**	**B1 (B1 Connector 1 pin) (TP-91)** **TP-E(⏚) (B1 Connector 3 pin)**		1. Receive a black and white signal (color off). (NTSC) 2. Connect a DC voltmeter to TP-91(B1) and TP-E(⏚). 3. Confirm that the voltage is DC134.5V±2V.

IF VCO ADJUSTMENT

Item	Measuring instrument	Test point	Adjustment item	Description
IF VCO adjustment	**Signal generator**		**CW TRANSF. (T111)** **[VCO (CW)] mode**	● **Under normal conditions, no adjustment is required.** 1. Receive a broadcast. (use channels without offset frequency). 2. Select the VCO(CW) mode from the SERVICE MENU. 3. Confirm the color change (yellow) from TOO HIGH to TOO LOW by CW TRANSF. and SYNC : YES being shown on the screen. Then, adjust CW TRANSF. until BELOW REFERENCE mark turns yellow and confirm again SYNC : YES being shown on the screen.



RF AGC ADJUSTMENT

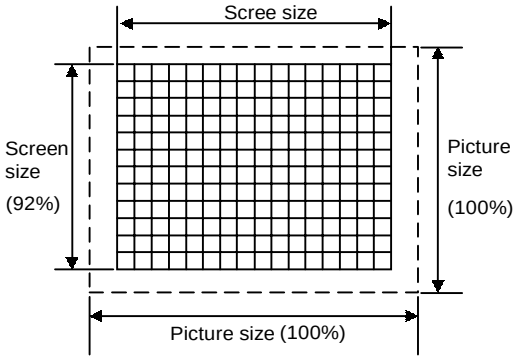
RF AGC adjustment			**No.60 RF AGC**	1. Receive a broadcast. 2. Select No.60 RF AGC of the PICTURE mode in SERVICE MENU. 3. Press the MUTE key and turn off color. 4. With the MENU LEFT key, get noise in the screen picture. (0 side of setting value) 5. Press the MENU RIGHT key and stop when noise disappears from the screen. 6. Change to other channels and make sure that there is no irregularity. 7. Press the MUTE key and get color out.

FOCUS ADJUSTMENT

FOCUS adjustment	**Signal generator**		**FOCUS VR [In HVT]**	1. Receive a crosshatch signal. 2. While looking at the screen, adjust FOCUS VR so that the vertical and horizontal lines will be clear and in fine detail. 3. Make sure that the picture is in focus even when the screen gets darkened.

DEFLECTION ADJUSTMENT

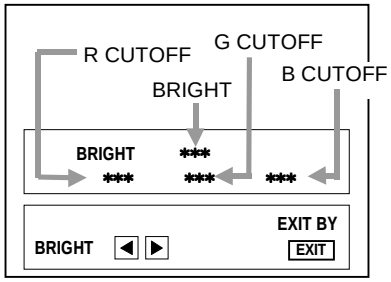
<table>
<tr><th>Item</th><th>Measuring instrument</th><th>Test point</th><th>Adjustment item</th><th>Description</th></tr>
<tr><td rowspan="2">V. HEIGHT,
V. POSITION,
V. LIN.
V. S CR
adjustment</td><td rowspan="2">Signal generator</td><td rowspan="2"></td><td>No.56 V POS. 60
No.57 V SIZE 60
No.58 V S CR60
No.59 V. LIN. 60</td><td>[60Hz]
1. Receive a crosshatch signal.(NTSC or PAL-M)
2. Confirm that the value of PICTURE MODE No.56 V POS. 60 is 0.
3. Confirm the initial setting value of the No.57 V SIZE 60, No.58 V S CR60 and No.59 V LIN. 60.
4. Adjust the vertical screen size to 92% with the PICTURE MODE No.57 V SIZE60.
5. Adjust the PICTURE MODE No.59 L LIN. 60 and No.58 V S CR60 to get the best vertical linearity.

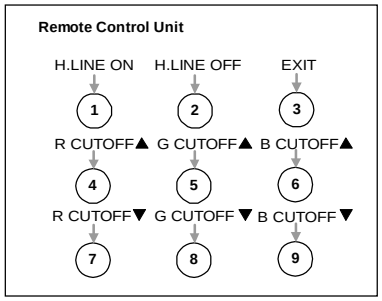
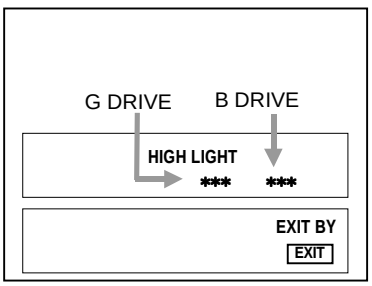
NOTE :
The PICTURE MODE No.56 V POS. 60 is fixed on value 0.</td></tr>
<tr><td>No.50 V POS.50
No.51 V SIZE 50
No.52 V S CR50
No.53 V LIN.50
 
</td><td>[50Hz]
1. Receive a crosshatch signal. (PAL-N)
2. Confirm the initial setting value of the No.50 V POS.50, No.51 V SIZE 50, No.52 V S CR 50 and No.53 V LIN.50.
3. Adjust the vertical screen size to 92% with the PICTURE MODE No.51 V SIZE50.
4. Adjust the PICTURE MODE No.53 V LIN.50 and No.52 V S CR50 to get the best vertical linearity.
5. Adjust the PICTURE MODE No.50 V POS.50 so that the vertical center line comes close to the CRT vertical center as much as possible.
● Readjust V SIZE, V LIN., V S CR if necessary.</td></tr>
<tr><td rowspan="2">H. POSITION
adjustment</td><td rowspan="2">Signal generator</td><td rowspan="2"></td><td>No.54 H POS.60</td><td>[60Hz]
1. Receive a crosshatch signal. (NTSC or PAL-M)
2. Select the No.54 H POS. 60 of the PICTURE mode in SERVICE MENU.
3. Confirm the initial setting value of the No.54 H POS. 60.
4. Adjust the No.54 H POS. 60 until the screen will be horizontally centered.</td></tr>
<tr><td>No.48 H POS.50</td><td>[50Hz]
1. Receive a crosshatch signal. (PAL-N)
2. Select the No.48 H POS. 50 of the PICTURE mode in SERVICE MENU.
3. Confirm the initial setting value of the No.48 H POS. 50.
4. Adjust the No.48 H POS. 50 until the screen will be horizontally centered.</td></tr>
</table>

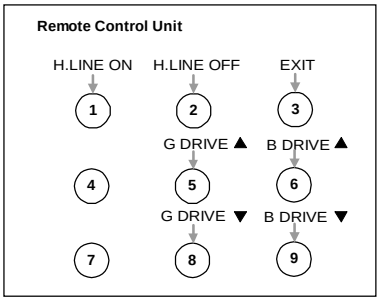
VIDEO / CHROMA ADJUSTMENT

<table>
<tr><th>Item</th><th>Measuring instrument</th><th>Test point</th><th>Adjustment item</th><th>Description</th></tr>
<tr><td>WHITE BALANCE (Low Light) adjustment</td><td>Signal generator
Remote control unit</td><td></td><td>BRIGHT

R CUTOFF
G CUTOFF
B CUTOFF

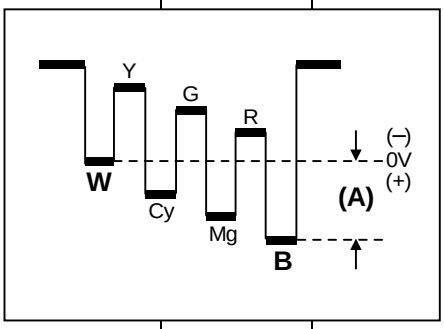
SCREEN VR</td><td>1. Receive a black and white signal (color off).
2. Select the LOW LIGHT mode from the SERVICE MENU.
3. Confirm the Initial setting value of BRIGHT, R CUTOFF, G CUTOFF and B CUTOFF.
4. Display a single horizontal line by pressing the ① key of the remote control unit.
5. Turn the screen VR all the way to the left.
6. Turn the screen VR gradually to the right from the left until either one of the red, blue or green colors appears faintly.
7. Adjust the two colors which did not appear until the single horizontal line that is displayed becomes white using the ④ to ⑨ keys of the remote control unit.
8. Turn the screen VR to where the single horizontal line glows faintly.
9. Press the ② key to return to the regular screen.</td></tr>
<tr><td colspan="4">[LOW LIGHT] MODE
 

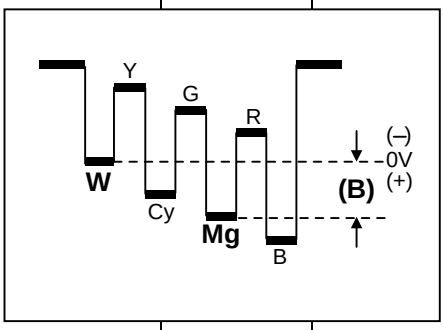

</td></tr>
<tr><td>WHITE BALANCE (High Light) adjustment</td><td>Signal generator
Remote control unit</td><td></td><td>G DRIVE
B DRIVE</td><td>1. Receive a black and white signal (color off).
2. Select the HIGH LIGHT mode in the SERVICE MENU.
3. Confirm the initial setting value of G DRIVE and B DRIVE.
4. Adjust the screen color to white with the⑤, ⑥, ⑧ and ⑨ keys of the remote control unit.</td></tr>
<tr><td colspan="4">[HIGH LIGHT] MODE
 


</td></tr>
</table>

Item	Measuring instrument	Test point	Adjustment item	Description
SUB BRIGHT adjustment	**Remote control unit**		**No.2 BRIGHT**	1. Receive a broadcast. 2. Select No.2 BRIGHT of the PICTURE mode in SERVICE MENU. 3. Confirm the initial setting value of the No.2 BRIGHT. 4. If the brightness is not the best with the initial setting value, make fine adjustment of the No.2 BRIGHT until you get the optimum brightness.
SUB CONTRAST adjustment	**Remote control unit**		**No.1 PICTURE**	1. Receive a broadcast. 2. Select No.1 PICTURE of the PICTURE mode in SERVICE MENU. 3. Confirm the initial setting value of the No.1 PICTURE. 4. If the contrast is not the best with the initial setting value, make fine adjustment of the No.1 PICTURE until you get the optimum contrast.
SUB COLOR Adjustment [I]	**Remote control unit**		**No.3 COL. PALM**	**[PAL-M]** 1. Receive a PAL-M broadcast. 2. Select No.3 COL. PALM of the PICTURE mode in SERVICE MENU. 3. Confirm the initial setting value of the No.3 COL. PALM. 4. If the color is not the best with the initial setting value, make fine adjustment until you get the best color.
			No.4 COL. PALN	**[PAL-N]** 1. Receive a PAL-N broadcast. 2. Select No.4 COL. PALN of the PICTURE mode in SERVICE MENU. 3. Confirm the initial setting value of the No.4 COL. PALN. 4. If the color is not the best with the initial setting value, make fine adjustment until you get the best color.
			No.5 COL. NTSC	**[NTSC]** 1. Receive a NTSC broadcast. 2. Select No.5 COL. NTSC of the PICTURE mode in SERVICE MENU. 3. Confirm the initial setting value of the No.5 COL. NTSC. 4. If the color is not the best with the initial setting value, make fine adjustment until you get the best color.
SUB TINT adjustment [I]	**Remote control unit**		**No. 6 TINT**	1. Receive a NTSC color bar signal. 2. Select No. 6 TINT of the PICTURE mode in SERVECE MENU. 3. Confirm the initial setting value of the No. 6 TINT. 4. If the tint is not the best with the initial setting value, make fine adjustment until you get the best tint.

Item	Measuring instrument	Test point	Adjustment item	Description
Adjustment of SUB COLOR-Ⅱ	● **Signal generator** ● **Oscillo-scope** ● **Remote control unit**	**TP-47B** **TP-E(⏚)** **[CRT SOCKET PWB]**		**[Method of adjustment using measuring instrument]**
			3. COL. PALM	**(PAL-M COLOR)** 1. Receive a PAL-M full field color bar signal (75% white). 2. Select the sub menu screen **PICTURE** from the SERVICE MENU. 3. Select **3. COL. PALM** with the MENU ▲/▼ key , and confirm its initial setting value. 4. Connect the oscilloscope between TP-47B and TP-E. 5. Adjust **3. COL. PALM** to set the value **(A)** in the figure to **+7V (W & B)**, with the MENU ◄/► key.
			4. COL. PALM	**(PAL-N COLOR)** 1. Receive a PAL-N full field color bar signal (75% white). 2. In the sub menu screen **PICTURE**, select **4. COL. PALN** with the MENU ▲/▼ key, and confirm its initial setting value. 3. Connect the oscilloscope between TP-47B and TP-E. 4. Adjust **4. COL. PALN** to set the value **(A)** in the figure to **+22V(W & B)**, with the MENU ◄/► key.
			5. COL. NTSC	**(NTSC COLOR)** 1. Receive a NTSC full field color bar signal (75% white). 2. In the sub menu screen **PICTURE,** select **5. COL. NTSC** with the MENU ▲/▼ key, and confirm its initial setting value. 3. Connect the oscilloscope between TP-47B and TP-E. 4. Adjust **5. COL. NTSC** to set the value **(A)** in the figure to **+10V(W & B)**, with the MENU ◄/► key.
Adjustment of SUB TINT-Ⅱ	● **Signal generator** ● **Oscillo-scope** **Remote control unit**	**TP-47B** **TP-E(⏚)** **[CRT SOCKET PWB]**		**[Method of adjustment using measuring instrument]**
			6.TINT	1. Receive a NTSC 3.58 color bar signal (full field color bar 75%white). 2. Select the sub menu screen **PICTURE** from the SERVICE MENU. 3. Select **6. TINT** with the MENU ▲/▼ key, and confirm its initial setting value. 4. Connect the oscilloscope betweenTP-47B and TP-E. 5. Adjust **6. TINT** to set the value **(B)** in the figure to **+14V(W & Mg)**, with the MENU ◄/► key.

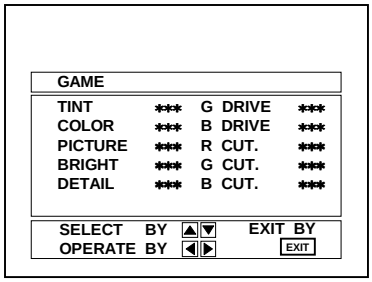




VIDEO STATUS ADJUSTMENT (Do not adjust. Each value should be set to the initial value.)

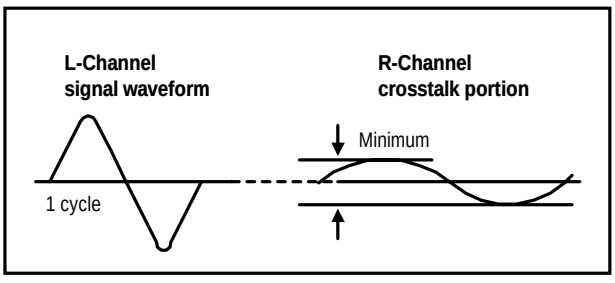
Item	Measuring instrument	Test point	Adjustment item	Description
Setting of VIDEO STATUS	**Remote control unit**		**TINT** **COLOR** **PICTURE** **BRIGHT** **DETAIL** **G DRIVE** **B DRIVE** **R CUT.** **G CUT.** **B CUT.**	1. Select the sub menu screen **VIDEO ST ATUS-CINEMA** from the SERVICE MENU. 2. Select **TINT ～ B CUT**. with the MENU ▲/▼ key, and reset each value to the initial setting value on page before, with the MENU ◀/▶ key. 3. Press the VIDEO STATUS key on the remote control unit to select **VIDEO STATUS-GAME**. (Each time you press the VIDEO STATUS key, **CINEMA** and **GAME** alternates.) 4. Make similar settings as in 2 above.

SUB MENU : VIDEO STATUS



MTS CIRCUIT ADJUSTMENT [AV-14F31 Only]

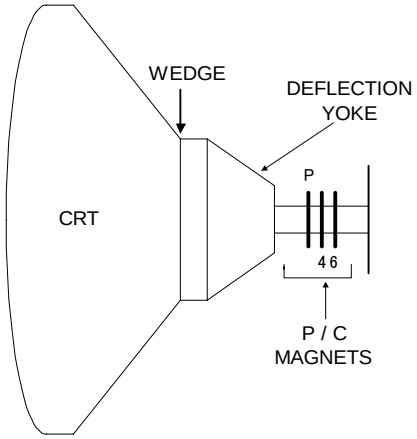
Item	Measuring instrument	Test point	Adjustment part	Description
INPUT LEVEL check			**No.2 IN LEVEL**	1. Select the No.2 IN LEVEL of the SOUND mode in SERVICE MENU. 2. Verify that the No.2 IN LEVEL is set at its initial setting value.
STEREO VCO adjustment	**Signal generator** **Frequency counter**	**R OUT [AUDIO OUT]**	**No.3 FH MON** **No.4 ST VCO**	1. Receive a NTSC RF signal (non modulated sound signal) from the antenna terminal. 2. Select the No.3 FH MON of SOUND mode in SERVICE MENU, change the setting value from 0 to 1. 3. Connect the frequency connector to R OUT RCA pin of the AUDIO OUT 4. Select the No.4 ST VCO. 5. Confirm the initial setting value of the No.4 ST VCO. 6. Adjust the No.4 ST VCO so that the frequency counter will display 15.73kHz±0.1kHz. 7. Select the No.3 FH MON of the SOUND mode, and reset the setting value from 1 to 0.
SAP VCO adjustment	**Signal generator** **Frequency counter**	**MPX Connector** **4 pin SDA** **3 pin GND** **[MAIN PWB]** **R OUT [AUDIO OUT]**	**No.9 5FH MON.** **No.10 SAP VCO.**	1. Receive a NTSC RF signal (non modulated sound signal) from the antenna terminal. 2. Connect between pin 4 of MPX connector and GND (pin 3 of MPX connector) through 1MΩ resistor. 3. Select the No.9 5FH MON. of the SOUND mode in SERVICE MENU, and reset the setting value from 0 to 1. 4. Connect the frequency connector to R OUT RCA pin of the AUDIO OUT. 5. Select the No.10 SAP VCO. 6. Confirm the initial setting value of No.10 SAP VCO. 7. Adjust the No.10 SAP VCO so that the frequency connector will display 78.67kHz±0.5kHz. 8. Select the No.9 5FH MON. of the SOUND mode, and reset the setting value from 1 to 0.
FILTER check			**No.6 FILTER**	1. Select the No.6 FLTER of the SOUND mode in SERVICE MENU. 2. Verify that the No.6 FLTER is set at its initial setting value.
SEPARATION adjustment	**TV audio multiplex signal generator** **Oscilloscope**	**L OUT** **R OUT [AUDIO OUT]**	**No.7 LOW SEP.** **No.8 HI SEP.**	1. Input a stereo L signal (300Hz) from the TV Audio multiplex signal generator to the antenna terminal. (NTSC) 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 No.7 LOW SEP. of the SOUND mode in SERVICE MENU. 5. Confirm the initial setting value of the No.7 LOW SEP. 6. Adjust the No.7 LOW SEP. so that the stroke element of the 300Hz signal will become minimum. 7. Change the signal to 3kHz, and similarly adjust the “No.8 HI SEP.



PURITY / CONVERGENCE ADJUSTMENT

PURITY ADJUSTMENT

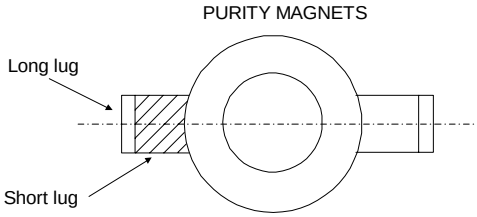
1. Demagnetize CRT with the demagnetizer.
2. Loosen the retainer screw of the deflection yoke.
3. Remove the wedges.
4. Input a green raster signal from the signal generator, and turn the screen to green raster.
5. Move the deflection yoke backward.
6. Bring the long lug of the purity magnets on the short lug and position them horizontally. (Fig.2)
7. Adjust the gap between two lugs so that the GREEN RASTER will come into the center of the screen. (Fig.3)
8. Move the deflection yoke forward, and fix the position of the deflection yoke so that the whole screen will become green.
9. Insert the wedge to the top side of the deflection yoke so that it will not move.
10. Input a crosshatch signal.
11. Verify that the screen is horizontal.
12. Input red and blue raster signals, and make sure that purity is properly adjusted.



• P/C MAGNETS

P : PURITY MAGNET
4 : 4 POLES (convergence magnets)
6 : 6 POLES (convergence magnets)

Fig.1



Bring the long lug over the short lug and position them horizontally.

Fig.2

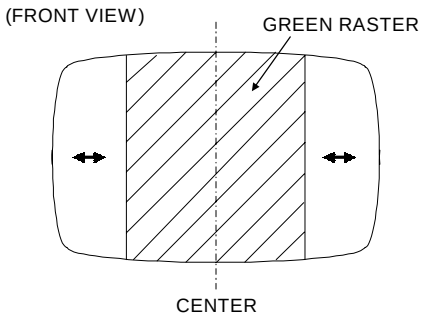


Fig.3

STATIC CONVERGENCE ADJUSTMENT

1. Input a crosshatch signal.
2. Using 4-pole convergence magnets, overlap the red and blue lines in the center of the screen (Fig.1) and turn them to magenta (red/blue).
3. Using 6-pole convergence magnets, overlap the magenta(red/blue) and green lines in the center of the screen and turn them to white.
4. Repeat 2 and 3 above, and make best convergence.

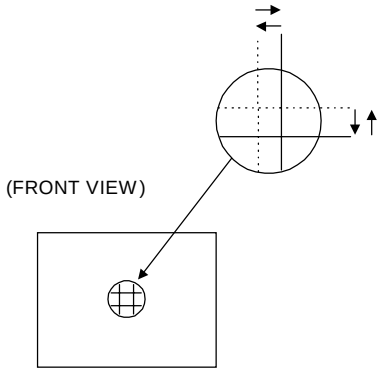


Fig.1

DYNAMIC CONVERGENCE ADJUSTMENT

1. Move the deflection yoke up and down and overlap the lines in the periphery. (Fig. 2)
2. Move the deflection yoke left to right and overlap the lines in the periphery. (Fig. 3)
3. Repeat 1 and 2 above, and make best convergence.

(FRONT VIEW)

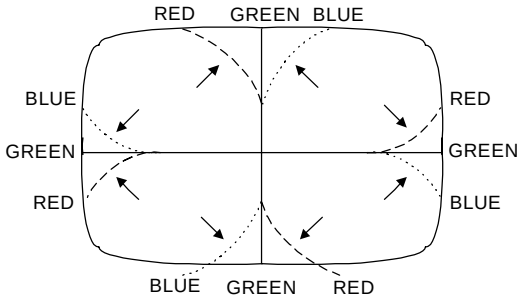


Fig.2

● After adjustment, fix the wedge at the original position.
Fasten the retainer screw of the deflection yoke.
Fix the 6 magnets with glue.

(FRONT VIEW)

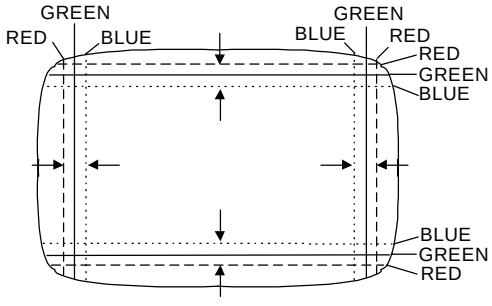


Fig.3

HOW TO CHECK THE HIGH VOLTAGE HOLD DOWN CIRCUIT

1. HIGH VOLTAGE HOLD DOWN CIRCUIT

After repairing the high voltage hold down circuit shown in Fig. 1.
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 Fig.2, set the resistor (between [X] connector [1] & [3]).
(3) Make sure that the screen picture disappears.
(4) Temporarily unplug the power cord.
(5) Remove the resistor (between [X] connector [1] & [3]).
(6) Again plug the power cord, make sure that the normal picture is displayed on the screen.

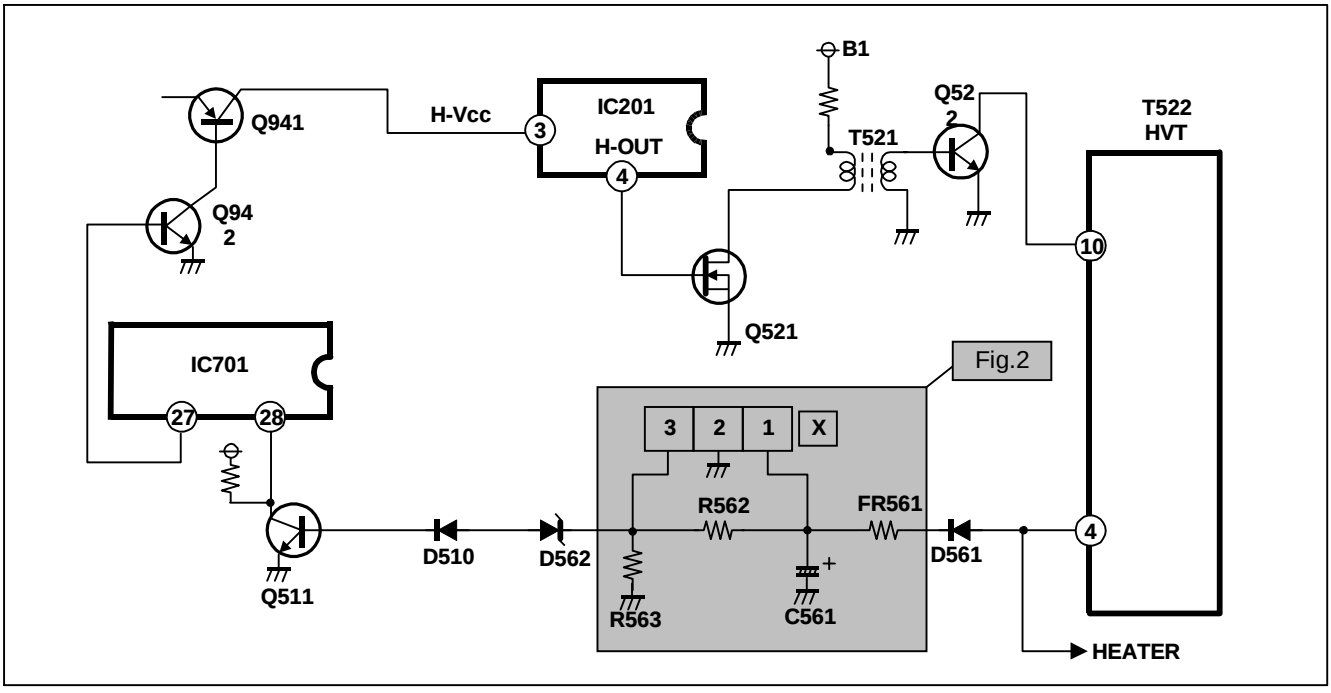


Fig. 1

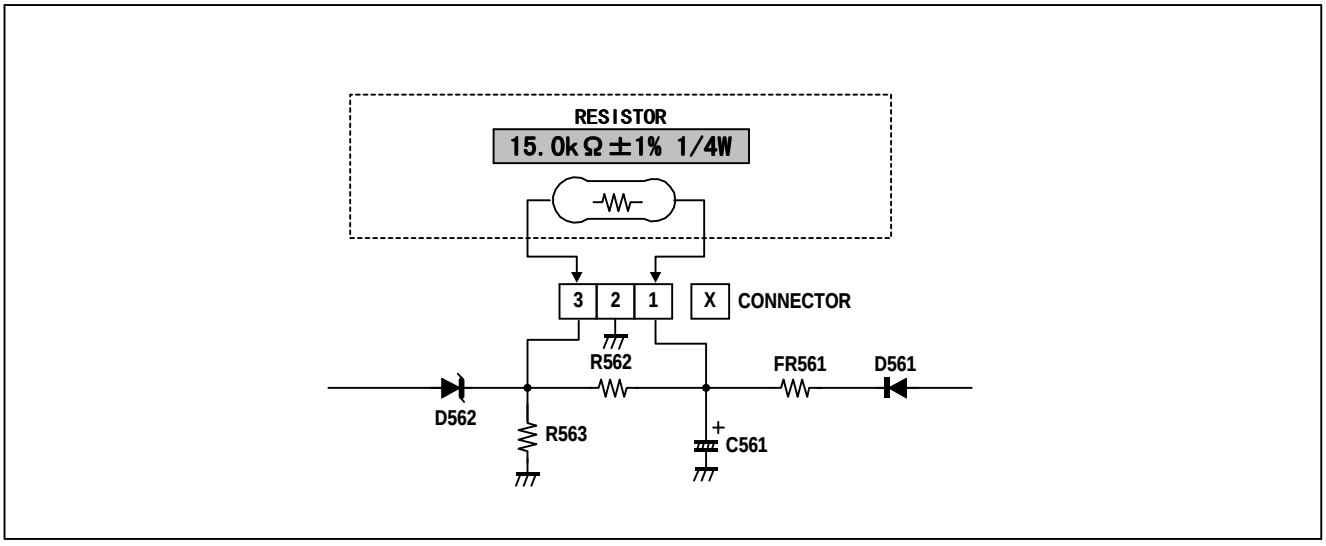


Fig. 2

SELF CHECK FUNCTIONS

1. Outline

This model includes protector functions for Over-current, X-ray and CRT NECK which cutoff the sub-power in the event of a malfunction and inform of the malfunction by flashing ON TIMER LED.

The malfunction is detected according to the state of the control line input connected to the main CPU.

2. Self check items

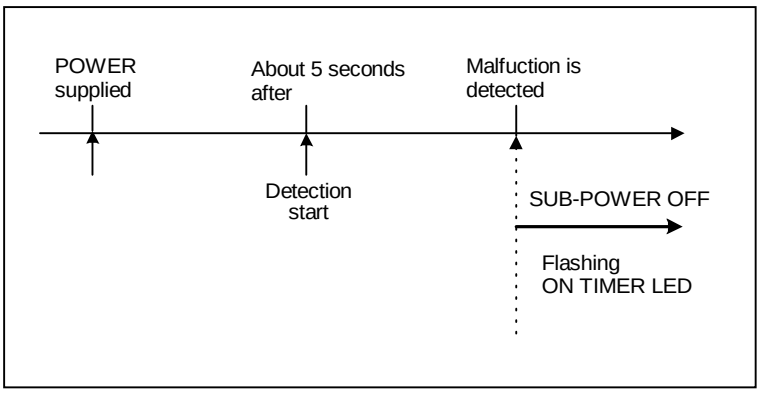
Check item	Detected contents	Detection method	Abnormality state
Over-current protector	An over-current on the B1 line and Audio-Vcc line is detected. **[AV-14F11]** An over-current on the B1 line is detected. **[AV-14F31]**	The main CPU detects at 1 second intervals. If NG is detected for more than 1 ms, a malfunction is interpreted.	During an abnormality the sub-power is cutoff. The remote controller power key operation is not recognized and sub-power off is maintained until the power cord is unplugged and reinserted.
X-ray protector	Operation of X-ray protection circuit	The main CPU detects at 1 second intervals. If NG is detected for more than 1 ms, a malfunction is interpreted.	During an abnormality the sub-power is cutoff. The remote controller power key operation is not recognized and sub-power off is maintained until the power cord is unplugged and reinserted.
CRT NECK protector	When the vertical circuit S-correction capacitor C413 is shorted, detect the potential drop of the C413, and prevent the burn damage to the CRT NECK.	The main CPU detects at 1 second intervals. If NG is detected for more than 1 ms, a malfunction is interpreted.	During an abnormality the sub-power is cutoff. The remote controller power key operation is not recognized and sub-power off is maintained until the power cord is unplugged and reinserted.

3. Self check indicating function

The self check function begins detection about 5 seconds after power is supplied.

In the event a malfunction is detected, the sub-power is cutoff immediately.

At this time, the ON TIMER LED flashes to inform of the malfunction.



Item	LED ON / OFF intervals	Priority of detection
OCP/X-ray	every 0.5-second	1
NECK	every 1.0-second	2