JVC

SERVICE MANUAL

COLOUR TELEVISION

BASIC CHASSIS
CG

AV-21AT

CONTENTS

■ SPECIFICATIONS 2
■ SAFETY PRECAUTIONS 3
■ FEATURES 4
★ OPERATING INSTRUCTIONS (APPENDED) 1-1
■ SPECIFIC SERVICE INSTRUCTIONS 4
■ SERVICE ADJUSTMENTS 10
★ STANDARD CIRCUIT DIAGRAM (APPENDED) 2-1
■ PARTS LIST 27

COPYRIGHT © 2000 VICTOR COMPANY OF JAPAN, LTD.

No. 56013
May 2000

SPECIFICATIONS

Item		Content
Dimensions (W × H × D)		502mm × 451mm × 480.5mm
Mass		19.5kg
TV RF System		B / G, I, D / K, K1
Colour System	TV Mode	PAL / SECAM
	VIDEO Mode	PAL / SECAM / NTSC3.58 / NTSC4.43
Receiving Frequency	VHF (VL)	46.25MHz ~ 168.25MHz
	VHF (VH)	175.25MHz ~ 463.25MHz
	UHF	471.25MHz ~ 863.25MHz
	CATV	● Cable TVs of Mid (X-Z, S1-S10) Super (S11-S20) & Hyper (S21-S41) bands receivable
Intermediate Frequency	VIF Carrier	38.0MHz
	SIF Carrier	31.5MHz (6.5MHz) 32.0MHz (6.0MHz) 32.5MHz (5.5MHz) 33.5MHz (4.5MHz)
Colour Sub Carrier Frequency		PAL (4.43MHz) SECAM (4.40625MHz / 4.25MHz) NTSC (3.58MHz / 4.43MHz)
Aerial Input Terminal		75Ω Unbalanced
Power Input		AC110 ~ 240V, 50 / 60Hz
Power Consumption		105W (Max.)/68W (Avg.)
Picture Tube		Visible size : 51cm measured diagonally
High Voltage		26.5kV ± 1.5kV (at zero beam current)
Speaker		5cm × 9 cm Oval type × 2
Audio Output		5W (Monaural)
Input	Video	1Vp-p, 75Ω
	Audio	500mVrms (–4dBs), High impedance
Output	Video	1Vp-p, 75Ω
	Audio	500mVrms (–4dBs), Low impedance
Headphone Jack		Stereo mini jack (3.5ø)
Remote Control Unit		RM-C364-1H (Battery size : AA/R06/UM-3 × 2)

Design & specifications are subject to change without notice.

FEATURES

- New chassis design enables use of an interactive on-screen control.
- Wide range voltage for AC power input.
- With AUDIO / VIDEO INPUT & OUTPUT terminals.
- MUTING button can reduce the audio level to zero instantly.
- Functional remote control to operate TV set (for channel select, volume control, power ON/OFF, etc.) from a distance.
- I^2C bus control utilizes single chip ICs for IF, V/C (Video/Chroma) and VSM (Video Status Memory).
- By means of AUTO PROGRAM, the TV stations can be selected automatically and the TV channels can also be rearranged automatically.
- Built-in ECO MODE (ECONOMY, ECOLOGY)
  In accordance with the brightness in a room, the brightness and/or contrast of the picture can be adjusted automatically to make the optimum picture which is easy on the eye.
- Built-in ON TIMER & RETURN +.

SPECIFIC SERVICE INSTRUCTIONS

DISASSEMBLY PROCEDURE

REMOVING THE REAR COVER

1. Unplug the AC power cord.
2. Remove the **6** screws marked "**A**" and **1** screw marked "**B**".
3. Withdraw the rear cover backward.

REMOVING THE MAIN PW BOARD

- After removing the rear cover.

1. Slightly raise both sides of the Main PW Board by hand and withdraw the Main PW Board backward.
   (If necessary, take off the wire clamp, connectors etc.)

REMOVING THE SPEAKER

- After removing the rear cover and the Main PW Board.

1. Remove the **2** screws marked "**C**".
2. Follow the same step for removing the other hand speaker.

CHECKING THE MAIN PW BOARD

To check the back side of the Main PW Board, follow the next steps.

1. Pull out the Main PW Board. (Refer to "REMOVING THE MAIN PW BOARD".)
2. Erect the Main PW Board vertically so that you can easily check the back side of it.

CAUTION:

- When erecting the Main PW Board, 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 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.

FRONT CABINET
SPEAKER
C (×2)
CRT SOCKET PWB
(Within MAIN PWB)
MAIN PWB
SPEAKER
C (×2)
REAR COVER
B
A
(×6)

REPLACEMENT OF MEMORY IC

1. MEMORY IC

This TV uses the following memory IC.

Memory IC: IC1702 on MAIN PW Board

The memory IC memorizes data for correctly operating the video and deflection circuits. When replacing the memory IC, be sure to use the same type IC written with the initial values of data. In other words, use the specific IC listed in "PRINTED WIRING BOARD PARTS LIST". For its mounting location, refer to "ADJUSTMENT LOCATIONS".

2. PROCEDURE FOR REPLACING MEMORY IC

(1) Power off

Switch the power off and unplug the power cord from the wall outlet.

(2) Replacing the memory IC

Replace the memory IC with new one. Be sure to use the memory IC written with the initial data values.

(3) Power on

Plug the power cord into the wall outlet and switch the power on.

(4) Check and setting of SYSTEM CONSTANT SET:

1) Press the DISPLAY key and the PICTURE MODE key on the remote control unit simultaneously.
   The SERVICE MENU screen will be displayed. (See Fig. 1.)
2) In the SERVICE MENU, press the DISPLAY key and PICTURE MODE key simultaneously. Then, the SYSTEM CONSTANT SET screen will be displayed. (See Fig. 2.)
3) Check whether the setting values of the SYSTEM CONSTANT SET are the same as those indicated in Table 1. If the value is different, select the setting item with the MENU ▽/△ key, and set the correct value with the MENU – / + key.
4) Press the DISPLAY key twice to return to the normal screen.

(5) Receive channel setting

Refer to the **OPERATING INSTRUCTIONS** and set the receive channels (channels preset).

NAME OF REMOTE CONTROL KEYS

(6) User setting

Check the user setting values in Table 2, and if setting value is different, set the correct value.
For setting, refer to the **OPERATING INSTRUCTIONS**.

(7) Setting of SERVICE MENU

Verify the setting for each setting item in the SERVICE MENU. (See Table 3.) If readjustment is necessary, perform adjustment referring to "SERVICE ADJUSTMENTS".

SERVICE MENU

```
SERVICE MENU

1. IF          2. V/C
3. DEF         4. VSM PRESET
5. PRESET
6. TURBO TIMER OFF

1-6 : SELECT          DISP : EXIT
******** *****          **.****
            *** *****      **.****
```

Fig. 1

SYSTEM CONSTANT - I

```
SYSTEM CONSTANT SET      1/3

☞ COLOUR          : TRIPLE
  BILINGUAL       : NO
  TUNER           : MU
  ECO SENSOR      : YES
  LANGUAGE        : E / R / C

▽/△: SELECT
– / + : OPERATE          DISP : EXIT
```

SYSTEM CONSTANT - II

```
SYSTEM CONSTANT SET      2/3

☞ B/B SOUND       : OFF
  LOCK            : 180
  COLOUR AUTO     : NO
  QSS             : MINT
  ALC             : NO
  TEXT RATE       : 20
▽/△: SELECT
– / + : OPERATE          DISP : EXIT
```

SYSTEM CONSTANT - III

```
SYSTEM CONSTANT SET      3/3

☞ AMP TUNER       : NO

▽/△: SELECT
– / + : OPERATE          DISP : EXIT
```

Fig. 2

SETTING OF SYSTEM CONSTANT SET

Table 1

Setting item	Setting contents	Setting value
COLOUR	→ MULTI. → TRIPLE → PAL →	TRIPLE
BILINGUAL	→ YES → NO →	NO
TUNER	→ MU → MA →	MU
ECO SENSOR	→ YES → NO →	YES
LANGUAGE	→ E/R/C/U → E/R/C → E/R/U → E/C →	E/R/C
B/B SOUND	→ ON → OFF →	OFF
LOCK	YES ↔ 10 ↔ 20 ↔ ... ↔ 230 ↔ 240 ↔ 250	180
COLOUR AUTO	→ YES → NO →	NO
QSS	→ MINT → MQSS →	MINT
ALC	→ YES → NO →	NO
TEXT RATE	10 ↔ 20 ↔ 40 ↔ 80	20
AMP TUNER	→ YES → NO →	NO

USER SETTING VALUES

Table 2

Setting item	Setting value	Setting item	Setting value
SUB POWER	ON	PICTURE MODE (VSM)	BRIGHT
CHANNEL POSITION	1 POSITION	VNR	OFF
CHANNEL PRESET	Refer to OPERATING INSTRUCTION	OFF TIMER	OFF
		LANGUAGE	ENGLISH
VOLUME	Appropriate sound volume	AUTO SHUTOFF	OFF
TV/VIDEO	TV	ECO SENSOR	OFF
ON SCREEN DISPLAY	POSITION NUMBER DISPLAY	BLUE BACK	OFF
COLOUR SYSTEM	AUTO PAL	ON TIMER	PR1 0:00
SOUND SYSTEM	B / G	CHILD LOCK	OFF

SERVICE MENU SETTING ITEMS

Table 3

Service menu	Setting item
1. IF	1. VCO 2. DELAY POINT
2. V / C	1. CUTOFF(R/G/B) 2. DRIVE(R/B) 3. BRIGHT 4. CONT. 5. COLOUR (P / S/ N3 / N4) 6. TINT (N3 / N4) 7. SECAM BL ADJ 8. SHARP (TV / VIDEO) ← **Do not adjust.**
3. DEF	1. VER. POSITION 2. HOR. POSITION 3. VER. HEIGHT 4. VER. LINEARITY 5. VER. SCURVE 6. HOR. VCO ADJUST ← **Do not adjust.**
4. VSM PRESET (BRIGHT/STD/SOFT)	TINT COLOUR BRIGHT CONT. SHARP **Do not adjust.**
5. PRESET	1. C-TRAP FIX 2. SHARP PEAK 3. ABL 4. GAMMA 5. Y.DELAY TIME 6. BLACK EXP START 7. C-BPF 8. CW/SCP 9. V.IF DET. LEVEL 10. S.IF DET. LEVEL 11. IF AGC MIN. 12. V.IF AGC 13. V.IF PMOD 14. S.IF BPF BW ADJUST 15. S.IF TRAP FO ADJUST 16. S.IF TRAP FO ADJUST 2 17. S.IF-TRAP 18. S.IF-BPF 19. VNR 20. RGB LIM. 21. RGB LIMIT LEVEL 22. S.IF SW 23. TEXT H. POSITION 24. READ DATA **Do not adjust.**
6. TURBO TIMER	ON/OFF Should be set to OFF. (When you turn the TV power off, the Turbo Timer is automatically set to OFF.)

SERVICE ADJUSTMENTS

BEFORE STARTING SERVICE ADJUSTMENT

1. **There are 2 ways for adjusting this TV: One is with the REMOTE CONTROL UNIT and the other is the conventional method using adjustment parts and components.**
2. **The setting (adjustment) using the REMOTE CONTROL UNIT is made on the basis of the initial setting values. The setting values which adjust the screen to the optimum condition can be different from the initial setting values.**
3. Make sure that connection is correctly made to AC power source.
4. Turn on the power of the TV and measuring instrument for warming up for at least 30 minutes before starting adjustment.
5. If the receive or input signal is not specified, use the most appropriate signal for adjustment.
6. Never touch parts (such as variable resistors, transformers and capacitors) not shown in the adjustment items of this service adjustment.
7. Preparation for adjustment (presetting):
   Unless otherwise specified in the adjustment items, preset the following functions with the remote control unit.

Function	Setting value
PICTURE MODE (VSM)	BRIGHT
COLOUR/BRIGHT/CONT./SHARP	See "VSM Preset" on page 22.
VNR	OFF
OFF TIMER	OFF
ECO SENSOR	OFF
BLUE BACK	OFF

MEASURING INSTRUMENT AND FIXTURES

1. DC voltmeter (or Digital voltmeter)
2. Oscilloscope
3. Signal generator (Pattern generator)
   [PAL / SECAM / NTSC]
4. Remote control unit

ADJUSTMENT/CHECK ITEMS

Adjustment/Check item	Page
B1 POWER SUPPLY Check	14
FOCUS Adjustment	14
IF CIRCUIT Adjustment	14
V/C (VIDEO/CHROMA) CIRCUIT Adjustment	15
DEFLECTION CIRCUIT Adjustment	20
VSM PRESET Adjustment	22
PRESET Adjustment	23
PURITY, CONVERGENCE Adjustment	24

BASIC OPERATION IN SERVICE MENU

1. **TOOL OF SERVICE MENU OPERATION**
   Operate the SERVICE MENU with the remote control unit.

2. **SERVICE MENU ITEMS**
   With the SERVICE MENU, various settings (adjustments) can be made, and they are broadly classified in the following items of settings:

- 1. IF ..... For entering/adjusting the setting values (adjustment values) of the IF circuit.
- 2. V/C ..... For entering/adjusting the setting values (adjustment values) of the VIDEO/CHROMA circuit.
- 3. DEF ..... For entering/adjusting the setting values (adjustment values) of the DEFLECTION circuit.
- 4. VSM PRESET ..... For setting the values of STANDARD, SOFT and BRIGHT. (Do not adjust the preset values.) (VSM: video status memory)
- 5. PRESET ..... For setting the values for VIDEO/CHROMA control. (Do not adjust the preset values.)
- 6. TURBO TIMER ..... For quick setting the values of TIMER COUNT — adjustable not only by minutes but also by second. If it i s ON, the time in TIMER mode changes from 1 minute into 1 second temporarily. (Applicable to OFF TIMER, ON TIMER and AUTO SHUTOFF)

  Note: When you turn the TV power off, the Turbo Timer is automatically set to OFF.

3. BASIC OPERATION IN SERVICE MENU

(1) How to enter SERVICE MENU

Press the DISPLAY key and the PICTURE MODE key on the remote control unit simultaneously.
The SERVICE MENU screen will be displayed. (See Fig. 1.)

SERVICE MENU

```
SERVICE MENU

1. IF          2. V/C
3. DEF         4. VSM PRESET
5. PRESET
6. TURBO TIMER OFF


1-6 : SELECT          DISP : EXIT
******** *****          **.****
            *** *****      **.****
```

Fig. 1

(2) Selection of SUB MENU SCREEN

Press one of the keys 1 ~ 6 on the remote control unit, and select the SUB MENU SCREEN from the SERVICE MENU. (See Fig. 2 on the next page.)

SERVICE MENU → SUB MENU

1. IF
2. V / C
3. DEF
4. VSM PRESET
5. PRESET
6. TURBO TIMER

(3) Method of Setting

*Once the setting values are set, they are memorized automatically.
*It must not adjust without inputting a signal.

1) 1. IF

[1. VCO]

(a) 1 Key ..... Select **1. IF**.
(b) 1 Key ..... Select 1. VCO. (CW)
(c) VCO(CW) . ..... Adjust VCO(CW) while watching the colour (yellow/blue) of the characters on the screen. For details, refer to the adjustment table.
(d) DISPLAY Key ..... When this is pressed twice, you will return to the SERVICE MENU.

[2. DELAY POINT]

(a) 1 Key ..... Select **1. IF**.
(b) 2 Key ..... Select 2. DELAY POINT.
(c) MENU – / + Key ..... Adjust the setting value.
(d) DISPLAY Key ..... When this is pressed twice, you will return to the SERVICE MENU.

2) 2. V/C, 3. DEF, 4. VSM PRESET and 5. PRESET

Note: Do not adjust "4. VSM PRESET" and "5. PRESET" unless you had changed its value by mistake.

(a) 2 ~ 5 Keys ..... Select one from **2. V/C, 3. DEF, 4. VSM PRESET and 5. PRESET**.
(b) MENU ▽/△ key ..... Select setting items.
(c) MENU – / + Key ..... Adjust the setting values of the setting items.
● Use the number keys on the remote control unit for setting of WHITE BALANCE and BLACK OFFSET. For the setting, refer to each item concerned.
(d) DISPLAY Key ..... When this is pressed, you will return to the SERVICE MENU.

3) 6. TURBO TIMER

(a) 6 Key ..... Each time you press the key, ON/OFF state of TURBO TIMER changes. (Should be set to OFF.)

(4) Release of SERVICE MENU

After completing the setting, return to the SERVICE MENU by pressing the DISPLAY key, then again press the DISPLAY key to return to the normal screen.

SUB MENU SCREEN

Fig. 2

ADJUSTMENT LOCATIONS

CRT SOCKET PWB (Within MAIN PWB)

(SOLDER SIDE)

MAIN PWB

ADJUSTMENTS

B1 POWER SUPPLY

Item	Measuring instrument	Test point	Adjustment part	Description
Check of B1 POWER SUPPLY	● **Signal Generator** ● **DC Voltmeter**	**TP-91 (B1)** **TP-E (⏚)** **[S1 connector]**		1. Receive a whole black signal. 2. Connect a DC voltmeter between TP-91 (B1) and TP-E (⏚) (between pins 1 and 5 of the connector S1). 3. Make sure that the voltage is **DC114.5 ± 1.5V**.

FOCUS ADJUSTMENT

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of FOCUS	**Signal generator**		**FOCUS VR** **[In HVT]**	1. Receive a cross-hatch signal. 2. While watching the screen, adjust the FOCUS VR to make the vertical and horizontal lines as fine and sharp as possible. 3. Make sure that, when the screen is darkened, the lines remain in good focus.

IF CIRCUIT ADJUSTMENT

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of VCO (CW)	**Remote control unit**		**VCO (CW)**	● **Under normal conditions, no adjustment is required.** **Note: Do not adjust without inputting signal.** 1. Receive a colour bar signal. 2. Select **1. IF** from the SERVICE MENU. 3. Press the **1** key to select **1. VCO**. 4. Select **VCO ADJUST** with the MENU ▽/△ key and make sure that the setup value shown in the screen is +00. 5. Press the MENU – or + key until the colour of the characters "TOO HIGH" displayed on the screen changes from blue to **yellow**. 6. Press the MENU – or + key until the colour of the characters "TOO LOW" displayed on the screen changes from blue to **yellow**. At this time, check that the value of **VCO ADJUST** on the screen is +00 or about +00. 7. Select **AFT ADJUST** with the MENU ▽/△ key. 8. Then, press the MENU – or + key until the colour of the characters "JUST REFERENCE" displayed on the screen changes from blue to **yellow**. 9. Press the DISPLAY key three times to return to normal screen.

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of DELAY POINT	**Remote control unit**		**DELAY POINT (AGC TAKE-OVER)**	1. Receive a black and white signal (colour off). 2. Select **1. IF** from the SERVICE MENU. 3. Select **2. DELAY POINT** by pressing the **2** key on the remote control. 4. Adjust the MENU – or + key until video noise disappears. 5. Press the DISPLAY key three times to return to the normal screen. 6. Turn to other channels and make sure that there are no irregularities.

Setting (Adjustment) Item	Variable range	Initial setting value
DELAY POINT (AGC TAKE-OVER)	0 ~ 127	43

V/C (VIDEO/CHROMA) CIRCUIT ADJUSTMENT

The setting (adjustment) using the remote control unit is made on the basis of the initial setting values.
The setting values which adjust the screen to the optimum condition can be different from the initial setting values.
- **Do not change the initial setting values of the setting (adjustment) items not listed in "ADJUSTMENT".**

[SUB MENU 2. V/C]

Setting item \ Colour system		Variable range	Initial setting value			
			PAL	SECAM	NTSC 3.58	NTSC 4.43
1. CUT OFF (R / G / B)		–128 ~ +127	–50	←	←	←
2. DRIVE (R / B)		–64 ~ +63	0	←	←	←
3. BRIGHT		–128 ~ +127	0	←	←	←
4. CONT.		–64 ~ +63	0	←	←	←
5. COLOUR (P / S / N3 / N4)		–64 ~ +63	0	←	←	←
6. TINT (N3 / N4)	TV / VIDEO	–64 ~ +63	———	———	0 / 0	0 / 0
7. SECAM BL ADJUST		–32 ~ +31	0	←	←	←
8. SHARP	TV / VIDEO	–32 ~ +31	–5 / +15	←	←	←

: Do not adjust.

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of WHITE BALANCE (Low light)	● **Signal generator** ● **Remote control unit**		**1. CUTOFF (R)** **CUTOFF (G)** **CUTOFF (B)** **SCREEN VR (In HVT)**	1. Receive a black and white signal (colour off). 2. Select **2. V/C** from the SERVICE MENU. 3. Select **1. CUTOFF (R), (G)** and **(B)** with the MENU ▽/△ key, and set each value to initial setting value with **4 ~ 9** keys on the remote control unit. 4. Press the **1** key on the remote control unit to produce a single horizontal line. 5. Turn the SCREEN VR fully counterclockwise, then slowly turn it clockwise to where a red, blue, or green colour is faintly visible. 6. Use keys **4 ~ 9** on the remote control unit and adjust the other 2 colours to where the single horizontal line appears white. 7. Turn the SCREEN VR to where the single horizontal line glows faintly. 8. Press the **2** key to return to **1. CUTOFF** screen. 9. Press the DISPLAY key twice to return to the normal screen.

Setting (Adjustment) item		Variable range	Initial setting value
1. CUT OFF	R	–128 ~ +127	–50
	G	–128 ~ +127	–50
	B	–128 ~ +127	–50

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of WHITE BALANCE (High light)	● **Signal generator** ● **Remote control unit**		**2. DRIVE (R)** **DRIVE (B)**	1. Receive a black and white signal (colour off). 2. Select **2. V/C** from the SERVICE MENU. 3. Select **2. DRIVE (R) / (B)** with MENU ▽/△ key, and set each value to initial setting value with **4** and **7** keys, or **6** and **9** keys on the remote control unit. 4. Use the keys **4** and **7** or **6** and **9** to produce a white screen. 5. Press the DISPLAY key twice to return to the normal screen.

Setting (Adjustment) item		Variable range	Initial setting value
2. DRIVE	R	–64 ~ +63	0
	B	–64 ~ +63	0

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of SUB BRIGHT	**Remote control unit**		**3. BRIGHT**	1. Receive any broadcast. 2. Select **2. V/C** from the SERVICE MENU. 3. Select **3. BRIGHT** with the MENU ▽/△ key. 4. Set the initial setting value with the MENU – or + key. 5. If the brightness is not the best with the initial set value, make fine adjustment until you get the best brightness. 6. Press the DISPLAY key twice to return to the normal screen.
Adjustment of SUB CONT.	**Remote control unit**		**4. CONT.**	1. Receive any broadcast. 2. Select **2. V/C** from the SERVICE MENU. 3. Select **4. CONT.** with the MENU ▽/△ key. 4. Set the initial setting value with the MENU – or + key. 5. If the contrast is not the best with the initial set value, make fine adjustment until you get the best contrast. 6. Press the DISPLAY key twice to return to the normal screen.
Adjustment of SUB COLOUR-I	**Remote control unit**		**5. COLOR**	**[Method of adjustment without measuring instrument]**
			PAL COLOUR	**(PAL COLOUR)** 1. Receive a PAL broadcast. 2. Select **2. V/C** from the SERVICE MENU. 3. Select **5. COLOUR** with the MENU ▽/△ key. 4. Set the initial setting value for PAL COLOUR with the MENU – or + key. 5. If the colour is not the best with the initial set value, make fine adjustment until you get the best colour. 6. Press the DISPLAY key twice to return to the normal screen.
			SECAM COLOUR	**(SECAM COLOUR)** 1. Receive a SECAM broadcast. 2. Make fine adjustment of SECAM COLOUR in the same way as for "PAL COLOUR".
			NTSC 3.58 COLOUR	**(NTSC 3.58 COLOUR)** 1. Receive a NTSC 3.58MHz broadcast. 2. Make similar fine adjustment of NTSC 3.58 COLOUR in the same way as for "PAL COLOUR".
				(NTSC 4.43 COLOUR) When adjustment is done for NTSC 3.58 COLOUR, appropriate values are automatically set for NTSC 4.43 COLOUR.

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of SUB COLOUR-II	● **Signal generator** ● **Oscillo-scope** ● **Remote control unit**	**TP-47G/R TP-E (⏚) [CRT SOCKET PWB]**	**5. COLOUR**	**[Method of adjustment using measuring instrument]**
			PAL COLOUR	**(PAL COLOUR)** 1. Receive a PAL full field colour bar signal (75% white). 2. Select **2. V/C** from the SERVICE MENU. 3. Select **5. COLOUR** with the MENU ▽/△ key. 4. Set the initial setting value of PAL COLOUR with the MENU – or + key. 5. Connect the oscilloscope between TP-47G/R and TP-E. 6. Adjust PAL COLOUR to set the value **(A)** in the figure to **+12V (W & G)**.
			SECAM COLOUR	**(SECAM COLOUR)** 1. Receive a SECAM full field colour bar signal (75% white). 2. Set the initial setting value of SECAM COLOUR with the MENU – or + key. 3. Adjust SECAM COLOUR to set the value **(A)** in the figure to **+9V (W & G)**.
			NTSC 3.58 COLOUR	**(NTSC 3.58 COLOUR)** 1. Receive a NTSC 3.58 full field colour bar signal (75% white). 2. Set the initial setting value of NTSC 3.58 COLOUR with the MENU – or + key. 3. Adjust NTSC 3.58 COLOUR to set the value **(A)** in the figure to **+7V (W & G)**.
				(NTSC 4.43 COLOUR) When adjustment is done for NTSC 3.58 COLOUR, appropriate values are automatically set for NTSC 4.43 COLOUR.
Adjustment of SUB TINT-I	**Remote control unit**		**6. TINT**	**[Method of adjustment without measuring instrument]**
			NTSC 3.58 TINT	**(NTSC 3.58 TINT)** 1. Receive a NTSC 3.58 colour bar signal (full field colour bar 75% white). 2. Select **2. V/C** from the SERVICE MENU. 3. Select **6. TINT** with the MENU ▽/△ key. 4. Set the initial setting value of NTSC 3.58 with the MENU – or + key. 5. If you cannot get the best tint with the initial setting value, make fine adjustment until you get the best tint. 6. Press the DISPLAY key twice to return to the normal screen.
				(NTSC 4.43 COLOUR) When adjustment is done for NTSC 3.58 TINT, appropriate values are automatically set for NTSC 4.43 TINT.

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of SUB TINT-II	● **Signal generator** ● **Oscillo-scope** ● **Remote control unit**	**TP-47G/R TP-E (⏚) [CRT SOCKET PWB]**	**6. TINT**	**[Method of adjustment using measuring instrument]**
			NTSC 3.58 TINT	**(NTSC 3.58 TINT)** 1. Receive a NTSC 3.58 colour bar signal (full field colour bar 75% white). 2. Select **2. V/C** from the SERVICE MENU. 3. Select **6. TINT** with the MENU a key. 4. Set the initial setting value of NTSC 3.58 with the MENU - or + key. 5. Connect the oscilloscope between TP-47G/R and TP-E. 6. Adjust NTSC 3.58 TINT to set the value **(B)** in the figure to **+7V (W & Cy)**. 7. Press the DISPLAY key twice to return to the normal screen.
				(NTSC 4.43 TINT) When adjustment is done for NTSC 3.58 TINT, appropriate values are automatically set for NTSC 4.43 TINT.
Adjustment of BLACK OFFSET (SECAM)	**Remote control unit**			**[Method of adjustment without measuring instrument]**
			7. SECAM BL ADJUST	1. Receive a SECAM HALF COLOUR BAR signal (210.25MHz). 2. Select **2. V/C** from the SERVICE MENU. 3. Select **7. SECAM BL ADJUST** with the MENU a key. 4. Set the initial setting value the MENU - or + key. 5. While alternately pressing keys **1** (Black & White ON) and **2** (Black & White OFF), make sure that there is no colour on the black & white screen. 6. If the black & white screen is not the best with the initial setting value, make fine adjustment until you get the best black & white screen. 7. Press the DISPLAY key twice to return to the normal screen.

DEFLECTION CIRCUIT ADJUSTMENT

- There are 2 modes of adjustment (initial setting value) — 50Hz mode and 60Hz mode — depending upon the kind of signals (vertical frequency 50Hz / 60Hz).
- When adjusted in 50Hz mode, 60Hz mode will be automatically set.

The setting (adjustment) using the remote control unit is made on the basis of the initial setting values.
The setting values which adjust the screen to the optimum condition can be different from the initial setting values.

[SUB MENU 4. DEF]

Setting item	Adjustment name	Variable range	Initial setting value	
			50Hz	60Hz
1. VER. POSITION	Vertical center	–4 ~ +3	–1	–3
2. HOR. POSITION	Horizontal center	–16 ~ +15	+3	+3
3. VER. HEIGHT	Vertical height	–64 ~ +63	–35	+1
4. VER. LINEARITY	Vertical linearity	–32 ~ +31	+15	–1
5. VER. SCURVE	Vertical scurve	–32 ~ +31	–32	0
6. HOR. VCO ADJUST	Horizontal VCO	–64 ~ +63	0	0

: Do not adjust.

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of V-HEIGHT & V-POSITION	● **Signal generator** ● **Remote control unit**		**1. VER. POSITION** **3. VER. HEIGHT**	**[fv : 50Hz mode]** 1. Receive a cross-hatch signal. 2. Select **3. DEF** from the SERVICE MENU. 3. Select **1. VER. POSITION** with the MENU ▽/△ key. 4. Set the initial setting value of **1. VER. POSITION** with the MENU – / + key. 5. Adjust VER. POSITION to make **V = V'.** 6. Select **3. VER. HEIGHT** with the MENU ▽/△ key. 7. Set the initial setting value of **3. VER. HEIGHT** with the MENU – / + key. 8. Adjust VER. HEIGHT and make the vertical screen size 92% of the picture size with the MENU – / + key. (to be continued)

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of H-POSITION			**2. HOR. POSITION**	9. Receive a circle pattern signal. 10. Select **2. HOR. POSITION** with the MENU ▽/△ key. 11. Set the initial setting value of **2. HOR. POSITION** with the MENU – / + key. 12. Adjust HOR. POSITION to make **H = H'** with the MENU – / + key.
Adjustment of V-LINEARITY & V-SCURVE			**4. VER. LINEARITY** **5. VER. SCURVE**	● **When the vertical linearity has been deteriorated remarkably, perform the following steps.** 13. Receive a cross-hatch signal. 14. Select **4. VER. LINEARITY** with the MENU ▽/△ key. 15. Set the initial setting value of **4. VER. LINEARITY** with the MENU – / + key. 16. Select **5. VER. SCURVE** with the MENU ▽/△ key. 17. Set the initial setting value of **5. VER. SCURVE** with the MENU – / + key. 18. Adjust VER. LINEARITY and VER. SCURVE so that the spaces of each line on TOP, CENTER and BOTTOM become uniform.
				19. Make sure that the adjustment is properly done on the screen of 60Hz mode. 20. Press the DISPLAY key twice to return to the normal screen. **[NOTE]** ● When adjust in 60Hz mode, only 60Hz mode is adjust.

VSM PRESET ADJUSTMENT

Item	Measuring instrument	Test point	Adjustment part	Description
Setting of VSM PRESET	**Remote control unit**		**TINT** **COLOUR** **BRIGHT** **CONT.** **SHARP**	(VSM PRESET) 1. Select **4. VSM PRESET** from the SERVICE MENU. 2. Select BRIGHT with the PICTURE MODE key. 3. Adjust the MENU ▽/△ key and MENU – or + key to reset the set values of **TINT ~ SHARP** to the values shown in the table. 4. Respectively select the VSM PRESET mode for SOFT and STANDARD, and make similar adjustment as in 3 above. 5. Press the DISPLAY key twice to return to the normal screen.

SUB MENU 4. VSM PRESET

[Setting Values for SUB MENU 4. VSM PRESET]

VSM preset mode / VSM Setting item	BRIGHT	STANDARD	SOFT
TINT SETTING VALUE	+15	←	←
COLOUR SETTING VALUE	+15	←	←
BRIGHT SETTING VALUE	+15	←	←
CONT. SETTING VALUE	+30	+15	+11
SHARP SETTING VALUE	+15	+15	+12

: Do not adjust.

PRESET ADJUSTMENT

- **No adjustment is necessary.**
- **Adjust only when you had changed the value by miss operation.**

[SUB MENU 5. PRESET]

Colour system / Setting item		Initial setting value			
		PAL	SECAM	NTSC 3.58	NTSC 4.43
1. C-TRAP FIX		1	←	←	←
2. SHARP PEAK		0	←	←	←
3. ABL		1	←	←	←
4. GAMMA		0	←	←	←
5. Y.DELAY TIME	TV	0	2	2	3
	VIDEO	0	2	0	2
6. BLACK EXP START		3	←	←	←
7. C-BPF	TV	1	←	0	←
	VIDEO	1	←	←	←
8. CW/SCP		0	←	←	←
9. V.IF DET. LEVEL		0	←	←	←
11. IF AGC MIN.		0	←	←	←
12. V.IF AGC		0	←	←	←
13. V.IF PMOD		0	←	←	←
19. VNR		15	←	←	←
20. RGB LIM.		1	←	←	←
21. RGB LIMIT LEVEL		2	←	←	←
23. TEXT H. POSITION		–3	←	←	←
24. READ DATA		———	———	———	———

: Do not adjust.

TV RF system / Setting item	Initial setting value			
	B/G	I	D/K	M
10. S.IF DET. LEVEL	0	←	←	←
14. S.IF BPF BW ADJUST	0	←	←	←
15. S.IF TRAP FO ADJUST	0	←	←	←
16. S.IF TRAP FO ADJUST 2	0	←	←	←
17. S.IF-TRAP	0	←	←	←
18. S.IF-BPF	0	←	←	1
22. S.IF SW	1	←	←	0

: Do not adjust.

PURITY, CONVERGENCE

PURITY ADJUSTMENT

1. Demagnetize CRT with the demagnetizer.
2. Loosen the retainer screw of the deflection yoke.
3. Remove the wedges. (Fig. 1.)
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 cross-hatch 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 cross-hatch signal.

2. Using 4-pole convergence magnets, overlap the red and blue lines in the center of the screen (Fig. 1) to 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 to 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 center. (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.

Fig. 2

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

Fig. 3

SELF-CHECK FUNCTIONS

1. Outline

This model has self-check functions given below. When an abnormality has been detected, the SUB POWER is turned off and the ON TIMER LED flashes to inform of the failure. An abnormality is detected by the signal input state of the control line connected to the microcomputer.

2. Self-check items

Check item	Details of detection	Method of detection	State of abnormality
Over-current protection	An over-current on the low B line is detected.	The main microcomputer detects the possible abnormality at 20-msec. intervals and judges the results in every 24 time. Of the 24 times, if NG is detected more than 13 times, it is judged that there is an abnormality.	When an abnormality has been detected, the SUB-POWER is turned off. While the SUB-POWER is being turned off, the POWER key on the remote control unit is not operational until the power cord is taken out and put in again.
CRT NECK protection	Operation of CRT NECK protection circuit	DITTO	DITTO

3. Self-check indicating function

When an abnormality has been detected at about 3 seconds after the power is turned on, the SUB POWER is turned off immediately and the ON TIMER LED flashes.

[Indication by the LED]

Item	LED flashing intervals
Over-current and CRT NECK protection	At 0.24-second intervals

PARTS LIST

CAUTION

- The parts identified by the ⚠ symbol are important for the safety. Whenever replacing these parts, be sure to use specified ones to secure the safety.
- The parts not indicated in this Parts List and those which are filled with lines — in the Parts No. columns will not be supplied.
- P. W. Board Ass'y will not be supplied, but those which are filled with the Parts No. in the Parts No. columns will be supplied.

ABBREVIATIONS OF RESISTORS, CAPACITORS AND TOLERANCES

RESISTORS		CAPACITORS	
C R	Carbon Resistor	C CAP.	Ceramic Capacitor
F R	Fusible Resistor	E CAP.	Electrolytic Capacitor
P R	Plate Resistor	M CAP.	Mylar Capacitor
V R	Variable Resistor	HV CAP.	High Voltage Capacitor
HV R	High Voltage Resistor	MF CAP.	Metalized Film Capacitor
MF R	Metal Film Resistor	MM CAP.	Metalized Mylar Capacitor
MG R	Metal Glazed Resistor	MP CAP.	Metalized Polystyrol Capacitor
MP R	Metal Plate Resistor	PP CAP.	Polypropylene Capacitor
OM R	Metal Oxide Film Resistor	PS CAP.	Polystyrol Capacitor
CMF R	Coating Metal Film Resistor	TF CAP.	Thin Film Capacitor
UNF R	Non-Flammable Resistor	MPP CAP.	Metalized Polypropylene Capacitor
CH V R	Chip Variable Resistor	TAN. CAP.	Tantalum Capacitor
CH MG R	Chip Metal Glazed Resistor	CH C CAP.	Chip Ceramic Capacitor
COMP. R	Composition Resistor	BP E CAP.	Bi-Polar Electrolytic Capacitor
LPTC R	Linear Positive Temperature Coefficient Resistor	CH AL E CAP.	Chip Aluminum Electrolytic Capacitor
NETW R	Network Resistor	CH AL BP CAP.	Chip Aluminum Bi-Polar Capacitor
		CH TAN. E CAP.	Chip Tantalum Electrolytic Capacitor
		CH AL BP E CAP.	Chip Tantalum Bi-Polar Electrolytic Capacitor

TOLERANCES									
F	G	J	K	M	N	R	H	Z	P
±1%	±2%	±5%	±10%	±20%	±30%	+30% –10%	+50% –10%	+80% –20%	+100% –0%

CONTENTS

■ P.W. BOARD 28
■ EXPLODED VIEW PARTS LIST 28
■ EXPLODED VIEW 29
■ PRINTED WIRING BOARD PARTS LIST
● MAIN PW BOARD ASS'Y 30
■ PACKING 34
■ PACKING PARTS LIST 34
■ REMOTE CONTROL UNIT PARTS LIST 34

P.W. BOARD

P.W.B. ASS'Y	Part No.
MAIN P.W.B.	SCG-1247A-H2

EXPLODED VIEW PARTS LIST

⚠	Ref.No.	Part No.	Part Name	Description	Local
⚠	V01	A51LMV20X	PICTURE TUBE		
	DY01	CE20336-00A	DEF YOKE		
⚠	L01	QQW0006-001	DEGAUSSING COIL		
⚠	T1522	QQH0069-001	H.V. TRANSF.		
	1	GG10047-002A-H	FRONT CABINET ASSY		
	2	CM43094-009-H	JVC MARK		
	3	CM36375-001-H	CDS WINDOW		
	4	CM36516-004-H	POWER KNOB		
	5	CM35235-012-H	SPRING		
	6	CM36518-001-H	LED LENS		
	7	CM36517-004-H	CONTROL KNOB		
	8	CE42153-00AJ1	WEDGE ASSY	(x4)	
	9	A75034-B	PC MAGNET	or CE42378-00B	
	10	CHGB0016-0B-FH	BRAIDED ASSY		
	11	A48457-3-H	SPRING		
	12	CEBSS09D-05KJ2	SPEAKER	(x2) SP01	
	13	CM48144-002-H	PB STOPPER		
⚠	14	CM12863-002-MH	REAR COVER		
⚠	15	LC20377-010B-H	RATING LABEL		
	16	QYSBSF3010Z	TAPPING SCREW		
⚠	17	CM23167-A01-H	CORD CLAMP		
⚠	18	QMP40D0-200J5	POWER CORD	or QMP40D0-200J3	
	19	QYSBSFG4016Z	TAPPING SCREW	(x6)	
	20	CM36617-B01-H	BACK BOARD		