

# JVC

## SERVICE MANUAL

### COLOUR TELEVISION

BASIC CHASSIS

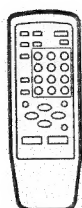
CG

## AV-F21M3

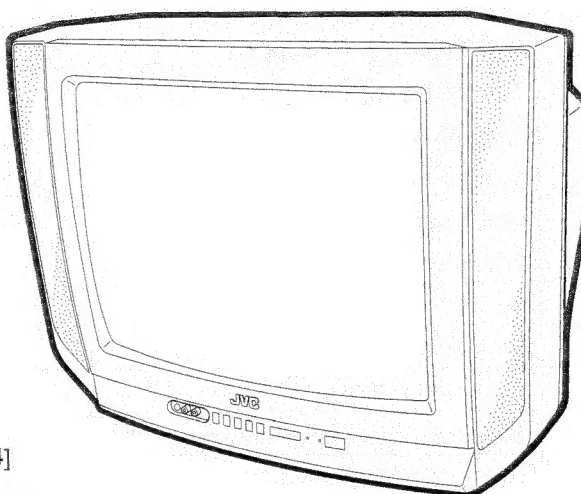
## AV-F21M3<sub>(-A)</sub>

## AV-F21T3

## AV-F21T3<sub>(-A)</sub>



[RM-C364]



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# SPECIFICATIONS

Item		Content	
		AV-F21M3 / (-A)	AV-F21T3 / (-A)
<b>Dimensions(W×H×D)</b>		61.9cm × 45.8cm × 48.7cm	
<b>Mass</b>		22kg	
<b>TV RF System</b>		B / G, I, D / K, K1, M	B / G, I, D / K, K1
<b>Colour System</b>	TV Mode	PAL / SECAM / NTSC3.58 / NTSC4.43	PAL / SECAM
	VIDEO Mode	PAL / SECAM / NTSC3.58 / NTSC4.43	
<b>Receiving Frequency</b>	VHF (VL)	46.25MHz~168.25MHz	
	VHF (VH)	175.25MHz~463.25MHz	
	UHF	471.25MHz~863.25MHz	
	CATV	<ul style="list-style-type: none"> <li>● Cable TVs of Mid (X-Z, S1-S10)</li> </ul> Super (S11-S20) & Hyper (S21-S41) bands receivable	
<b>Intermediate Frequency</b>	VIF Carrier	38.0MHz	
	SIF Carrier	32.5MHz(5.5MHz) 31.5MHz (6.5MHz) 32.0MHz (6.0MHz)	
<b>Colour Sub Carrier Frequency</b>		PAL (4.43MHz), SECAM (4.40625MHz / 4.25MHz) NTSC (3.58MHz / 4.43MHz)	
<b>Aerial Input Terminal</b>		75Ω Unbalanced	
<b>Power Input</b>	Rated Voltage	110~240VAC, 50 / 60Hz	
<b>Power Consumption</b>		100W (Max.) / 67W (Avg.)	
<b>Picture Tube</b>		Visible size : 51cm measured diagonally	
<b>High Voltage</b>		26.5kV±1.5kV(at zero beam current)	
<b>Speaker</b>		6cm × 12 cm Oval type × 2	
<b>Audio Output</b>		5W (monaural)	
<b>Input</b>	Video	1Vp-p, 75Ω, RCA × 2	
	Audio	500mVrms (-4dBs), High impedance, RCA × 2	
<b>Output</b>	Video	1Vp-p, 75Ω, RCA × 1	
	Audio	500mVrms (-4dBs), Low impedance, RCA × 1	
	Headphone jack	Mimi jack (φ 3.5mm)	
<b>Remote Control Unit</b>		RM-C364 (Battery size : AA / R06 / UM-3 × 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 ( $\Delta$ ) 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.
- 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 : ( $\perp$ ) side GND, the ISOLATED(NEUTRAL) : ( $\pm$ ) side GND and EARTH : ( $\oplus$ ) 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 10k $\Omega$  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.

## 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, 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 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

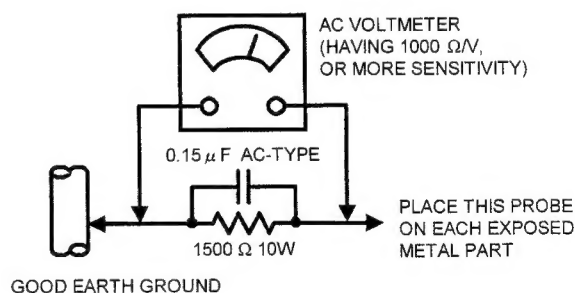
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known 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 1500 $\Omega$  10W resistor paralleled by a 0.15 $\mu$ F 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 an interactive on-screen control.
- Wide range voltage (110V~240V) AC power input.
- With AUDIO / VIDEO INPUT & OUTPUT terminal.
- 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<sup>2</sup>C bus control utilizes single chip ICs for IF, V/C, DEF. VSM PRESET, PRESET & TURBO TIMER.
- 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 / of contrast of the picture can be adjusted automatically to make the optimum picture which is easy on the eye.
- Built – in ON TIMER, RETURN + & CHILD LOCK.

# MODEL ID. (IDENTIFICATION) / MAIN DIFFERENCE LIST

## MODEL IDENTIFICATION

While referring to the illustration given below, identify each model No. on the rating label affixed to the rear cover of TV set.

△	MODEL No.	AV-F21M3 AV-F21T3	AV-F21M3(-A) AV-F21T3(-A)
△	Parts Name		
△	RATING LABEL	LC20377-010A-H	LC20413-002A-H

## MAIN DIFFERENCE LIST

△	MODEL No.	AV-F21M3	AV-F21M3(-A)	AV-F21T3	AV-F21T3(-A)
△	Parts Name				
△	POWER CORD	QMP40D0-200J5	QMPR010-200-E2	QMP40D0-200J5	QMPR010-200-E2
△	RATING LABEL	LC20377-010A-H	LC20413-002A-H	LC20377-010A-H	LC20413-002A-H
	PACKING CASE	LC10453-014A-H	CP11781-061-H	LC10453-020A-H	CP11781-070-H
△	INST. BOOK	LCT0404-001A-H	←	←	←
△	INST. BOOK	LCT0405-001A-H	X	X	X
△	DIGEST MANUAL	X	LTC0443-001A-H	LTC0440-001A-H	LTC0443-001A-H
	CONVERSION PLUG	X	QAM0055-001	X	QAM0055-001

# SPECIFIC SERVICE INSTRUCTIONS

## DISASSEMBLY PROCEDURE

### REMOVING THE REAR COVER

1. Unplug the power supply cord.
2. Remove the 6 screws marked (A) and a screw marked (B) as shown in figure.
3. Withdraw the rear cover toward you.

### REMOVING THE MAIN PW BOARD

- After removing the rear cover.
1. Slightly raise the both sides of the MAIN PW BOARD by hand.
  2. Withdraw the MAIN PW BOARD backward.  
(If necessary, take off the wire clamp, connectors etc.)

### REMOVING THE SPEAKER

- After removing the rear cover.
1. Remove the 2 screws marked (C) as shown in figure.
  2. Follow the same steps when removing the other hand speaker.

### CHECKING THE MAIN PW BOARD

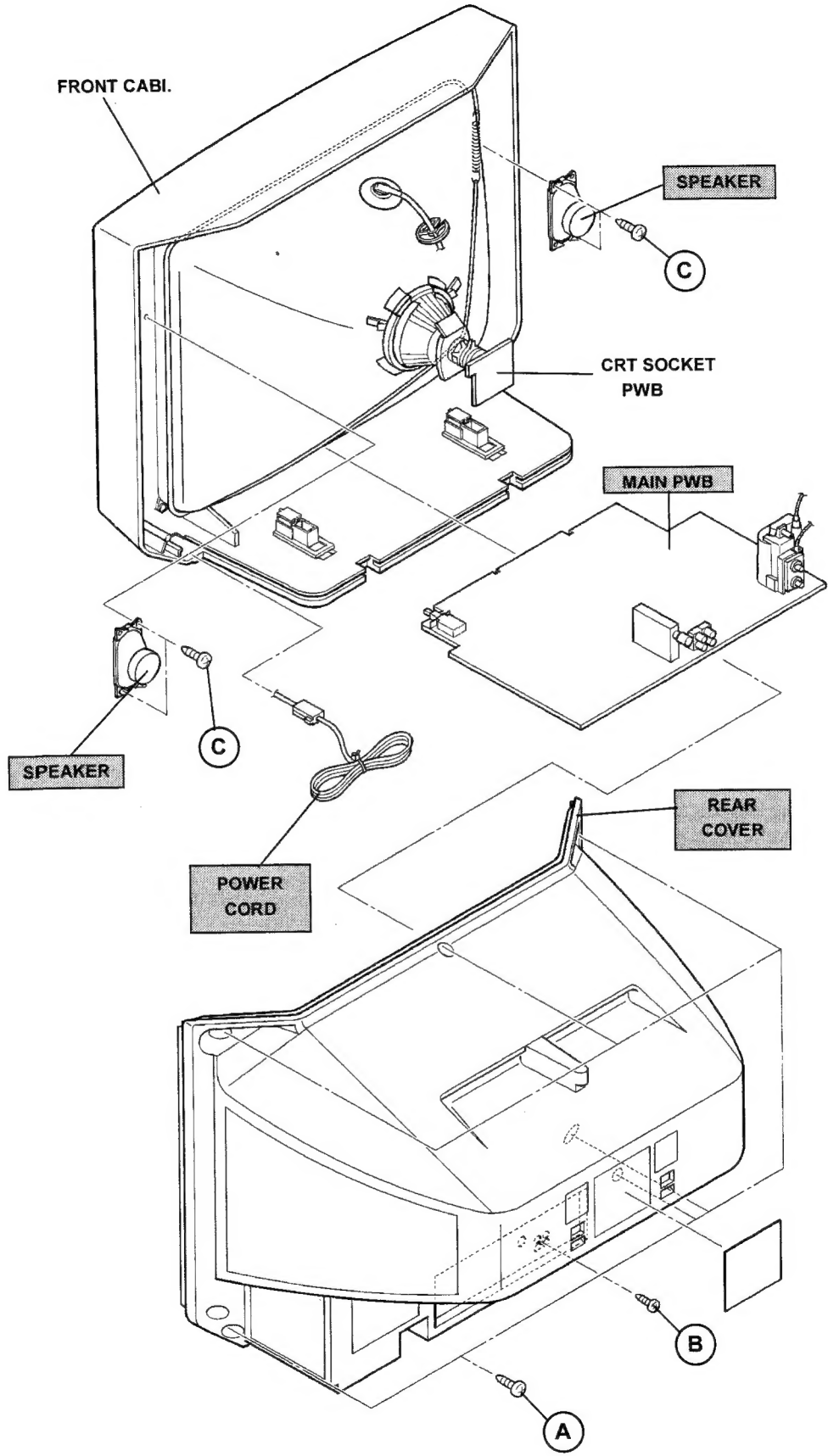
1. To check the back side of the PW Board.
  - 1) Pull out the MAIN PW Board. (Refer to REMOVING THE MAIN PW Board)
  - 2) Erect the PW Board vertically so that you can easily check the back side of the PW Board.

#### [CAUTION]

- When erecting the 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 connector 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.



## REPLACEMENT OF MEMORY ICs

### 1. MEMORY ICs

This TV uses memory ICs. In the memory ICs are memorized data for correctly operating the video and deflection circuits. When replacing memory ICs, be sure to use ICs written with the initial values of data.

### 2. PROCEDURE FOR REPLACING MEMORY ICs

#### (1) Power off

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

#### (2) Replace ICs

Be sure to use memory ICs 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 set SYSTEM CONSTANT SET:

- It must not adjust without signal.

- 1) Press the DISPLAY key and the PICTURE MODE key of the REMOTE CONTROL UNIT simultaneously.
- 2) The SERVICE MENU screen of Fig. 1 will be displayed.
- 3) While the SERVICE MENU on display, press the DISPLAY key and PICTURE MODE key simultaneously, and the SYSTEM CONSTANT SET screen of Fig. 2 will be displayed
- 4) Check the setting value of the SYSTEM CONSTANT SET of Table 1. If the value is different, select the setting item with the MENU  $\nabla/\Delta$  key, and set the correct value with the MENU - / + key.
- 5) Press the DISPLAY key twice, and return to the normal screen.

#### (5) Receive channel of setting

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

#### (6) User Setting

Check the user setting value of 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 items of the SERVICE MENU of Table 3, and reset where necessary.

For setting, refer to the **SERVICE ADJUSTMENTS**.

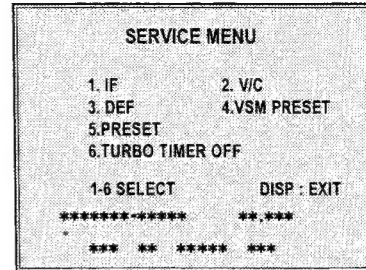


Fig. 1

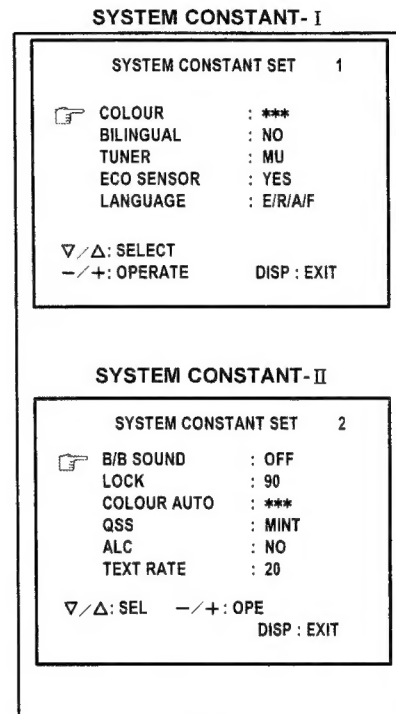
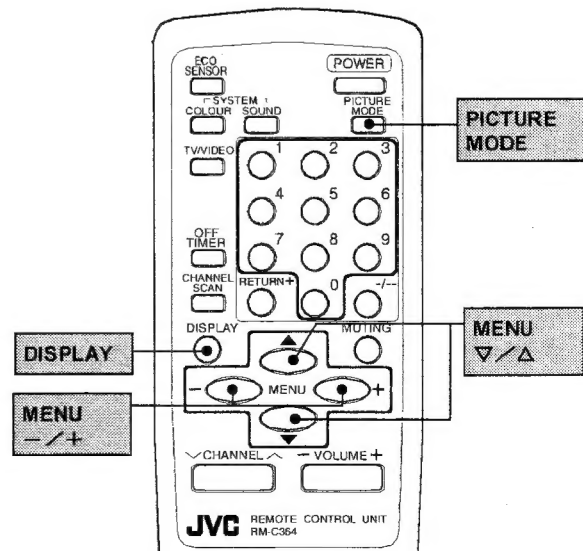


Fig.2

#### NAME OF REMOTE CONTROL KEY



## REPLACEMENT OF IC301 (IF V/C DECODER)

- For the IC301(IF V/C DECODER) of this model, all data are written in the micro-computer. So, write the data in the micro-computer in accordance with the following procedures before starting adjustment.

- While pressing **MENU** button and **VOL+** button on the **FRONT CABINET** simultaneously, turn the **POWER** on. When the **POWER** is turned on, the data is written in the micro-computer immediately.

### REPLACING PROCEDURES

- Turn the **POWER** off.
- Replace the **IC301** with a new one.

### SETTING OF SYSTEM CONSTANT SET

Setting item	Setting contents	Setting value			
		AV-F21M3	AV-F21M3(-A)	AV-F21T3	AV-F21T3(-A)
COLOUR	▶ MULTI. → TRIPLE → PAL ◀	MULTI.	←	TRIPLE	←
BILINGUAL	▶ YES → NO ◀	NO	←	←	←
TUNER	▶ MU → MA ◀	MU	←	←	←
ECO SENSOR	▶ YES → NO ◀	YES	←	←	←
LANGUAGE	▶ E/R/A/F → E/A/F → E/A → E/F ◀	E/R/A/F	←	←	←
B/B SOUND	▶ ON → OFF ◀	OFF	←	←	←
LOCK	YES ↔ 10 ↔ 20 ↔ ~ ↔ 230 ↔ 240 ↔ 250	90	←	←	←
COLOUR AUTO	▶ YES → NO ◀	NO	YES	NO	YES
QSS	▶ MINT → MQSS ◀	MINT	←	←	←
ALC	▶ YES → NO ◀	NO	←	←	←
TEXT RATE	1 ↔ 10 ↔ 20 ↔ 40 ↔ 80	20	←	←	←

Table 1

### USER SETTING VALUES

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

Table 2

**SERVICE MENU SETTING ITEMS**

Service menu	Setting item	Service menu	Setting item
1. IF	1. VCO 2. DELAY POINT	5. PRESET (RF CIRCUIT)	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. VIF DET. LEVEL 10. SIF DET. LEVEL 11. IF AGC MIN. 12. VIF AGC 13. VIF P MOD 14. SIF BPF BW ADJUST 15. SIF TRAP FO ADJUST 16. SIF TRAP FO ADJUST 2 17. SIF -TRAP 18. SIF -BPF 19. VNR 20. RGB LIM. 21. RGB LIMIT LEVEL 22. SIF SW 23. TEXT H. POSITION 24. READ DATA  <b>DO NOT ADJUST</b>
2. V/C	1. CUT OFF (R/G/B) 2. DRIVE (R/B) 3. BRIGHT 4. CONT. 5. COLOUR (P/S/N3/N4) 6. TINT (N3/N4) 7. SECAM BL ADJUST 8. SHARP (TV/VIDEO)		
3. DEF.	1. VER. POSITION 2. HOR. POSITION 3. VER. HEIGHT 4. VER. LINEARITY 5. VER. SCURVE 6. HOR. VCO ADJUST		
4. VSM PRESET (BRIGHT/STD/SOFT)	TINT COLOUR BRIGHT CONT. SHARP	6. TURBO TIMER	ON or OFF <b>(Should be OFF)</b>
		<div style="border: 1px solid black; padding: 5px;"> <p>* If it is ON, the timer in TIMER mode changes from 1 minute into 1 sec temporarily. (It is easier to checks the Operation of TIMER) If you turn the TV power off, this setting becomes OFF automatically.</p> </div>	

Table 3

# SERVICE ADJUSTMENTS

## BEFORE STARTING SERVICE ADJUSTMENT

1. There are 2 way of 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 staring 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 condensers) 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.

PICTURE MODE (VSM)	BRIGHT
VNR	OFF
TINT / COLOUR BRIGHT / CONT. / SHARP	Refer to VSM PRESET Value
BLUE BACK	OFF
OFF TIMER	OFF
ECO SENSOR	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 ITEMS

Adjustment item	Adjustment item
B1 POWER SUPPLY	V/C (Video / Chrom) circuit adjustment
FOCUS adjustment	DEF. circuit adjustment
	VSM PRESET setting
	PRESET adjustment
IF circuit adjustment	PURITY, CONVERGENCE

## BASIC OPERATION OF 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 ..... This mode adjusts the setting values of the IF circuit.
- 2. V/C ..... This mode adjusts the setting values of the VIDEO/CHROMA circuit.
- 3. DEF. .... This mode adjusts the setting value of the DEFLECTION circuit.
- 4. VSM PRESET ..... For setting the values of STANDARD, SOFT and BRIGHT. (VSM : video status memory)
- 5. PRESET ..... This mode adjusts the setting value of the RF circuit (Do not adjust).
- 6. TURBO TIMER ..... For quick setting the value of TIMER COUNT adjustable not only by minutes but also by second. (Should be OFF)

3. BASIC OPERATION OF SERVICE MENU

(1) How to enter SERVICE MENU

Press the DISPLAY key and the PICTURE MODE key of the REMOTE CONTROL UNIT simultaneously.  
The SERVICE MENU screen of Fig. 1 will be displayed.

(2) Selection of SUB MENU SCREEN

Press one of the keys 1 ~ 6 of the REMOTE CONTROL UNIT, and select the SUB MENU SCREEN (See Fig.2) from the SERVICE MENU.

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

SERVICE MENU

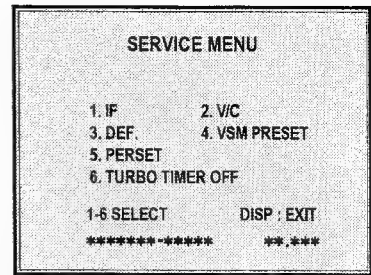


Fig. 1

SUB MENU SCREEN

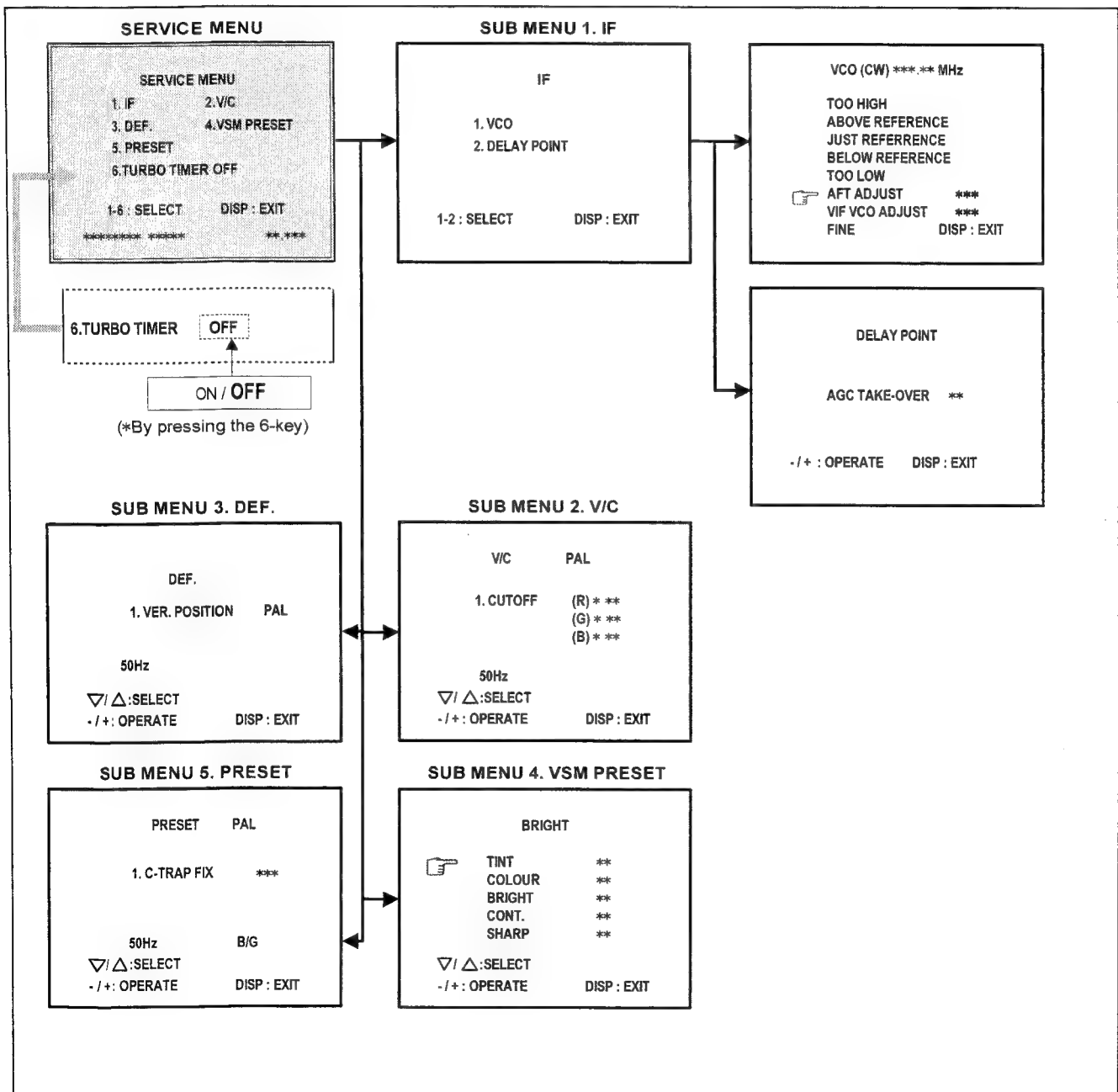


Fig. 2

**(3) Method of Setting**

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

**1. IF**

[1. VCO]

- ① 1 Key ..... Select **1. IF**.
- ② 1 Key ..... Select **1. VCO. (CW)**
- ③ The VCO(CW) screen will be displayed in yellow when the AFC voltage is at a certain level and in blue when it is at other levels.
- ④ DISPLAY Key ..... When this is pressed twice, you will return to the **SERVICE MENU**.

[2. DELAY POINT]

- ① 1 Key ..... Select **1. IF**.
- ② 2 Key ..... Select **2. DELAY POINT**.
- ③ MENU - / + Key ..... Set (adjust) the setting values of the setting items.
- ④ DISPLAY Key ..... When this is pressed twice, you will return to the **SERVICE MENU**.

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

- ① 2, 3, 4 Keys ..... Select one from **2. V/C, 3.DEF. and 4. VSM PRESET**
- ② MENU ▽ / △ key ..... Select setting items.
- ③ MENU - / + Key ..... Set (adjust) the setting values of the setting items.
- ④ DISPLAY Key ..... When this is pressed, you will return to the **SERVICE MENU**.

**5. PRESET (DO NOT ADJUST)**

- ① 5 Keys ..... Select **5. PRESET**.
- ② MENU ▽ / △ key ..... Select setting item.
- ③ MENU - / + Key ..... Set (adjust) the setting values of the setting item.
- ④ DISPLAY Key ..... When this is pressed, you will return to the **SERVICE MENU**.

**6. TURBO TIMER**

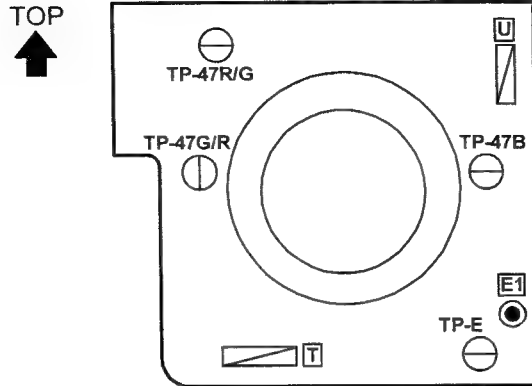
- ① By pressing the 6-key, you can change the ON or OFF(should be **OFF**)

**(4) Release of SERVICE MENU**

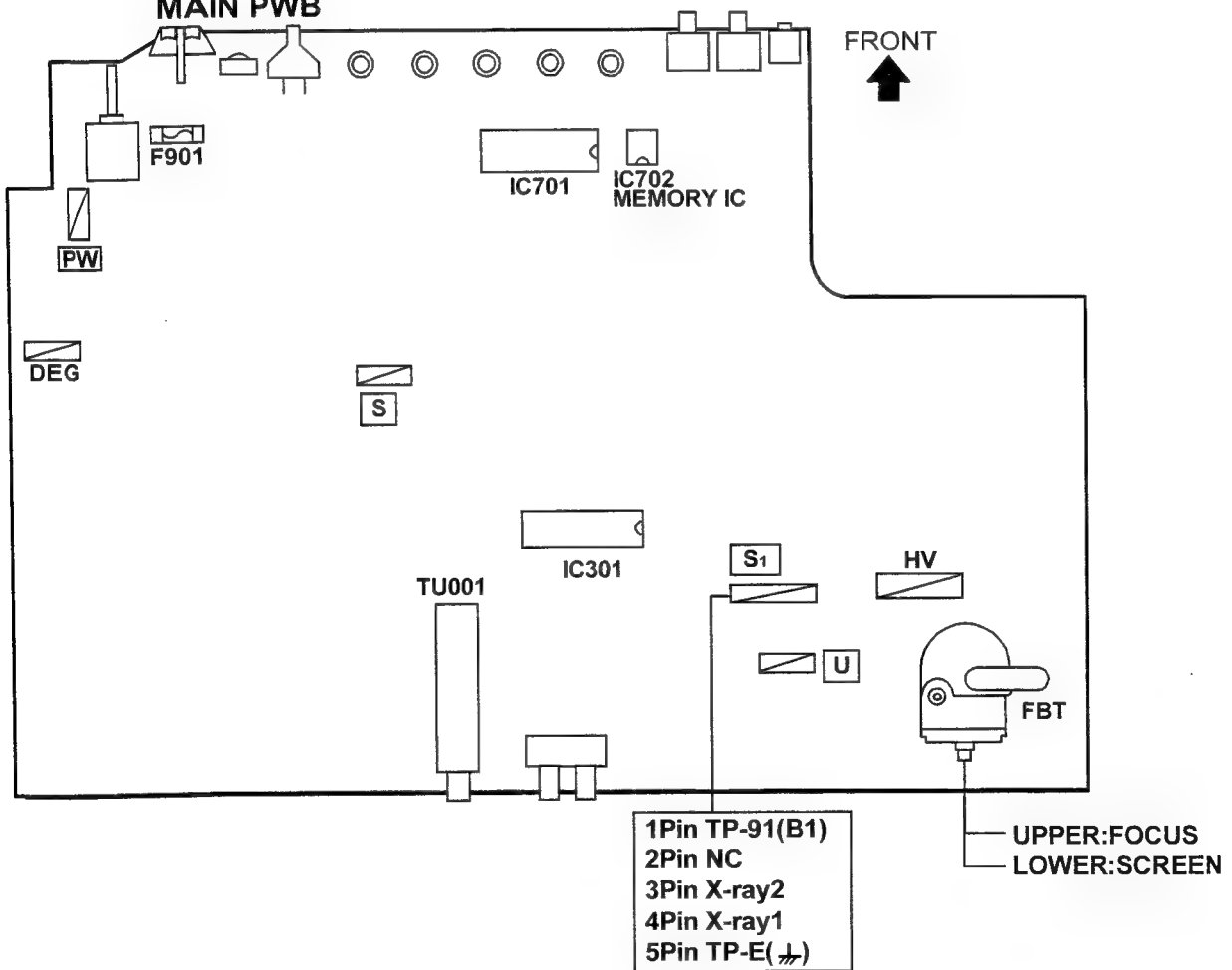
After completing the setting, return to the SERVICE MENU, then again press the DISPLAY key.

## ADJUSTMENT LOCATIONS

**CRT SOCKET 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 (↔)		<ol style="list-style-type: none"> <li>1. Receive a whole black signal.</li> <li>2. Connect a DC voltmeter to TP-91(B1) and TP-E (↔).</li> <li>3. Make sure that the voltage is <math>DC114.5 \pm 1.5V</math>.</li> </ol>

## FOCUS ADJUSTMENT

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of FOCUS	Signal generator		FOCUS VR [In FBT]	<ol style="list-style-type: none"> <li>1. Receive a cross-hatch signal.</li> <li>2. While watching the screen, adjust the FOCUS VR to make the vertical and horizontal lines as fine and sharp as possible.</li> <li>3. Make sure that when the screen is darkened, the lines remain in good focus.</li> </ol>

## IF CIRCUIT ADJUSTMENT

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of VCO(CW)	Remote control unit		VCO(CW) TRANSF.	<p>* It must not adjust without signal.</p> <ol style="list-style-type: none"> <li>1. Receive a COLOUR BAR SIGNAL(210.25MHz).</li> <li>2. Select 1. IF from the SERVICE MENU.</li> <li>3. Press 1 key and select 1. VCO to display VCO SCREEN.</li> <li>4. Select VCO ADJUST with MENU <math>\nabla/\Delta</math> key and make sure that the set-up value is shown as +00. Then check the items 5 and 6 below.</li> <li>5. With MENU -/+ key, change the value from +00 to -01 and make sure that the colour of the characters TOO LOW changes to YELLOW. Then return the value to +00.</li> <li>6. With MENU -/+ key, change the value from +00 to +01 and make sure that the colour of the characters TOO HIGH changes to YELLOW. Then return the value to +00.</li> <li>7. Select AFT ADJUST with MENU <math>\nabla/\Delta</math> key. Then press MENU -/+ key until the characters JUST REFERENCE changes from blue to YELLOW.</li> <li>8. Press the DISPLAY key three times to return to normal screen.</li> </ol> <p>◆ If you cannot check the colour change of the characters within the range of <math>\pm 01</math> as explained in item 5 and 6 above, use the <math>\pm 02</math> range for checking.</p>

VCO (CW) \*\*\*.\*\* MHz ← fv

TOO HIGH ABOVE REFERENCE

JUST REFERENCE ← YELLOW

BELOW REFERENCE

TOO LOW

AFT ADJUST \*\*\*

VCO ADJUST \*\*\*

FINE ← Do not adjust

DISP : EXIT

ADJUSTMENT ITEM	SET-UP VALUE
VCO ADJUST	+00(**)
AFT ADJUST	+00(**)

**SET-UP VALUE**

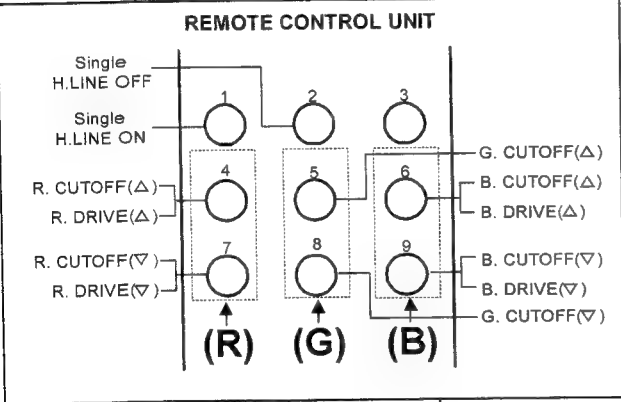
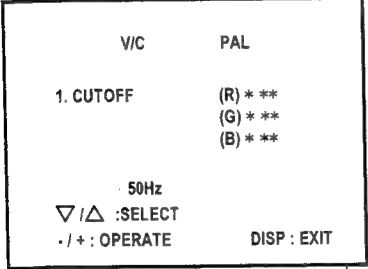
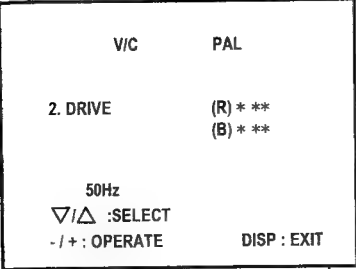
Item	Measuring instrument	Test point	Adjustment part	Description						
Adjustment of DELAY POINT (AGC)	Remote control unit		DELAY POINT (AGC TAKE-OVER)	<ol style="list-style-type: none"> <li>1. Receive a black and white signal (colour off).</li> <li>2. Select <b>1. IF</b> from the SERVICE MENU.</li> <li>3. Select <b>2. DELAY POINT</b> by pressing the <b>2</b> key on the remote control.</li> <li>4. Adjust the MENU - or + key until video noise disappears.</li> <li>5. Turn to other channels and make sure that there are no irregularities.</li> </ol>						
					<table border="1"> <thead> <tr> <th>Setting (adjustment) item</th> <th>Variable range</th> <th>Initial setting value</th> </tr> </thead> <tbody> <tr> <td rowspan="2">DELAY POINT (AGC TAKE-OVER)</td> <td>NTSC 3.58(M)</td> <td>0~63</td> <td>+51</td> </tr> <tr> <td>OTHER</td> <td></td> <td>+48</td> </tr> </tbody> </table>	Setting (adjustment) item	Variable range	Initial setting value	DELAY POINT (AGC TAKE-OVER)	NTSC 3.58(M)
Setting (adjustment) item	Variable range	Initial setting value								
DELAY POINT (AGC TAKE-OVER)	NTSC 3.58(M)	0~63	+51							
	OTHER		+48							
<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">DELAY POINT</td> </tr> <tr> <td style="text-align: center;">AGC TAKE-OVER **</td> </tr> <tr> <td style="text-align: center;">-/+ : OPERATE    DISP : EXIT</td> </tr> </table>					DELAY POINT	AGC TAKE-OVER **	-/+ : OPERATE    DISP : EXIT			
DELAY POINT										
AGC TAKE-OVER **										
-/+ : OPERATE    DISP : EXIT										

### V / C CIRCUIT ADJUSTMENT

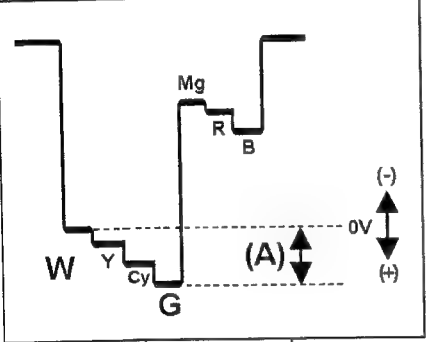
The setting (adjustment) using the REMOTE CONTROL UNIT is made on the basis of the initial setting values.  
The setting values which adjust the screen to the optimum condition can be different from the initial setting values.

- Do not change the initial setting values of the setting items not listed in "ADJUSTMENT".

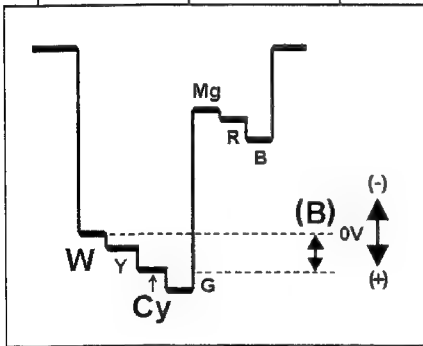
Setting item	Colour system	Variable range	Initial setting value			
			PAL	SECAM	VIDEO	
					NTSC 3.58	NTSC 4.43
1. CUT OFF	RED	-128~+127	-50	←	←	←
	GREEN		-50			
	BLUE		-50			
2. DRIVE	RED	-128~+127	+0	←	←	←
	BLUE		+0			
3. BRIGHT		-124~+127	+0	←	—	—
4. CONT.		-63~+63	+0	←	←	←
5. COLOUR		-63~+63	+0	←	←	←
6. TINT	TV	-63~+63	—	—	+0	←
	VIDEO		—	—	+19	←
7. SECAM BL ADJ.		-32~+31	—	+0	—	—
8. SHARP (Do Not Adj.)	TV	-32~+31	-5	←	←	←
	VIDEO		+15			

Item	Measuring instrument	Test point	Adjustment part	Description										
<p><b>Adjustment of WHITE BALANCE (Low light)</b></p>	<ul style="list-style-type: none"> <li>● Signal generator</li> <li>● Remote control unit</li> </ul>		<p>1. <b>CUT OFF (R)</b> <b>CUT OFF (G)</b> <b>CUT OFF (B)</b></p> <p><b>SCREEN VR (IN FBT)</b></p>	<ol style="list-style-type: none"> <li>1. Receive a black and white signal (colour off).</li> <li>2. From the SERVICE MENU, select 2. V/C to display 1. CUT OFF (R), (G) and (B).</li> <li>3. Set each value to initial setting value with 4~9 keys of the remote control unit.</li> <li>4. Press the 1 key of the remote control unit to produce a single horizontal line.</li> <li>5. Turn the <b>SCREEN VR</b> fully counter-clockwise, then slowly turn it clockwise to where a red, blue and green colour is faintly visible.</li> <li>6. Use keys 4~9 of the remote control unit and adjust the other 2 colours to where the single horizontal line appears white.</li> <li>7. Turn the <b>SCREEN VR</b> to where the single horizontal line glows faintly.</li> <li>8. Press the 2 key to return to 1. CUT OFF screen.</li> <li>9. Press the DISPLAY key twice to return to the normal screen.</li> </ol>										
														
														
<table border="1" data-bbox="874 958 1470 1144"> <thead> <tr> <th>Setting (Adjustment) item</th> <th>Variable range</th> <th>Initial setting value</th> </tr> </thead> <tbody> <tr> <td rowspan="3">1. CUT OFF</td> <td>R</td> <td>-128~+127</td> </tr> <tr> <td>G</td> <td>-128~+127</td> </tr> <tr> <td>B</td> <td>-128~+127</td> </tr> </tbody> </table>					Setting (Adjustment) item	Variable range	Initial setting value	1. CUT OFF	R	-128~+127	G	-128~+127	B	-128~+127
Setting (Adjustment) item	Variable range	Initial setting value												
1. CUT OFF	R	-128~+127												
	G	-128~+127												
	B	-128~+127												
<p><b>Adjustment of WHITE BALANCE (High light)</b></p>	<ul style="list-style-type: none"> <li>● Signal generator</li> <li>● Remote control unit</li> </ul>		<p>2. <b>DRIVE (R)</b> <b>DRIVE (B)</b></p>	<ol style="list-style-type: none"> <li>1. Receive a black and white signal (colour off).</li> <li>2. From the SERVICE MENU, select 2. V/C.</li> <li>3. Select 2. <b>DRIVE (R) / (B)</b> with MENU <math>\nabla/\Delta</math> key, and set each value to initial setting value with 4 and 7 or 6 and 9 keys of the remote control unit.</li> <li>4. Use the keys 4 and 7 or 6 and 9 to produce a white screen</li> <li>5. Press the DISPLAY key twice to return to the normal screen.</li> </ol>										
														
<table border="1" data-bbox="882 1720 1478 1872"> <thead> <tr> <th>Setting (Adjustment) item</th> <th>Variable range</th> <th>Initial setting value</th> </tr> </thead> <tbody> <tr> <td rowspan="2">2. DRIVE</td> <td>R</td> <td>-128~+127</td> </tr> <tr> <td>B</td> <td>-128~+127</td> </tr> </tbody> </table>					Setting (Adjustment) item	Variable range	Initial setting value	2. DRIVE	R	-128~+127	B	-128~+127		
Setting (Adjustment) item	Variable range	Initial setting value												
2. DRIVE	R	-128~+127												
	B	-128~+127												

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of SUB BRIGHT	● Remote control unit		3. BRIGHT	<ol style="list-style-type: none"> <li>1. Receive any broadcast.</li> <li>2. Select 2. V/C from SERVICE MENU.</li> <li>3. Select 3. BRIGHT with the MENU <math>\nabla/\Delta</math> key.</li> <li>4. Set the initial setting value with the MENU - or + key.</li> <li>5. If the brightness is not the best with the initial set value, make fine adjustment until you get the best brightness.</li> </ol>
Adjustment of SUB CONT.	● Remote control unit		4. CONT.	<ol style="list-style-type: none"> <li>1. Receive any broadcast.</li> <li>2. Select 2. V/C from SERVICE MENU.</li> <li>3. Select 4. CONT. with the MENU <math>\nabla/\Delta</math> key.</li> <li>4. Set the initial setting value with the MENU - or + key.</li> <li>5. If the contrast is not the best with the initial set value, make fine adjustment until you get the best contrast.</li> </ol>
Adjustment of SUB COLOUR I	● Remote control unit		5. COLOUR	[Method of adjustment without measuring instrument]
			PAL COLOUR	<b>(PAL COLOUR)</b> <ol style="list-style-type: none"> <li>1. Receive a PAL broadcast.</li> <li>2. Select 2. V/C from the SERVICE MENU.</li> <li>3. Select 5. COLOUR with the MENU <math>\nabla/\Delta</math> key.</li> <li>4. Set the initial setting value for PAL COLOUR with the MENU - or + key.</li> <li>5. If the colour is not the best with the initial set value, make fine adjustment until you get the best colour.</li> </ol>
			SECAM COLOUR	<b>(SECAM COLOUR)</b> <ol style="list-style-type: none"> <li>1. Receive a SECAM broadcast.</li> <li>2. Make fine adjustment of SECAM COLOUR as previously.</li> </ol>
			NTSC 3.58 COLOUR	<b>(NTSC 3.58 COLOUR)</b> <ol style="list-style-type: none"> <li>1. At RF or VIDEO terminal, receive a NTSC 3.58 video colour bar signal.</li> <li>2. Make similar fine adjustment of NTSC 3.58 COLOUR as previously.</li> </ol>
				<b>(NTSC 4.43 COLOUR)</b> When NTSC 3.58 is set, NTSC 4.43 will be automatically set at the respective values.

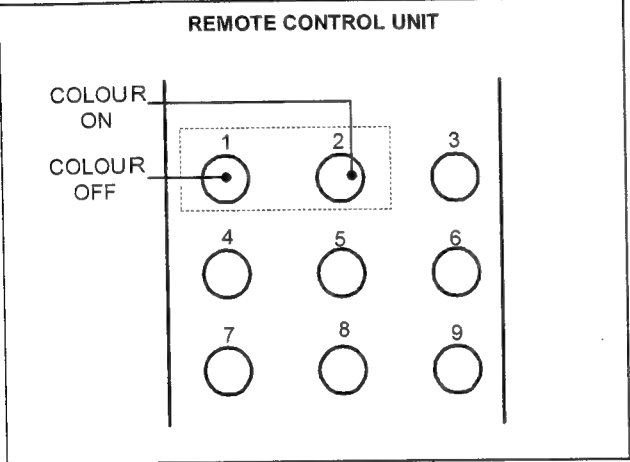
Item	Measuring instrument	Test point	Adjustment part	Description			
Adjustment of SUB COLOUR II  	<ul style="list-style-type: none"> <li>● Signal generator</li> <li>● Oscilloscope</li> <li>● Remote control unit</li> </ul>	TP-47G / B  TP-E (↕) [CRT SOCKET PWB]	<b>5. COLOUR</b>	<b>[Method of adjustment using measuring instrument]</b>			
			PAL COLOUR	<b>(PAL COLOUR)</b> 1. Receive a PAL full field colour bar signal (75% white). 2. Select <b>2. V/C</b> from SERVICE MENU. 3. Select <b>5. COLOUR</b> with the MENU $\nabla/\Delta$ key. 4. Set the initial setting value of PAL COLOUR with the MENU - or + key. 5. Connect the oscilloscope between TP-47G and TP-E. 6. Adjust PAL COLOUR to bring the value of <b>(A)</b> in the illustration to <b>+11V (W&amp;G)</b> .			
			SECAM COLOUR	<b>(SECAM COLOUR)</b> 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 bring the value of <b>(A)</b> in the illustration to <b>+6V (W &amp; G)</b> .			
			NTSC 3.58 COLOUR	<b>(NTSC 3.58 COLOUR)</b> 1. At RF or VIDEO terminal, 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 bring the value of <b>(A)</b> in the illustration to given below table <b>(W&amp;G)</b> . <table border="1" data-bbox="953 1532 1401 1749" style="margin: 10px auto;"> <thead> <tr> <th>MODEL No.</th> <th>Value (Vw-g)</th> </tr> </thead> <tbody> <tr> <td>AV-F21M3 AV-F21M3(-A)</td> <td>+8V</td> </tr> <tr> <td>AV-F21T3 AV-F21T3(-A)</td> <td>+9V</td> </tr> </tbody> </table>	MODEL No.	Value (Vw-g)	AV-F21M3 AV-F21M3(-A)
MODEL No.	Value (Vw-g)						
AV-F21M3 AV-F21M3(-A)	+8V						
AV-F21T3 AV-F21T3(-A)	+9V						
	<b>(NTSC 4.43 COLOUR)</b> When NTSC 3.58 is set, NTSC 4.43 will be automatically set at the respective values.						

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of TINT I	<ul style="list-style-type: none"> <li>● Remote control unit</li> </ul>		6. TINT	<b>[Method of adjustment without measuring instrument]</b>
			NTSC 3.58 TINT	<p><b>(NTSC 3.58 TINT)</b></p> <ol style="list-style-type: none"> <li>1. Receive (RF or VIDEO terminal) a NTSC 3.58 full field colour bar signal (75% white).</li> <li>2. Select <b>2. V/C</b> from SERVICE MENU.</li> <li>3. Select <b>6. TINT</b> with the MENU <math>\nabla/\Delta</math> key.</li> <li>4. Set the initial setting value of NTSC 3.58 with the MENU - or + key.</li> <li>5. If you cannot get the best tint with the initial setting value, make fine adjustment until you get the best tint.</li> </ol>
Adjustment of TINT II	<ul style="list-style-type: none"> <li>● Signal generator</li> <li>● Oscilloscope</li> <li>● Remote control unit</li> </ul>	TP-47G / B TP-E (↕) <b>[CRT SOCKET PWB]</b>	6. TINT	<b>[Method of adjustment using measuring instrument]</b>
			NTSC 3.58 TINT	<p><b>(NTSC 3.58 TINT)</b></p> <ol style="list-style-type: none"> <li>1. At RF or VIDEO terminal, receive a NTSC 3.58 full field colour bar signal (75% white).</li> <li>2. Select <b>2. V/C</b> from SERVICE MENU.</li> <li>3. Select <b>6. TINT</b> with the MENU <math>\nabla/\Delta</math> key.</li> <li>4. Set the initial setting value of NTSC 3.58 with the MENU - or + key.</li> <li>5. Connect the oscilloscope between TP-47G and TP-E.</li> <li>6. Adjust NTSC 3.58 TINT to bring the value of <b>(B)</b> in the illustration to given below table (<b>W&amp;Cy</b>).</li> </ol>
				<p><b>(NTSC 4.43 TINT)</b></p> <p>When NTSC 3.58 is set, NTSC 4.43 will be automatically set at the respective values.</p>



MODEL No.	Value (V <sub>W-Cy</sub> )
AV-F21M3 AV-F21M3(-A)	+4V
AV-F21T3 AV-F21T3(-A)	+7V

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment Of SECAM BL (BLACK OFFSET)	<ul style="list-style-type: none"> <li>● Remote control unit</li> <li>● Signal generator</li> </ul>		7. SECAM BL ADJUST	<p><b>[Method of adjustment using measuring instrument]</b></p> <ol style="list-style-type: none"> <li>1. Receive a SECAM HALF COLOUR BAR signal (210.25MHz).</li> <li>2. Select <b>2. V/C</b> from SERVICE MENU.</li> <li>3. Select <b>7. SECAM BL ADJUST</b> with MENU ▽/△ key.</li> <li>4. Set the initial setting value with the MENU - or + key.</li> <li>5. Switch the ①key (colour OFF) and ②key (colour ON) on the remote control and make sure that there is no colour on the black and white screen.</li> <li>6. If the black and white screen is not best with the initial setting value, make fine adjustment until you get the best black and white screen.</li> <li>7. Press the DISPLAY key twice to return to the normal screen.</li> </ol>



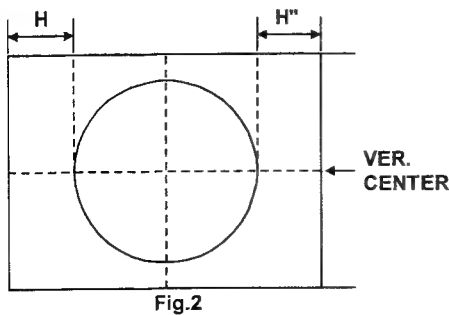
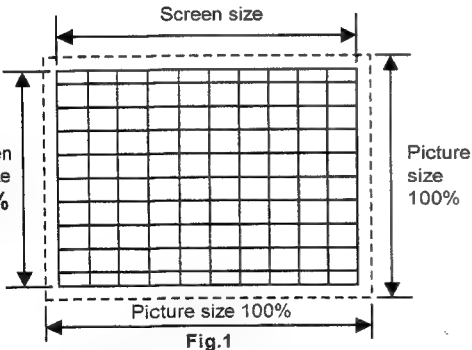
### DEFLECTION CIRCUIT ADJUSTMENT

- There are 2 modes of adjustment (setting value) ——— fv : 50Hz mode and fv : 60Hz mode ——— depending upon the kind of signals (vertical frequency 50Hz / 60Hz).
- When adjusted in mode ① , mode ② 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.

Setting item	Variable range	Initial setting value	
		fv : 50Hz MODE	fv : 60Hz MODE
1. VER. POSITION	-4 ~ +3	-1	-3
2. HOR. POSITION	-16 ~ +15	+4	+3
3. VER. HEIGHT	-64 ~ +63	-21	-2
4. VER. LINEARITY	-32 ~ +31	+14	-5
5. VER. SCURVE	-32 ~ +31	-32	+0
6. HOR. VCO ADJUST	-63 ~ +62	+0	+0

Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of V.HEIGHT & V. POSITION	● Remote control unit		1. VER. POSITION 3. VER. HEIGHT	<p>[ fv : 50Hz mode ]</p> <ol style="list-style-type: none"> <li>1. Receive a cross-hatch signal.</li> <li>2. Select 3. DEF. from SERVICE MENU.</li> <li>3. Select 1. VER. POSITION with the MENU <math>\Delta</math> / <math>\nabla</math> key.</li> <li>4. Set the initial setting value with the MENU - / + key.</li> <li>5. Adjust VER. POSITION and adjust it to be vertical center. as shown in Fig.2, with the MENU - / + key.</li> <li>6. Select 3. VER. HEIGHT with the MENU key.</li> <li>7. Set the initial setting value with the MENU - / + key.</li> <li>8. Adjust VER. HEIGHT and make the vertical screen size 92% of the picture size as shown in Fig.1 with the MENU - / + keys of remote control unit.</li> </ol>
Adjustment of HOR. POSITION	● Remote control unit		2. HOR. POSITION	<ol style="list-style-type: none"> <li>9. Receive a circle pattern signal.</li> <li>10. Select 2. HOR POSITION with the MENU <math>\Delta</math> / <math>\nabla</math> key.</li> <li>11. Set the initial setting value of 2. HOR. POSITION with the MENU - / + key.</li> <li>12. Adjust 2. HOR. POSITION to make <math>H=H''</math> as shown in Fig.2 with the MENU - / + key.</li> </ol>



Item	Measuring instrument	Test point	Adjustment part	Description
Adjustment of VER. LIN. & VER. SCURVE	● Remote control unit		4. VER. LIN. 5. VER. SCURVE	<ul style="list-style-type: none"> <li>When the vertical linearity is too bad, perform the following steps.</li> </ul> <ol style="list-style-type: none"> <li>Receive a cross-hatch signal.</li> <li>Select 4. VER. LIN. with the MENU ▽/△ key.</li> <li>Set the initial setting value of 4. VER. LIN. with the MENU - / + key.</li> <li>Select 5. VER. SCURVE with the MENU ▽/△ key.</li> <li>Set the initial setting value of 5. VER. SCURVE with the MENU - / + key.</li> <li>Adjust 4. VER. LIN. and 5. VER. SCURVE so that the spaces of each line as shown in Fig.3 on TOP, CENTER and BOTTOM become uniform.</li> </ol> <p>19. Make sure that the adjustment is properly done on the screen of 60Hz mode.</p> <p><b>[NOTE]</b></p> <ul style="list-style-type: none"> <li>Adjust to make both 50Hz &amp; 60Hz are the same v. size and fine straight line.</li> <li>When adjust again, adjust 50Hz mode first.</li> <li>When adjust in 60Hz mode, only 60Hz mode is adjust.</li> <li>Ver. linearity adjustment is only fine adjustment.</li> </ul>

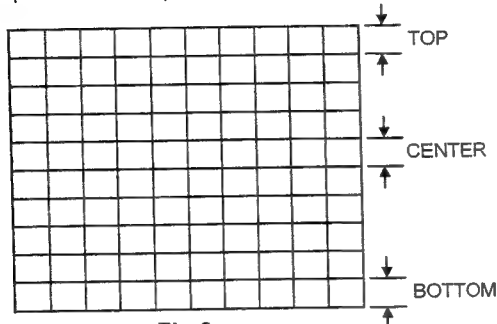
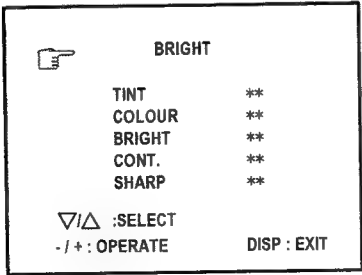


Fig.3

**VSM PRESET ADJUSTMENT**

Item	Measuring instrument	Test point	Adjustment part	Description																																			
Setting of VSM PRESET	● Remote control unit		TINT COLOUR BRIGHT CONT. SHARP	<p>(VSM PRESET)</p> <ol style="list-style-type: none"> <li>Select 4. VSM PRESET from the SERVICE MENU.</li> <li>Select BRIGHT with the PICTURE MODE key.</li> <li>Adjust the MENU ▽/△ and MENU - or + key to bring the set values of TINT ~ SHARP to the values shown in the table.</li> <li>Respectively select the VSM PRESET mode for SOFT and STANDARD, and make similar adjustment as in 3 above.</li> </ol> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 25%;">VSM preset mode</th> <th style="width: 25%;">BRIGHT</th> <th style="width: 25%;">STANDARD</th> <th style="width: 25%;">SOFT</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">VSM Setting item</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TINT SETTING VALUE</td> <td></td> <td>15</td> <td>←</td> <td>←</td> </tr> <tr> <td>COLOUR SETTING VALUE</td> <td></td> <td>15</td> <td>←</td> <td>←</td> </tr> <tr> <td>BRIGHT SETTING VALUE</td> <td></td> <td>15</td> <td>←</td> <td>←</td> </tr> <tr> <td>CONT. SETTING VALUE</td> <td></td> <td>30</td> <td>15</td> <td>11</td> </tr> <tr> <td>SHARP SETTING VALUE</td> <td></td> <td>15</td> <td>←</td> <td>12</td> </tr> </tbody> </table> <p style="text-align: center;"><b>SETTING VALUE OF VSM PRESET</b></p>		VSM preset mode	BRIGHT	STANDARD	SOFT	VSM Setting item					TINT SETTING VALUE		15	←	←	COLOUR SETTING VALUE		15	←	←	BRIGHT SETTING VALUE		15	←	←	CONT. SETTING VALUE		30	15	11	SHARP SETTING VALUE		15	←	12
	VSM preset mode	BRIGHT	STANDARD	SOFT																																			
VSM Setting item																																							
TINT SETTING VALUE		15	←	←																																			
COLOUR SETTING VALUE		15	←	←																																			
BRIGHT SETTING VALUE		15	←	←																																			
CONT. SETTING VALUE		30	15	11																																			
SHARP SETTING VALUE		15	←	12																																			



## PRESET ADJUSTMENT (DO NOT ADJUST)

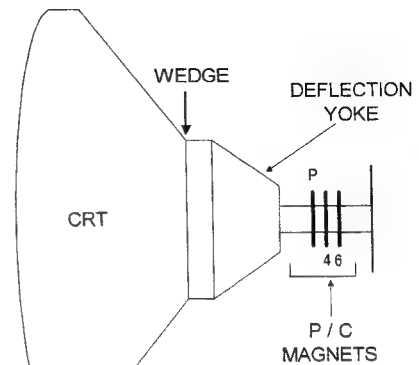
- The items in the following table, it is no requirement for adjustment.
- If values had changed by the miss operation, set the initial setting values in the following table.

Setting item		Initial setting value			
		PAL	SECAM	NTSC 3.58	NTSC 4.43
1. C TRAP FIX		0	←	←	←
2. SHARP PEAK		0	←	—	—
3. ABL		1	←	—	—
4. GAMMA		0	←	←	←
5. Y. DELAY TIME	TV	1	2	←	3
	VIDEO	0	2	0	2
6. BLACKEXP START		3	←	←	←
7. C-BPF	TV	1	←	0	←
	VIDEO	1	←	←	←
8. CW / SCP		0	←	←	←
9. VIF DET LEVEL		+0	←	←	←
11. IF AGC MIN		0	←	0	0
12. VIF AGC		0	←	←	←
13. VIF PMOD		0	←	0	0
19. VNR		15	←	←	←
20. RGB LIM		1	←	←	←
21. RGB LIMIT LEVEL		2	←	2	2
23. TEXT H. POSITION		+5	←	←	←
24. READ DATA		—	—	—	—
Setting item		B/G	I	D/K	M <small>(AV-F21M3 AV-F21M3(-A))</small>
10. SIF DET LEVEL		+0	←	←	←
14. SIF BPF BW ADJUST		+0	←	←	←
15. SIF TRAP FO ADJUST		+0	←	←	←
16. SIF TRAP FO ADJUST 2		+0	←	←	←
17. SIF -TRAP		0	←	←	←
18. SIF -BPF		0	←	←	1
22. SIF SW		+1	←	←	0

## PURITY / CONVERGENCE ADJUSTMENT

### PURITY ADJUSTMENT

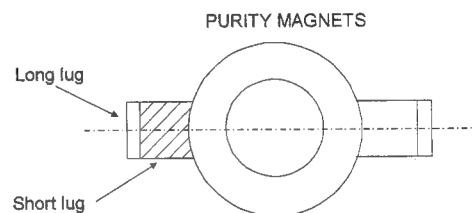
1. Demagnetize CRT with the demagnetizer.
2. Loosen the retainer screw of the deflection yoke.
3. Remove the wedges.
4. Input a green raster signal from the signal generator, and turn the screen to green raster.
5. Move the deflection yoke backward.
6. Bring the long lug of the purity magnets on the 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

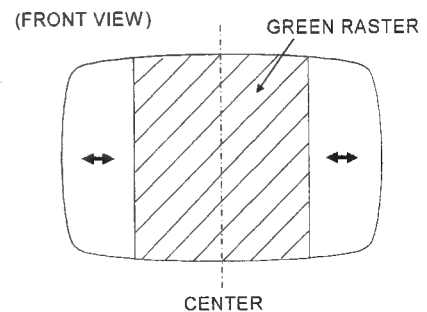


Fig.3

**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.

**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.

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

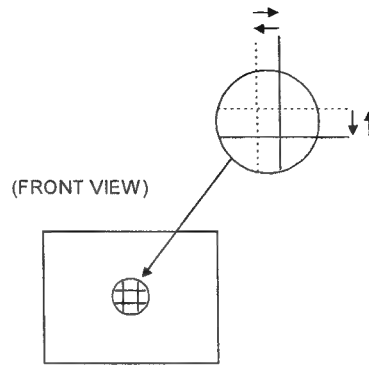


Fig.1

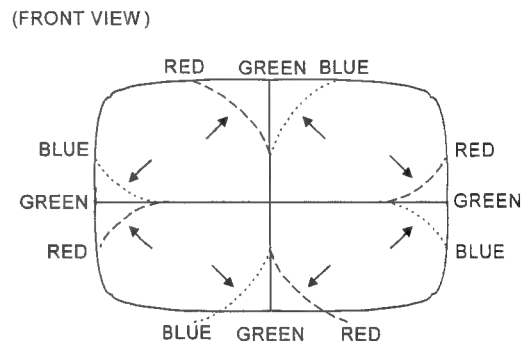


Fig.2

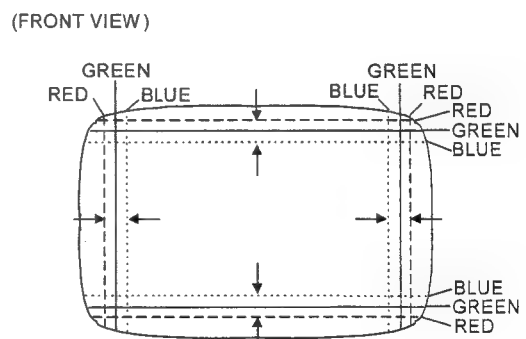


Fig.3

# 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 LED flashes to inform of the failure. An abnormality is detected by the signal input state of the control line connected to the microcomputer.

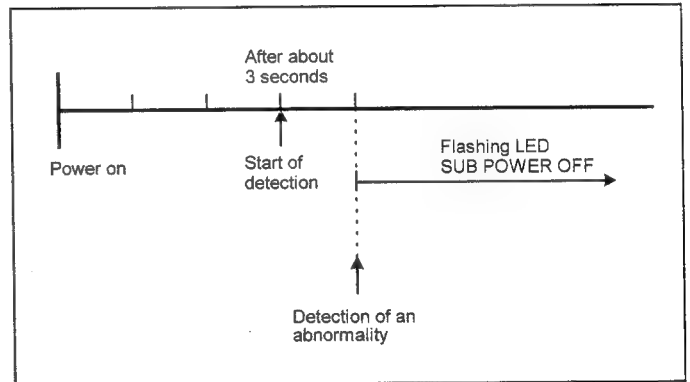
## 2. Self check items

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 of the remote controller is not operational until the power plug is taken out and put in again.
CRT NECK protection	Operation of Vertical deflection circuit.	DITTO	DITTO

## 3. Self check indicating function

At about 3 seconds after the power is turned ON, the self-check function starts.

In case where an abnormality has been detected, the OFF TIMER LED flashes, and the SUB-POWER is turned OFF.



### [ Indication by LED ]

Item	LED flashing intervals
Over-current protection CRT NECK protection	Turning on and off 0.24-second intervals

## 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

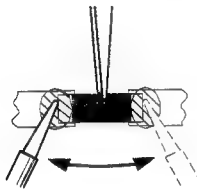
1. Use a high insulation soldering iron with a thin pointed end of it.
2. A 30w soldering iron is recommended for easily removing parts.

### ■ REPLACEMENT STEPS

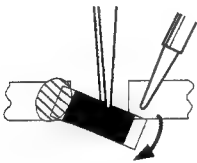
#### 1. How to remove Chip parts

##### ◆ Resistors, capacitors, etc.

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

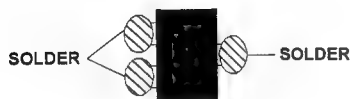


- (2) Shift with tweezers and remove the chip part.



##### ◆ 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.

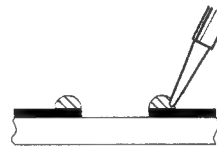


Note : After removing the part, remove remaining solder from the pattern.

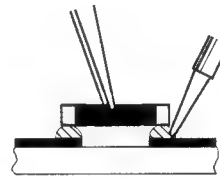
#### 2. How to install Chip parts

##### ◆ Resistors, capacitors, etc.

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

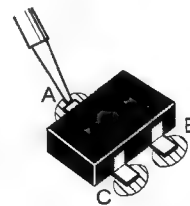


- (2) Grasp the chip part with tweezers and place it on the solder. Then heat and melt the solder at both ends of the chip part.

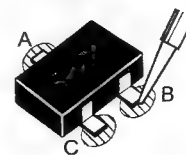


##### ◆ Transistors, diodes, variable resistors, etc.

- (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**.



# PARTS LIST

## CAUTION

- The parts identified by the  $\triangle$  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	
CR	Carbon Resistor	C CAP.	Ceramic Capacitor
FR	Fusible Resistor	E CAP.	Electrolytic Capacitor
PR	Plate Resistor	M CAP.	Mylar Capacitor
VR	Variable Resistor	HV CAP.	High Voltage Capacitor
HVR	High Voltage Resistor	MF CAP.	Metalized Film Capacitor
MFR	Metal Film Resistor	MM CAP.	Metalized Mylar Capacitor
MGR	Metal Glazed Resistor	MP CAP.	Metalized Polystyrol Capacitor
MPR	Metal Plate Resistor	PP CAP.	Polypropylene Capacitor
OMR	Metal Oxide Film Resistor	PS CAP.	Polystyrol Capacitor
CMFR	Coating Metal Film Resistor	TF CAP.	Thin Film Capacitor
UNFR	Non-Flammable Resistor	MPP CAP.	Metalized Polypropylene Capacitor
CHVR	Chip Variable Resistor	TAN. CAP.	Tantalum Capacitor
CHMGR	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
		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%	+50%	+80%	+100%
						-10%	-10%	-20%	-0%

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## USING P.W. BOARD & REMOTE CONTROL UNIT

PWB NAME	Model	AV-F21M3	AV-F21M3(-A)	AV-F21T3	AV-F21T3(-A)
	MAIN P.W.B	SCG-1011A-H2		←	←
REMOTE CONTROL UNIT	RM-C364-1H		←	←	←

## REMOTE CONTROL UNIT PARTS LIST (RM-C364-1H)

△ Ref.No.	Part No.	Part Name	Description	Local
	25-1168 B	BATTERY COVER		

## EXPLODED VIEW PARTS LIST

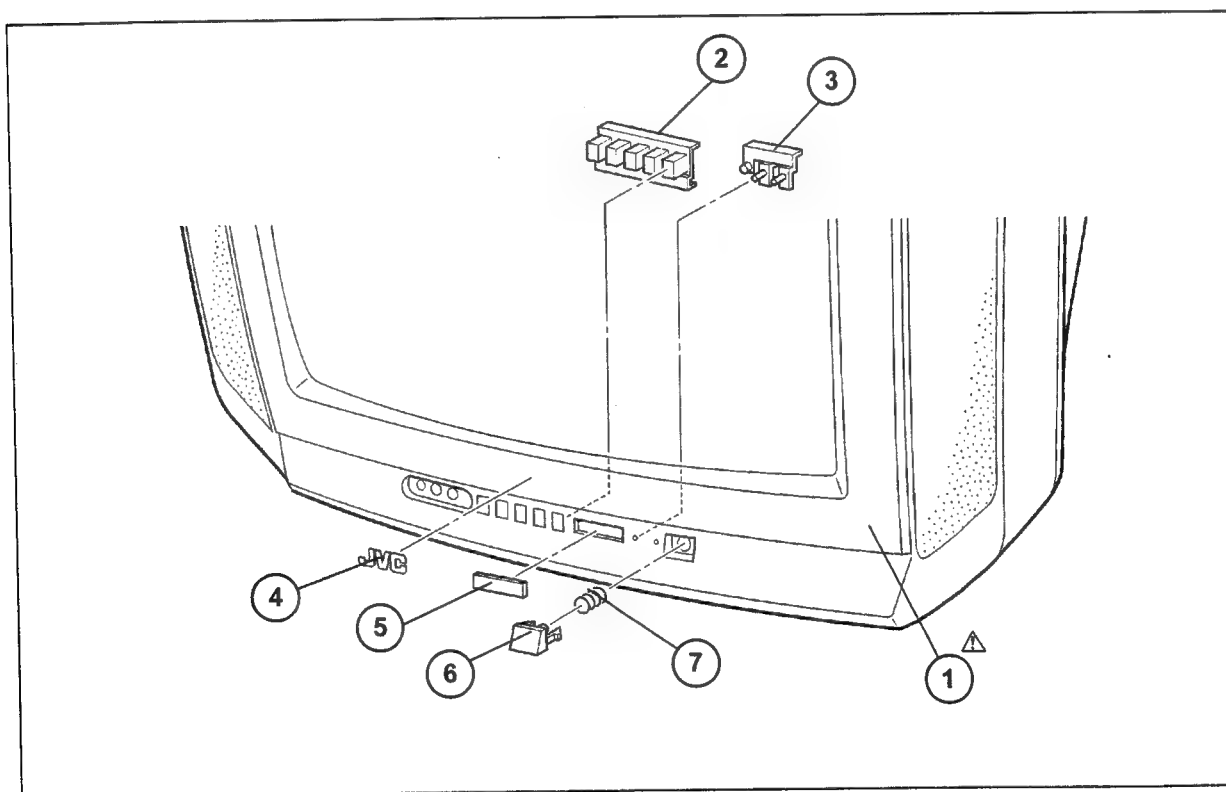
### AV-F21M3 / AV-F21M3(-A)

△ Ref.No.	Part No.	Part Name	Description	Local
△ 1	LC10394-004A-H	FRONT CABINET		
2	LC20292-001A-H	CONTROL KNOB		
3	LC30618-001A-H	L.E.D. LENS		
4	CM48006-A03-H	JVC MARK	[AV-F21M3]	
4	CM48006-006-C	JVC MARK	[AV-F21M3(-A)]	
5	LC30617-001C-H	E.E. WINDOW		
6	LC30616-001B-H	POWER KNOB		
7	CM35235-006-H	SPRING		

### AV-F21T3 / AV-F21T3(-A)

△ 1	LC10394-017A-H	FRONT CABINET	
2	LC20292-001A-H	CONTROL KNOB	
3	LC30618-001A-H	L.E.D. LENS	
4	CM48006-006-C	JVC MARK	
5	LC30617-001C-H	E.E. WINDOW	
6	LC30616-001B-H	POWER KNOB	
7	CM35235-006-H	SPRING	

## EXPLODED VIEW



## EXPLODED VIEW PARTS LIST

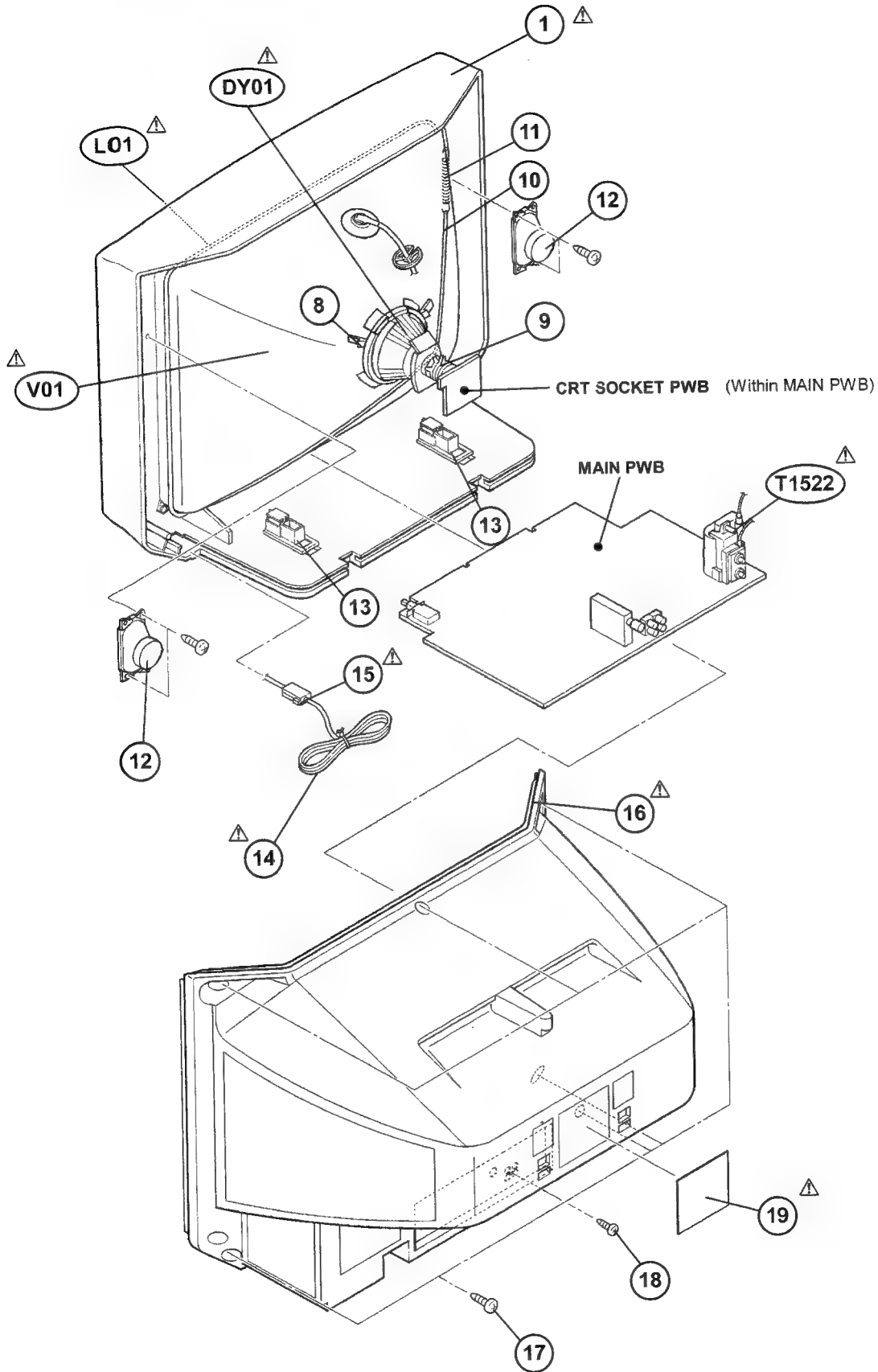
### AV-F21M3 / AV-F21M3(-A)

△ Ref.No.	Part No.	Part Name	Description	Local
△ V01	A51LMV20X	PICTURE TUBE(C)		
△ DY01	CE20336-00A	DEF YOKE		
△ L01	QQW0006-001	DEG.COIL		
△ T1522	QQH0021-002	FB TRANSF.		
8	CE40764-00A	WEDGE ASSY	(×3)	
9	A75034-B	P.C.MAGNET		
10	CHGB0016-0B-FH	BRAIDED WIRE		
11	A48457-3-H	SPRING		
12	QAS0036-001	SPEAKER	(×2)	
13	CM36623-B01-H	CHASSIS RAIL	(×2)	
△ 14	QMP40D0-200J5	POWER CORD	[AV-F21M3]	
△ 14	QMPRO10-200-E2	POWER CORD	[AV-F21M3(-A)]	
△ 15	CM47005-A01-H	CORD CLAMP		
△ 16	LC10448-002B-H	REAR COVER		
17	QYSBSFG4016Z	TAPPING SCREW	(×6)	
18	QYSBSF3010Z	TAPPING SCREW	(×1)	
△ 19	LC20377-010A-H	RATING LABEL	[AV-F21M3]	
△ 19	LC20413-002A-H	RATING LABEL	[AV-F21M3(-A)]	

### AV-F21T3 / AV-F21T3(-A)

△ V01	A51LMV20X	PICTURE TUBE(C)		
△ DY01	CE20336-00A	DEF YOKE		
△ L01	QQW0006-001	DEG.COIL		
△ T1522	QQH0021-002	FB TRANSF.		
8	CE40764-00A	WEDGE ASSY	(×3)	
9	A75034-B	P.C.MAGNET		
10	CHGB0016-0B-FH	BRAIDED WIRE		
11	A48457-3-H	SPRING		
12	QAS0036-001	SPEAKER	(×2)	
13	CM36623-B01-H	CHASSIS RAIL	(×2)	
△ 14	QMP40D0-200J5	POWER CORD	[AV-F21T3]	
△ 14	QMPRO10-200-E2	POWER CORD	[AV-F21T3(-A)]	
△ 15	CM47005-A01-H	CORD CLAMP		
△ 16	LC10448-002B-H	REAR COVER		
17	QYSBSFG4016Z	TAPPING SCREW	(×6)	
18	QYSBSF3010Z	TAPPING SCREW	(×1)	
△ 19	LC20377-010A-H	RATING LABEL	[AV-F21T3]	
△ 19	LC20413-002A-H	RATING LABEL	[AV-F21T3(-A)]	

# EXPLODED VIEW



# PRINTED WIRING BOARD PARTS LIST

## MAIN P.W. BOARD ASS'Y (SCG-1011A-H2)

△ Symbol No.	Part No.	Part Name	Description	Local
<b>RESISTOR</b>				
R1002-03	NRSA02J-221X	MG R	220Ω 1/10W J	
R1004	NRSA02J-224X	MG R	220kΩ 1/10W J	
R1102	NRSA02J-750X	MG R	75Ω 1/10W J	
R1103	NRSA02J-100X	MG R	10Ω 1/10W J	
R1109	NRSA02J-682X	MG R	6.8kΩ 1/10W J	
R1110	NRSA02J-272X	MG R	2.7kΩ 1/10W J	
R1111	NRSA02J-181X	MG R	180Ω 1/10W J	
R1112	NRSA02J-100X	MG R	10Ω 1/10W J	
R1113	NRSA02J-101X	MG R	100Ω 1/10W J	
R1114	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1115	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
R1117	NRSA02J-0R0X	MG R	0.0Ω 1/10W J	
R1118	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
R1120	NRSA02J-391X	MG R	390Ω 1/10W J	
R1121	NRSA02J-221X	MG R	220Ω 1/10W J	
R1159	NRSA02J-184X	MG R	180kΩ 1/10W J	
R1161	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1162	NRSA02J-122X	MG R	1.2kΩ 1/10W J	
R1163	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
R1164	NRSA02J-221X	MG R	220Ω 1/10W J	
R1165	NRSA02J-220X	MG R	22Ω 1/10W J	
R1166	NRSA02J-821X	MG R	820Ω 1/10W J	
R1301	NRSA02J-221X	MG R	220Ω 1/10W J	
R1302	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1303-05	NRSA02J-101X	MG R	100Ω 1/10W J	
R1306	NRSA02J-221X	MG R	220Ω 1/10W J	
R1307	NRSA02J-122X	MG R	1.2kΩ 1/10W J	
R1308	NRSA02J-182X	MG R	1.8kΩ 1/10W J	
R1312	NRSA02J-0R0X	MG R	0.0Ω 1/10W J	
R1313-14	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1321	NRSA02J-152X	MG R	1.5kΩ 1/10W J	
R1322	NRSA02J-272X	MG R	2.7kΩ 1/10W J	
R1323	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1324	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1326	NRSA02J-101X	MG R	100Ω 1/10W J	
R1327	NRSA02J-475X	MG R	4.7kΩ 1/10W J	
R1341	NRSA02J-332X	MG R	3.3kΩ 1/10W J	
R1347	NRSA02J-392X	MG R	3.9kΩ 1/10W J	
R1349	NRSA02J-123X	MG R	12kΩ 1/10W J	
R1351-53	NRSA02J-151X	MG R	150Ω 1/10W J	
R1354-56	NRSA02J-331X	MG R	330Ω 1/10W J	
R1357-59	NRSA02J-101X	MG R	100Ω 1/10W J	
R1360-61	QRZ0107-152Z	C R	1.5kΩ 1/2W K	
R1362	QRZ0107-152Z	C R	1.5kΩ 1/2W J	
R1363-65	QRL029J-123	OM R	12kΩ 2W J	
R1366-68	NRSA02J-182X	MG R	1.8kΩ 1/10W J	
R1369	QRE121J-394Y	C R	390kΩ 1/2W J	
R1372	NRSA02J-0R0X	MG R	0.0Ω 1/10W J	
R1373	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1374	NRSA02J-392X	MG R	3.9kΩ 1/10W J	
R1401	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1421-22	NRSA02J-122X	MG R	1.2kΩ 1/10W J	
R1423	NRSA02J-331X	MG R	330Ω 1/10W J	
R1424	NRSA02J-101X	MG R	100Ω 1/10W J	
R1425	NRSA02J-471X	MG R	470Ω 1/10W J	
R1426	NRSA02J-0R0X	MG R	0.0Ω 1/10W J	
R1429	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1430	NRSA02J-823X	MG R	82kΩ 1/10W J	
R1431	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1432-33	QRE121J-2R7Y	C R	2.7Ω 1/2W J	
R1436	NRSA02J-823X	MG R	82kΩ 1/10W J	
R1440	QRE121J-471Y	C R	470Ω 1/2W J	
R1441	NRSA02J-822X	MG R	8.2kΩ 1/10W J	
R1442	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1443	QRE121J-1R0Y	C R	1.0Ω 1/2W J	
R1453	NRSA02J-272X	MG R	2.7kΩ 1/10W J	
R1501	QRE121J-181Y	C R	180Ω 1/2W J	
R1502	NRSA02J-0R0X	MG R	0.0Ω 1/10W J	

△ Symbol No.	Part No.	Part Name	Description	Local
<b>RESISTOR</b>				
R1503	NRSA02J-682X	MG R	6.8kΩ 1/10W J	
R1521	NRSA02J-681X	MG R	680Ω 1/10W J	
R1522	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1524-25	QRL02EJ-820X	OM R	82Ω 2W J	
R1526	QRE121J-270Y	C R	27Ω 1/2W J	
R1530	QRE121J-223Y	C R	22kΩ 1/2W J	
R1531	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1533-34	NRSA02J-332X	MG R	3.3kΩ 1/10W J	
△ R1551	QRZ9011-1R0	F R	1.0 Ω 1/2W J	
R1552	QRJ146J-2R2X	C R	2.2Ω 1/4W J	
R1554	QRE121J-182Y	C R	1.8kΩ 1/2W J	
R1571	QRE121J-222Y	C R	2.2kΩ 1/2W J	
R1573-74	QRTO2EJ-1R5X	MF R	1.5Ω 2W J	
R1576	QRE121J-223Y	C R	22kΩ 1/2W J	
R1577	NRSA02J-392X	MG R	3.9kΩ 1/10W J	
R1581	QRE121J-182Y	C R	1.8kΩ 1/2W J	
R1582	NRSA02J-223X	MG R	22kΩ 1/10W J	
R1583	NRSA02J-393X	MG R	39kΩ 1/10W J	
R1651	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1652	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1653	QRE121J-1R0Y	C R	1.0Ω 1/2W J	
R1654	QRX029J-4R7	MF R	4.7Ω 2W J	
R1656	NRSA02J-123X	MG R	12kΩ 1/10W J	
R1657	NRSA02J-391X	MG R	390Ω 1/10W J	
R1658-59	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1660	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1661-62	QRE121J-271Y	C R	270Ω 1/2W J	
R1664	NRSA02J-221X	MG R	220Ω 1/10W J	
R1665	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1701	NRSA02J-562X	MG R	5.6kΩ 1/10W J	
R1702	NRSA02J-822X	MG R	8.2kΩ 1/10W J	
R1703	NRSA02J-392X	MG R	3.9kΩ 1/10W J	
R1704-05	NRSA02J-221X	MG R	220Ω 1/10W J	
R1706-07	NRSA02J-561X	MG R	560Ω 1/10W J	
R1708	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1709-14	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1715-16	NRSA02J-221X	MG R	220Ω 1/10W J	
R1717	NRSA02J-273X	MG R	27kΩ 1/10W J	
R1718	NRSA02J-561X	MG R	560Ω 1/10W J	
R1719	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1720	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1721	NRSA02J-103X	MG R	10kΩ 1/10W J	
△ R1723	QRZ9023-270	F R	27 Ω 2W J	
R1725	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1726	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1727	NRSA02J-153X	MG R	15kΩ 1/10W J	
R1728-29	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1730	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1731	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1736	NRSA02J-823X	MG R	82kΩ 1/10W J	
R1737	NRSA02J-104X	MG R	100kΩ 1/10W J	
R1738-39	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1740	NRSA02J-392X	MG R	3.9kΩ 1/10W J	
R1741	NRSA02J-561X	MG R	560Ω 1/10W J	
R1742	NRSA02J-563X	MG R	56kΩ 1/10W J	
R1746	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1747	NRSA02J-0R0X	MG R	0.0Ω 1/10W J	
R1748	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1749	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1771-72	NRSA02J-821X	MG R	820Ω 1/10W J	
R1791-95	NRSA02J-221X	MG R	220Ω 1/10W J	
R1797	NRSA02J-153X	MG R	15kΩ 1/10W J	
R1802	NRSA02J-750X	MG R	75Ω 1/10W J	
R1806	QRE121J-271Y	C R	270Ω 1/2W J	
R1807	NRSA02J-680X	MG R	68Ω 1/10W J	
R1810	QRG016J-560	OM R	56Ω 1W J	
R1811	NRSA02J-221X	MG R	220Ω 1/10W J	
R1815	QRE121J-181Y	C R	180Ω 1/2W J	

Symbol No.	Part No.	Part Name	Description	Local
<b>RESISTOR</b>				
R1816	NRSA02J-681X	MG R	680Ω 1/10W J	
R1817	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1846	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1849	NRSA02J-153X	MG R	15kΩ 1/10W J	
△ R1901	QRF104K-3R9	UNF R	3.9 Ω 10W J	
R1903	QRL02EJ-683X	OM R	68kΩ 2W J	
R1921	QRE121J-681Y	C R	680Ω 1/2W J	
R1922	QRT029J-1R2	MF R	1.2Ω 2W J	
R1923	QRMO59J-R22	MP R	0.22 Ω 5W J	
R1926	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
R1928	QRL03EJ-563X	O M R	56kΩ 3W J	
R1929	QRE121J-822Y	C R	8.2kΩ 1/2W J	
R1932	QRE121J-564Y	C R	560kΩ 1/2W J	
R1933	QRE121J-180Y	C R	18Ω 1/2W J	
R1934	NRSA02J-333X	MG R	33kΩ 1/10W J	
R1936	QRGO16J-561	OM R	560Ω 1W J	
R1941	QRE121J-821Y	C R	820Ω 1/2W J	
R1942	NRSA02J-122X	MG R	1.2kΩ 1/10W J	
R1943	NRSA02J-473X	MG R	47kΩ 1/10W J	
R1944	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1974	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
R1976	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1977	QRE121J-122Y	C R	1.2kΩ 1/2W J	
R1978	NRSA02J-473X	MG R	47kΩ 1/10W J	
R1979	QRT02EJ-2R7X	MF R	2.7Ω 2W J	
R1980	QRL02EJ-103X	O M R	10kΩ 2W J	
△ R1991	QRZ0057-825	C R	8.2MΩ 1W J	

**CAPACITOR**

C1001	QETN1HM-106Z	E CAP.	10μF 50V M
C1002-03	NCB21HK-103X	C CAP.	0.01μF 50V K
C1004	QETN1CM-107Z	E CAP.	100μF 16V M
C1005	QETN1CM-227Z	E CAP.	220μF 16V M
C1006	NCB21HK-103X	C CAP.	0.01μF 50V K
C1008	QETN1HM-475Z	E CAP.	4.7μF 25V M
C1103	QETN1EM-476Z	E CAP.	47μF 25V M
C1104-07	NCB21HK-472X	C CAP.	4700pF 50V K
C1109	NCB21HK-472X	C CAP.	4700pF 50V K
C1110	NRSA02J-0R0X	MG R	0.0Ω 1/10W J
C1112	QETN1EM-476Z	E CAP.	47μF 25V M
C1113	NCB21HK-472X	C CAP.	4700pF 50V K
C1115-16	NCB21HK-103X	C CAP.	0.01μF 50V K
C1117	QFV71HJ-224Z	MF CAP.	0.22μF 50V J
C1119	QETN1HM-474Z	E CAP.	0.47μF 50V M
C1120	NDC21HJ-121X	C CAP.	120pF 50V J
C1121-22	NCB21HK-103X	C CAP.	0.01μF 50V K
C1161	NCB21HK-103X	C CAP.	0.01μF 50V K
C1162	NCB21HK-152X	C CAP.	1500pF 50V K
C1164-65	NCB21HK-103X	C CAP.	0.01μF 50V K
C1166	NCB21HK-104X	CHIP CAP.	0.1μF 50V K
C1301	NCB21HK-123X	C CAP.	0.012μF 50V K
C1302	QETN1HM-475Z	E CAP.	4.7μF 50V M
C1303	NDC21HJ-8R0X	C CAP.	8.0pF 50V J
C1304-05	QETN1HM-474Z	E CAP.	0.47μF 50V M
C1306	NCB21HK-103X	C CAP.	0.01μF 50V K
C1307	QETN1CM-477Z	E CAP.	470μF 16V M
C1308	QETN1CM-107Z	E CAP.	100μF 16V M
C1309	NCB21HK-103X	C CAP.	0.01μF 50V K
C1310	NDC21HJ-221X	C CAP.	220pF 50V J
C1311	NCB21HK-103X	C CAP.	0.01μF 50V K
C1312	QENC1HM-474Z	BP E CAP.	0.47μF 50V M
C1313	QETN1HM-335Z	E CAP.	3.3μF 50V M
C1314	NCB21HK-103X	C CAP.	0.01μF 50V K
C1315	QETN1CM-107Z	E CAP.	100μF 16V M
C1316	QETN1HM-106Z	E CAP.	10μF 50V M
C1317	NCB21HK-473X	C CAP.	0.047μF 50V K
C1321	NDC21HJ-120X	C CAP.	12pF 50V J
C1322	NCB21HK-273X	C CAP.	0.027μF 50V K
C1323	QETN1HM-225Z	E CAP.	2.2μF 50V M

Symbol No.	Part No.	Part Name	Description	Local
<b>CAPACITOR</b>				
C1324	QETN1HM-106Z	E CAP.	10μF 50V M	
C1325	QENC1HM-106Z	BP E CAP.	10μF 50V M	
C1326	NCS21HJ-221X	C CAP.	220pF 50V J	
C1341	QETN1HM-106Z	E CAP.	10μF 50V M	
C1352	QFZ0097-103	MM CAP.	0.01μF 1250V K	
C1354-56	NDC21HJ-271X	C CAP.	270pF 50V J	
C1357	QETN1AM-477Z	E CAP.	470μF 10V M	
C1365-67	QENC1HM-105Z	BP E CAP.	1μF 50V M	
C1401	QFV71HJ-474Z	MF CAP.	0.47μF 50V J	
C1402	QFV71HJ-104Z	MF CAP.	0.1μF 50V J	
C1422	QETN1HM-105Z	E CAP.	1μF 50V M	
C1423	QCS32HJ-100Z	C CAP.	10pF 500V J	
C1424	QFLC2AJ-103Z	M CAP.	0.01μF 100V J	
C1426	QFLC1HJ-103Z	M CAP.	0.01μF 50V J	
C1427	QETN1VM-107Z	E CAP.	100μF 35V M	
C1428	QEH1VM-107Z	E CAP.	100μF 35V M	
C1429	QETN1HM-106Z	E CAP.	10μF 50V M	
C1430	QFN32AJ-472Z	M CAP.	4700pF 100V J	
C1433	QEH1HM-475Z	E CAP.	4.7μF 50V M	
C1435	QETN1EM-228	E CAP.	220μF 25V M	
C1436	QFV71HJ-334Z	MF CAP.	0.33μF 50V J	
C1501	QETN1EM-476Z	E CAP.	47μF 25V M	
C1502	NCB21HK-103X	C CAP.	0.01μF 50V K	
C1503	QETN1HM-106Z	E CAP.	10μF 50V M	
C1523	QTMN1VM-476Z	E CAP.	47μF 35V M	
△ C1525	QFZ0117-114Z	MPP CAP.	0.114μF 1.4kVH±2.5%	
C1526	QTMN1EM-337Z	E CAP.	370μF 25V M	
△ C1527	QFZ0199-404	MPP CAP.	0.4μF 250V J	
C1528	QETN2EM-475Z	E CAP.	4.7μF 250V M	
C1531	QEZ0203-107	E CAP.	100μF 160V M	
C1552	QETN1VM-108	E CAP.	1000μF 35V M	
C1554	QETN2EM-475Z	E CAP.	4.7μF 250V M	
C1555	QFLC2AJ-104Z	M CAP.	0.1μF 100V J	
C1571	QETN1AM-107Z	E CAP.	100μF 16V M	
C1572	QETN1EM-476Z	E CAP.	47μF 25V M	
C1581	QFV71HJ-104Z	MF CAP.	0.1μF 50V J	
C1651	QTN1HM-105Z	E CAP.	1μF 50V M	
C1652	QEH1HM-106Z	E CAP.	10μF 50V M	
C1653	QEH1VM-476Z	E CAP.	47μF 35V M	
C1654	NCB21HK-104X	CHIP CAP.	0.1μF 50V K	
C1655	QEHQ1VM-228	E CAP.	2200pF 35V M	
C1656	QEH1EM-477Z	E CAP.	470μF 25V M	
C1658	QETN1HM-226Z	E CAP.	22μF 50V M	
C1659	QETN1CM-107Z	E CAP.	100μF 16V M	
C1663	QEH1HM-106Z	E CAP.	10μF 50V M	
C1664	NCB21HK-104X	CHIP CAP.	0.1μF 50V K	
C1665	QEH1HM-105Z	E CAP.	1μF 50V M	
C1701	QETN1HM-106Z	E CAP.	10μF 50V M	
C1705	QETN1CM-477Z	E CAP.	470μF 16V M	
C1706	NCB21EK-104X	C CAP.	0.1μF 25V K	
C1707	NCB21HK-103X	C CAP.	0.01μF 50V K	
C1708	QETN1EM-476Z	E CAP.	47μF 25V M	
C1709	NCB21HK-103X	C CAP.	0.01μF 50V K	
C1710	QETN1CM-107Z	E CAP.	100μF 16V M	
C1711-13	NCB21HK-103X	C CAP.	0.01μF 50V K	
C1714-15	NDC21HJ-330X	C CAP.	33pF 50V J	
C1716-17	NDC21HJ-181X	C CAP.	180pF 50V J	
C1718	NCB21HK-103X	C CAP.	0.01μF 50V K	
C1719	QETN1HM-105Z	E CAP.	1μF 50V M	
C1720	NCB21HK-103X	C CAP.	0.01μF 50V K	
C1721	NCB21HK-333X	C CAP.	0.033μF 50V K	
C1722	NCB21HK-102X	C CAP.	1000pF 50V K	
C1724	NDC21HJ-560X	C CAP.	56pF 50V J	
C1728-29	NDC21HJ-181X	C CAP.	180pF 50V J	
C1730	NCB21HK-103X	C CAP.	0.01μF 50V K	
C1738	QETN1HM-226Z	E CAP.	22μF 50V M	
C1741-43	QETN1HM-105Z	E CAP.	1μF 50V M	
C1744	NCB21HK-103X	C CAP.	0.01μF 50V K	
C1805	QETN1CM-227Z	E CAP.	220μF 16V M	
C1806	QETN1CM-477Z	E CAP.	470μF 16V M	
C1811	QETN1HM-106Z	E CAP.	10μF 50V M	
C1841	NCB21HK-152X	C CAP.	1500pF 50V K	

Symbol No.	Part No.	Part Name	Description	Local
<b>CAPACITOR</b>				
△ C1901	QFZ9040-104	MF CAP.	0.1μFAC250V	M
△ C1904	QCZ9082-222Z	C CAP.	2200pFAC250V	M
△ C1905	QCZ9082-222Z	C CAP.	2200pFAC250V	M
△ C1907	QCZ9082-222Z	C CAP.	2200pFAC250V	M
△ C1909	QEZO199-127	E CAP.	120μF 400V	M
△ C1910	QFZ9040-473	MM CAP.	470μFAC250V	M
C1922	QFLC1HJ-471Z	M CAP.	470pF 50V	J
C1924	QETN1VM-107Z	E CAP.	100μF 35V	M
C1926	QFLC1HJ-332Z	M CAP.	3300pF 50V	J
C1928	NCB21HK-473X	C CAP.	0.047μF 50V	K
C1929	QFP32GJ-223Z	PP CAP.	0.022μF 400V	J
C1930	QCZ0325-561	C CAP.	560pF 2KV	K
C1931-32	QCZ0325-151	C CAP.	150pF 2KV	K
C1941	QCZ0122-561	C CAP.	560pF 2KV	K
C1942	QEZO420-107	E CAP.	100μF 160V	M
C1945	QEHR1CM-108Z	E CAP.	1000μF 16V	M
C1948	QEHR1VM-108Z	E CAP.	1000μF 35V	M
C1949	NDC21HJ-471X	C CAP.	470pF 50V	J
C1950	NCB21HK-104X	CHIP CAP.	0.1μF 50V	K
C1971	QETN1HM-475Z	E CAP.	4.7μF 50V	M
C1976	QETN1HM-105Z	E CAP.	1μF 50V	M
C1977	QETN1CM-107Z	E CAP.	100μF 16V	M
C1978	QETN1CM-227Z	E CAP.	220μF 16V	M
C1979	QETN1CM-107Z	E CAP.	100μF 16V	M
△ C1991	QCZ9079-471	C CAP.	470pFAC250V	K
△ C1992	QCZ9079-471	C CAP.	470pFAC250V	K
△ C1993	QCZ9079-102	C CAP.	1000pFAC250V	K

**TRANSFORMER**

△ T1522	QQH0021-002	FB TRANSF.
△ T1921	QQS0050-001	SW TRANSF.

**COIL**

L1001-02	QQL244K-8R2Z	COIL	8.2μH
L1101	QQLZ014-2R2	PEAKING COIL	
L1103	QQL244K-8R2Z	COIL	8.2μH
L1351-53	QQL244K-470Z	COIL	47μH
L1523	QQL342J-2R2Z	INDUCTOR	
L1551	QQLZ018-430	HEATER CHOKE	
L1701	QQL395K-5R6Z	COIL	5.6μH
L1941-42	QQL26AK-820Z	COIL	82μH

**DIODE**

D1001	MA3330/L/-X	ZENER DIODE
D1102	1S585-T2	SI DIODE
D1301-02	MA3091/M/-X	ZENER DIODE
D1305	RB100A-T2	SI DIODE
D1341-42	MA111-X	SI DIODE
D1351-53	MA3056/L/-X	ZENER DIODE
D1354-56	MA111-X	SI DIODE
D1421-22	MA3360/M/-X	ZENER DIODE
D1423	1SR124-400A-T2	SI DIODE
D1424-25	MA111-X	SI DIODE
D1427	MA3270/H/-X	ZENER DIODE
D1551	RGP10J-T5-T3	SI DIODE
D1552	RH1S-T3	SI DIODE
D1553	MA3091/M/-X	ZENER DIODE
D1554	MA111-X	SI DIODE
D1555	1SR124-400A-T2	SI DIODE
D1571	MA3075/M/-X	ZENER DIODE
D1581	MA3200/M/-X	CHIP ZENER DIODE
D1582	RGP10J-T5-T3	SI DIODE
D1651-52	MA111-X	SI DIODE
D1653	MA3180/M/-X	ZENER DIODE
D1701	MA111-X	SI DIODE
D1704	SLR-342VR-T16	L.E.D.
D1705	SLR-342DU-T16	L.E.D. (ORG)
D1706-07	MA111-X	SI DIODE
D1731	MA111-X	SI DIODE
D1791-95	MA3056/M/-X	ZENER DIODE
△ D1901	D2SBA60	BRIDGE DIODE
D1921	RGP10J-T5-T3	SI DIODE
D1922-24	MA111-X	SI DIODE

Symbol No.	Part No.	Part Name	Description	Local
<b>DIODE</b>				
D1926	MA3056/M/-X	ZENER DIODE		
D1927	MA3068/M/-X	ZENER DIODE		
D1929	RD12E/B2/-T5	ZENER DIODE		
D1930	EG1A-T3	SI DIODE		
D1932	MA111-X	SI DIODE		
D1933	RD27E/B2/-T5	ZENER DIODE		
D1941	RU3AM-LFC4	SI DIODE		
D1942	RU3YX-LFC4	SI DIODE		
D1943	RGP10J-T5-T3	SI DIODE		
D1945	MA3075/H/-X	ZENER DIODE		
D1982-83	MA111-X	SI DIODE		

**TRANSISTOR**

Q1102	2SC5083/L-P/-T	SI TRANSISTOR	
Q1103	DTC124EKA-X	DIGI TRANSISTOR	
Q1161	2SC2412K/QR/-X	SI TRANSISTOR	
Q1301	2SA1037AK/QR/-X	SI TRANSISTOR	
Q1302	2SC2412K/QR/-X	SI TRANSISTOR	
Q1351-53	2SC3620	SI TRANSISTOR	
Q1401	DTC124ESA-T	DIGI TRANSISTOR	
Q1402	2SC2412K/QR/-X	SI TRANSISTOR	
Q1521	2SK3065-W	CHIP FET	
△ Q1522	BU808DFI-030Y	POWER TRANSISTOR	H.OUT
Q1523-24	2SC2412K/QR/-X	SI TRANSISTOR	
Q1571	2SA949/Y/Z1-T	SI TRANSISTOR	
Q1572	2SC2412K/QR/-X	SI TRANSISTOR	
Q1651	2SA1037AK/QR/-X	SI TRANSISTOR	
Q1652	DTC323TK-X	DIGI TRANSISTOR	
Q1654-55	2SC2412K/QR/-X	SI TRANSISTOR	
Q1701	2SC2785/JH/-T	SI TRANSISTOR	
Q1702-03	2SC2412K/QR/-X	SI TRANSISTOR	
Q1708	DTC124EKA-X	DIGI TRANSISTOR	
Q1709	2SA1037AK/QR/-X	SI TRANSISTOR	
Q1803	2SC1815/YG/-T	SI TRANSISTOR	
Q1804	2SC2412K/QR/-X	SI TRANSISTOR	
Q1821	-	-	
Q1941	2SC2412K/QR/-X	SI TRANSISTOR	
Q1943	DTC114EKA-X	DIGI TRANSISTOR	
Q1974	2SA966/OV/-T	SI TRANSISTOR	
Q1975	DTC124EKA-X	DIGI TRANSISTOR	

**IC**

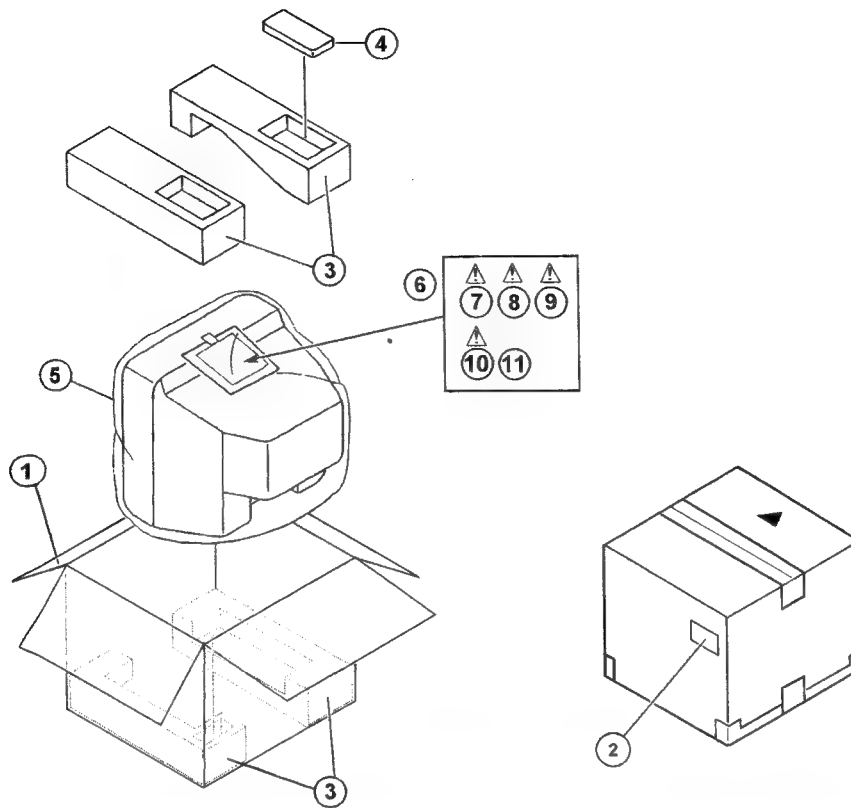
IC1301	NNS198K	I C	
IC1421	ANS539-LF	I C	
IC1651	LA4287	I C	
IC1652	SI-5001X-W	I C	
IC1701	NN1873287JX	I C	
IC1702	AT24C08-F21TR3	I.C.	(SERVICE)
IC1703	L78LRO5E-MA	I.C. (MONO-ANA)	
IC1704	PIC-281435Y	IR DETECT UNIT	
IC1921	STR-G6653	I C	
IC1941	SE115N-LF12	I C	
IC1971	BA51W125T-V5	I C	

**OTHERS**

CF1161	LC30114-001C-H	L.E.D. HOLDER	
CP1981	CM35921-005-H	CDS HOLDER	
CP1982	SFSH4.5MCB	CERAMIC FILTER	
F1901	ICP-N75-Y	I.C. PROTECT	
FC1901	ICP-N75-Y	I.C. PROTECT	
J1002	QMF51E2-3R15J4	FUSE	3.15A
J1003	CENG002-001Z	FUSE CLIP	
J1004	CEMN075-001	PIN JACK	
J1005	CEMN065-002	PIN JACK	
K1001	QMS3004-C01	HEADPHONE JACK	
K1351	CE41433-001Z	BEADS CORE	
K1421	CE41433-001Z	BEADS CORE	
K1921-22	CE42050-001Z	CORE	
K1923	QQR0872-001Y	FERRITE BEADS	
K1924	QQR0716-001Z	LEAD CORE	
K1941-43	QQR0872-001Y	FERRITE BEADS	
K1941-43	QQR0872-001Y	FERRITE BEADS	

Symbol No.	Part No.	Part Name	Description	Local
<b>OTHERS</b>				
△ LF1901	QQR0527-002	LINE FILTER		
	PC1701	C.D.S.		
△ PC1921	PC1241-04	I.C.(PH. COUPLER)		
	PC123F2			
S1701	QSW0619-003Z	PUSH SWITCH	VOL +	
S1702	QSW0619-003Z	PUSH SWITCH	VOL -	
S1703	QSW0619-003Z	PUSH SWITCH	CH +	
S1704	QSW0619-003Z	PUSH SWITCH	CH -	
S1705	QSW0619-003Z	PUSH SWITCH	MENU	
△ S1901	QSW0750-001	PUSH SWITCH		POWER SW
SF1102	QAX0594-001	SAW FILTER		
SF1122	QAX0325-001	SAW FILTER		
△ SK1351	CE42446-001	CRT SOCKET		
△ TH1901	CEK0002-003	W.P.THERMISTOR		
TU1001	QAU0094-001	U/V TUNER		
△ VA1901	ERZV10V621CS	VARISTOR		
W1136	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1155	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1231	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1270	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1276-77	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1286	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1294-95	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1338	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1422	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1427	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1527	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1529-30	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1541	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1549	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1553	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1573-74	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1581	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1583	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1586	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1590-93	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1595	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1599	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
W1600-01	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
X1301	QAX0500-001Z	CRYSTAL		
X1302	CE42690-001Z	CRYSTAL		
X1701	FCR12.0M2S	CER.RESONATOR		
Y1302	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
Y1372-74	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
Y1704	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
Y1921	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
Y1941-42	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
Y1945	NRSA02J-OROX	MG R	0.0Ω 1/10W	J
Y1972	NRSA02J-OROX	MG R	0.0Ω 1/10W	J

## PACKING



## PACKING PARTS LIST

### AV-F21M3 / AV-F21M3(-A)

△ Ref.No.	Part No.	Part Name	Description	Local
1	LC10453-014A-H	PACKING CASE	[AV-F21M3]	
1	CP11781-061-H	PACKING CASE	[AV-F21M3(-A)]	
2	CM47385-00B-H	POS/SERIAL LABEL		
3	LC10516-002A-H	CUSSION ASSY	4pcs in 1set	
4	RM-C364-1H	REMOCON UNIT		
5	CP30967-003-H	POLY BAG		
6	CP30966-001-H	POLY BAG		
△ 7	LCT0404-001A-H	INST BOOK		
△ 8	LCT0405-001A-H	INST BOOK	[AV-F21M3] ONLY	
△ 9	LCT0443-001A-H	DIGEST MANUAL	[AV-F21M3(-A)] ONLY	
11	QAM0055-001	CONVERSION PLUG	[AV-F21M3(-A)] ONLY	

### AV-F21T3 / AV-F21T3(-A)

△ Ref.No.	Part No.	Part Name	Description	Local
1	LC10453-020A-H	PACKING CASE	[AV-F21T3]	
1	CP11781-070-H	PACKING CASE	[AV-F21T3(-A)]	
2	CM47385-00B-H	POS/SERIAL LABEL		
3	LC10516-002A-H	CUSSION ASSY	4pcs in 1set	
4	RM-C364-1H	REMOCON UNIT		
5	CP30967-003-H	POLY BAG		
6	CP30966-001-H	POLY BAG		
△ 7	LCT0404-001A-H	INST BOOK		
△ 9	LCT0443-001A-H	DIGEST MANUAL	[AV-F21T3(-A)] ONLY	
△ 10	LCT0440-001A-H	DIGEST MANUAL	[AV-F21T3] ONLY	
11	QAM0055-001	CONVERSION PLUG	[AV-F21T3(-A)] ONLY	

# AV-F21M3/AV-F21M3(-A)/AV-F21T3/AV-F21T3(-A) STANDARD CIRCUIT DIAGRAM

## NOTE ON USING CIRCUIT DIAGRAMS

### 1. SAFETY

The components identified by the  $\Delta$  symbol and shading are critical for safety. For continued safety replace safety critical components only with manufactures recommended parts.

### 2. SPECIFIED VOLTAGE AND WAVEFORM VALUES

The voltage and waveform values have been measured under the following conditions.

- (1) Input signal : Colour bar signal
  - (2) Setting positions of each knob/button and variable resistor : Original setting position when shipped
  - (3) Internal resistance of tester : DC 20k  $\Omega$  /V
  - (4) Oscilloscope sweeping time : H  $\Rightarrow$  20 $\mu$ S/div  
: V  $\Rightarrow$  5mS/div  
: Others  $\Rightarrow$  Sweeping time is specified
  - (5) Voltage values : All DC voltage values
- \* Since the voltage values of signal circuit vary to some extent according to adjustments, use them as reference values.

### 3. INDICATION OF PARTS SYMBOL [EXAMPLE]

- In the PW board : R1209  $\rightarrow$  R209

### 4. INDICATIONS ON THE CIRCUIT DIAGRAM

#### (1) Resistors

##### ● Resistance value

- No unit : [ $\Omega$ ]
- K : [K  $\Omega$ ]
- M : [M  $\Omega$ ]

##### ● Rated allowable power

- No indication : 1/10[W]
- Others : As specified

##### ● Type

- No indication : Carbon resistor
- OMR : Oxide metal film resistor
- MFR : Metal film resistor
- MPR : Metal plate resistor
- UNFR : Uninflammable resistor
- FR : Fusible resistor

\* Composition resistor 1/2 [W] is specified as 1/2S or Comp.

#### (2) Capacitors

##### ● Capacitance value

- .1 or higher : [pF]
- less than 1 : [ $\mu$ F]

##### ● Withstand voltage

- No indication : DC50[V]
- AC indicated : AC withstand voltage [V]
- Others : DC withstand voltage [V]

##### \* Electrolytic Capacitors

47/50[Example]:Capacitance value [ $\mu$ F]/withstand voltage[V]

##### ● Type

- No indication : Ceramic capacitor
- MY : Mylar capacitor
- MM : Metalized mylar capacitor
- PP : Polypropylene capacitor
- MPP : Metalized polypropylene capacitor
- MF : Metalized film capacitor
- TF : Thin film capacitor
- BP : Bipolar electrolytic capacitor
- TAN : Tantalum capacitor

#### (3) Coils

- No unit : [ $\mu$ H]
- Others : As specified

#### (4) Power Supply



\*Respective voltage values are indicated

#### (5) Test point

- : Test point
- : Only test point display

#### (6) Connecting method

- : Connector
- : Wrapping or soldering
- : Receptacle

#### (7) Ground symbol

- : LIVE side ground
- : ISOLATED(NEUTRAL) side ground
- : EARTH ground
- : DIGITAL ground

## 5. NOTE FOR REPAIRING SERVICE

This model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE (  $\perp$  ) side GND and the ISOLATED(NEUTRAL) : (  $\nearrow$  ) side GND. Therefore, care must be taken for the following points.

- (1) Do not touch the LIVE side GND or the LIVE side GND and the ISOLATED(NEUTRAL) side GND simultaneously. If the above caution is not respected, an electric shock may be caused. Therefore, make sure that the power cord is surely removed from the receptacle when, for example, the chassis is pulled out.
- (2) Do not short between the LIVE side GND and ISOLATED(NEUTRAL) side GND or never measure with a measuring apparatus ( oscilloscope, etc.) the LIVE side GND and ISOLATED(NEUTRAL) side GND at the same time. If the above precaution is not respected , a fuse or any parts will be broken.

◇ Since the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.

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**BLOCK DIAGRAM** ..... 2-3

**CIRCUIT DIAGRAMS**

**MAIN PWB CIRCUIT DIAGRAMS (Inc. CRT SOCKET PWB)** ..... 2-5

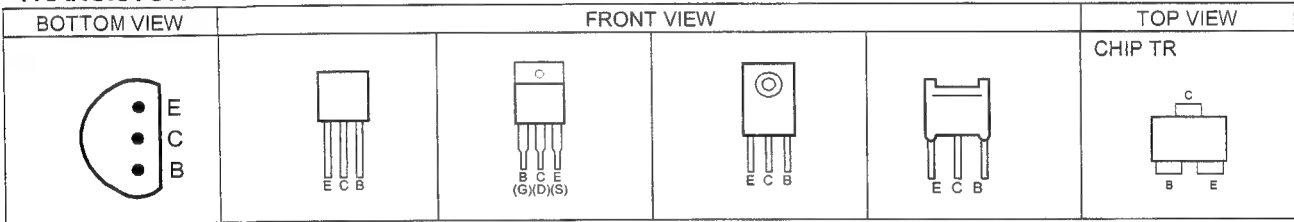
**PATTERN DIAGRAMS**

**MAIN PWB PATTERN** ..... 2-9

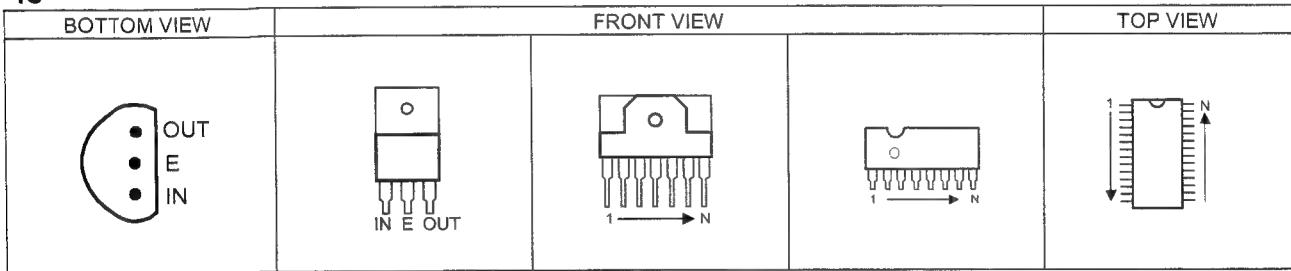
**CRT SOCKET PWB PATTERN** ..... 2-11

## SEMICONDUCTOR SHAPES

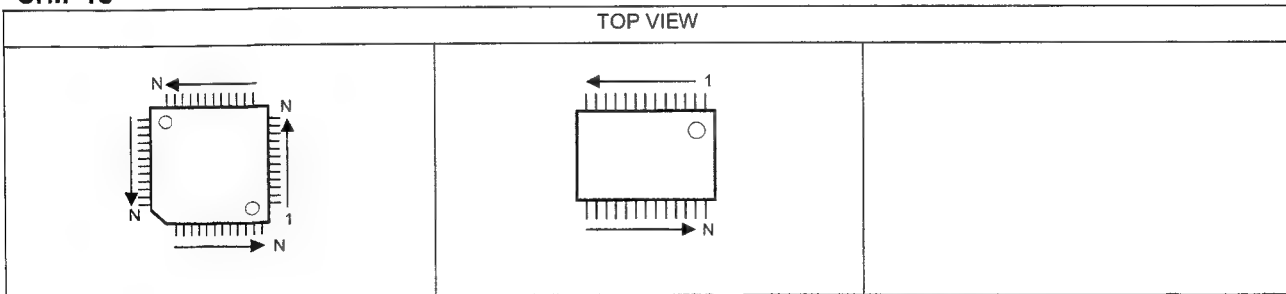
### TRANSISTOR



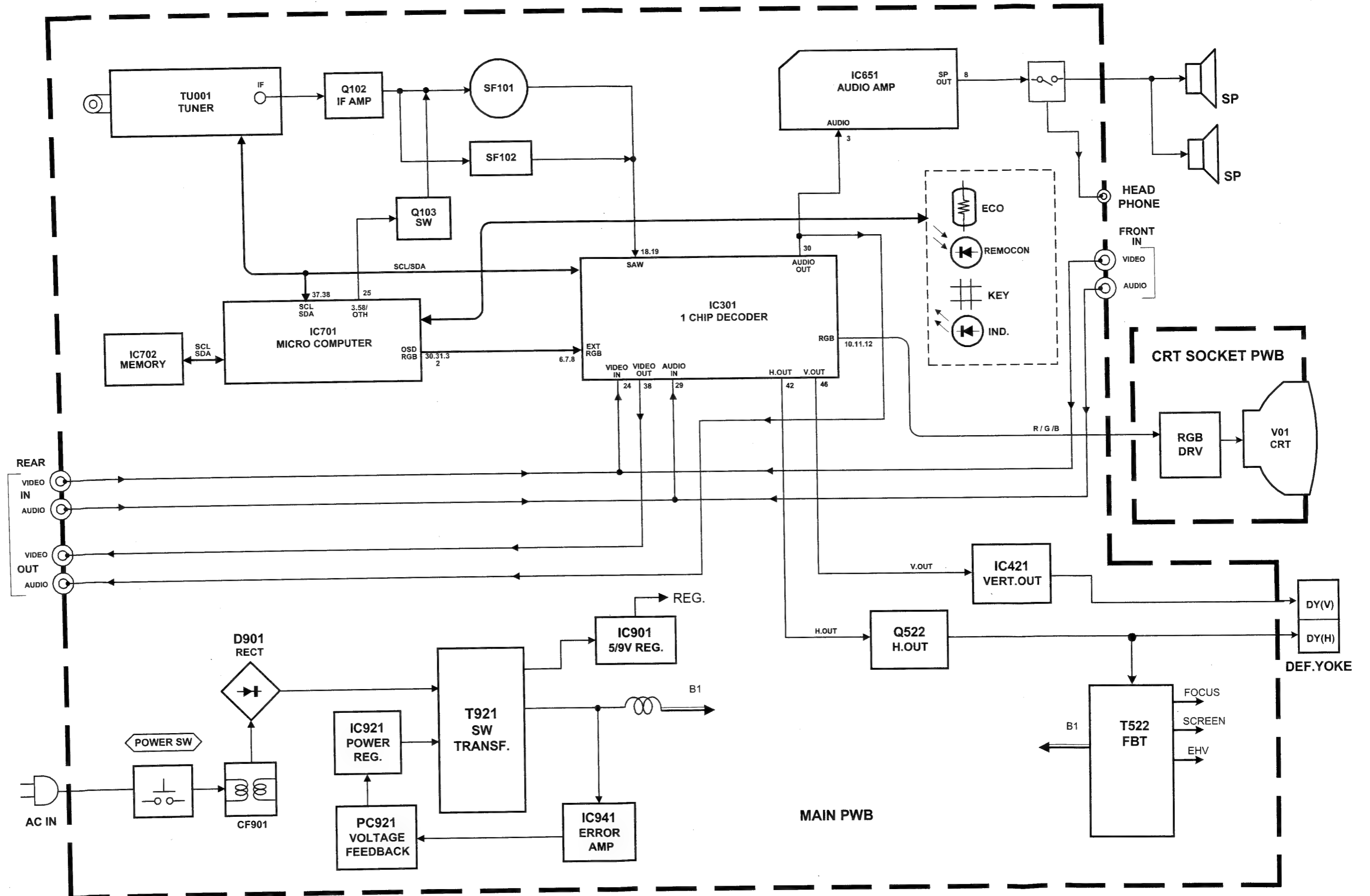
### IC



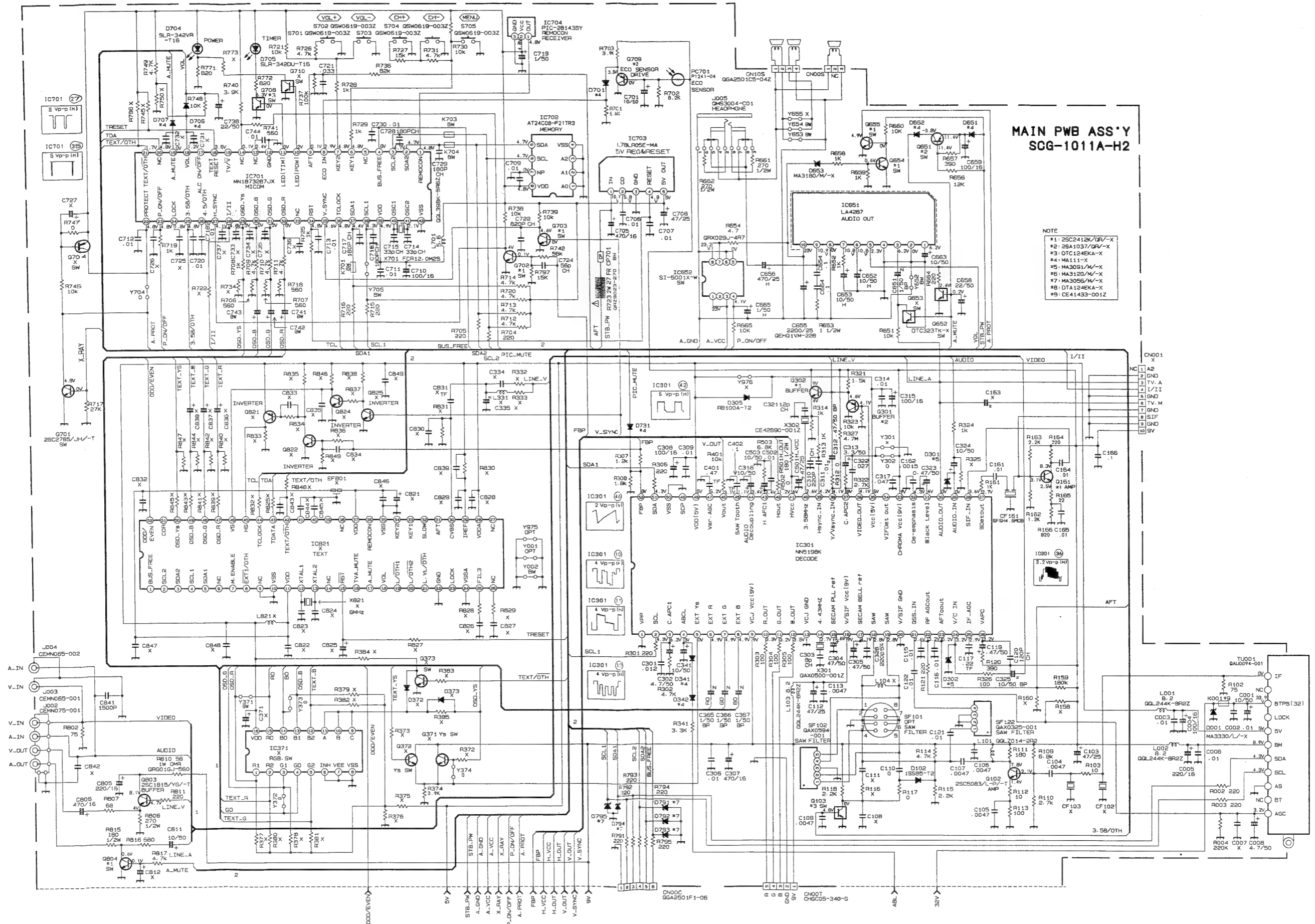
### CHIP IC



# BLOCK DIAGRAM



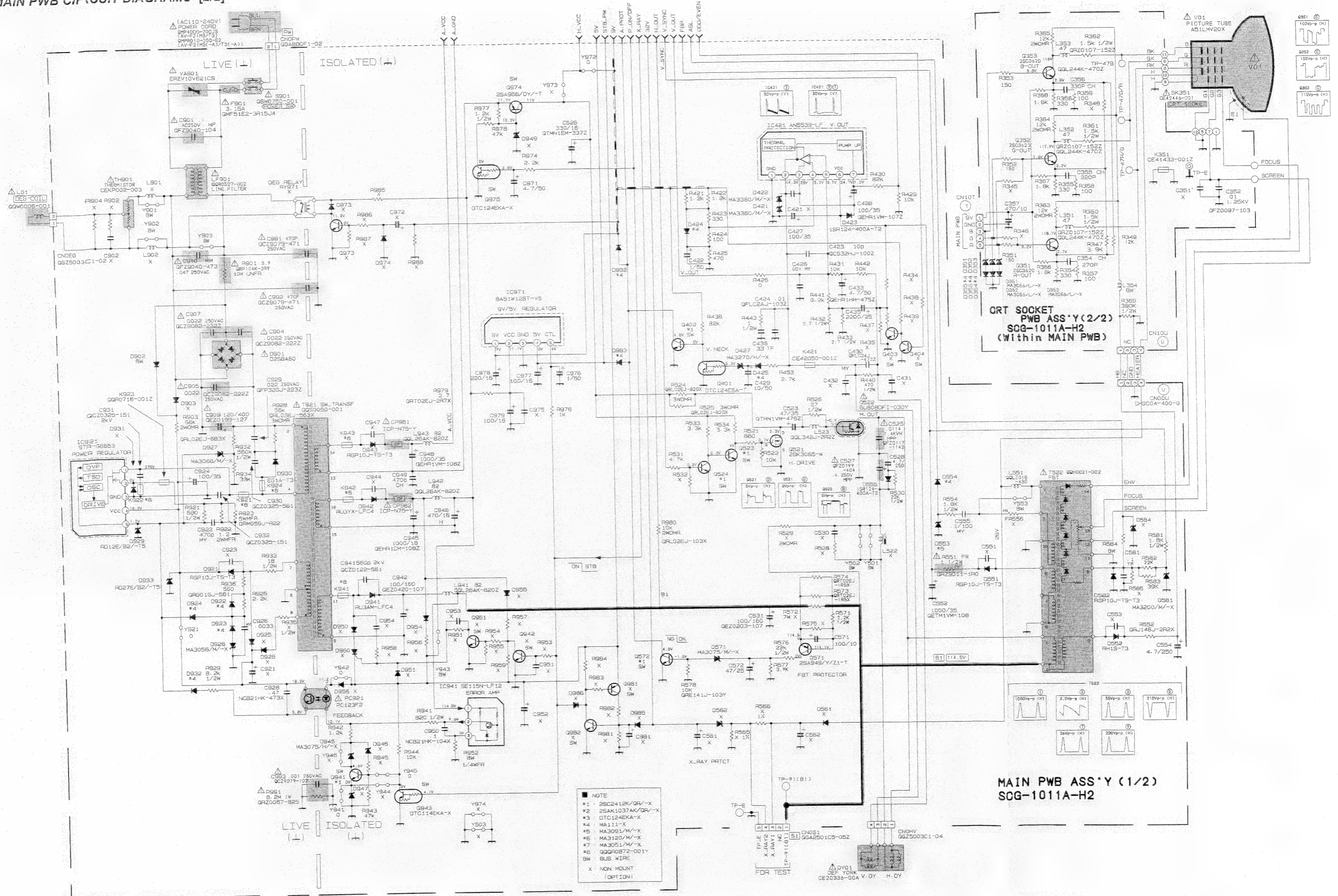
CIRCUIT DIAGRAMS MAIN PWB CIRCUIT DIAGRAMS [1/2]



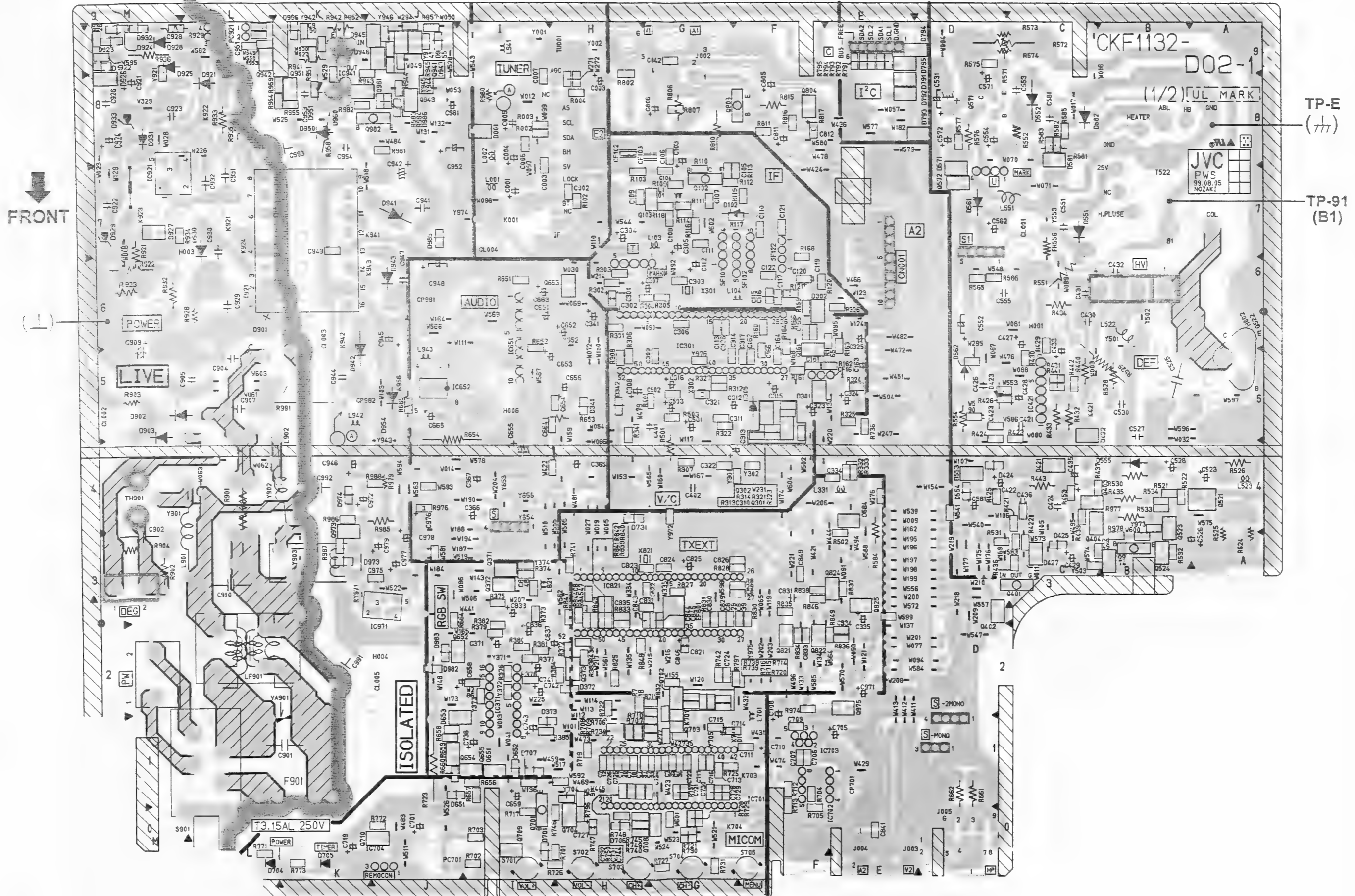
MAIN PWB CIRCUIT DIAGRAMS [2/2]

AV-F21M3  
AV-F21T3

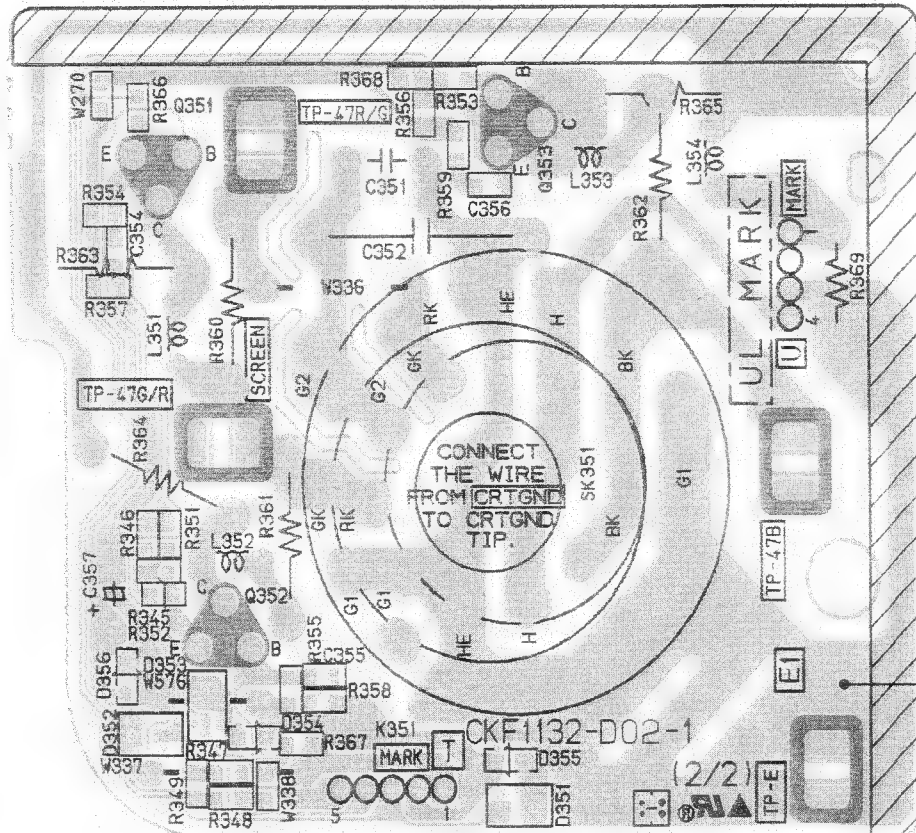
AV-F21M3  
AV-F21T3



PATTERN DIAGRAMS MAIN PWB PATTERN



CRT SOCKET PWB PATTERN [Within MAIN PWB]



# OPERATING INSTRUCTIONS

# JVC



## COLOUR TELEVISION

**AV-A21M3**  
**AV-A21T3**  
**AV-F21M3**  
**AV-F21T3**  
**AV-F21AU3**  
**AV-K14M3**  
**AV-K14T3**

## INSTRUCTIONS

Thank you for purchasing this JVC colour television.

To ensure your complete understanding, please read this manual thoroughly before operation.

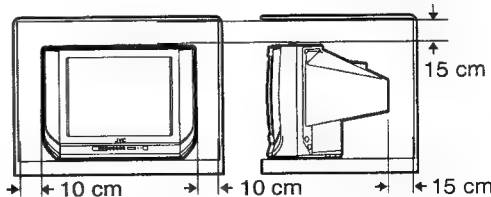
Locations .....	2
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Sound and Picture .....	16
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Troubleshooting .....	24
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### WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

### CAUTION:

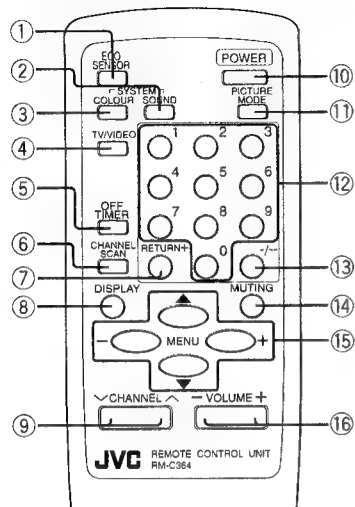
- TO ENSURE PERSONAL SAFETY, OBSERVE THE FOLLOWING RULES REGARDING THE USE OF THIS TV.
- Operate only from the power source specified on the TV.
- Avoid damaging the power plug and power cord.
- Avoid improper installation and never position this TV where good ventilation is unattainable. When installing this TV distance recommendations must be maintained between the floor and wall, as well as installment in a tightly enclosed area or piece of furniture. Adhere to the minimum distance guidelines shown for safe operation.
- Do not allow objects or liquid into the cabinet openings.
- In the event of a fault, unplug this TV and call a service technician. Do not attempt to repair it by yourself or remove the rear cover.
- When you don't use this TV for a long period of time, be sure to disconnect the power plug from the AC outlet.



# Locations

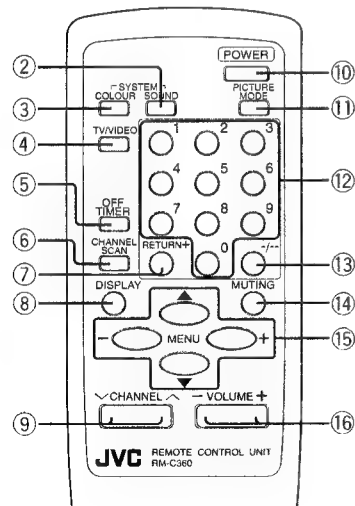
## Locations of remote control buttons

<RM-C364>



- ① ECO SENSOR button p.18
- ② SOUND SYSTEM button p.16
- ③ COLOUR SYSTEM button p.16
- ④ TV/VIDEO button p.15
- ⑤ OFF TIMER button p.18
- ⑥ CHANNEL SCAN button p.14
- ⑦ RETURN + button p.19
- ⑧ DISPLAY button p.18
- ⑨ CHANNEL  $\nabla/\wedge$  buttons p.13
- ⑩ POWER button p.7,13,14
- ⑪ PICTURE MODE button p.16
- ⑫ Number buttons p.13
- ⑬  $-/--$  button p.13
- ⑭ MUTING button p.14
- ⑮ MENU buttons
  - MENU  $\blacktriangle/\blacktriangledown$  buttons
  - MENU  $-/+$  buttons
- ⑯ VOLUME  $-/+$  buttons p.14

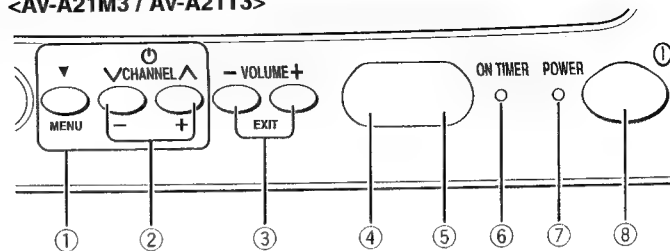
<RM-C360>



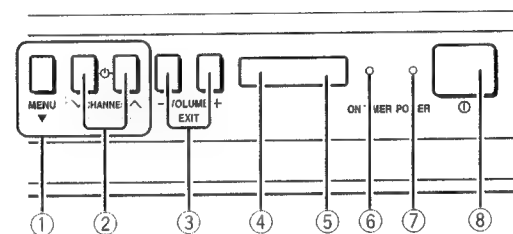
# Locations

## Locations of front panel buttons and lamps

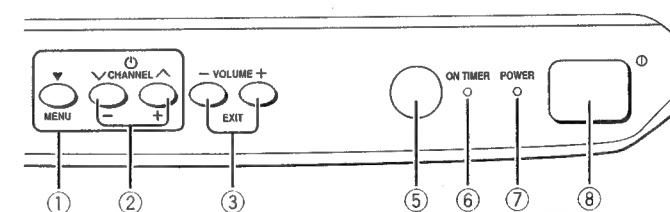
<AV-A21M3 / AV-A21T3>



<AV-F21M3 / AV-F21T3 / AV-F21AU3>



<AV-K14M3 / AV-K14T3>



- ① MENU buttons p.23
  - MENU button
  - MENU  $-/+$  buttons
- ② CHANNEL  $\nabla/\wedge$  buttons p.14
- ③ VOLUME  $-/+$  buttons p.14

- ④ ECO sensor
- ⑤ Remote control sensor
- ⑥ ON TIMER lamp p.20
- ⑦ POWER lamp p.7,14
- ⑧ Main power button p.7,14

## Preparation

### 1. Connecting the aerial and external devices

#### Notes:

- For further details, refer to the manuals provided with the devices you are connecting.
- Connecting cables are not supplied.
- The front and rear AUDIO/VIDEO input jacks are directly connected so that input to either jack is output through both. You cannot provide input to both the front and rear jacks at the same time. Disconnect one input, or use one of the jacks as an output jack only (for monitoring or recording).

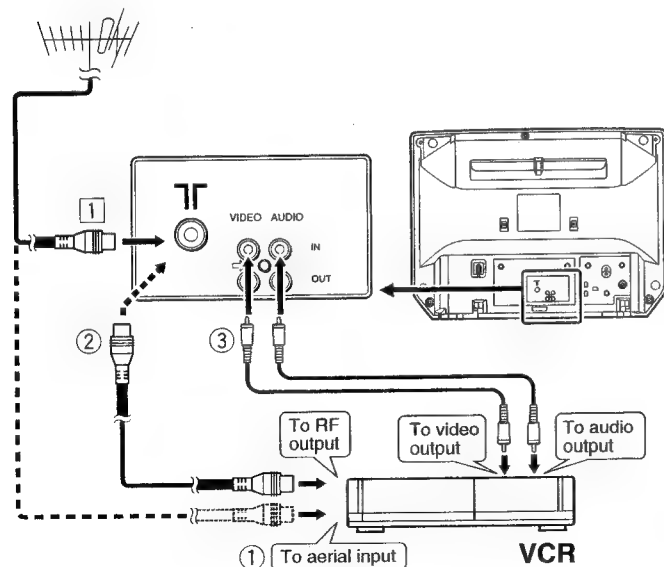
#### ■ Connecting the aerial and VCR

If not connecting a VCR (video cassette recorder), do ①.

If connecting a VCR, proceed ① → ② → ③.

- You can view images from the VCR without doing ③. For details, see "To view images from a VCR connected to the TV with only an aerial cable" on page 15.

#### VHF/UHF outdoor aerial



## Preparation

#### Note:

- The rod aerial is supplied with the AV-K14M3/AV-K14T3.

If not connecting a VCR (video cassette recorder), do ①.

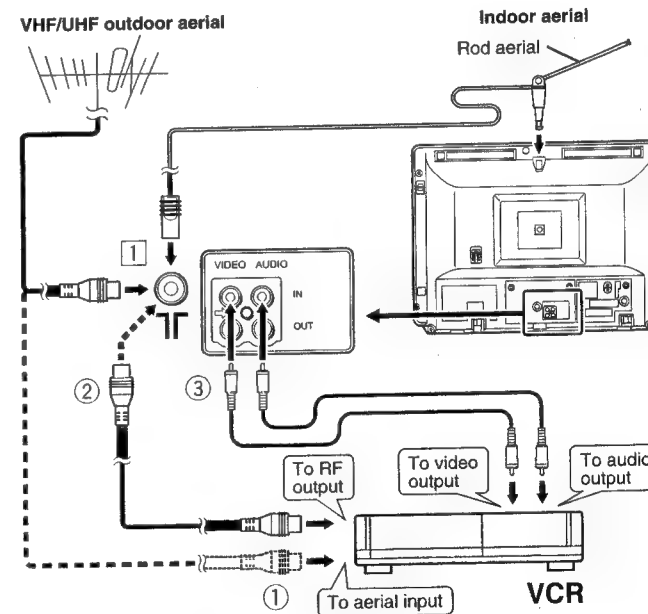
If connecting a VCR, proceed ① → ② → ③.

- You can view images from the VCR without doing ③. For details, see "To view images from a VCR connected to the TV with only an aerial cable" on page 15.

To install rod aerial:

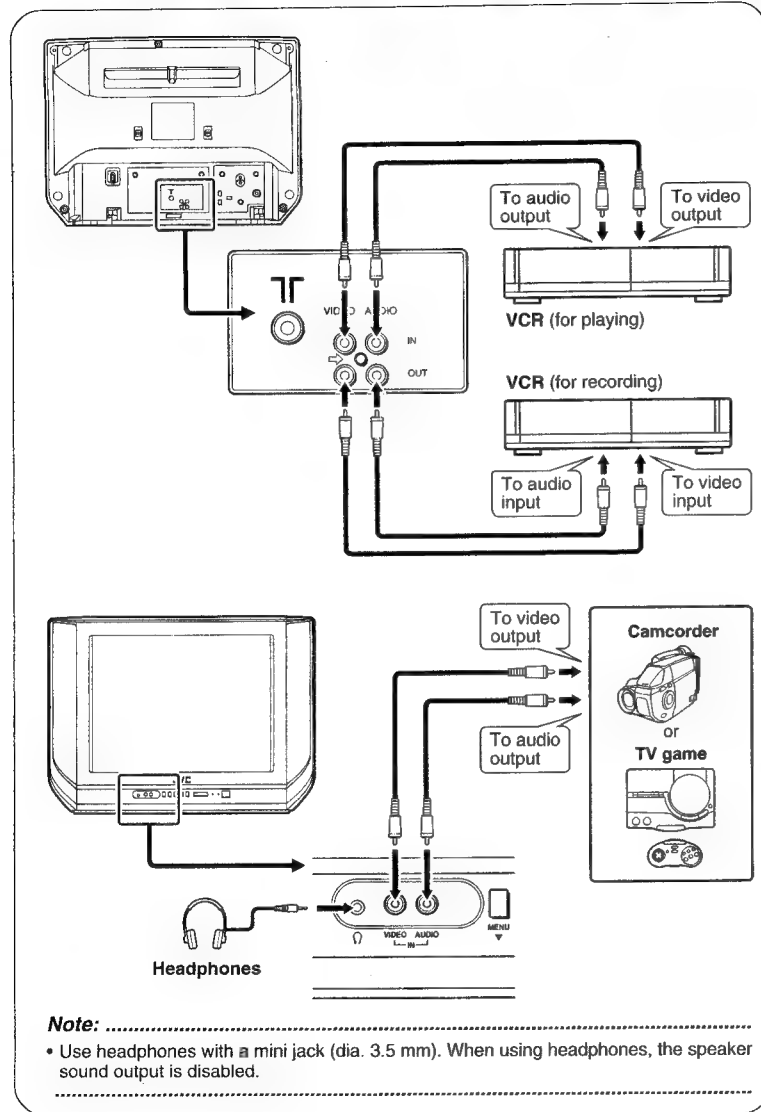
Install into the top-rear aerial holder. Once installed, it cannot be removed.

#### <AV-K14M3 / AV-K14T3>



# Preparation

## ■ Connecting other external devices



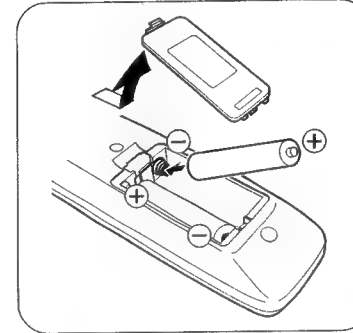
# Preparation

## 2. Connecting the power cord

Insert the Power plug into an AC outlet.

## 3. Inserting batteries into the remote control

Correctly insert two batteries, observing the ⊕ and ⊖ polarities and inserting the ⊖ end first.



**CAUTION:** .....

- Follow the cautions printed on the batteries.

**Notes:** .....

- Use AA/R6/UM-3 dry cell batteries.
- Battery life is approximately six months to one year depending on frequency of use.
- If the remote control operates erratically, replace the batteries.
- We recommend that you use the supplied batteries initially and replace them as soon as operation becomes erratic. The supplied batteries are for testing, not regular use.

## 4. Turning your TV on

**1. Press the Main power button on the TV to turn the TV's main power on.**

*The POWER lamp lights red.*

**If image does not appear:**

Your TV is in the standby mode. Press the POWER button on the remote control to turn your TV on.

- You can also turn on your TV by pressing the CHANNEL V/∧ button on your TV.

**To turn your TV off:**

Press the POWER button on the remote control. Your TV enters the standby mode.

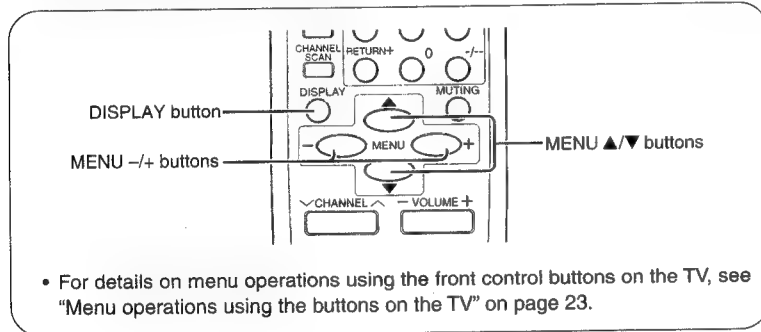
**To turn the TV's main power off:**

Press the Main power button on the TV. The POWER lamp goes off.

## Preparation

### 5. Selecting the on-screen language

You can select one of four languages for the on-screen display. The displayed menus on the screen are described in the selected language. In this manual, on-screen descriptions are given in English. Select ENGLISH.



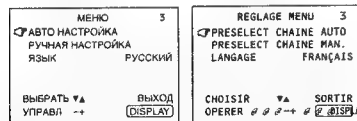
#### 1. Repeatedly press MENU ▲/▼ to display the following menu.

The following menu is displayed in one of four languages.



English

Arabic



Russian

French

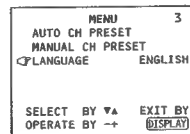
**Note:** .....

- If the menu appears in English, the TV's on-screen language is already set to English, so you can skip steps 2 and 3.

#### 2. Press MENU ▲/▼ to select the third item on the menu 3.

#### 3. Press MENU +/- to select ENGLISH.

The menu is displayed in English.



#### 4. Proceed to "6. Presetting TV stations" on the following page.

- If you want to complete operations at this stage, press the DISPLAY button to turn the menu display off.

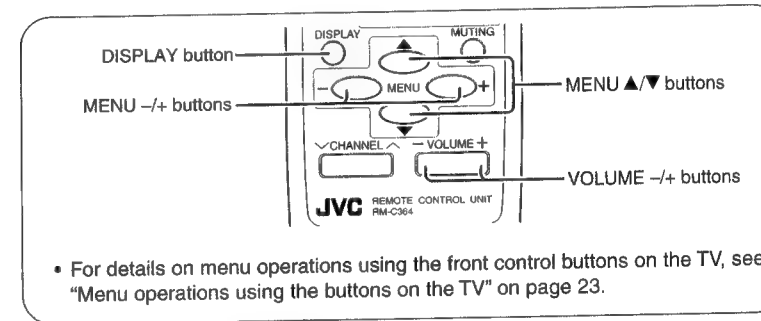
## Preparation

### 6. Presetting TV stations

To view a TV programme, you must first preset TV stations to channels on the TV. This TV has 100 channels (channel 1 to 99 and channel AV). You can choose between two functions, the Auto Channel Preset and Manual Channel Preset and preset TV stations to channels on TV.

**Note:** .....

- After you have finished presetting, you can set undesired channels to be skipped over, see "Skip" on page 12.



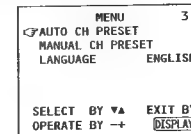
#### Auto Channel Preset

You can automatically preset all TV stations that can be received on your TV to channels in one simple operation.

**Notes:** .....

- When you use this function, no station is preset to the channel AV. Channel AV is offered for viewing images from a VCR connected to your TV with only an aerial cable. For more details, see "To view images from a VCR connected to the TV with only an aerial cable" on page 15.
- If the Auto Channel Preset does not work well, preset TV stations manually. For details, see "Manual Channel Preset" on page 10.

#### 1. Press MENU ▲/▼ to select AUTO CH PRESET in the "MENU 3" menu.



**To display this menu:**  
Repeatedly press MENU ▲/▼ button until it is displayed.

#### 2. Press MENU +/- to start the Auto Channel Preset function.

">>> ON SEARCH" is displayed on the screen.

## Preparation

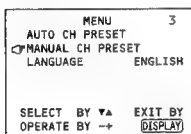
When you have finished presetting all TV channels that can be received on your TV, the display will go out and the Auto Channel Preset function will end.

- To stop the Auto Channel Preset, press the MENU  $\rightarrow$  button.

### Manual Channel Preset

You can manually preset the desired TV stations to the desired channels.

- Press MENU  $\blacktriangle/\blacktriangledown$  to select **MANUAL CH PRESET** in the "MENU 3" menu.

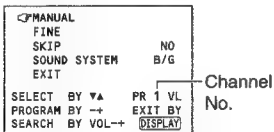


**To display this menu:**

Repeatedly press the MENU  $\blacktriangle/\blacktriangledown$  button until it is displayed.

- Press MENU  $\rightarrow$ .

The sub-menu is displayed.



- The channel No. is displayed as a PR No. For example, channel 1 will be displayed as PR 1. However, channel AV will be displayed as AV.

- Press MENU  $\rightarrow$  to select the channel No. to be preset.

- Press VOLUME  $\rightarrow$  to start selection of the TV station.

">>>>" or "<<<<" is displayed on the screen.

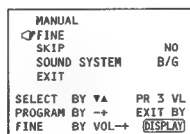
When a TV station is received, the ">>>>" or "<<<<" display goes out, and the TV station is preset to the currently selected channel No.

- If you have selected the wrong TV station for preset, repeatedly press the VOLUME  $\rightarrow$  button until the desired TV station is selected.
- To stop the Manual Channel Preset, press any button other than the VOLUME  $\rightarrow$  button.

**If the picture is not clear:**

Use the Fine function to fine-tune the TV station.

- Press MENU  $\blacktriangle/\blacktriangledown$  to select **FINE**.

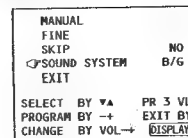


- Hold VOLUME  $\rightarrow$  down to fine-tune the TV station so that the best image is displayed on screen.

">" or "<" indicates that the TV station is being fine-tuned.

## Preparation

- Press MENU  $\blacktriangle/\blacktriangledown$  to select **SOUND SYSTEM**.



- Press VOLUME  $\rightarrow$  to select the appropriate sound system.

- For the sound systems in each country or region, refer to the table "The Broadcasting systems of Each country or Region" below.

- Press MENU  $\blacktriangle/\blacktriangledown$  to select **MANUAL**.

- Repeat steps 3 to 7 if you want to preset another TV station to a channel.

- Press DISPLAY to turn the display off.

### The Broadcasting Systems of Each Country or Region

Area	Country or Region	System	
		Colour	Sound
Asia, Middle East	Bahrain, Kuwait, Oman, Qatar, United Arab Emirates, Yemen, etc.	PAL	B/G
	Indonesia, Malaysia, Singapore, Thailand, India, etc.	PAL	D/K
	China, Vietnam, etc.	PAL	I
	Hong Kong, etc.	PAL	I
	Islamic Republic of Iran, Lebanon, Saudi Arabia, etc.	SECAM	B/G
Europe	Philippine, Taiwan, Myanmar, etc.	NTSC	M
	Russia, etc.	SECAM	D/K
	Czech Republic, Poland, etc.	PAL	D/K
	Germany, Holland, Belgium, etc.	PAL	B/G
Oceania	UK, etc.	PAL	I
	Australia, New Zealand, etc.	PAL	B/G
Africa	Republic of South Africa, etc.	PAL	I
	Nigeria, etc.	PAL	B/G
	Egypt, Morocco, etc.	SECAM	B/G

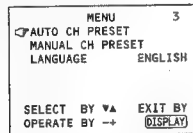
## Preparation

### ■ Skip

When selecting channels, you can set undesired channels to be skipped. Channels set to be skipped cannot be selected by the CHANNEL  $\nabla/\wedge$  buttons nor the CHANNEL SCAN button.

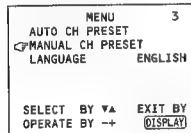
- Channels to which a station has not been preset are automatically set to be skipped.

#### 1. Press MENU $\blacktriangle/\blacktriangledown$ to display the "MENU 3" menu.



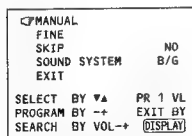
- If a different menu is displayed, repeatedly press the MENU  $\blacktriangle/\blacktriangledown$  button until this menu is displayed.

#### 2. Press MENU $\blacktriangle/\blacktriangledown$ to select MANUAL CH PRESET.

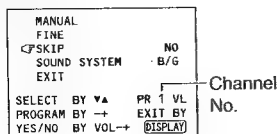


#### 3. Press MENU $\blackleft/\blackright$ .

The sub-menu is displayed.



#### 4. Press MENU $\blacktriangle/\blacktriangledown$ to select SKIP.

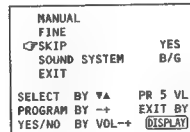


- The channel No. is displayed as a PR No. For example, channel 1 will be displayed as PR 1. However, channel AV will be displayed as AV.

#### 5. Press MENU $\blackleft/\blackright$ to select the channel you want to skip.

#### 6. Press VOLUME $\blackleft/\blackright$ to select YES.

The channel you selected is set to be skipped.



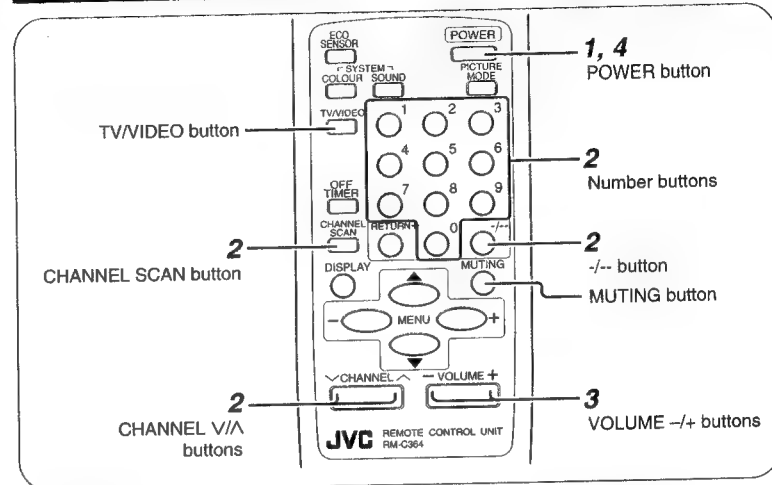
To cancel the Skip: select NO.

#### 7. Repeat steps 5 and 6 if you want to set another channel to skip.

#### 8. Press DISPLAY to turn the display off.

## Viewing a Television Programme

### Using the remote control



#### 1. Press POWER to turn your TV on.

Notes: .....

- If your TV does not turn on, press the Main power button on the TV then press the POWER button again.
- You can also turn on your TV by pressing any of the following buttons;
  - the CHANNEL  $\nabla/\wedge$  button
  - the Number buttons
  - the TV/VIDEO button

#### 2. Select a channel.

##### ■ Up/ down selection

1. Press CHANNEL  $\nabla/\wedge$ .

##### ■ Direct selection

1. Repeatedly press the  $\blackleft/\blackright$  button to select the desired mode.

##### - : 1-digit mode

To select a channel with a 1-digit number.

##### - - : 2-digit mode

To select a channel with a 1-digit number or a 2-digit number.

#### 2. Press the Number buttons to select a channel.

##### For 1-digit mode:

(example)  
Channel 6  $\rightarrow$  Press 6.

##### For 2-digit mode:

(example)  
Channel 6  $\rightarrow$  Press 0, 6.  
Channel 16  $\rightarrow$  Press 1, 6.

- When you want to select channel AV, press 0 in 1-digit mode or 00 in 2-digit mode.

## Viewing a Television Programme

### ■ Channel Scan selection

You can search for the channel you want to view while scanning all of the channels that can be viewed on this TV.

#### 1. Press CHANNEL SCAN.

Channels will be scanned in channel No. order.

#### 2. When the channel that you want to view appears, press CHANNEL SCAN again before scanning for the next channel begins.

#### Note:

- Up/down and Channel Scan selections cannot be selected for channels to which the Skip has been set to YES. (See "Skip" on page 12.)

#### If the colour is abnormal:

Repeatedly press the COLOUR SYSTEM button to select the appropriate colour system. For details, see "Colour System" on page 16.

### 3. Press VOLUME +/- to adjust the sound.

#### To temporarily render the sound inaudible:

Press the MUTING button.

- To return the sound, press the MUTING button again.

#### If the sound is abnormal:

Repeatedly press the SOUND SYSTEM button to select the appropriate sound system. For details, see "Sound System" on page 16.

### 4. To turn your TV off, press POWER.

#### Note:

- We recommend that you press the Main power button on the TV to turn the main power off if you do not plan to use your TV for a long time or if you wish to save energy.

## Using the buttons on the TV

#### Condition:

- Check to make sure the Child Lock function is set to OFF. When the Child Lock function is set to ON, the TV cannot be operated using the front control buttons. For details, see "Child Lock" on page 21.

### 1. Press CHANNEL V/∧ to turn your TV on.

#### Note:

- If your TV does not turn on, press the Main power button and then press the CHANNEL V/∧ button again.

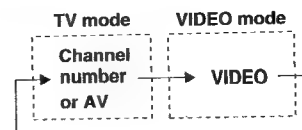
### 2. Press CHANNEL V/∧ to select a channel.

### 3. Press VOLUME +/- to adjust the sound.

## Viewing Images from an External Device

You can view images from VCRs or other external devices connected to your TV.

### 1. Press TV/VIDEO to select the VIDEO mode.



#### TV mode:

This mode is for viewing TV programmes. Press the TV/VIDEO button, or press the CHANNEL V/∧ buttons, or press the number buttons to return to this mode.

#### To view images from a VCR connected to the TV with only an aerial cable:

Your VCR must be preset to the channel AV of this TV.

Thoroughly read the manual of your VCR, and preset your VCR to the channel AV using the Manual Channel Preset function on page 10.

As a result, you can view images from your VCR when you select the channel AV in the TV mode.

#### If the colour is abnormal:

Repeatedly press the COLOUR SYSTEM button to select the appropriate colour system. For details, see "Colour System" on page 16.

#### To select the VIDEO mode using the buttons on the TV:

When not using the remote control, you can select the VIDEO mode using the MENU buttons on the TV.

### 1. Repeatedly press the MENU button to select INPUT from "MENU 1" menu.

### 2. Press the MENU +/- button on the TV.

TV mode changes to VIDEO mode.

#### Note:

- For details, see "Menu operations using the buttons on the TV" on page 23.

## Sound and Picture

### Colour System

If the colour is abnormal, select the appropriate colour system. Each press of the COLOUR SYSTEM button changes the colour system as follows.

**In TV mode (channel 1 to 99 and AV):**  
<AV-A21M3/AV-F21M3/AV-K14M3>

→ AUTO → PAL → SECAM  
NTSC4.43 ← NTSC3.58 ←

<AV-A21T3/AV-F21T3/AV-F21AU3/  
AV-K14T3>

→ AUTO → PAL → SECAM

**In VIDEO mode:**

→ AUTO → PAL → SECAM  
NTSC4.43 ← NTSC3.58 ←

**AUTO:**

Automatic colour system selection.

**Notes:**

- For the colour systems in each country or region, see the table "The Broadcasting Systems of Each Country or Region" on page 11.
- If the colour is abnormal even though you selected AUTO, change the appropriate colour system manually.

### Sound System

If the sound is abnormal, select the appropriate sound system. Each press of the SOUND SYSTEM button changes the sound system as follows.

<AV-A21M3/AV-F21M3/AV-K14M3>

→ B/G → I → D/K → M

<AV-A21T3/AV-F21T3/AV-F21AU3/  
AV-K14T3>

→ B/G → I → D/K

**Notes:**

- For the sound systems in each country or region, see the table "The Broadcasting Systems of Each Country or Region" on page 11.
- You cannot select any sound system when in VIDEO mode.

### Picture Mode

You can select one of three picture adjustment modes.

Repeatedly press the PICTURE MODE button to select the desired mode.

**BRIGHT:**

Heightens contrast and sharpness.

**STANDARD:**

Standardizes picture adjustments.

**SOFT:**

Softens contrast and sharpness.

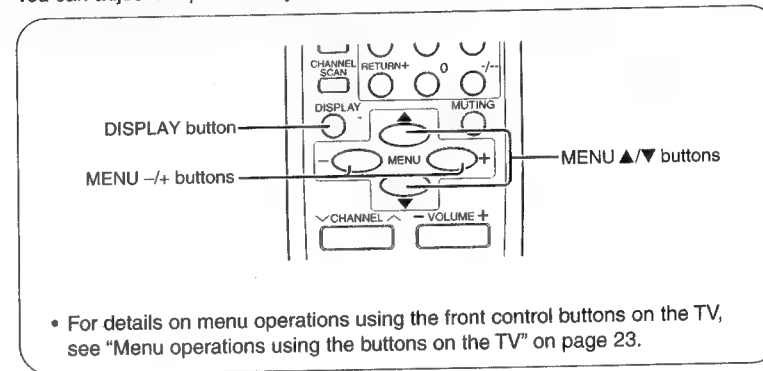
**Note:**

- Pressing the PICTURE MODE button returns all the picture settings in the "MENU 4" menu to their default settings.

## Sound and Picture

### Picture Adjustment

You can adjust the picture as you like.



- For details on menu operations using the front control buttons on the TV, see "Menu operations using the buttons on the TV" on page 23.

1. Press MENU ▲/▼ to display a menu.
2. Press MENU ▲/▼ repeatedly to display the desired menu.

Display the "MENU 4" menu.

MENU 4	
TINT	..... .....
COLOUR	..... .....
BRIGHT	..... .....
CONT.	..... .....
SHARP	..... .....
SELECT BY ▼▲	EXIT BY
OPERATE BY →	(DISPLAY)

3. Press MENU ▲/▼ to select an item and press MENU +/- to adjust it.

-	Item	+
Reddish	TINT (tint)	Greenish
Lighter	COLOUR (colour depth)	Deeper
Darker	BRIGHT (brightness)	Brighter
Lower	CONT. (contrast)	Higher
Softer	SHARP (sharpness)	Sharper

**Note:**

- TINT (tint) is displayed only when viewing images from NTSC3.58 or NTSC4.43 colour systems.

4. Press DISPLAY to turn the display off.

## Other Features

### Display

You can continuously display the current channel number or VIDEO mode on the screen.

Press the DISPLAY button. To turn the display off, press the DISPLAY button again.

**Note:** .....

- When selecting a channel or VIDEO mode with no input signal, indication of selected channel or VIDEO mode becomes fixed on the screen.

### Off Timer

You can set this TV to turn off automatically within a specified period of time.

Repeatedly press the OFF TIMER button to select the period of time.

- You can set the period of time a maximum of 120 minutes in 10 minute increments.
- 1 minute before the Off Timer turns off the TV, "GOOD NIGHT!" displays.

**To display the remaining time:**

Press the OFF TIMER button once.

**To cancel the Off Timer:**

Press the OFF TIMER button to return the period of time to 0.

**Note:** .....

- The Off Timer will not turn off the TV's main power.

### Eco Sensor

(AV-A21M3/AV-A21T3/AV-F21M3/AV-F21T3/AV-F21AU3)

You can adjust this TV so that the screen automatically adjusts to the optimum contrast according to the brightness of your room. This function reduces eye strain and the power consumption of this TV.

Repeatedly press the ECO SENSOR button to select the desired mode.

**ECO SENSOR DISPLAY:**

The Eco Sensor function will work. In this mode, the heart mark ♥ indicating the brightness of your room is displayed for several seconds each time the brightness changes. The number of heart marks displayed on screen increases as your room becomes darker. Up to six heart marks are displayed.

**ECO SENSOR:**

The Eco Sensor function will work. However, in this mode, the heart mark ♥ will not be displayed even if the brightness of your room changes.

**ECO SENSOR OFF:**

The Eco Sensor function will not work.

## Other Features

### Return +

By setting a channel to "Return channel", you can return to that channel with one touch.

1. Press CHANNEL V/A or the Number buttons to select a channel to set to "Return channel".
2. Press RETURN + for more than 3 seconds continuously. "RETURN PLUS PROGRAMMED!" appears.
3. When viewing another channel, press RETURN +. The channel changes to the channel set for "Return channel".

**To cancel the channel set for "Return channel":**

Press the RETURN + button for more than 3 seconds continuously.

- "RETURN PLUS CANCELLED!" appears.

**Notes:** .....

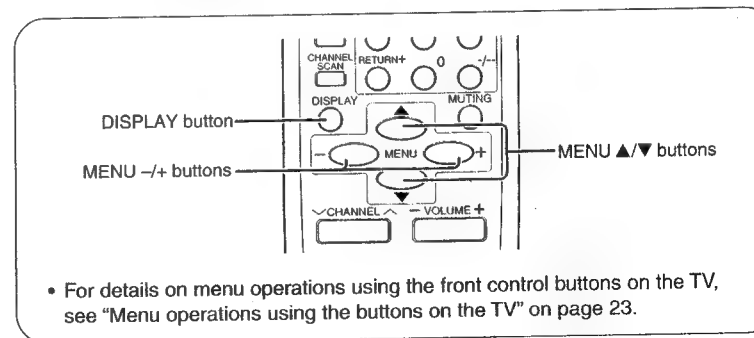
- When you turn the TV off, the "Return channel" setting will be canceled.
- When you press the RETURN + button while viewing the channel set for "Return channel", the channel changes to the previously viewed channel.
- When you press the RETURN + button while in a VIDEO mode, the mode switches to TV mode. To return to the channel set for "Return channel", press the RETURN + button again.

**When there is no setting for "Return channel":**

When you press the RETURN + button, the channel changes to the previously viewed channel.

### On Timer

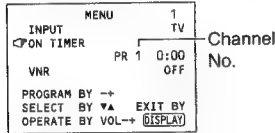
Your TV will automatically turn on and tune into the channel you want after a certain period of time you have specified.



- For details on menu operations using the front control buttons on the TV, see "Menu operations using the buttons on the TV" on page 23.

## Other Features

1. Repeatedly press MENU ▲/▼ to display the "MENU 1" menu, and press MENU ▲/▼ to select ON TIMER.



2. Press MENU -/+ to select a channel you want to view when the TV turns on.

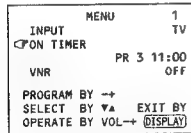
**Note:** .....

- You cannot select the channel AV, the VIDEO modes, and the channels for which the Skip is set (See "Skip" on page 12).

3. Press VOLUME -/+ to select the period of time after which you want to turn on the TV.

The ON TIMER lamp lights and the On Timer starts.

- Each time you press the button, the period of time changes in 15 minute intervals (up to 12 hours).



**To cancel the On Timer:**  
Press the VOLUME -/+ button to return the period of time to "0:00".

4. Press DISPLAY to turn the display off.

5. Press POWER to turn the TV off.  
The ON TIMER lamp will stay lit.

**Notes:** .....

- If you turn off the TV's main power by pressing the Main power button, the On Timer setting is canceled.
- If you do not turn off the TV after starting the On Timer, once the time set for the On Timer is reached, the channel will automatically switch to the channel set for the On Timer.

**While the On Timer is operating:**  
The ON TIMER lamp lights.

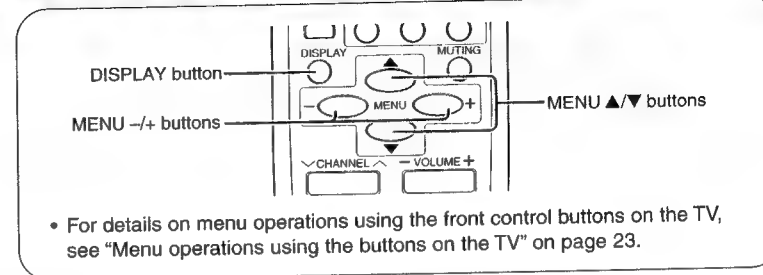
**When the time set for the On Timer is reached:**

The TV automatically turns on and the channel set for the On Timer is displayed.

**Notes:** .....

- For safety reasons the TV will automatically turn off if no operations are made within approximately two hours after the TV is turned on with the On Timer.
- The Off Timer and Auto Shutoff have priority over the On Timer.

## Other Features

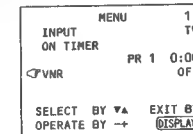


## VNR

### (Video Noise Reduction)

You can reduce the picture noise.

1. Repeatedly press MENU ▲/▼ to display the "MENU 1" menu, and press MENU ▲/▼ to select VNR.



2. Press MENU -/+ to select "ON" or "OFF."

**ON:**

Activates the VNR. Select "ON" when viewing a noisy picture.

**OFF:**

Cancels the VNR.

3. Press DISPLAY to turn the display off.

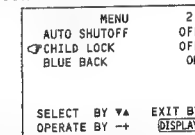
## Child Lock

You can disable the front control buttons of the TV.

When this function is set to ON, the TV can be operated using only the remote control.

Use this function to prevent children from operating the TV at their own discretion (without parental consent).

1. Repeatedly press MENU ▲/▼ to display the "MENU 2" menu, and press MENU ▲/▼ to select CHILD LOCK.



2. Press MENU -/+ to select "ON" or "OFF."

**ON:**

Activates the Child Lock, disabling operation of the TV using the front control buttons.

**OFF:**

Cancels the Child Lock.

3. Press DISPLAY to turn the display off.

**Note:** .....

- The Child Lock is canceled when you turn the TV's main power off.

## Other Features

### Auto Shutoff

You can set your TV to turn off if no signals are received for about 15 minutes or longer after the end of a broadcast.

1. Repeatedly press MENU ▲/▼ to display the "MENU 2" menu, and press MENU ▲/▼ to select AUTO SHUTOFF.

MENU	2
PAUTO SHUTOFF	OFF
CHILD LOCK	OFF
BLUE BACK	ON
SELECT BY ▼▲ EXIT BY	
OPERATE BY →→ [DISPLAY]	

2. Press MENU -/+ to select "ON" or "OFF".

MENU	2
PAUTO SHUTOFF	ON
CHILD LOCK	OFF
BLUE BACK	ON
SELECT BY ▼▲ EXIT BY	
OPERATE BY →→ [DISPLAY]	

**ON:**

Activates the Auto Shutoff.

**OFF:**

Cancels the Auto Shutoff.

3. Press DISPLAY to turn the display off.

**Notes:** .....

- The Auto Shutoff function does not turn off the TV's main power.
- The Auto Shutoff will not work for a VIDEO mode.

### Blue Back

You can mute the sound and change the picture into a blue screen while no signals come into the TV, or when the input signals are unstable.

1. Repeatedly press MENU ▲/▼ to display the "MENU 2" menu, and press MENU ▲/▼ to select BLUE BACK.

MENU	2
AUTO SHUTOFF	OFF
CHILD LOCK	OFF
BLUE BACK	OFF
SELECT BY ▼▲ EXIT BY	
OPERATE BY →→ [DISPLAY]	

2. Press MENU -/+ to select "ON" or "OFF".

MENU	2
AUTO SHUTOFF	OFF
CHILD LOCK	OFF
BLUE BACK	ON
SELECT BY ▼▲ EXIT BY	
OPERATE BY →→ [DISPLAY]	

**ON:**

Activates the Blue Back.

**OFF:**

Cancels the Blue Back.

**Notes:** .....

- To view a broadcast even when the reception signal is poor, set the Blue Back to OFF.
- Even when the Blue Back is set to OFF, the sound may not be audible.
- The Blue Back function does not operate in VIDEO mode.

3. Press DISPLAY to turn the display off.

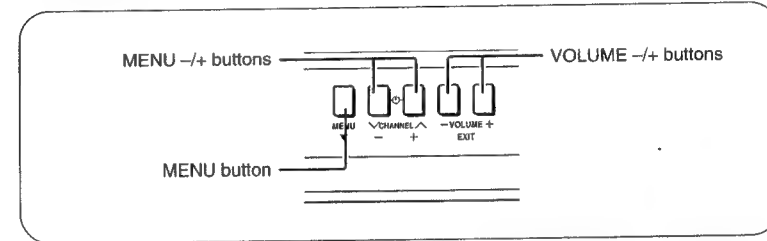
## Other Features

### Menu operations using the buttons on the TV

You can operate functions in menus using the front control buttons on the TV without having to use the remote control.

**Condition:** .....

- Check to make sure the Child Lock function is set to OFF. When the Child Lock function is set to ON, the TV cannot be operated using the front control buttons. For details, see "Child Lock" on page 21.



1. Press MENU to display the menu.

**If the desired menu is not displayed:**

Repeatedly press the MENU button until the desired menu is displayed.

2. Repeatedly press MENU to select the desired function or item.

**To select a function or item above the currently selected function or menu:**

Repeatedly press the MENU button to proceed to another menu, and then repeatedly press the MENU button again to return to the original menu. Then select the function or item.

3. Press MENU -/+ or VOLUME -/+ to carry out the desired operation.

- For details, see the description for the respective function.

4. Press VOLUME -/+ to turn the menu display off.

**If the sub-menu is displayed:**

The sub-menu cannot be turned off by the VOLUME -/+ button when it is displayed. Follow the procedure below to turn the sub-menu display off.

1. Press MENU to select EXIT.

MANUAL	
FINE	
SKIP	NO
SOUND SYSTEM	B/G
EXIT	
SELECT BY ▼▲ PR 1 VL	
PROGRAM BY →→ EXIT BY	
EXIT BY VOL-+ [DISPLAY]	

2. Press VOLUME -/+ to turn the sub-menu display off.

## Troubleshooting

**Important:** Review all the instructions in this manual.

Problem	Check/Action
Cannot turn TV on.	Press the Main power button (see p.7). Insert the power plug in an AC outlet.
No picture nor sound.	Press the TV/VIDEO button to select the correct mode (see p.15). Check the aerial connections.
Remote control inoperable.	Replace the batteries (see p.7).
Buttons on front of TV do not work.	Is the Child Lock function ON? (see p.21).
The TV turns on suddenly.	The TV will automatically turn on when the On Timer is operated (see p.19).
The TV turns off suddenly.	The TV will automatically turn off in the following cases. <ul style="list-style-type: none"> <li>• When the Off Timer or Auto Shutoff is operated (see p.18 and p.22).</li> <li>• When no operations are made within approximately two hours after the TV was turned on with the On Timer (see p.20).</li> </ul>
Abnormal sound	Select the appropriate sound system (see p.16).
Abnormal colour	Adjust the colour and brightness (see p.17). Select the appropriate colour system (see p.16). Set the Picture mode to STANDARD (see p.16).
Lines or streaks in picture (interference)	Move the components apart until the interference disappears. Reposition the aerial.
Spotted picture (crosstalk)	Move the aerial away from the source of interference. Replace the aerial cable with a coaxial cable, which is less prone to interference.
Double picture (ghost)	Reposition the aerial. Replace with an aerial with good directionality.
Snowy picture (image noise)	Check the aerial connection and aim it correctly. Replace or repair the aerial.
The TV channel changes suddenly.	The channel will automatically be changed when the On Timer operates (see p.20).
The screen turns blue.	Is the Blue Back set to ON? (see p.22).

**The following are normal occurrences and are not the result of TV malfunctions:**

- When you touch the CRT surface, you might feel a slight charge of static electricity. This is because the CRT contains static electricity; it does not affect the human body.
- Your TV may emit a crackling sound due to a sudden change in temperature. There is no problem unless the picture or sound is abnormal.
- When a still bright image (of a white dress, for example) appears on the screen, the image may be coloured. This problem occurs in all CRTs, and when the bright image disappears, the colouration also disappears.
- This TV is equipped with a microcomputer that may operate abnormally due to interference from external devices. If this happens, press the Main power button to turn the main power off and disconnect the power plug from the AC outlet. Then, reconnect the power plug to the AC outlet and press the Main power button again.

## Specifications

Model	AV-A21M3	AV-A21T3
TV RF systems	B, G, I, D, K, K1, M	B, G, I, D, K, K1
Colour systems	PAL, SECAM, NTSC 3.58 / 4.43 MHz	PAL, SECAM, NTSC 3.58 / 4.43 MHz (in VIDEO mode only)
Channel and frequencies	VHF low channel (VL) = 46.25 to 168.25 MHz VHF high channel (VH) = 175.25 to 463.25 MHz UHF channel (U) = 471.25 to 863.25 MHz ■ Receives cable channels in mid band (X to Z, S1 to S10), super band (S11 to S20) and hyper band (S21 to S41) .	
Power input	AC110 to 240 V, 50 / 60 Hz	
Power consumption	Maximum 100 W, Average 67 W	
Screen size (measured diagonally)	Picture tube 55 cm Visible area 51 cm	
Audio output (Rated power output)	5W (monaural)	
Speakers	(5 cm × 9 cm) oval × 2	
External input / output	VIDEO input (RCA) AUDIO input (RCA) VIDEO output (RCA) AUDIO output (RCA) Headphone jack: mini jack (dia. 3.5 mm)	
Dimensions (W × H × D)	502 mm × 451 mm × 481 mm	
Weight	19.5 kg	
Accessories	• Remote control unit: RM-C364 × 1 • AA / R6 / UM-3 dry cell battery × 2	

**Design and specifications subject to change without notice.**

## Specifications

Model	AV-F21M3	AV-F21T3	AV-F21AU3
TV RF systems	B, G, I, D, K, K1, M	B, G, I, D, K, K1	
Colour systems	PAL, SECAM, NTSC 3.58 / 4.43 MHz	PAL, SECAM, NTSC 3.58 / 4.43 MHz (in VIDEO mode only)	
Channel and frequencies	VHF low channel (VL) = 46.25 to 168.25 MHz VHF high channel (VH) = 175.25 to 463.25 MHz UHF channel (U) = 471.25 to 863.25 MHz ■ Receives cable channels in mid band (X to Z, S1 to S10), super band (S11 to S20) and hyper band (S21 to S41) .		
Power input	AC110 to 240 V, 50 / 60 Hz		
Power consumption	Maximum 100 W, Average 67 W		
Screen size (measured diagonally)	Picture tube 55 cm Visible area 51 cm		
Audio output (Rated power output)	5W (monaural)		
Speakers	(6 cm × 12 cm) oval × 2		
External input / output	VIDEO input (RCA) AUDIO input (RCA) VIDEO output (RCA) AUDIO output (RCA) Headphone jack: mini jack (dia. 3.5 mm)		
Dimensions (W × H × D)	619 mm × 458 mm × 486.5 mm		
Weight	22 kg		
Accessories	<ul style="list-style-type: none"> <li>• Remote control unit: RM-C364 × 1</li> <li>• AA / R6 / UM-3 dry cell battery × 2</li> </ul>		

*Design and specifications subject to change without notice.*

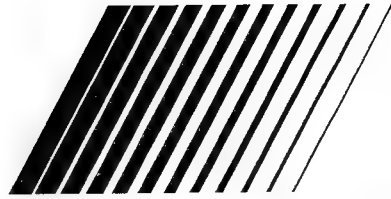
## Specifications

Model	AV-K14M3	AV-K14T3
TV RF systems	B, G, I, D, K, K1, M	B, G, I, D, K, K1
Colour systems	PAL, SECAM, NTSC 3.58 / 4.43 MHz	PAL, SECAM, NTSC 3.58 / 4.43 MHz (in VIDEO mode only)
Channel and frequencies	VHF low channel (VL) = 46.25 to 168.25 MHz VHF high channel (VH) = 175.25 to 463.25 MHz UHF channel (U) = 471.25 to 863.25 MHz ■ Receives cable channels in mid band (X to Z, S1 to S10), super band (S11 to S20) and hyper band (S21 to S41) .	
Power input	AC110 to 240 V, 50 / 60 Hz	
Power consumption	Maximum 70 W, Average 47 W	
Screen size (measured diagonally)	Picture tube 36 cm Visible area 34 cm	
Audio output (Rated power output)	3W (monaural)	
Speakers	(5 cm × 9 cm) oval × 2	
External input / output	VIDEO input (RCA) AUDIO input (RCA) VIDEO output (RCA) AUDIO output (RCA) Headphone jack: mini jack (dia. 3.5 mm)	
Dimensions (W × H × D)	462 mm × 341 mm × 375 mm	
Weight	9.9 kg	
Accessories	<ul style="list-style-type: none"> <li>• Remote control unit: RM-C360 × 1</li> <li>• AA / R6 / UM-3 dry cell battery × 2</li> <li>• Rod aerial × 1</li> </ul>	

*Design and specifications subject to change without notice.*

# JVC

## COLOUR TELEVISION



**AV-2113EE**  
**AV-2133EE**  
**AV-1433EE**

## INSTRUCTIONS

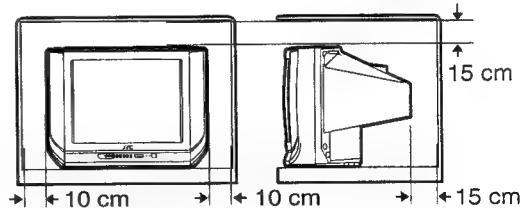
Thank you for purchasing this JVC colour television.  
To ensure your complete understanding, please read this manual thoroughly before operation.

### **WARNING:**

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

### **CAUTION:**

- TO ENSURE PERSONAL SAFETY, OBSERVE THE FOLLOWING RULES REGARDING THE USE OF THIS TV.
- Operate only from the power source specified on the TV.
- Avoid damaging the power plug and power cord.
- Avoid improper installation and never position this TV where good ventilation is unattainable. When installing this TV distance recommendations must be maintained between the floor and wall, as well as installment in a tightly enclosed area or piece of furniture. Adhere to the minimum distance guidelines shown for safe operation.
- Do not allow objects or liquid into the cabinet openings.
- In the event of a fault, unplug this TV and call a service technician. Do not attempt to repair it by yourself or remove the rear cover.
- When you don't use this TV for a long period of time, be sure to disconnect the power plug from the AC outlet.



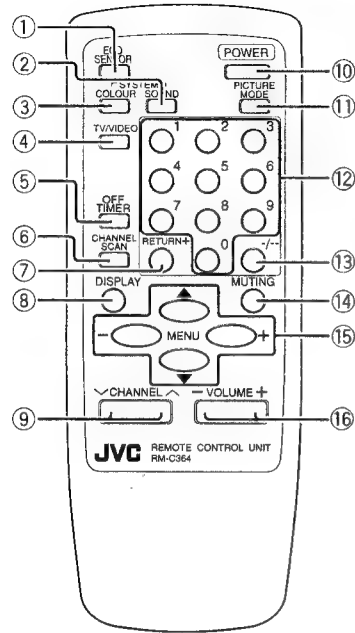
### **Contents**

Locations .....	2
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Viewing Images from an External Device .....	15
Sound and Picture .....	16
Other Features .....	18
Troubleshooting .....	24
Specifications .....	25



# Locations

## Locations of remote control buttons

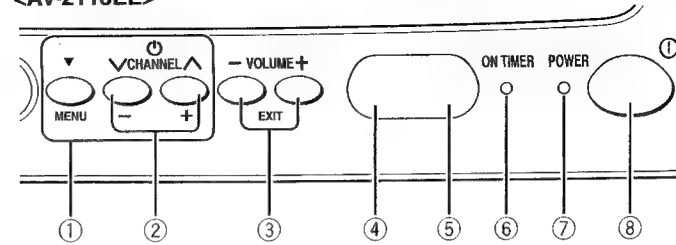


- |                        |             |
|------------------------|-------------|
| ① ECO SENSOR button    | p.18        |
| (AV-2113EE, AV-2133EE) |             |
| ② SOUND SYSTEM button  | p.16        |
| ③ COLOUR SYSTEM button | p.16        |
| ④ TV/VIDEO button      | p.15        |
| ⑤ OFF TIMER button     | p.18        |
| ⑥ CHANNEL SCAN button  | p.14        |
| ⑦ RETURN + button      | p.19        |
| ⑧ DISPLAY button       | p.18        |
| ⑨ CHANNEL V/∧ buttons  | p.13        |
| ⑩ POWER button         | p.7, 13, 14 |
| ⑪ PICTURE MODE button  | p.16        |
| ⑫ Number buttons       | p.13        |
| ⑬ -/-- button          | p.13        |
| ⑭ MUTING button        | p.14        |
| ⑮ MENU buttons         |             |
| • MENU ▲/▼ buttons     |             |
| • MENU -/+ buttons     |             |
| ⑯ VOLUME -/+ buttons   | p.14        |

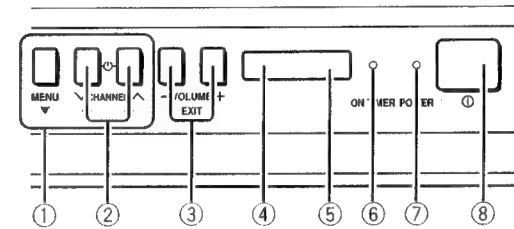
# Locations

## Locations of front panel buttons and lamps

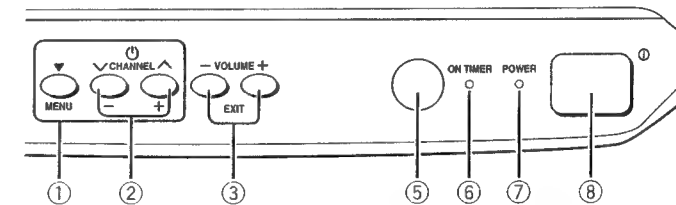
### <AV-2113EE>



### <AV-2133EE>



### <AV-1433EE>



- |                       |      |
|-----------------------|------|
| ① MENU buttons        | p.23 |
| • MENU button         |      |
| • MENU -/+ buttons    |      |
| ② CHANNEL V/∧ buttons | p.14 |
| ③ VOLUME -/+ buttons  | p.14 |

- |                         |         |
|-------------------------|---------|
| ④ ECO sensor            |         |
| ⑤ Remote control sensor |         |
| ⑥ ON TIMER lamp         | p.20    |
| ⑦ POWER lamp            | p.7, 14 |
| ⑧ Main power button     | p.7, 14 |

## Preparation

### 1. Connecting the aerial and external devices

#### Notes:

- For further details, refer to the manuals provided with the devices you are connecting.
- Connecting cables are not supplied.
- The front and rear AUDIO/VIDEO input jacks are directly connected so that input to either jack is output through both. You cannot provide input to both the front and rear jacks at the same time. Disconnect one input, or use one of the jacks as an output jack only (for monitoring or recording).

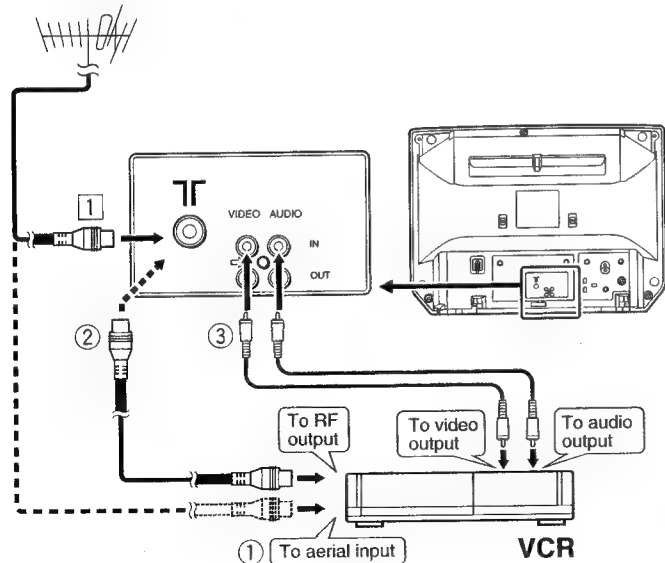
#### ■ Connecting the aerial and VCR

If not connecting a VCR (video cassette recorder), do ①.

If connecting a VCR, proceed ① → ② → ③.

- You can view images from the VCR without doing ③. For details, see "To view images from a VCR connected to the TV with only an aerial cable" on page 15.

#### VHF/UHF outdoor aerial



## Preparation

#### Note:

- The rod aerial is supplied with the AV-1433EE.

If not connecting a VCR (video cassette recorder), do ①.

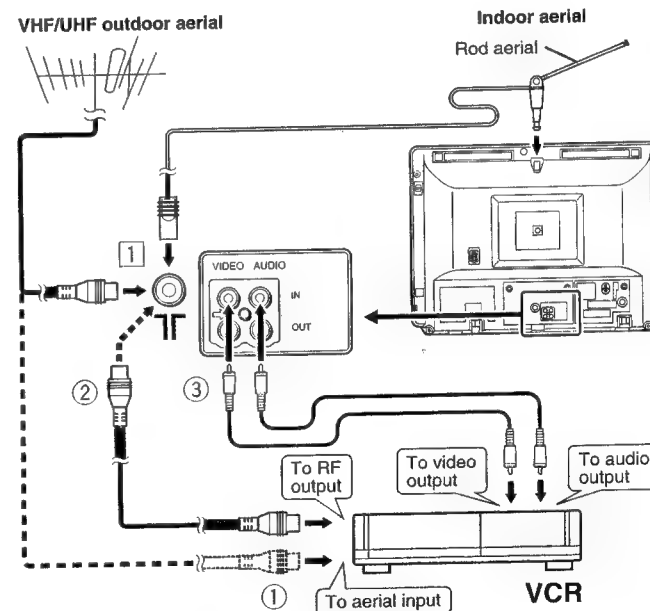
If connecting a VCR, proceed ① → ② → ③.

- You can view images from the VCR without doing ③. For details, see "To view images from a VCR connected to the TV with only an aerial cable" on page 15.

#### To install rod aerial:

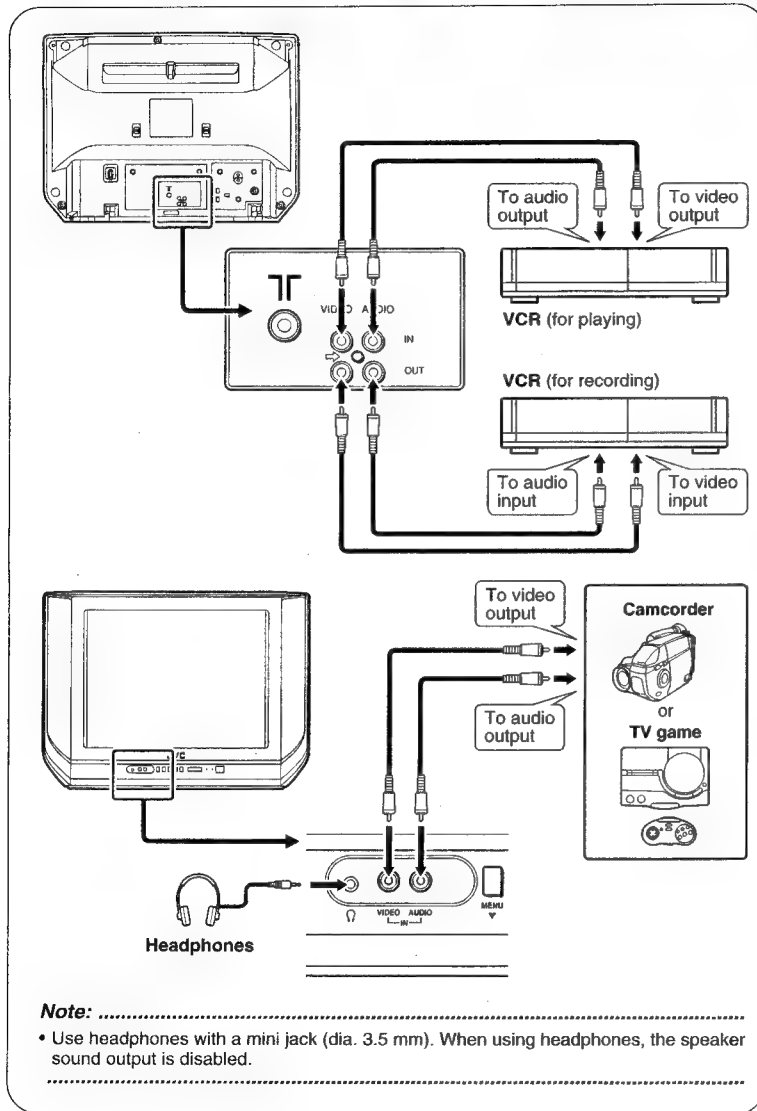
Install into the top-rear aerial holder. Once installed, it cannot be removed.

#### <AV-1433EE>



**Preparation**

**■ Connecting other external devices**



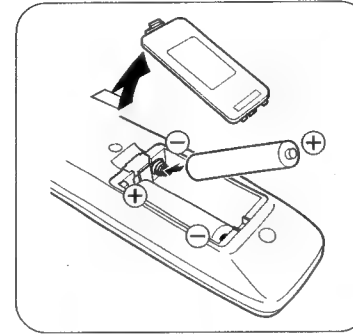
**Preparation**

**2. Connecting the power cord**

Insert the Power plug into an AC outlet.

**3. Inserting batteries into the remote control**

Correctly insert two batteries, observing the ⊕ and ⊖ polarities and inserting the ⊖ end first.



**CAUTION:** .....

- Follow the cautions printed on the batteries.

**Notes:** .....

- Use AA/R6/UM-3 dry cell batteries.
  - Battery life is approximately six months to one year depending on frequency of use.
  - If the remote control operates erratically, replace the batteries.
  - We recommend that you use the supplied batteries initially and replace them as soon as operation becomes erratic. The supplied batteries are for testing, not regular use.
- .....

**4. Turning your TV on**

**1. Press the Main power button on the TV to turn the TV's main power on.**

*The POWER lamp lights red.*

**If image does not appear:**

Your TV is in the standby mode. Press the POWER button on the remote control to turn your TV on.

- You can also turn on your TV by pressing the CHANNEL V/∧ button on your TV.

**To turn your TV off:**

Press the POWER button on the remote control. Your TV enters the standby mode.

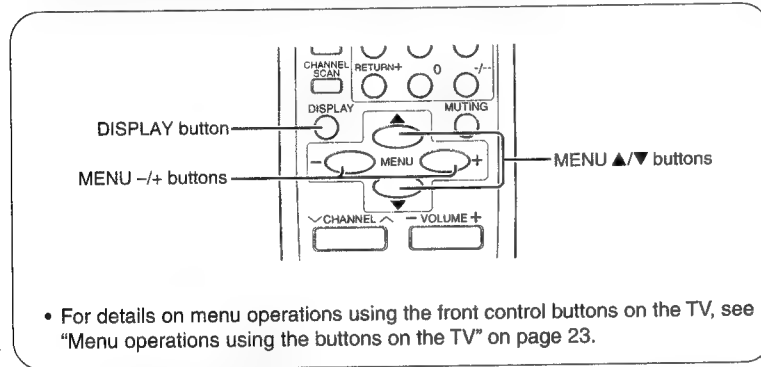
**To turn the TV's main power off:**

Press the Main power button on the TV. The POWER lamp goes off.

## Preparation

### 5. Selecting the on-screen language

You can select one of two languages for the on-screen display. The displayed menus on the screen are described in the selected language. In this manual, on-screen descriptions are given in English. Select ENGLISH.



- For details on menu operations using the front control buttons on the TV, see "Menu operations using the buttons on the TV" on page 23.

#### 1. Repeatedly press MENU ▲/▼ to display the following menu.

The following menu is displayed in one of two languages.



English

Russian

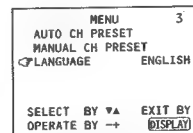
**Note:** .....

- If the menu appears in English, the TV's on-screen language is already set to English, so you can skip steps 2 and 3.

#### 2. Press MENU ▲/▼ to select the third item on the menu 3.

#### 3. Press MENU +/- to select ENGLISH .

The menu is displayed in English.



#### 4. Proceed to "6. Presetting TV stations" on the following page.

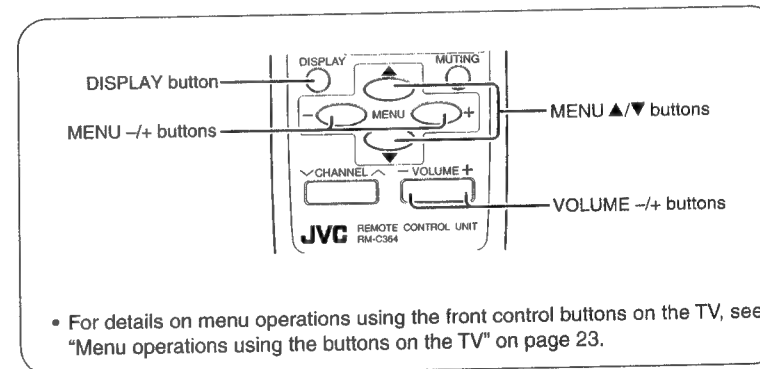
- If you want to complete operations at this stage, press the DISPLAY button to turn the menu display off.

## Preparation

### 6. Presetting TV stations

To view a TV programme, you must first preset TV stations to channels on the TV. This TV has 100 channels (channel 1 to 99 and channel AV). You can choose between two functions, the Auto Channel Preset and Manual Channel Preset and preset TV stations to channels on TV.

- Note:** .....
- After you have finished presetting, you can set undesired channels to be skipped over, see "Skip" on page 12.



- For details on menu operations using the front control buttons on the TV, see "Menu operations using the buttons on the TV" on page 23.

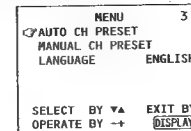
#### ■ Auto Channel Preset

You can automatically preset all TV stations that can be received on your TV to channels in one simple operation.

**Notes:** .....

- When you use this function, no station is preset to the channel AV. Channel AV is offered for viewing images from a VCR connected to your TV with only an aerial cable. For more details, see "To view images from a VCR connected to the TV with only an aerial cable" on page 15.
- If the Auto Channel Preset does not work well, preset TV stations manually. For details, see "Manual Channel Preset" on page 10.

#### 1. Press MENU ▲/▼ to select AUTO CH PRESET in the "MENU 3" menu.



**To display this menu:**  
Repeatedly press MENU ▲/▼ button until it is displayed.

#### 2. Press MENU +/- to start the Auto Channel Preset function.

">>> ON SEARCH" is displayed on the screen.

## Preparation

When you have finished presetting all TV channels that can be received on your TV, the display will go out and the Auto Channel Preset function will end.

- To stop the Auto Channel Preset, press the MENU  $\rightarrow$  button.

### Manual Channel Preset

You can manually preset the desired TV stations to the desired channels.

1. Press MENU  $\blacktriangle/\blacktriangledown$  to select **MANUAL CH PRESET** in the "MENU 3" menu.

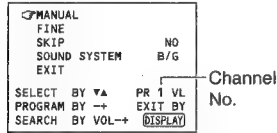


**To display this menu:**

Repeatedly press the MENU  $\blacktriangle/\blacktriangledown$  button until it is displayed.

2. Press MENU  $\rightarrow$ .

The sub-menu is displayed.



- The channel No. is displayed as a PR No. For example, channel 1 will be displayed as PR 1. However, channel AV will be displayed as AV.

3. Press MENU  $\rightarrow$  to select the channel No. to be preset.

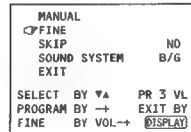
4. Press VOLUME  $\rightarrow$  to start selection of the TV station. " $\gggg$ " or " $\llll$ " is displayed on the screen.

When a TV station is received, the " $\gggg$ " or " $\llll$ " display goes out, and the TV station is preset to the currently selected channel No.

- If you have selected the wrong TV station for preset, repeatedly press the VOLUME  $\rightarrow$  button until the desired TV station is selected.
- To stop the Manual Channel Preset, press any button other than the VOLUME  $\rightarrow$  button.

**If the picture is not clear:**  
 Use the Fine function to fine-tune the TV station.

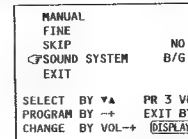
1. Press MENU  $\blacktriangle/\blacktriangledown$  to select **FINE**.



2. Hold VOLUME  $\rightarrow$  down to fine-tune the TV station so that the best image is displayed on screen. " $\gg$ " or " $\ll$ " indicates that the TV station is being fine-tuned.

## Preparation

5. Press MENU  $\blacktriangle/\blacktriangledown$  to select **SOUND SYSTEM**.



6. Press VOLUME  $\rightarrow$  to select the appropriate sound system.

- For the sound systems in each country or region, refer to the table "The Broadcasting systems of Each country or Region" below.

7. Press MENU  $\blacktriangle/\blacktriangledown$  to select **MANUAL**.

8. Repeat steps 3 to 7 if you want to preset another TV station to a channel.

9. Press DISPLAY to turn the display off.

### The Broadcasting Systems of Each Country or Region

Area	Country or Region	System	
		Colour	Sound
Asia, Middle East	Bahrain, Kuwait, Oman, Qatar, United Arab Emirates, Yemen, etc.	PAL	B/G
	Indonesia, Malaysia, Singapore, Thailand, India, etc.		
	China, Vietnam, etc.	PAL	D/K
	Hong Kong, etc.	PAL	I
Europe	Islamic Republic of Iran, Lebanon, Saudi Arabia, etc.	SECAM	B/G
	Russia, etc.	SECAM	D/K
	Czech Republic, Poland, etc.	PAL	D/K
	Germany, Holland, Belgium, etc.	PAL	B/G
Oceania	UK, etc.	PAL	I
	Australia, New Zealand, etc.	PAL	B/G
Africa	Republic of South Africa, etc.	PAL	I
	Nigeria, etc.	PAL	B/G
	Egypt, Morocco, etc.	SECAM	B/G

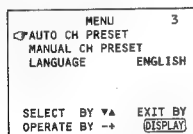
## Preparation

### ■ Skip

When selecting channels, you can set undesired channels to be skipped. Channels set to be skipped cannot be selected by the CHANNEL  $\nabla/\wedge$  buttons nor the CHANNEL SCAN button.

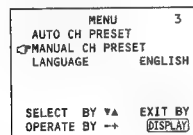
- Channels to which a station has not been preset are automatically set to be skipped.

#### 1. Press MENU $\blacktriangle/\blacktriangledown$ to display the "MENU 3" menu.



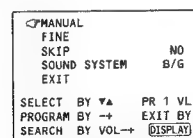
- If a different menu is displayed, repeatedly press the MENU  $\blacktriangle/\blacktriangledown$  button until this menu is displayed.

#### 2. Press MENU $\blacktriangle/\blacktriangledown$ to select MANUAL CH PRESET.

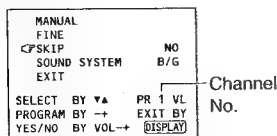


#### 3. Press MENU $\rightarrow$ .

The sub-menu is displayed.



#### 4. Press MENU $\blacktriangle/\blacktriangledown$ to select SKIP.

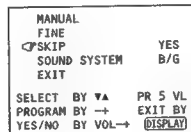


- The channel No. is displayed as a PR No. For example, channel 1 will be displayed as PR 1. However, channel AV will be displayed as AV.

#### 5. Press MENU $\rightarrow$ to select the channel you want to skip.

#### 6. Press VOLUME $\rightarrow$ to select YES.

The channel you selected is set to be skipped.



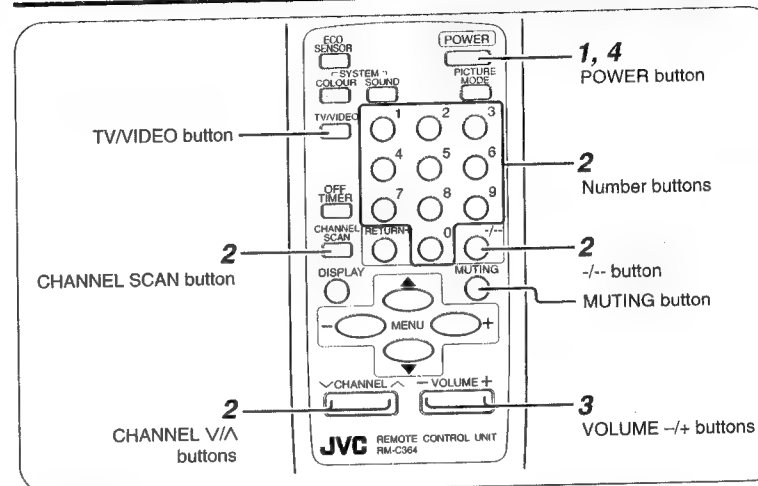
To cancel the Skip: select NO.

#### 7. Repeat steps 5 and 6 if you want to set another channel to skip.

#### 8. Press DISPLAY to turn the display off.

## Viewing a Television Programme

### Using the remote control



#### 1. Press POWER to turn your TV on.

Notes: .....

- If your TV does not turn on, press the Main power button on the TV then press the POWER button again.
- You can also turn on your TV by pressing any of the following buttons;
  - the CHANNEL  $\nabla/\wedge$  button
  - the Number buttons
  - the TV/VIDEO button

#### 2. Select a channel.

##### ■ Up/ down selection

1. Press CHANNEL  $\nabla/\wedge$ .

##### ■ Direct selection

1. Repeatedly press the  $\rightarrow$  button to select the desired mode.

##### - : 1-digit mode

To select a channel with a 1-digit number.

##### - - : 2-digit mode

To select a channel with a 1-digit number or a 2-digit number.

#### 2. Press the Number buttons to select a channel.

##### For 1-digit mode:

(example)  
Channel 6  $\rightarrow$  Press 6.

##### For 2-digit mode:

(example)  
Channel 6  $\rightarrow$  Press 0, 6.  
Channel 16  $\rightarrow$  Press 1, 6.

- When you want to select channel AV, press 0 in 1-digit mode or 00 in 2-digit mode.

## Viewing a Television Programme

### ■ Channel Scan selection

You can search for the channel you want to view while scanning all of the channels that can be viewed on this TV.

1. Press **CHANNEL SCAN**.  
*Channels will be scanned in channel No. order.*
2. When the channel that you want to view appears, press **CHANNEL SCAN** again before scanning for the next channel begins.

**Note:** .....

- Up/down and Channel Scan selections cannot be selected for channels to which the Skip has been set to YES. (See "Skip" on page 12.)

.....

**If the colour is abnormal:**  
Repeatedly press the **COLOUR SYSTEM** button to select the appropriate colour system. For details, see "Colour System" on page 16.

3. Press **VOLUME +/-** to adjust the sound.

#### **To temporarily render the sound inaudible:**

Press the **MUTING** button.

- To return the sound, press the **MUTING** button again.

#### **If the sound is abnormal:**

Repeatedly press the **SOUND SYSTEM** button to select the appropriate sound system. For details, see "Sound System" on page 16.

4. To turn your TV off, press **POWER**.

**Note:** .....

- We recommend that you press the Main power button on the TV to turn the main power off if you do not plan to use your TV for a long time or if you wish to save energy.

.....

## Using the buttons on the TV

**Condition:** .....

- Check to make sure the Child Lock function is set to OFF. When the Child Lock function is set to ON, the TV cannot be operated using the front control buttons. For details, see "Child Lock" on page 21.

.....

1. Press **CHANNEL V/∧** to turn your TV on.

**Note:** .....

- If your TV does not turn on, press the Main power button and then press the **CHANNEL V/∧** button again.

.....

2. Press **CHANNEL V/∧** to select a channel.

3. Press **VOLUME +/-** to adjust the sound.

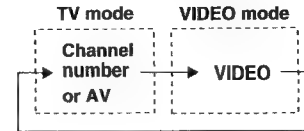
4. To turn your TV off, press the **Main power button** to turn the main power off.  
*The POWER lamp goes off.*

- If you press the Main power button again, your TV turns on immediately. Step 1 is no longer required.

## Viewing Images from an External Device

You can view images from VCRs or other external devices connected to your TV.

1. Press **TV/VIDEO** to select the **VIDEO** mode.



#### **TV mode:**

This mode is for viewing TV programmes. Press the **TV/VIDEO** button, or press the **CHANNEL V/∧** buttons, or press the number buttons to return to this mode.

#### **To view images from a VCR connected to the TV with only an aerial cable:**

Your VCR must be preset to the channel AV of this TV. Thoroughly read the manual of your VCR, and preset your VCR to the channel AV using the Manual Channel Preset function on page 10. As a result, you can view images from your VCR when you select the channel AV in the TV mode.

#### **If the colour is abnormal:**

Repeatedly press the **COLOUR SYSTEM** button to select the appropriate colour system. For details, see "Colour System" on page 16.

#### **To select the VIDEO mode using the buttons on the TV:**

When not using the remote control, you can select the VIDEO mode using the **MENU** buttons on the TV.

1. Repeatedly press the **MENU** button to select **INPUT** from "MENU 1" menu.
2. Press the **MENU +/-** button on the TV.  
TV mode changes to VIDEO mode.

**Note:** .....

- For details, see "Menu operations using the buttons on the TV" on page 23.

.....

# Sound and Picture

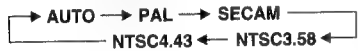
## Colour System

If the colour is abnormal, select the appropriate colour system. Each press of the COLOUR SYSTEM button changes the colour system as follows.

**In TV mode (channel 1 to 99 and AV):**



**In VIDEO mode:**



**AUTO:**  
Automatic colour system selection.

**Notes:** .....

- For the colour systems in each country or region, see the table "The Broadcasting Systems of Each Country or Region" on page 11.
- If the colour is abnormal even though you selected AUTO, change the appropriate colour system manually.

## Sound System

If the sound is abnormal, select the appropriate sound system. Each press of the SOUND SYSTEM button changes the sound system as follows.



**Notes:** .....

- For the sound systems in each country or region, see the table "The Broadcasting Systems of Each Country or Region" on page 11.
- You cannot select any sound system when in VIDEO mode.

## Picture Mode

You can select one of three picture adjustment modes. Repeatedly press the PICTURE MODE button to select the desired mode.

**BRIGHT:**  
Heightens contrast and sharpness.

**STANDARD:**  
Standardizes picture adjustments.

**SOFT:**  
Softens contrast and sharpness.

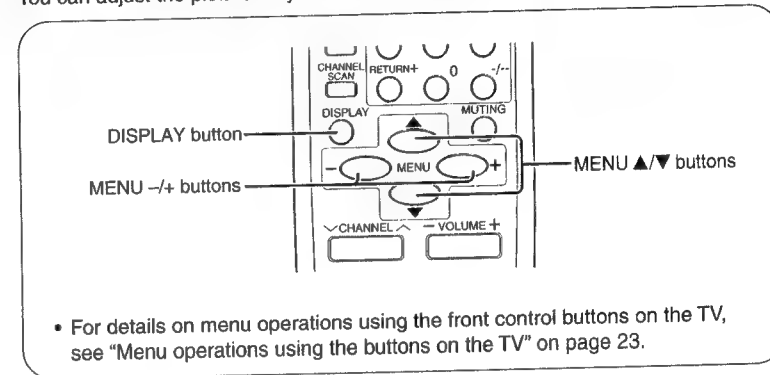
**Note:** .....

- Pressing the PICTURE MODE button returns all the picture settings in the "MENU 4" menu to their default settings.

# Sound and Picture

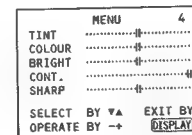
## Picture Adjustment

You can adjust the picture as you like.



1. Press MENU ▲/▼ to display a menu.
2. Press MENU ▲/▼ repeatedly to display the desired menu.

Display the "MENU 4" menu.



3. Press MENU ▲/▼ to select an item and press MENU +/- to adjust it.

-	Item	+
Reddish	TINT (tint)	Greenish
Lighter	COLOUR (colour depth)	Deeper
Darker	BRIGHT (brightness)	Brighter
Lower	CONT. (contrast)	Higher
Softer	SHARP (sharpness)	Sharper

**Note:** .....

- TINT (tint) is displayed only when viewing images from NTSC3.58 or NTSC4.43 colour systems.

4. Press DISPLAY to turn the display off.

## Other Features

### Display

You can continuously display the current channel number or VIDEO mode on the screen.

Press the DISPLAY button.

To turn the display off, press the DISPLAY button again.

**Note:** .....

- When selecting a channel or VIDEO mode with no input signal, indication of selected channel or VIDEO mode becomes fixed on the screen.
- .....

### Off Timer

You can set this TV to turn off automatically within a specified period of time.

Repeatedly press the OFF TIMER button to select the period of time.

- You can set the period of time a maximum of 120 minutes in 10 minute increments.
- 1 minute before the Off Timer turns off the TV, "GOOD NIGHT!" is displayed.

**To display the remaining time:**

Press the OFF TIMER button once.

**To cancel the Off Timer:**

Press the OFF TIMER button to return the period of time to 0.

**Note:** .....

- The Off Timer will not turn off the TV's main power.
- .....

### Eco Sensor

(AV-2113EE, AV-2133EE)

You can adjust this TV so that the screen automatically adjusts to the optimum contrast according to the brightness of your room. This function reduces eye strain and the power consumption of this TV.

Repeatedly press the ECO SENSOR button to select the desired mode.

**ECO SENSOR DISPLAY:**

The Eco Sensor function will work. In this mode, the heart mark ♥ indicating the brightness of your room is displayed for several seconds each time the brightness changes. The number of heart marks displayed on screen increases as your room becomes darker. Up to six heart marks are displayed.

**ECO SENSOR:**

The Eco Sensor function will work. However, in this mode, the heart mark ♥ will not be displayed even if the brightness of your room changes.

**ECO SENSOR OFF:**

The Eco Sensor function will not work.

## Other Features

### Return +

By setting a channel to "Return channel", you can return to that channel with one touch.

1. Press CHANNEL V/∧ or the Number buttons to select a channel to set to "Return channel".
2. Press RETURN + for more than 3 seconds continuously. "RETURN PLUS PROGRAMMED!" appears.
3. When viewing another channel, press RETURN +. The channel changes to the channel set for "Return channel".

**To cancel the channel set for "Return channel":**

Press the RETURN + button for more than 3 seconds continuously.

- "RETURN PLUS CANCELLED!" appears.

**Notes:** .....

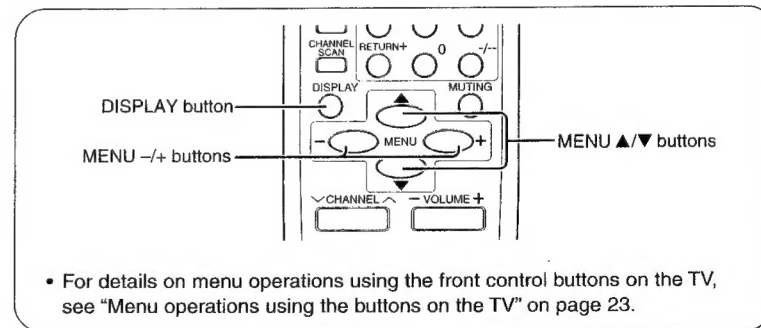
- When you turn the TV off, the "Return channel" setting will be canceled.
  - When you press the RETURN + button while viewing the channel set for "Return channel", the channel changes to the previously viewed channel.
  - When you press the RETURN + button while in a VIDEO mode, the mode switches to TV mode. To return to the channel set for "Return channel", press the RETURN + button again.
- .....

**When there is no setting for "Return channel":**

When you press the RETURN + button, the channel changes to the previously viewed channel.

### On Timer

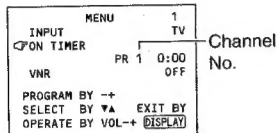
Your TV will automatically turn on and tune into the channel you want after a certain period of time you have specified.



- For details on menu operations using the front control buttons on the TV, see "Menu operations using the buttons on the TV" on page 23.

## Other Features

1. Repeatedly press MENU ▲/▼ to display the "MENU 1" menu, and press MENU ▲/▼ to select ON TIMER.



2. Press MENU -/+ to select a channel you want to view when the TV turns on.

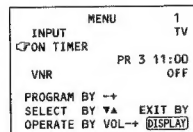
**Note:**

- You cannot select the channel AV, the VIDEO modes, and the channels for which the Skip is set (See "Skip" on page 12).

3. Press VOLUME -/+ to select the period of time after which you want to turn on the TV.

The ON TIMER lamp lights and the On Timer starts.

- Each time you press the button, the period of time changes in 15 minute intervals (up to 12 hours).



**To cancel the On Timer:**

Press the VOLUME -/+ button to return the period of time to "0:00".

4. Press DISPLAY to turn the display off.

5. Press POWER to turn the TV off.

The ON TIMER lamp will stay lit.

**Notes:**

- If you turn off the TV's main power by pressing the Main power button, the On Timer setting is canceled.
- If you do not turn off the TV after starting the On Timer, once the time set for the On Timer is reached, the channel will automatically switch to the channel set for the On Timer.

**While the On Timer is operating:**

The ON TIMER lamp lights.

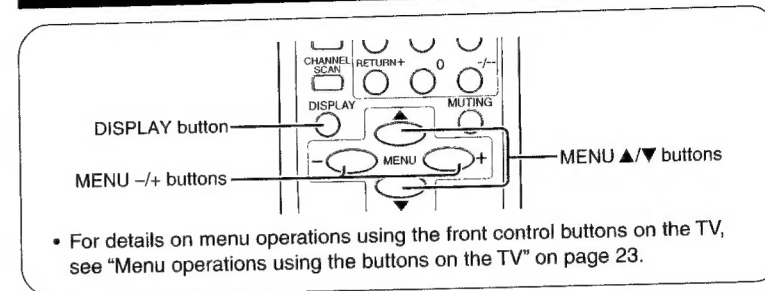
**When the time set for the On Timer is reached:**

The TV automatically turns on and the channel set for the On Timer is displayed.

**Notes:**

- For safety reasons the TV will automatically turn off if no operations are made within approximately two hours after the TV is turned on with the On Timer.
- The Off Timer and Auto Shutoff have priority over the On Timer.

## Other Features



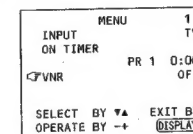
- For details on menu operations using the front control buttons on the TV, see "Menu operations using the buttons on the TV" on page 23.

## VNR

### (Video Noise Reduction)

You can reduce the picture noise.

1. Repeatedly press MENU ▲/▼ to display the "MENU 1" menu, and press MENU ▲/▼ to select VNR.



2. Press MENU -/+ to select "ON" or "OFF."

**ON:**

Activates the VNR. Select "ON" when viewing a noisy picture.

**OFF:**

Cancels the VNR.

3. Press DISPLAY to turn the display off.

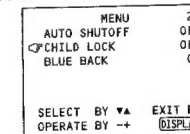
## Child Lock

You can disable the front control buttons of the TV.

When this function is set to ON, the TV can be operated using only the remote control.

Use this function to prevent children from operating the TV at their own discretion (without parental consent).

1. Repeatedly press MENU ▲/▼ to display the "MENU 2" menu, and press MENU ▲/▼ to select CHILD LOCK.



2. Press MENU -/+ to select "ON" or "OFF."

**ON:**

Activates the Child Lock, disabling operation of the TV using the front control buttons.

**OFF:**

Cancels the Child Lock.

3. Press DISPLAY to turn the display off.

**Note:**

- The Child Lock is canceled when you turn the TV's main power off.

## Other Features

### Auto Shutoff

You can set your TV to turn off if no signals are received for about 15 minutes or longer after the end of a broadcast.

1. Repeatedly press MENU ▲/▼ to display the "MENU 2" menu, and press MENU ▲/▼ to select AUTO SHUTOFF.

MENU	2
☐ AUTO SHUTOFF	OFF
☐ CHILD LOCK	OFF
☐ BLUE BACK	ON
SELECT BY ▼▲ EXIT BY	
OPERATE BY →	[DISPLAY]

2. Press MENU -/+ to select "ON" or "OFF".

MENU	2
☐ AUTO SHUTOFF	ON
☐ CHILD LOCK	OFF
☐ BLUE BACK	ON
SELECT BY ▼▲ EXIT BY	
OPERATE BY →	[DISPLAY]

**ON:**

Activates the Auto Shutoff.

**OFF:**

Cancels the Auto Shutoff.

3. Press DISPLAY to turn the display off.

**Notes:** .....

- The Auto Shutoff function does not turn off the TV's main power.
- The Auto Shutoff will not work for a VIDEO mode.

### Blue Back

You can mute the sound and change the picture into a blue screen while no signals come into the TV, or when the input signals are unstable.

1. Repeatedly press MENU ▲/▼ to display the "MENU 2" menu, and press MENU ▲/▼ to select BLUE BACK.

MENU	2
☐ AUTO SHUTOFF	OFF
☐ CHILD LOCK	OFF
☐ BLUE BACK	OFF
SELECT BY ▼▲ EXIT BY	
OPERATE BY →	[DISPLAY]

2. Press MENU -/+ to select "ON" or "OFF".

MENU	2
☐ AUTO SHUTOFF	ON
☐ CHILD LOCK	OFF
☐ BLUE BACK	ON
SELECT BY ▼▲ EXIT BY	
OPERATE BY →	[DISPLAY]

**ON:**

Activates the Blue Back.

**OFF:**

Cancels the Blue Back.

**Notes:** .....

- To view a broadcast even when the reception signal is poor, set the Blue Back to OFF.
- Even when the Blue Back is set to OFF, the sound may not be audible.
- The Blue Back function does not operate in VIDEO mode.

3. Press DISPLAY to turn the display off.

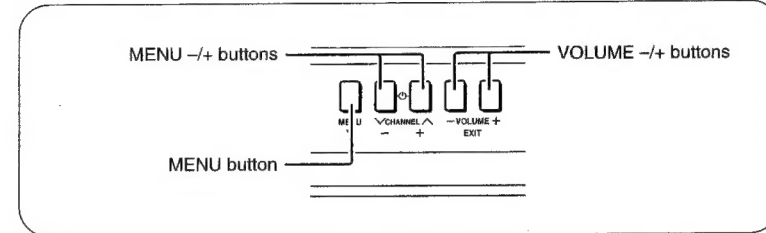
## Other Features

### Menu operations using the buttons on the TV

You can operate functions in menus using the front control buttons on the TV without having to use the remote control.

**Condition:** .....

- Check to make sure the Child Lock function is set to OFF. When the Child Lock function is set to ON, the TV cannot be operated using the front control buttons. For details, see "Child Lock" on page 21.



1. Press MENU to display the menu.

**If the desired menu is not displayed:**

Repeatedly press the MENU button until the desired menu is displayed.

2. Repeatedly press MENU to select the desired function or item.

**To select a function or item above the currently selected function or menu:**

Repeatedly press the MENU button to proceed to another menu, and then repeatedly press the MENU button again to return to the original menu. Then select the function or item.

3. Press MENU -/+ or VOLUME -/+ to carry out the desired operation.

- For details, see the description for the respective function.

4. Press VOLUME -/+ to turn the menu display off.

**If the sub-menu is displayed:**

The sub-menu cannot be turned off by the VOLUME -/+ button when it is displayed. Follow the procedure below to turn the sub-menu display off.

1. Press MENU to select EXIT.

MANUAL	
☐ FINE	NO
☐ SKIP	B/G
☐ SOUND SYSTEM	B/G
☐ EXIT	
SELECT BY ▼▲ PR 1 VL	
PROGRAM BY →	EXIT BY
EXIT BY VOL+→	[DISPLAY]

2. Press VOLUME -/+ to turn the sub-menu display off.

## Troubleshooting

**Important:** Review all the instructions in this manual.

Problem	Check/Action
Cannot turn TV on.	Press the Main power button (see p.7). Insert the power plug in an AC outlet.
No picture nor sound.	Press the TV/VIDEO button to select the correct mode (see p.15). Check the aerial connections.
Remote control inoperable.	Replace the batteries (see p.7).
Buttons on front of TV do not work.	Is the Child Lock function ON? (see p.21).
The TV turns on suddenly.	The TV will automatically turn on when the On Timer is operated (see p.19).
The TV turns off suddenly.	The TV will automatically turn off in the following cases. <ul style="list-style-type: none"> <li>• When the Off Timer or Auto Shutoff is operated (see p.18 and p.22).</li> <li>• When no operations are made within approximately two hours after the TV was turned on with the On Timer (see p.20).</li> </ul>
Abnormal sound	Select the appropriate sound system (see p.16).
Abnormal colour	Adjust the colour and brightness (see p.17). Select the appropriate colour system (see p.16). Set the Picture mode to STANDARD (see p.16).
Lines or streaks in picture (interference)	Move the components apart until the interference disappears. Reposition the aerial.
Spotted picture (crosstalk)	Move the aerial away from the source of interference. Replace the aerial cable with a coaxial cable, which is less prone to interference.
Double picture (ghost)	Reposition the aerial. Replace with an aerial with good directionality.
Snowy picture (image noise)	Check the aerial connection and aim it correctly. Replace or repair the aerial.
The TV channel changes suddenly.	The channel will automatically be changed when the On Timer operates (see p.20).
The screen turns blue.	Is the Blue Back set to ON? (see p.22).

### The following are normal occurrences and are not the result of TV malfunctions:

- When you touch the CRT surface, you might feel a slight charge of static electricity. This is because the CRT contains static electricity; it does not affect the human body.
- Your TV may emit a crackling sound due to a sudden change in temperature. There is no problem unless the picture or sound is abnormal.
- When a still bright image (of a white dress, for example) appears on the screen, the image may be coloured. This problem occurs in all CRTs, and when the bright image disappears, the colouration also disappears.
- This TV is equipped with a microcomputer that may operate abnormally due to interference from external devices. If this happens, press the Main power button to turn the main power off and disconnect the power plug from the AC outlet. Then, reconnect the power plug to the AC outlet and press the Main power button again.

## Specifications

Model	AV-1433EE	AV-2113EE	AV-2133EE
TV RF systems	B, G, I, D, K, K1		
Colour systems	PAL, SECAM, NTSC 3.58 / 4.43 MHz (in VIDEO mode only)		
Channel and frequencies	VHF low channel (VL) = 46.25 to 168.25 MHz VHF high channel (VH) = 175.25 to 483.25 MHz UHF channel (U) = 471.25 to 863.25 MHz ■ Receives cable channels in mid band (X to Z, S1 to S10), super band (S11 to S20) and hyper band (S21 to S41) .		
Power input	AC110 to 240 V, 50 / 60 Hz		
Power consumption	Maximum 70 W Average 47 W	Maximum 100 W Average 67 W	
Screen size (measured diagonally)	Picture tube 36 cm Visible area 34 cm	Picture tube 55 cm Visible area 51 cm	
Audio output (Rated power output)	3W (monaural)	5W (monaural)	
Speakers	(5 cm × 9 cm) oval × 2		(6 cm × 12 cm) oval × 2
External input / output	VIDEO input (RCA) AUDIO input (RCA)  VIDEO output (RCA) AUDIO output (RCA)  Headphone jack: mini jack (dia. 3.5 mm)		
Dimensions (W × H × D)	462 mm × 341 mm × 375 mm	502 mm × 451 mm × 481 mm	619 mm × 458 mm × 486.5 mm
Weight	9.9 kg	19.5 kg	22 kg
Accessories	<ul style="list-style-type: none"> <li>• Remote control unit: RM-C360 × 1</li> <li>• AA / R6 / UM-3 dry cell battery × 2</li> <li>• Rod aerial × 1</li> </ul> <ul style="list-style-type: none"> <li>• Remote control unit: RM-C364 × 1</li> <li>• AA / R6 / UM-3 dry cell battery × 2</li> </ul>		

**Design and specifications subject to change without notice.**