KV-20M10/20S10/MT2000/ST2050
RM-Y116 RM-Y116 RM-Y123 RM-Y123

KV-21R10/21RS10/2180R/2190RS
RM-Y116 RM-Y116 RM-Y123 RM-Y123

SERVICE MANUAL

US Model

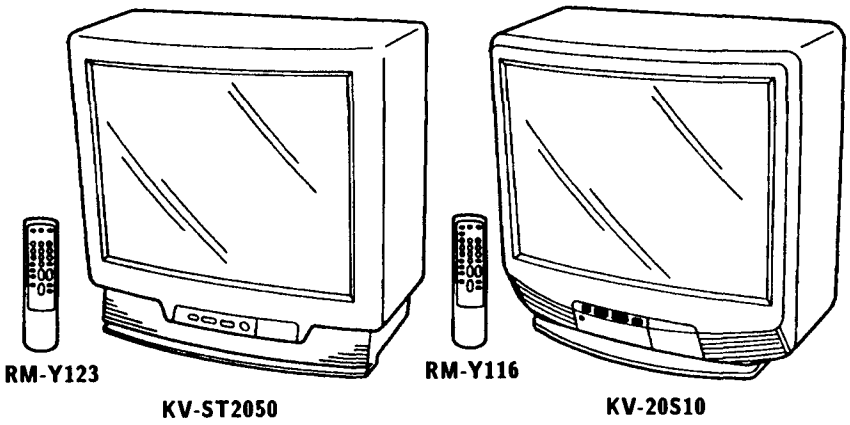
KV-20M10	Chassis No. SCC-G92B-A
KV-20S10	Chassis No. SCC-G92C-A

Canadian Model

KV-20M10	Chassis No. SCC-G94D-A
KV-20S10	Chassis No. SCC-G94F-A
KV-MT2000	Chassis No. SCC-G94C-A
KV-ST2050	Chassis No. SCC-G94E-A

E Model

KV-21R10	Chassis No. SCC-G93E-A
KV-21RS10	Chassis No. SCC-G93F-A
KV-2180R	Chassis No. SCC-G93B-A
KV-2190RS	Chassis No. SCC-G93C-A



KV-ST2050 KV-20S10

BA-2 CHASSIS

MODELS OF THE SAME SERIES	
KV-20M10/20S10/MT2000/ST2050	
KV-21R10/21RS10/2180R/2190RS	
KV-13M10/MT1300/14R10/1460R	

SPECIFICATIONS

Television system
American TV standard
Channel coverage
VHF: 2-13
UHF: 14-69
CATV: 1-125
Antenna
75-ohm external antenna terminal for VHF/UHF
Picture tube
Trinitron® tube
Power requirements
120 V, 60 Hz

■ *KV-20M10/MT2000/21R10/2180R*
Screen size
20 in.
Inputs
1 video, 1 audio *(KV-20M10/21R10 only)*
Speaker output
2 W
Power consumption
97 W when in use
4 W in standby

Sony Corporation Printed in U.S.A

— Continued on page 2 —

MICROFILM

TRINITRON® COLOR TV
SONY®

Dimensions (W/H/D)
KV-20M10/21R10: 522 × 475 × 471.2 mm ($20\frac{5}{8} \times 18\frac{3}{4} \times 18\frac{5}{8}$ in.)
KV-MT2000/2180R: 526 × 488 × 477.5 mm ($20\frac{3}{4} \times 19\frac{1}{4} \times 18\frac{7}{8}$ in.)
Mass
21.7 kg (47 lb 14 oz)
Supplied accessories
Size AA batteries (2)
KV-20M10/21R10: Remote commander RM-Y116 (1), Dipole antenna (1), Antenna connector (1)
KV-MT2000: Remote commander RM-Y123 (1)
KV-2180R: Remote commander RM-Y123 (1), Dipole antenna (1), Antenna connector (1)

■ ***KV-20S10/ST2050/21RS10/2190RS***
Screen size
20 in.
Inputs
1 video, 2 audio *(KV-20S10/21RS10 only)*
Speaker output
2 W + 2 W
Power consumption
100 W when in use
4 W in standby
Dimensions (W/H/D)
KV-20S10/21RS10: 522 × 475 × 471.2 mm ($20\frac{5}{8} \times 18\frac{3}{4} \times 18\frac{5}{8}$ in.)
KV-ST2050/2190RS: 526 × 488 × 477.5 mm ($20\frac{3}{4} \times 19\frac{1}{4} \times 18\frac{7}{8}$ in.)
Mass
21.8 kg (48 lb 10 oz)
Supplied accessories
Size AA batteries (2)
KV-20S10/21RS10: Remote commander RM-Y116 (1), Dipole antenna (1), Antenna connector (1)
KV-ST2050: Remote commander RM-Y123 (1)
KV-2190RS: Remote commander RM-Y123 (1), Dipole antenna (1), Antenna connector (1)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

(US model only)

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

1. Check the area of your repair for unsoldered or poorly-soldered connections Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the condition of the monopole antenna (if any). Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.
8. Check the B+ and HV to see they are at the values specified Make sure your instruments are accurate;be suspicious of your HV meter if sets always have low HV.
9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

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

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

HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground;the cover-plate retaining screw on most AC outlet boxes is also at earth ground If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms If a cold-water pipe is not accessible, connect a 60-100 watts trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B)

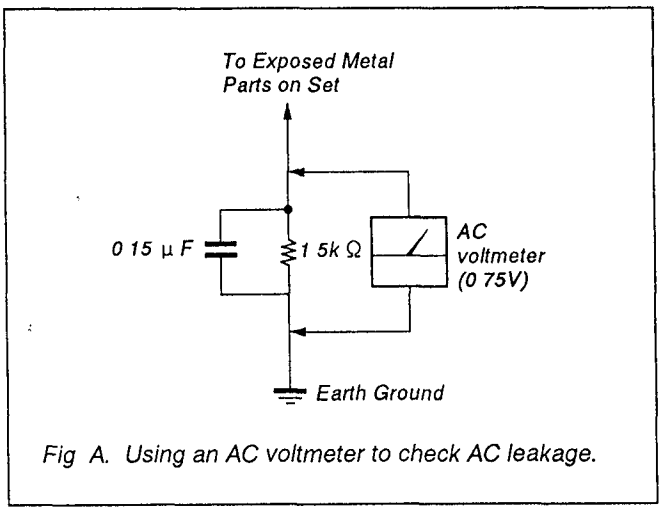


Fig A. Using an AC voltmeter to check AC leakage.

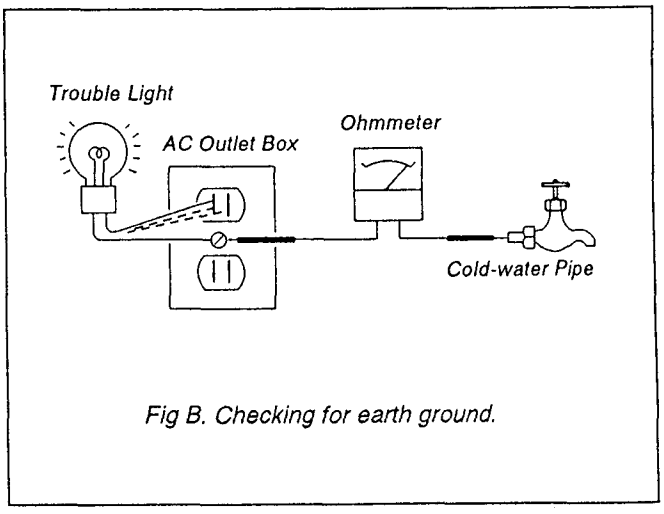


Fig B. Checking for earth ground.

TABLE OF CONTENTS

(CAUTION)

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

(ATTENTION)

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURTCIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

WARNING!!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS.
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

ATTENTION!!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÁSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE.
LE CHÁSSIS DE CE RECEPTEUR EST DIRECTEMENT RACCORDÉ Á L'ALIMENTATION SECTEUR.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

ATTENTION AUX COMPOSANTS RELATIFS ÁLA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET PAR UNE MAPQUE ⚠ SUR LES SCHÉMAS DE PRINCIPE, LES VUES EXPLOSÉES ET LES LISTES DE PIECES CONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DE CIRCUIT DONT L'IMPORTANCE EST CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT SONT IDENTIFIES DANS LE PRÉSENT MANUEL. SUIVRE CES PROCÉDURES LORS DE CHAQUE REMPLACEMENT DE COMPOSANTS CRITIQUES, OU LORSQU'UN MAUVAIS FONCTIONNEMENT EST SUSPECTÉ.

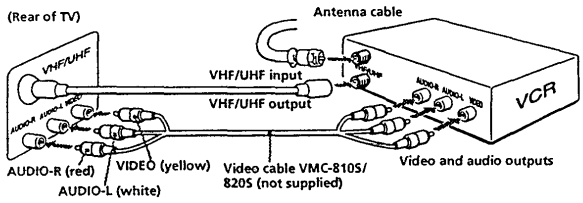
The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remein as in the manual.

Connections

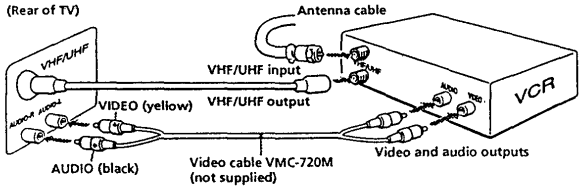
Connecting to a VCR

To connect the VCR to the TV, first check the model number of the TV and select the appropriate connection diagram below. For details on connection, see the instruction manual of the VCR. Before making the connection, disconnect the AC power cords of equipment being used.

■ *For KV-20S10/21RS10*



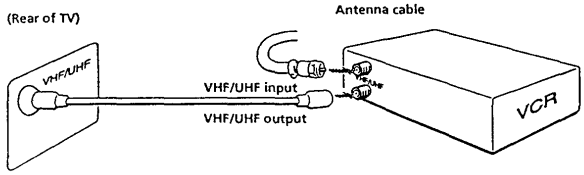
■ *For KV- 20M10/21R10*



To watch video tapes

Press the TV/VIDEO button until "VIDEO" appears on the screen.

■ *For KV-MT2000/ST2050/2180R/2190RS*



To watch video tapes

1 On the TV: Preset channel 3 or 4, whichever is not used in your area, following the instructions for adding channels in "Presetting channels" (page 13).
2 On the VCR: Set the channel to the same channel as chosen above. Then begin viewing the video tape.

Setting cable TV on or off

If the TV is connected to a cable TV system, then the factory setting CABLE ON is correct. If the TV is not connected, set CABLE to OFF.

Note
If more than 90 seconds elapse after you press a button, the menu disappears automatically.

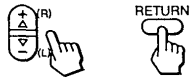
1 Press MENU.
The main menu appears.

2 Press △+ or ▽– on the remote commander to move the cursor (▶) on the screen to SET UP. To select that function, press RETURN.
The SET UP menu appears.

Note
If CABLE appears in black, the TV is set to video input and CABLE cannot be selected. Press TV/VIDEO so that a channel number appears.

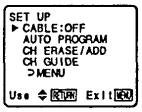
3 Set CABLE to ON or OFF.

(1) If the cursor is not beside CABLE, press △+ or ▽– to move the cursor and press RETURN.



(2) Press △+ or ▽–, to select ON or OFF.

(3) Press RETURN.



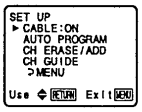
4 Press MENU to return to the original screen.

Presetting channels

TV channels can be preset easily: first store all the receivable channels automatically, following the procedure below. Next, erase unwanted channels or add additional channels. Preset channels during the day rather than late at night, when some channels may not be broadcasting.

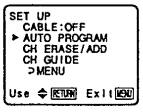
1 Press MENU.

2 Press △+ or ▽– on the remote commander to move the cursor (▶) on the screen to SET UP and press RETURN.
The SET UP menu appears.



Note
If AUTO PROGRAM appears in black, the TV is set to video input and AUTO PROGRAM cannot be selected. Press TV/VIDEO so that a channel number appears.

3 Select AUTO PROGRAM.
(1) Press △+ or ▽– to move the cursor (▶) to AUTO PROGRAM.



(2) Press RETURN.

"AUTO PROGRAM" appears on the screen and the TV starts scanning and presetting channels automatically. When all the receivable channels are stored, "AUTO PROGRAM" disappears and the lowest numbered channel is displayed.

Erasing or adding channels

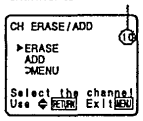
1 Press MENU.

2 Press Δ+ or ∇– to select SET UP and press RETURN.

3 Press Δ+ or ∇– to select CH ERASE/ADD and press RETURN.

4 To erase an unwanted channel:
(1) Press CH +/– to select the channel you want to erase.
(2) Make sure the cursor (▶) is beside ERASE.

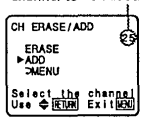
Channel to be erased



(3) Press RETURN.
The indication "–" appears beside the channel number, showing that the channel is erased from the preset memory.

To add a channel that you want:
(1) Press 0-9 buttons to select the channel you want to add and press ENTER.
(2) Press Δ+ or ∇– to select ADD.

Channel to be added



(3) Press RETURN.
The indication "+" appears beside the channel number, showing that the channel is added to the preset memory.

5 To erase and/or add other channels, repeat step **4**.

6 When finished, press MENU.

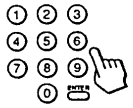
Note
If you erase or add a VHF or UHF channel, the cable TV channel with the same number is also erased or added, and vice versa.

Functions

Note
If "VIDEO" appears on the screen, press TV/VIDEO so that a channel number appears.

Selecting a channel directly

Press the 0-9 buttons to select a channel. Or press ENTER after entering the channel for immediate selection.



To scan through channels

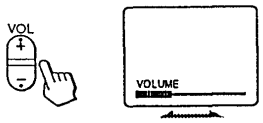
Press CH +/– until the channel you want appears.

Switching quickly between two channels

Press JUMP.
The channel you watched previously appears. Pressing JUMP again switches back to the previous channel.

Adjusting the volume

Press VOL +/– to adjust the volume.



Muting the sound

Press MUTING.
"MUTING" appears on the screen.

To restore the sound, press MUTING again, or press VOL +.

Displaying on-screen information

Use this feature to check your channels and MTS mode.
Press DISPLAY.

To cancel the display, press DISPLAY again.

Setting the Sleep Timer

The TV stays on for the length of time specified and then shuts off automatically.
Press SLEEP repeatedly until the time (minutes) wanted appears. Each time you press SLEEP, the time changes as follows: 30 → 60 → 90 → OFF.

To cancel the Sleep Timer, press SLEEP repeatedly until "SLEEP OFF" appears, or turn the TV off.

Note
If DISPLAY or MUTING is pressed with Caption Vision selected, the channel or muting display will disappear after a few seconds.

Setting the language preference

■ *For models KV-21R10/21RS10/2180R/ 2190RS*

If Spanish is preferred to English, the menu language can be changed.

1 Press MENU.

2 Press △+ or ▽– to move the cursor (▶) to ENGLISH and press RETURN.

3 Press △+ or ▽– to select SPANISH and press RETURN.

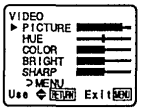
4 Press MENU to return to the normal screen.

Adjusting the picture

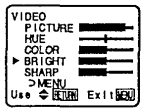
When watching TV programs, the quality of the picture can be adjusted to suit your taste.

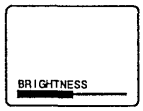
1 Press MENU.

2 Make sure the cursor (▶) is beside VIDEO and press RETURN.

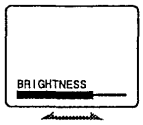


3 Select the item to adjust. See following chart for details on results of adjustments. For example:
To adjust brightness, press △+ or ▽– to select BRIGHT and press RETURN.





4 Adjust the selected item:
(1) Press △+ or ▽– to adjust the item.



(2) Press RETURN.
The new setting appears in the VIDEO menu.

5 To adjust other items, repeat steps **3** and **4** above.

Description of adjustable items

Item	Adjustment	
	Press △+ to	Press ▽– to
PICTURE	Increase picture contrast for vivid color	Decrease picture contrast for soft color
HUE	Make skin tones become greenish	Make skin tones become purplish
COLOR	Increase color intensity	Decrease color intensity
BRIGHT	Brighten the picture	Darken the picture
SHARP	Sharpen the picture	Soften the picture

To restore the factory settings

Press RESET while the VIDEO menu is displayed. All the settings except PICTURE are restored to factory settings.

Displaying Caption Vision

■ USA and Canadian models only

Some programs are broadcast with Caption Vision. To display Caption Vision, select either CC1, CC2, TEXT1, or TEXT2 from the menu. CC1 or CC2 shows you a caption, that is a printed version of the dialog or sound effects of a program. (The mode should be set to CC1 for most programs.) TEXT1 or TEXT2 shows you text, that is information presented using half of the screen. It is not usually related to the program.

1 Press MENU.

2 Press △+ or ▽– to select CC /TEXT and press RETURN.

3 Press △+ or ▽– to select the caption type and press RETURN.

Notes

- Captions disappear for a few seconds when you press the DISPLAY or MUTING button.
- Captions may appear with a white box or other errors instead of a certain word. Poor reception of TV programs can also cause errors in captions.

Specifying stereo or bilingual programs (MTS)

■ For models KV-20S10/ST2050/21RS10/2190RS

The Multichannel TV Sound (MTS) feature allows you to enjoy stereo sound (MAIN) or Second Audio Programs (SAP) at your choice. The initial setting is stereo sound (MAIN).

1 Press MENU.

2 Make sure the cursor (▶) is beside MTS and press RETURN.

3 Press △+ or ▽– to select MAIN, SAP, or MONO and press RETURN.

MTS mode	Sound source
MAIN	Listen to stereo sound.
SAP	Listen to bilingual programs. The sound of non-SAP programs will be muted when SAP is selected.
MONO	Reduce noise during stereo broadcasts.

Customizing the channel number buttons

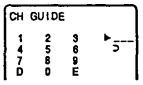
Up to 12 channels can be assigned to a specific channel number. This feature allows the easy selection of your favorite channels using the on-screen menu. For example, channel number button 2 can be assigned to channel 124.

Assigning a channel number button to a favorite channel

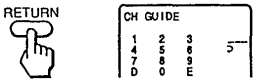
1 Press MENU.

2 Press △+ or ▽– to select SET UP and press RETURN.

3 Press △+ or ▽– to select CH GUIDE and press RETURN.



4 Press RETURN again.



5 Press △+ or ▽– to select a customized channel number (chosen number will appear in red) and press RETURN.
Numbers 0-9 and DISPLAY and ENTER are available for use as a customized channel number. DISPLAY and ENTER are shown as D and E respectively on the screen. The channel number button selected will be the one you press to call up your favorite channel.

6 Press △+ or ▽– to select the channel and press RETURN.

7 Repeat steps **5** and **6** to set other channels.

To cancel a setting

Select the channel you want to cancel in step **5**, then press RESET.

Using the customized channel number buttons

1 Press CH GUIDE.
The CHANNEL GUIDE menu appears showing channel number buttons and the corresponding channels.

2 Press a channel number button, DISPLAY or ENTER on the commander to select the channel you want.

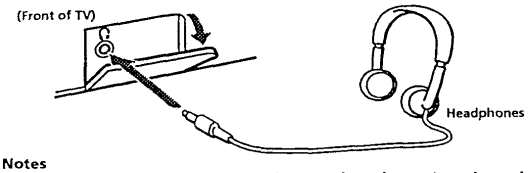
To cancel the CHANNEL GUIDE menu

Press CH GUIDE while the CHANNEL GUIDE menu is displayed.

Listening with headphones

■ *For models KV-20M10/20S10/21R10/ 21RS10/21M10*

Plug the headphones into the headphones jack.

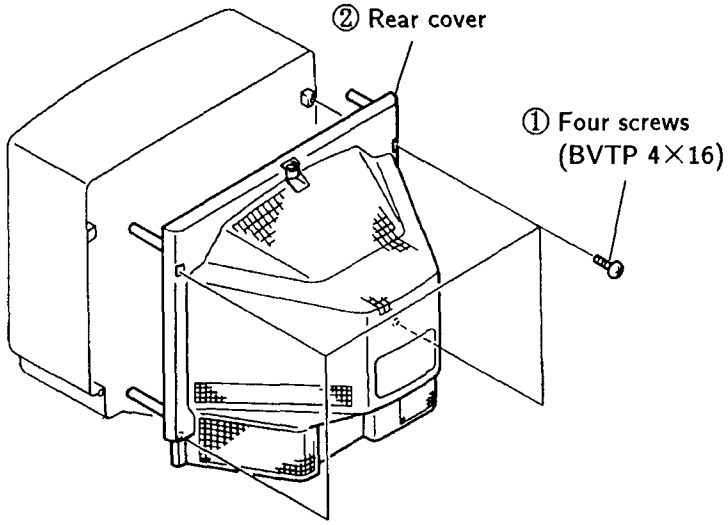


Notes

- To prevent hearing damage due to sudden or prolonged excessive volume, do not raise the headphones volume too high while listening.
- Using the headphones jack will turn off the sound to TV speakers.
- If your TV is a monaural TV, the monaural sound will be heard from both headphones.

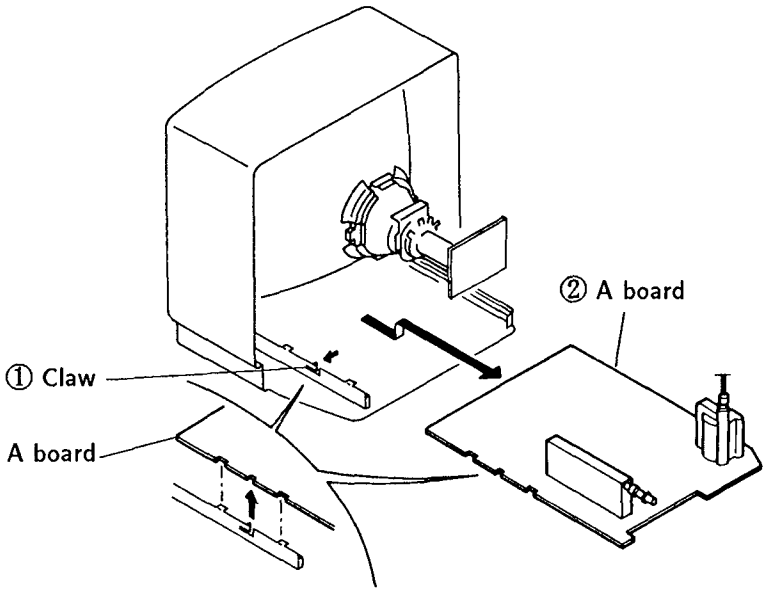
SECTION 2
DISASSEMBLY

2-1. REAR COVER REMOVAL



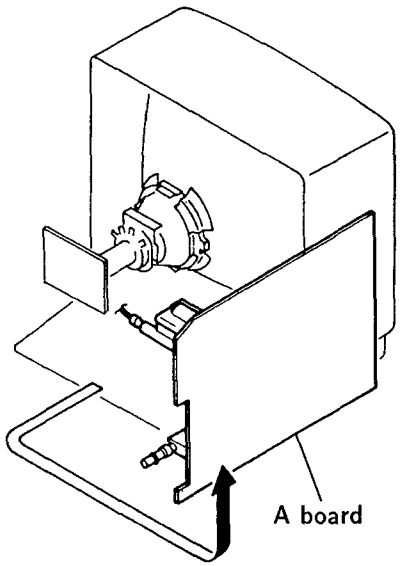
KV-MT2000/ST2050/2180R/2190RS

2-2. A BOARD REMOVAL



KV-20M10/21R10/20S10/21RS10 only

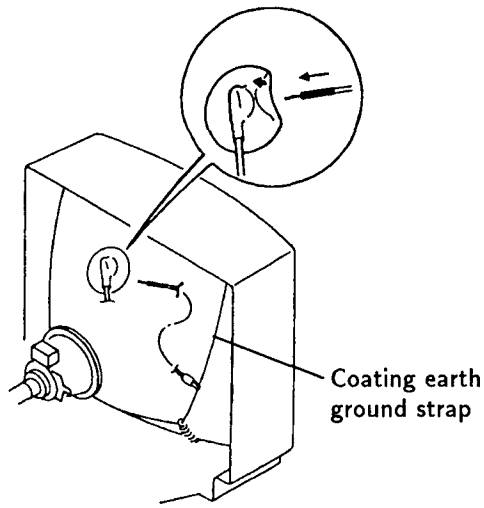
2-3. SERVICE POSITION



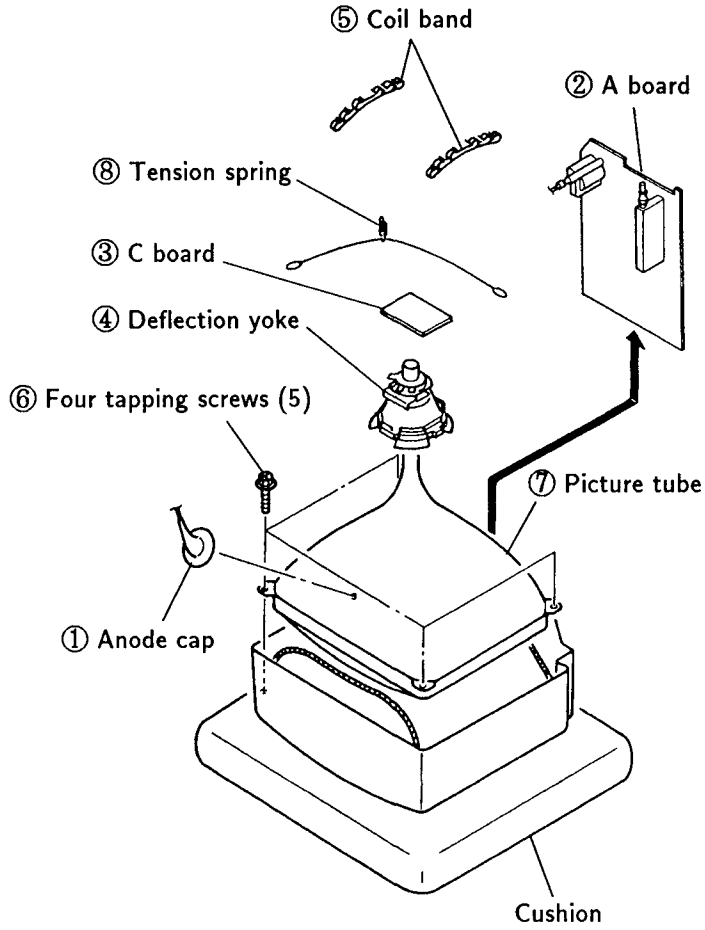
WARNING : Before removing anode cap

H. V. remains in the CRT even after the power is disconnected.

To avoid electrical shock, before attempting to remove the anode cap, discharge CRT : Short between anode and CRT coating earth ground strap.



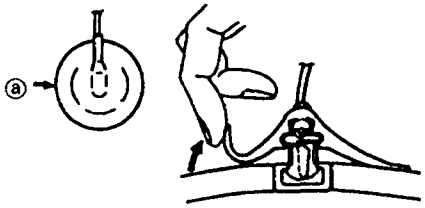
2-4. PICTURE TUBE REMOVAL



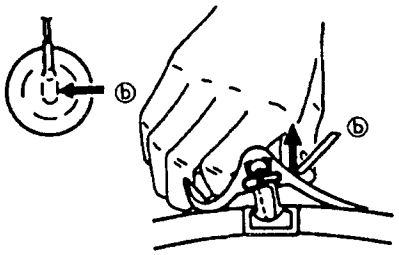
• REMOVAL OF ANODE-CAP

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

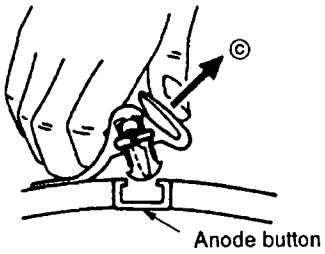
• REMOVING PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.



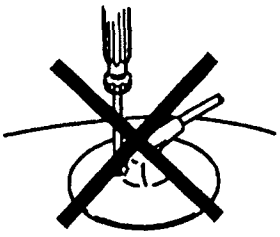
③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow ⓒ.

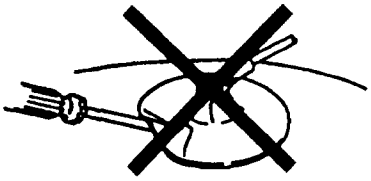
• HOW TO HANDLE AN ANODE-CAP

① Don't hurt the surface of anode-caps with sharp shaped material!

② Don't press the rubber hardly not to hurt inside of anode-caps!
A material fitting called as shatter-hook terminal is built in the rubber.

③ Don't turn the foot of rubber over hardly!
The shatter-hook terminal will stick out or hurt the rubber.





SECTION 3
SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustments should be performed with rated power supply voltage unless otherwise noted.

The controls and switch should be set as follows unless otherwise noted:

PICTURE control ····· normal
BRIGHTNESS control ····· normal

Preparation:

- Feed in the white pattern signal.
- Before starting, degauss the entire screen.

3-1. BEAM LANDING

1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown in Fig.2
3. Turn the raster signal of the pattern generator to green.
4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are at the sides evenly.(Fig.3)
5. Move the deflection yoke forward, and adjust so that the entire screen becomes green. (Fig.1)
6. Switch over the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. When landing at the corner is not right, adjust by using the disk magnets. (Fig.4)

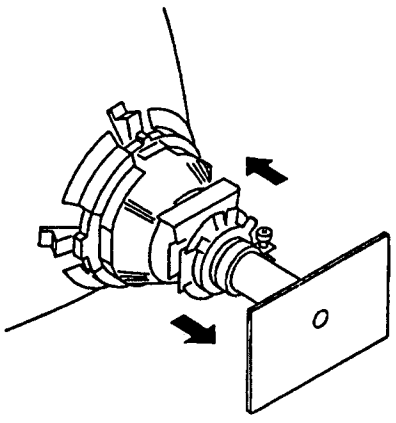


Fig.1

Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2) and White Balance

Note: Test Equipment Required.

1. Color bar Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital multimeter

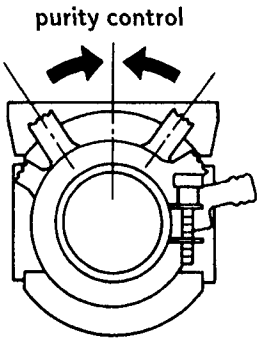


Fig.2

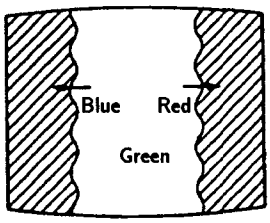


Fig.3

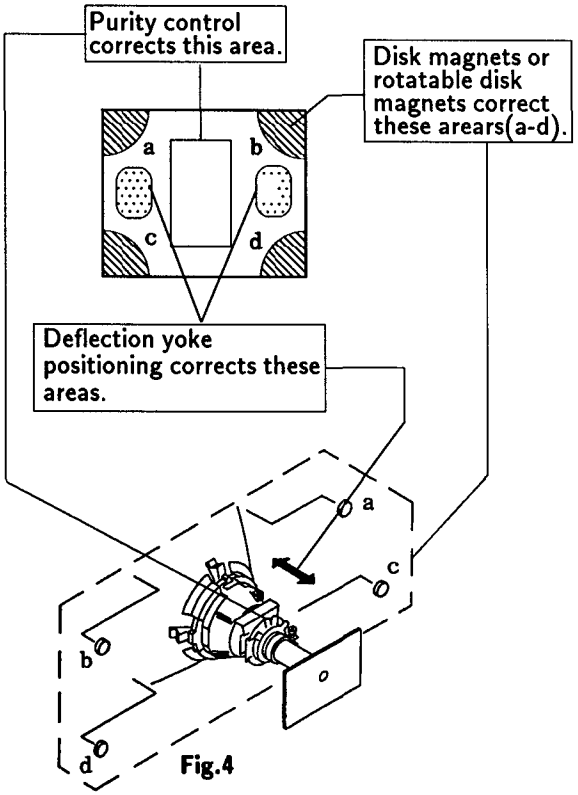


Fig.4

3-2. CONVERGENCE

Preparation:

- Before starting, perform FOCUS, V.LIN and V. SIZE adjustments.
- Set BRIGHTNESS control to minimum.
- Feed in dot pattern.

(1) Vertical Static Convergence

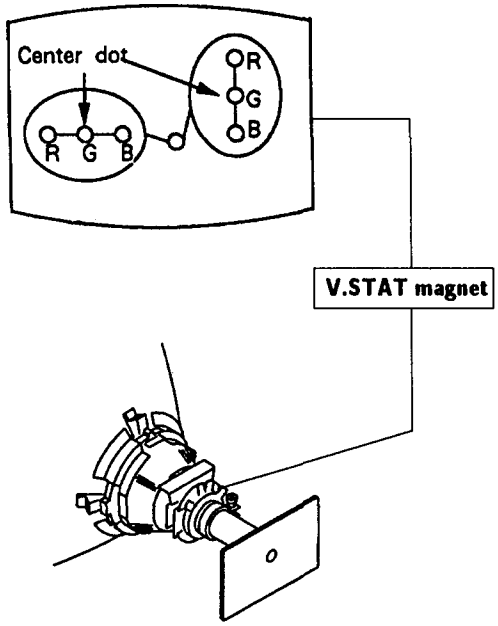
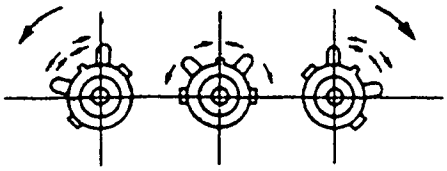


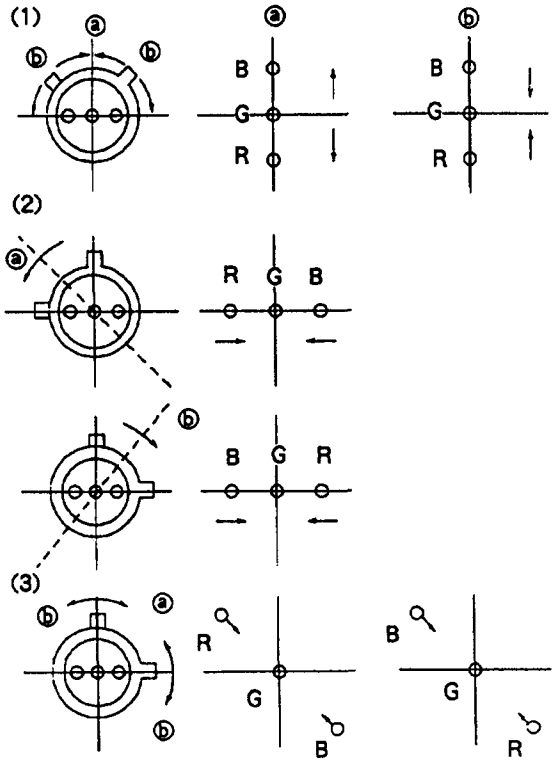
Fig.5

1. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen. (Vertical move -ment)

- Tilt the V.STAT magnet and adjust static convergence to open or close the V.STAT magnet.



2. When the V.STAT magnet is moved in the direction of arrow ⓐ and ⓑ, red, green and blue dots move as shown below.



If the blue dot does not converge with red and green dots, perform following steps.

Move BMC magnet (a) to correct insufficient H.static convergence.

Rotate BMC magnet (b) to correct insufficient V.static convergence.

In either case, repeat Beam Landing Adjustment.

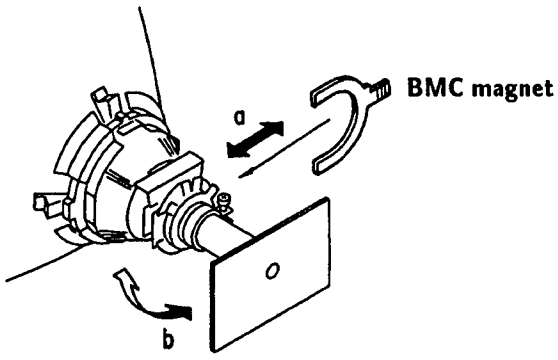


Fig.6

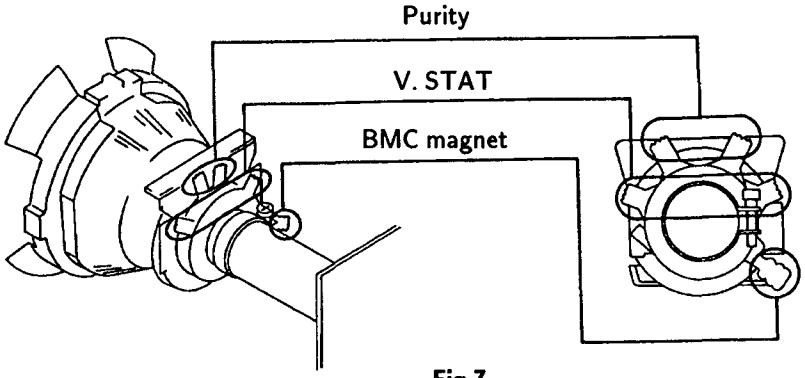


Fig.7

(2)Dynamic Convergence Adjustment

Preparation:

● Before starting perform Horizontal and Vertical static convergence Adjustment.

1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

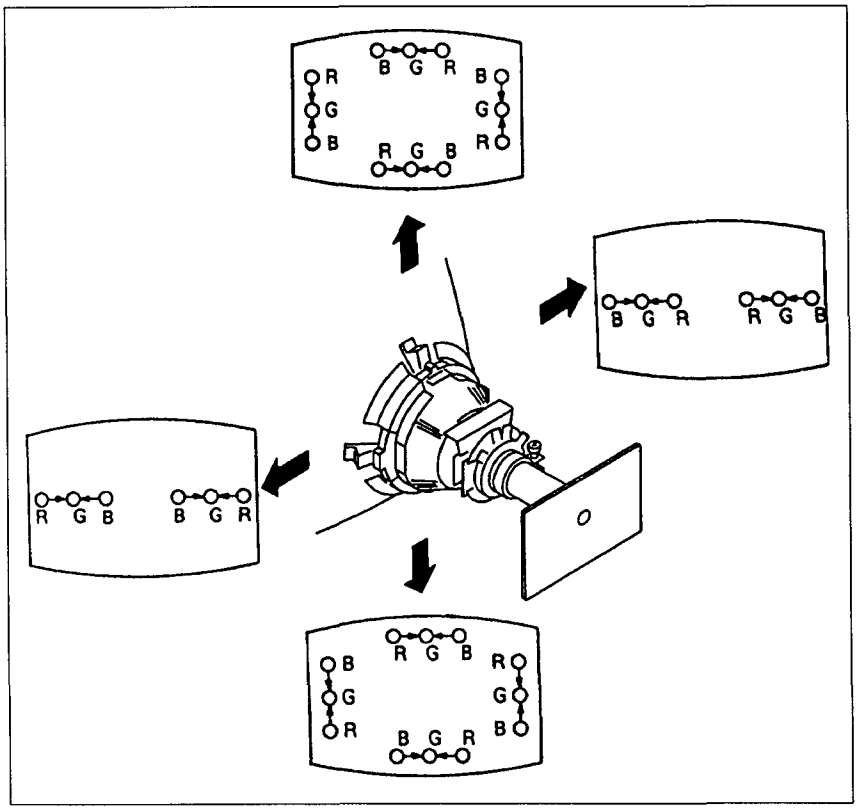


Fig.8

(3) Screen-corner Convergence

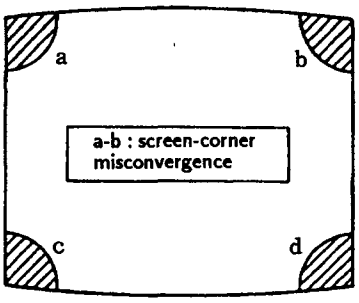
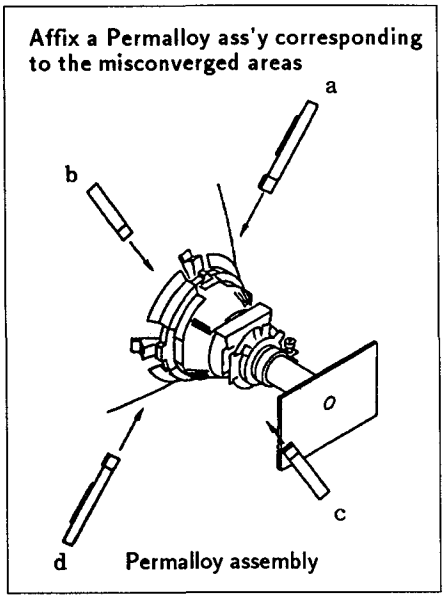


Fig.9



3-3. FOCUS

Adjust FOCUS control for best picture.

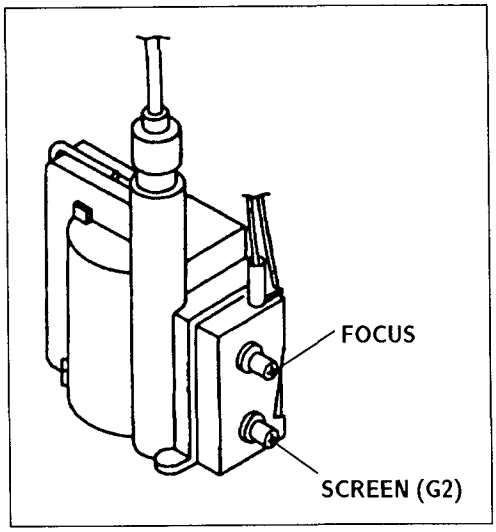


Fig.10

3-4. SCREEN (G 2)

1. Input a dots pattarn.
2. Set the PIC, BRT controls at minimum and COLOR control at normal.
3. Adjust S BRT, G CUT, B CUT in service mode so that voltages on the red, green and blue cathodes are 170V dc with an oscilloscope as shown in Fig.11.
4. Observe the screen and adjust SCREEN (G2)VR to obtain the faintly visible background of dot signal.

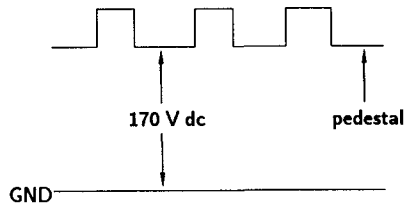


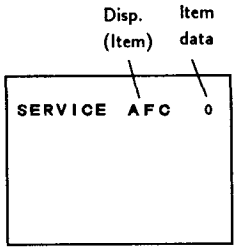
Fig.11

3-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

SERVICE MODE PROCEDURE

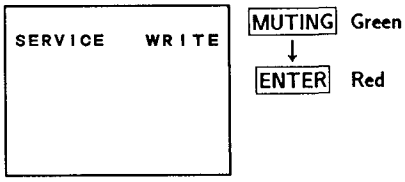
1. Standby mode.(Power off)
2. DISPLAY → 5 → VOL (+) → POWER on the Remote Commander. (Press each button within a second.)

SERVICE ADJUSTMENT MODE IN



3. The CRT displays the item Being adjusted.
4. Press 1 or 4 on the Remote Commander to select the item.
5. Press 3 or 6 on the Remote Commander to change the data.
6. Press MUTING then ENTER to write into memory.

SERVICE ADJUSTMENT MODE MEMORY



7. Turn set off and on to exit.

3-6. WHITE BALANCE ADJUSTMENTS

1. Input an entire white signal.
2. Set to service adjustment mode.
3. Set the PICTURE and BRIGHT to minimum.
4. Adjust with SBRT if necessary.
5. Select G CUT and B CUT with 1 and 4.
6. Adjust with 3 and 6 for the best white balance.
7. Set the PICTURE and BRIGHT to maximum.
8. Select GAMP and BAMP with 1 and 4.
9. Adjust with 3 and 6 for the best white balance.
10. Write into the memory by pressing MUTING then ENTER.

SECTION 4
SAFETY RELATED ADJUSTMENTS

A BOARD

⊠ R525 CONFIRMATION METHOD (HV HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components (marked with ◪ on the schematic diagram).

IC502, IC601, Q554, Q555, D505, D506, D507, D510, DY, C511, C513, C528, C531, R511, R519, R520, R523, R525, R527, R557, R558, R559, R560, R617, R618, T504 (FBT)

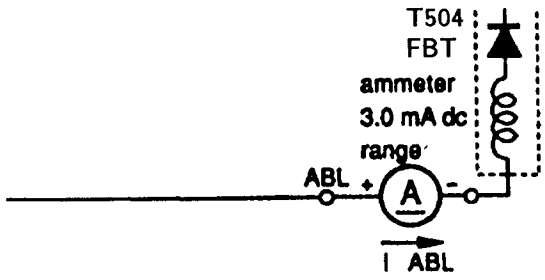
1. Preparation before confirmation

1) Turn the POWER switch ON, and receive entirely white signal and set the PICTURE and BRIGHT controls to maximum.
2) Confirm that the voltage of the check terminal of TP85 is more than 90VDC when the set is operating normaly with 120.0±2.0VAC supply.

2. Hold-down operation confirmation

1) Connect the currentmeter between the 7th pin of FBT (T504)and the land of it with connect polarity.
2) Receive White Signal and adjust the ABL current to follows with the PICTURE and the BRIGHT controls.
   1440 ± 100μA
3) Confirm the voltage of A board TP-91 is 115.0± 0.5VDC.
4) Connect the Digital Voltmeter and DC power Supply via 1SS 119 to TP-85.
5) Increase the DC power voltage gradually until the Picture just blanks out.
6) Read the digital voltmeter indication.
7) Turn DC power Source off immediatery.
   STANDARD
   Less or equal to 134.0 VDC
8) Receive Dot Signal and adjust the ABL current to follows, with the PIX and the BRT controls.
   140+100/-50 μA
9) Repeat steps from (3) to (7).
   STANDARD
   Less or equal to 134.0 VDC

3. Hold-down readjustment
   When step 2 is not satisfied, readjustment should be performed by altering the resistance value of R525 (a component marked with ⊠).

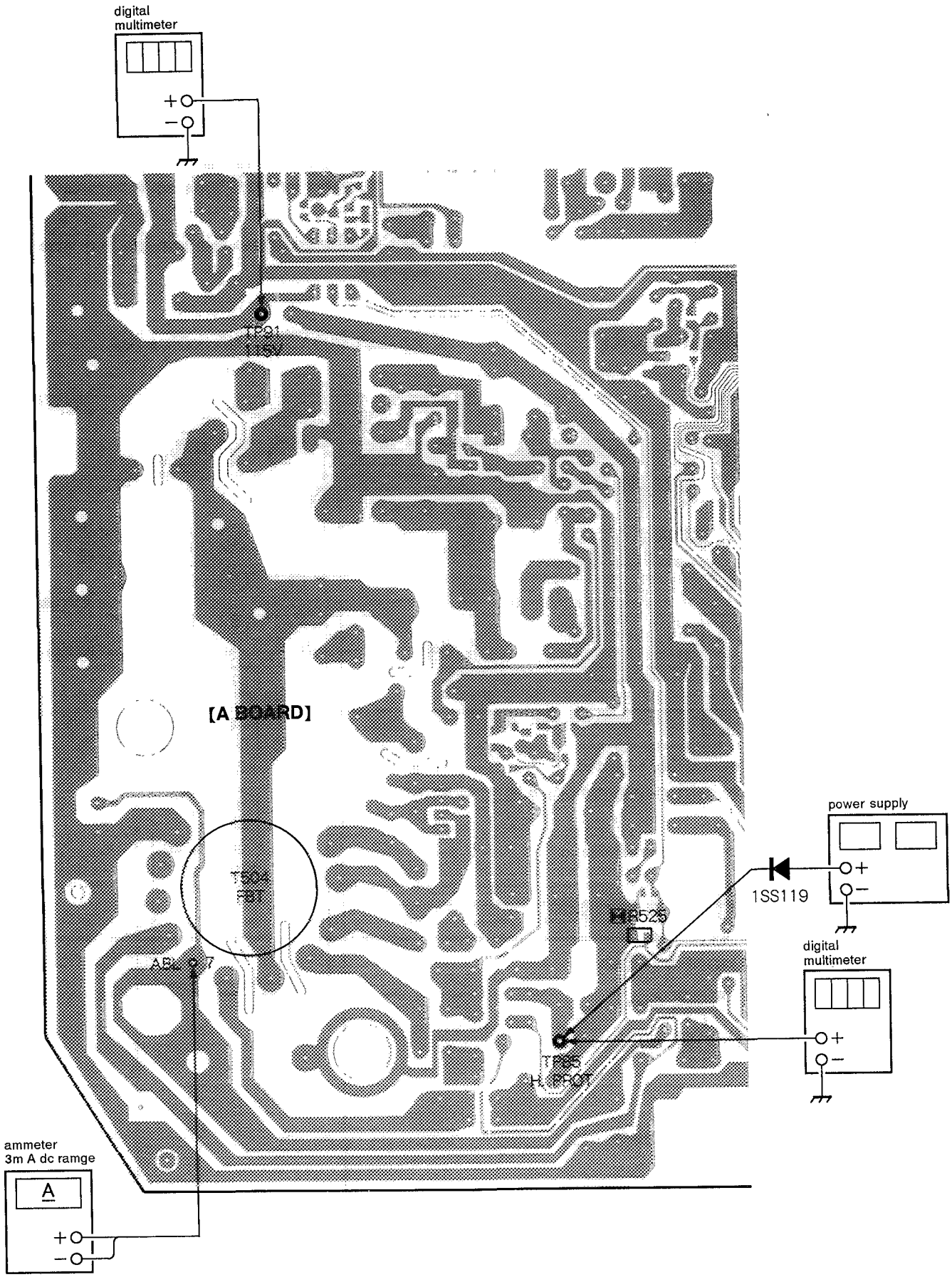


B+ VOLTAGE CONFIRMATION AND ADJUSTMENT

The following adjustments should always be performed when replacing the following components. (marked with ◪ on the schematic diagram).

IC101, IC601, Q609, R030, R617, R618, R629, R630, R636, R637

1) Supply 130±3%V AC to with variable autotrans-former.
2) Input an entirely monoscope signal.
3) Set the PICTURE control and the BRIGHT controls in to initial reset.
4) Set to Service adjustment Mode.
5) Select PADJ with [1] and [4].
6) Adjust with [6] for the 63 level.
7) Confirm the voltage of A BOARD TP-91 is less than 123.0V DC.
8) If step 7) is not satisfied, replace the components repeat above steps.
9) Supply 120±2.0VAC to with variable auto trans former.
10) Adjust with [3] and [6] for the 115±0.5V DC.
11) Write into the memory by pressing [MUTING] then [ENTER].



SECTION 5
CIRCUIT ADJUSTMENTS

5-1. ELECTRICAL ADJUSTMENT BY REMOTE COMMANDER

Use of Remote Commander (RM-Y116) can be performed circuit adjustments about this model.

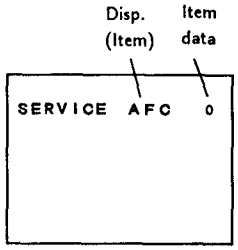
NOTE : Test Equipment Required.
1. Pattern Generator
2. Frequency counter
3. Digital multimeter
4. Audio OSC

1. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

SERVICE MODE PROCEDURE

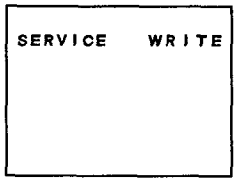
1. Standby mode.(Power off)
2. [DISPLAY] → [5] → [VOL (+)] → [POWER] on the Remote Commander. (Press each button within a second.)

SERVICE ADJUSTMENT MODE IN



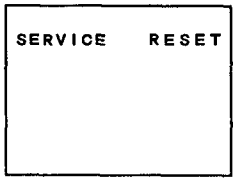
3. The CRT displays the item Being adjusted.
4. Press [1] or [4] on the Remote Commander to select the item.
5. Press [3] or [6] on the Remote Commander to change the data.
6. Press [MUTING] then [ENTER] to write into memory.

SERVICE ADJUSTMENT MODE MEMORY



[MUTING] Green
↓
[ENTER] Red

7. Press [8] then [ENTER] on the Remote Commander to initlalize.



Carry out step 7) when adjusting IDs 0 to 4 and when replacing and adjusting IC102.

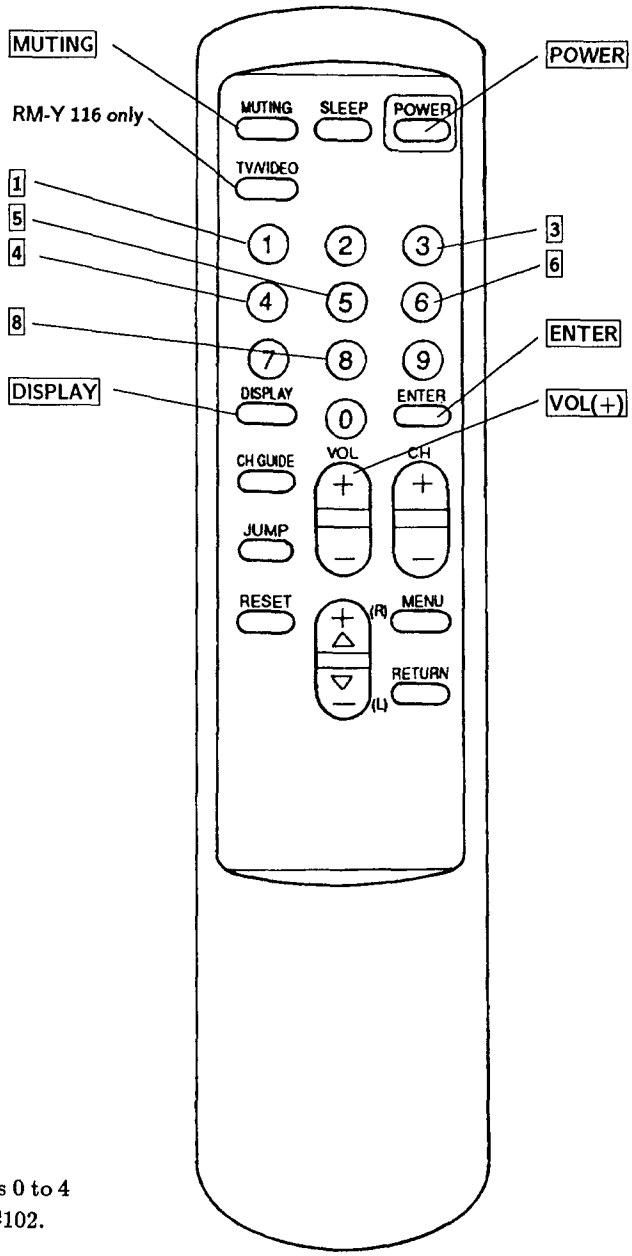
Factory original setting

8. Turn set off and on to exit.

2. MEMORY WRITE CONFIRMATION METHOD

1. After adjustment, pull out the plug from AC outlet, and next place, plug in AC outlet again.
2. Turn the power switch ON and set to Service Mode.
3. Call the adjusted items again, confirm they were adjusted.

3. ADJUST BUTTONS AND INDICATOR



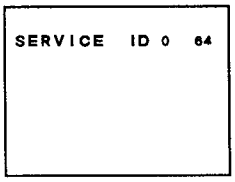
RM-Y116/Y123

4. AN ITEM OF ADJUSTMENTS

No.	Disp.	Item	Data range	Ave. data
1	AFC	AFC Loop Gain	0~3	* 0
2	HFRE	H. Frequency	0~127	78
3	VFRE	V. Frequency	0~31	15
4	VPOS	V. Center	0~31	20
5	VSIZ	V. Size	0~63	31
6	VLIN	V. Linearity	0~15	8
7	VSCO	V. Correction	0~15	6
8	HPOS	H. Center	0~15	6
9	VCOM	V. Compensation	0~7	* 2
10	GAMP	Green Amp	0~31	21
11	BAMP	Blue Amp	0~31	16
12	GCUT	Green Cut Off	0~15	6
13	BCUT	Blue Cut Off	0~15	7
14	CROM	Chroma Trap	0~63	26
15	SPIX	Sub Contrast	0~63	32
16	SHUE	Sub Hue	0~63	25
17	SCOL	Sub Color	0~63	30
18	SBRT	Sub Bright	0~63	34
19	SVOL	Sub Volume	0~15	* 0
20	SHAP	Sharpness	0~15	* 7
21	VSMO	V Pull in Range	0, 1	* 0
22	REF	Refference line	0~3	* 2
23	ROFF	Red Out	0, 1	—
24	GOFF	Green Out	0, 1	—
25	BOFF	Blue Out	0, 1	—
26	ABLM	ABL Mode	0, 1	* 0
27	NOTC	Notch On/Off	0, 1	—
28	DRGB	OSD intensity	0, 1	* 0
29	DISP	Display Position	0~63	4
30	PADJ	Plus B Adjust	0~63	43
31	ID-0	Model ID	0~127	by Model
32	ID-1	Model ID	0~127	by Model
33	ID-2	Model ID	0~127	by Model
34	ID-3	Model ID	0~127	by Model
35	ID-4	Model ID	0~127	by Model

* : Set-up value

Note : No.from 1 to 35 is to show adjusment order.



Note : IC101 of the A circuit board inputs a V sync signal to pin ⑤, and is always in operation. If on V sync signal is input to pin ⑤, there will be a waiting period of 2-4 seconds, and the power is shut off. When entering the service mode, the above function is cancelled and operation is possible.

Please adjust the function values as shown below when IC 102 on A board was replaced.

KV-20M10

No.	Disp.	Data
31	ID-0	64
32	ID-1	8
33	ID-2	64
34	ID-3	1
35	ID-4	16

KV-20S10

No.	Disp.	Data
31	ID-0	64
32	ID-1	9
33	ID-2	64
34	ID-3	1
35	ID-4	16

KV-MT2000

No.	Disp.	Data
31	ID-0	0
32	ID-1	8
33	ID-2	64
34	ID-3	1
35	ID-4	16

KV-ST2050

No.	Disp.	Data
31	ID-0	0
32	ID-1	9
33	ID-2	64
34	ID-3	1
35	ID-4	16

KV-21R10

No.	Disp.	Data
31	ID-0	64
32	ID-1	8
33	ID-2	32
34	ID-3	1
35	ID-4	16

KV-21RS10

No.	Disp.	Data
31	ID-0	64
32	ID-1	9
33	ID-2	32
34	ID-3	1
35	ID-4	16

KV-2180R

No.	Disp.	Data
31	ID-0	0
32	ID-1	8
33	ID-2	32
34	ID-3	1
35	ID-4	16

KV-2190RS

No.	Disp.	Data
31	ID-0	0
32	ID-1	9
33	ID-2	32
34	ID-3	1
35	ID-4	16

5-2. A BOARD ADJUSTMENTS

RF AGC ADJUSTMENT(IF BLOCK VR)

1. Input a color-bar signal.
2. Adjust AGC VR of TU 101 so that snow noise and cross-modulation disappear from the picture.
3. Confirm them at every channel.

H.FREQUENCY ADJUSTMENT (HFRE)

1. Input a color-bar signal.
2. Set to Service adjustment Mode.
3. Connect a frequency counter to base of Q 550 (TP-86 H.DRIVE).
4. Call the item of AFC, set to 3 level (free run).
5. Select HFRE with 1 and 4.
6. Adjust with 3 and 6 for the 15734± 60 Hz.
7. Call the item of AFC again, adjust the level" 0 ".
8. Write into the memory by pressing MUTING then ENTER.

V.FREQUENCY ADJUSTMENT (VFRE)

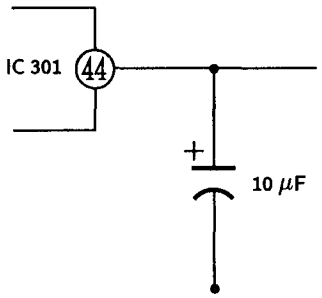
KV-20M10/20S10/21R10/21RS10 only

1. Select video 1 with no connecting the signal.
2. Set to Service adjustment Mode.
3. Connect the frequency counter across connector VDY (+) (CN501) connector and ground.
4. Select VFRE with 1 and 4.
5. Adjust with 3 and 6 for the 55 ±0.5Hz.
6. Write the memory by pressing MUTING then ENTER .

V.FREQUENCY ADJUSTMENT (VFRE)

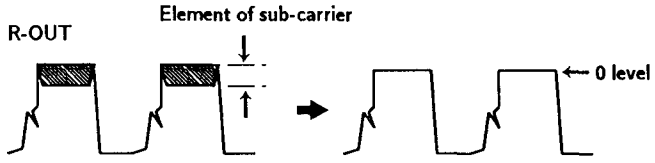
KV-MT2000/ST2050/2180R/2190RS only

1. Connect a capcitor (10 μF) across pin ㊹ of IC 301 (V. SYNC) and ground.
2. Set to Service adjustment Mode.
3. Connect the frequency counter across connector VDY (+) (CN501) connector and ground.
4. Select VFRE with 1 and 4.
5. Adjust with 3 and 6 for the 55 ±0.5Hz.
6. Write the memory by pressing MUTING then ENTER .
7. Disconnect a capcitor from IC 301.



CROMA TRAP ADJUSTMENT (CROM)

1. Input a red signal
2. Set to Service adjustment Mode.
3. Connect an oscilloscope CN703 Pin① (R OUT) of C board ground.
4. Select CROM with 1 and 4.
5. Adjust with 3 and 6 for the 0 level.



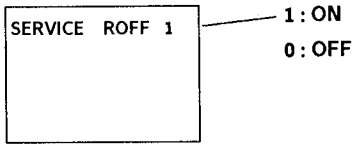
6. Write the memory by pressing MUTING then ENTER .

SUB CONTRAST ADJUSTMENT (SPIX)

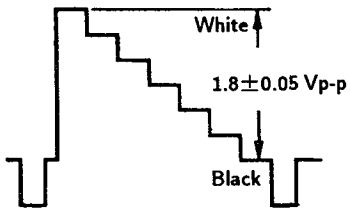
1. Input a color-bar signal.
2. Set to Service adjustment Mode.
3. Set the conditions as follows.

PICTURE	·····	MAX
COLOR	·····	MIN
BRIGHT	·····	CENTER

R OFF	·····	ON (1)
G OFF	·····	OFF (0)
B OFF	·····	OFF (0)



4. Connect an oscilloscope to CN703 Pin① (R OUT) of C board and ground.
5. Select SPIX with 1 and 4.
6. Adjust with 3 and 6 for the 1.8±0.05 Vp-p.

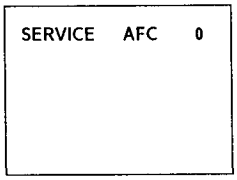


7. Write the memory by pressing MUTING then ENTER .
8. Return the following back to normal after adjustment.

PICTURE	·····	MAX
BRIGHT	·····	CENTER
COLOR	·····	CENTER
R OFF	·····	ON
G OFF	·····	ON
B OFF	·····	ON

DISPLAY POSITION ADJUSTMENT (DISP)

1. Input a color-bar signal.
2. Set to service adjustment Mode.
3. Select DISP with 1 and 4.
4. Adjust with 3 and 6 for the bar center.
5. Write the memory by pressing MUTING then ENTER .
6. Check if the text is displayed on the screen.

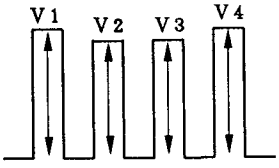


SUB BRIGHT ADJUSTMENT (SBRT)

1. Input a cross-hatch signal.
2. Set to service adjustment mode.
3. Set the PICTURE and BRIGHT to minimum.
4. Select SBRT with 1 and 4.
5. Adjust with 3 and 6 for obtain a faintly visible cross-hatch.
6. Write into the memory by pressing MUTING then ENTER .

SUB HUE, SUB COLOR ADJUSTMENT (SHUE, SCOL)

1. Input a color-bar signal.
2. Set to service adjustment Mode.
3. Connect an oscilloscope to CN703 Pin③ (B OUT) of C board.
4. Select SHUE and SCOL with 1 and 4.
5. Adjust with 3 and 6 for the V1=V4 (SCOR) and V2 =V3 (SHUE).

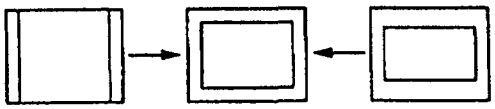


6. Write into the memory by pressing MUTING then ENTER .

V.SIZE ADJUSTMENT (VSIZ)

1. Input a cross-hatch signal.
2. Set to service adjustment Mode.
3. Select VSIZ with 1 and 4.
4. Adjust with 3 and 6 for the best vertical size.
5. Write into the memory by pressing MUTING then ENTER.

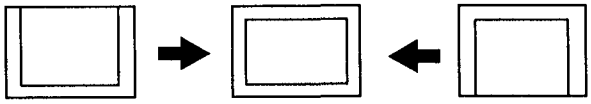
V. SIZE (VSIZ)



V.CENTER ADJUSTMENT (VPOS)

1. Input a cross-hatch signal.
2. Set to service adjustment Mode.
3. Select VPOS with 1 and 4.
4. Adjust with 3 and 6 for the best vertical senter.
5. Write into the memory by pressing MUTING then ENTER.

V. CENTER (VPOS)

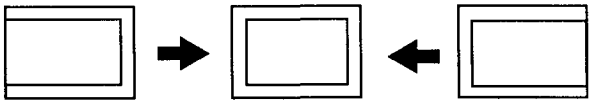


H.CENTER ADJUSTMENT (H POS)

Note: Perform this adjustment after H.FREQUENCY ADJUSTMENT (HFRE).

1. Input a cross-hatch signal.
2. Set the Service adjustment mode.
3. Select HPOS with 1 and 4.
4. Adjust with 3 and 6 to the best horizontal center.
5. Write into the memory by pressing MUTING then ENTER.

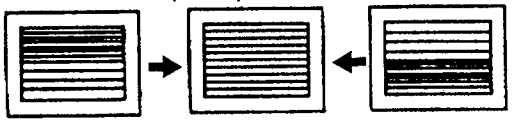
H. CENTER (HPOS)



V LINEARITY (VLIN) AND V CORRECTION (VSCO) ADJUSTMENTS

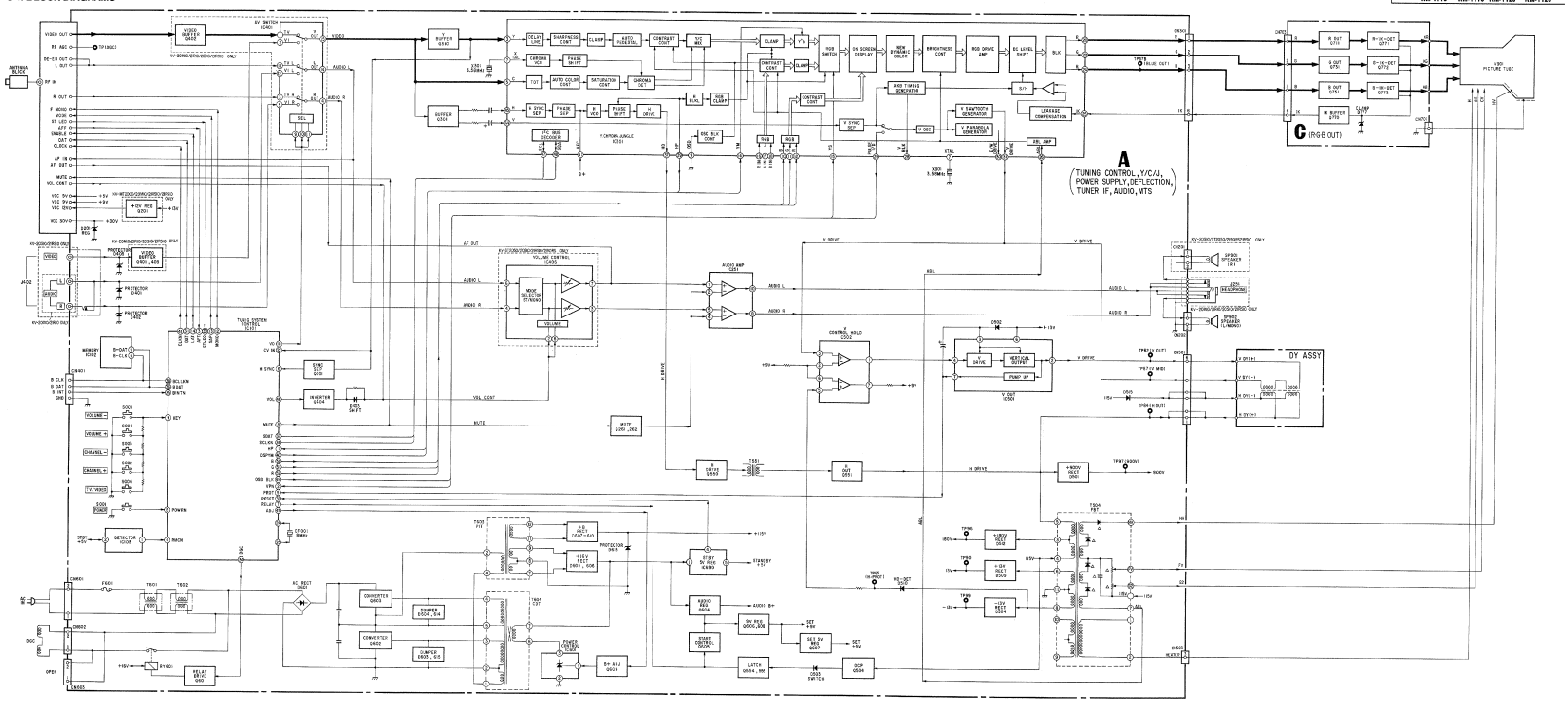
1. Input a cross-hatch signal.
2. Set to Service adjustment Mode.
3. Select VLIN and VSCO with 1 and 4.
4. Adjust with 3 and 6 for the best picture.
5. Write the memory byPressing MUTING then ENTER.

V LINEARITY (VLIN)

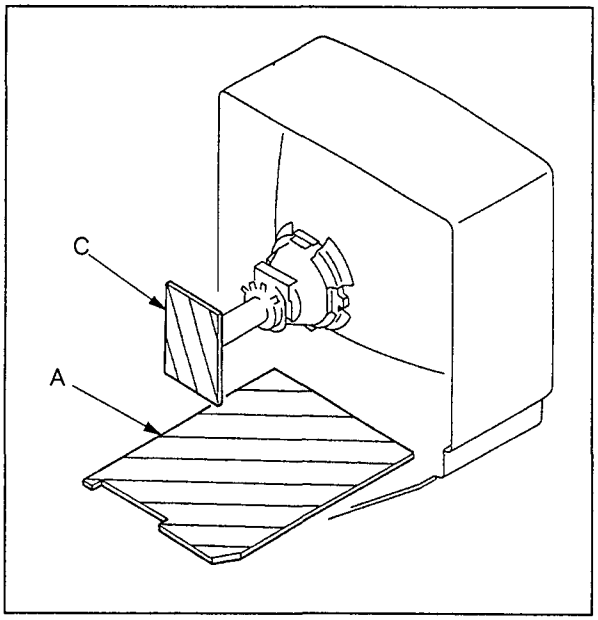


V CORRECTION (VSCO)

6-1. BLOCK DIAGRAMS



6-2. CIRCUIT BOARDS LOCATION



6-3. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

Note:

- All capacitors are in µF unless otherwise noted.
  pF· µµF 50WV or less are not indicated except for electrolytic and tantalums
- All electrolytics are in 50V unless otherwise specified
- Indication of resistance, which does not have one for rating electrical power, is as follows

Pitch. 5 mm Rating electrical power 1/4W

- All resistors are in ohms.
  kΩ=1000Ω, MΩ=1000KΩ
- : nonflammable resistor.
- △ internal component
- . panel designation, and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- The components identified by ◪ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation.
  Should replacement be required, replace only with the value originally used.
- When replacing components identified by ◪, make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by ⊠ and repeat the adjustment until the specified value is achieved.
  (Refer to R525 on Page 18, 19.)
- When replacing the part in below table be sure to parform the related adjustment

Part replaced (◪)	Adjustment (⊠)
IC502, IC601, Q554, Q555, D505, D506, D507, D510, DY, C511, C513, C528, C531, R511, R519, R520, R523, R525, R527, R557, R558, R559, R560, R617, R618, T504(FBT)	HV HOLD-DOWN (R525)
IC101, IC601, Q609, R030, R617, R618, R629, R630, R636, R637	B+ VOLTAGE CONFIRMATION

- All voltages are in V
- Voltage are dc with respect to ground unless otherwise noted
- Readings are taken with a 10 MΩ digital multimeter
- Readings are taken with a color-bar signal input
- Voltage variations may be noted due to normal production tolerance
- Circled numbers are waveform references
- · B+ Line.
- : signal path.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	. FUSE	NONFLAMMABLE FUSIBLE
	· RW	NONFLAMMABLE WIREWOUND
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: ※	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	· TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	· ALB	BIPOLAR
	· ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

Note: The symbol display is on the component side.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

The symbol indicate fast operating fuse. Replace only with fuse of same rating as marked.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une pièce portant le numéro spécifié.

Le symbole indique une fusible a action rapide. Doit etre remplacee par une fusible de meme yaleur, comme maque.

KV-20M10/20S10/MT2000/ST2050
RM-Y118 RM-Y116 RM-Y123 RM-Y123
KV-21R10/21RS10/2180R/2190RS
RM-Y118 RM-Y116 RM-Y123 RM-Y123

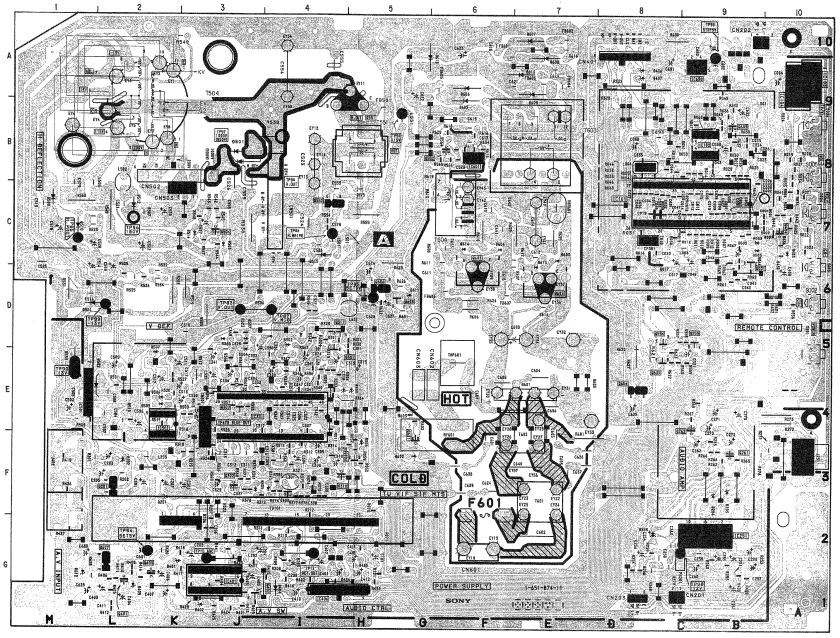
A TUNING CONTROL, Y/C/J, POWER SUPPLY, DEFLECTION, TUNER/IF, AUDIO MTS

– A BOARD –

NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

KV-20M10/20S10/MT2000/ST2050
RM-Y118 RM-Y116 RM-Y123 RM-Y123
KV-21R10/21RS10/2180R/2190RS
RM-Y118 RM-Y116 RM-Y123 RM-Y123

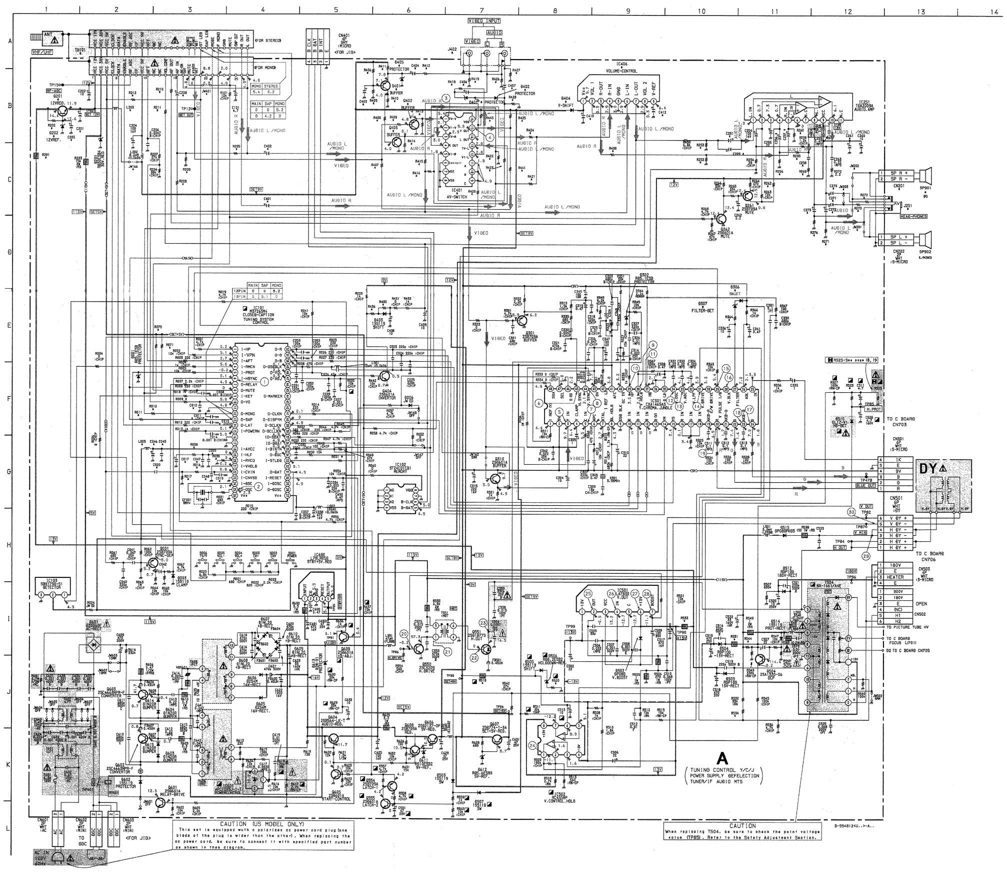
KV-20M10/20S10/MT2000/ST2050
RM-Y119 RM-Y116 RM-Y123 RM-Y123
KV-21R10/21RS10/2180R/2190RS
RM-Y116 RM-Y116 RM-Y123 RM-Y123



IC		DIODE	
IC101	C-8	D001	C-9
IC102	B-9	D003	C-9
IC103	A-10	D201	F-2
IC251	G-9	D302	D-4
IC301	E-3	D401	G-2
IC401	G-3	D403	C-10
IC501	E-1	D405	G-2
IC502	E-2	D501	B-3
IC601	B-6	D502	E-2
IC690	A-9	D503	C-3
		D504	D-1
TRANSISTOR		D505	E-2
Q001	C-9	D506	E-2
Q201	F-2	D507	E-2
Q251	F-9	D509	C-1
Q252	E-9	D510	C-1
Q301	D-4	D512	C-2
Q310	F-4	D514	C-3
Q401	G-2	D515	C-4
Q402	G-3	D601	E-7
Q403	G-2	D602	F-5
Q404	C-10	D603	C-7
Q504	C-3	D604	C-6
Q550	C-4	D605	A-6
Q551	A-5	D606	A-6
Q554	D-8	D607	A-7
Q555	D-9	D608	A-7
Q601	F-5	D609	A-7
Q602	D-7	D610	A-7
Q603	C-6	D611	D-5
Q604	E-5	D612	G-1
Q605	E-8	D613	A-8
Q606	D-5	D614	C-6
Q607	G-2	D615	C-7
Q608	D-5		

• A BOARD WAVEFORMS

① 4.5 Vp-p (H)	② 3.4 Vp-p (6MHz)	③ 2.6 Vp-p (H)
④ 2.6 Vp-p (H)	⑤ 2.6 Vp-p (H)	⑥ 2.0 Vp-p (H)
⑦ 2.6 Vp-p (H)	⑧ 1.8 Vp-p (H)	⑨ 0.3 Vp-p (V)
⑩ 5.4 Vp-p (H)	⑪ 2.4 Vp-p (H)	⑫ 1.6 Vp-p (V)
⑬ 1.8 Vp-p (V)	⑭ 1.4 Vp-p (V)	⑮ 5.6 Vp-p (V)
⑯ 5.2 Vp-p (V)	⑰ 3.9 Vp-p (H)	⑱ 3.5 Vp-p (H)
⑲ 3.8 Vp-p (H)	⑳ 1.7 Vp-p (H)	㉑ 125 Vp-p (H)
㉒ 930 Vp-p (H)	㉓ 23.2 Vp-p (H)	㉔ 2.4 Vp-p (V)
㉕ 53.5 Vp-p (V)	㉖ 1.7 Vp-p (V)	㉗ 2.4 Vp-p (V)
㉘ 2.7 Vp-p (V)	㉙ 72 Vp-p (H)	㉚ 1.3 Vp-p (V)



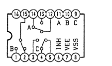
A BOARD ✻ MARK

Ref. No.	Location	KV-MT2000	KV-20M10	KV-21R10	KV-ST2050	KV-20S10	KV-21RS10	KV-2180R	KV-2190RS
C010	F－3	－	0.001	0.001	－	0.001	0.001	－	－
C011	F－3	0	0	0	－	－	－	0	－
C012	F－3	0	0	0	－	－	－	0	－
C017	F－3	1	1	－	1	1	－	－	－
C019	G－3	560p	560p	－	560p	560P	－	－	－
C020	G－2	0.1	0.1	－	0.1	0.1	－	－	－
C045	F－2	2200p	2200p	－	2200p	220P	－	－	－
C046	F－2	47	47 25V	－	47 25V	47 25V	－	－	－
C047	F－3	100p	100p	－	100p	100P	－	－	
C048	G－3	1000p	1000p	－	1000p	1000P	－	－	－
C055	F－3	100p	100p	－	100p	100P	－	－	－
C201	B－1	220/16V	220/16V	220/16V	－	－	－	220/16V	－
C205	B－1	22/50V	22/50V	22/50V	－	－	－	22/50V	－
C208	A－3	1	1	1	－	－	－	1	－
C209	B－10	2.2	2.2	2.2	－	－	－	2.2	－
C251	B－10	－	－	－	2.2	2.2	2.2	－	2.2
C256	B－11	－	－	－	100 16V	100 16V	100 16V	－	100 16V
C257	B－11	－	－	－	2.2	2.2	2.2	－	2.2
C258	B－11	－	－	－	0.22	0.22	0.22	－	0.22
C261	B－12	－	－	－	1000 16V	100 16V	1000 16V	－	100 16V
C270	C－12	－	10	10	－	10	10	－	－
C271	C－12	－	－	－	－	10	10	－	－
C273	C－11	－	－	－	470 16V	470 16V	470 16V	－	470 16V
C401	C－4	－	－	－	1	1	1	－	1
C402	B－4	－	1	1	1	1	1	－	
C403	A－5	－	10	10	－	10	10	－	－
C404	A－6	－	100 16V	100 16V	－	100 16V	100 16V	－	－
C406	A－7	－	1	1	－	1	1	－	－
C407	A－7	－	－	－	－	1	1	－	－
C410	B－8	－	－	－	10	10	10	－	10
C412	B－9	－	－	－	10	10	10	－	10
CN201	C－13	－	－	－	2P	2P	2P	－	2P
D202	B－1	RD33ESB2	RD13ESB1	RD13ESB1	－	－	－	RD13ESB1	－
D401	A－7	－	RD13ESB	RD13ESB	－	RD13ESB	RD13ESB	－	－
D402	A－7	－	－	－	－	RD13ESB	RD13ESB	－	－
D404	B－8	－	－	－	JW (10)	JW (10)	JW (10)	－	JW (10)
D405	A－6	－	RD13ESB	RD13ESB	－	RD13ESB	RD13ESB	－	－
IC401	B－7	－	MC14053BCP	MC14053BCP	－	MC1453BCP	MC14053BCP	－	－
IC406	A－9	－	－	－	μPC1406HA	μPC1406HA	μPC1406HA	－	μPC1406HA
J251	C－12	－	○	○	－	○	○	－	－
J402	A－7	－	2p	2p	－	3P	3P	－	－
JW166	B－2	－	－	－	JW (5.0MM)	JW (5.0MM)	JW (5.0MM)	－	－
JW201	C－12	5MM	－	－	5MM	－	－	5MM	5MM
JW202	C－12	－	－	－	5MM	－	－	－	5MM
JW203	C－12	－	5MM	5MM	－	－	－	－	－
JW401	A－3	15MM	15MM	15MM	－	－	－	15MM	－
L003	F－2	100 μH	100 μH	－	100 μH	100 μH	－	－	－
Q201	B－1	2SD774	2SD774	2SD774	－	－	－	2SD774	－
Q401	A－6	－	2SB709A	2SB709A	－	2SB709A	2SB709A	－	－
Q402	B－6	－	2SB709A	2SB709A	－	2SB709A	2SB709A	－	－
Q403	B－6	－	2SB709A	2SB709A	－	2SB709A	2SB709A	－	－

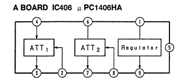
Ref. No.	Location	KV-MT2000	KV-20M10	KV-21R10	KV-ST2050	KV-20S10	KV-21RS10	KV-2180R	KV-2190RS
R009	F－3	－	220	220	－	220	220	－	－
R010	F－2	－	－	－	10k	10k	10k	－	10k
R011	F－2	－	－	－	10k	10k	10k	－	10k
R016	G－3	470	470	－	470	470	－	－	－
R017	G－3	1M	1M	－	1M	1M	－	－	－
R038	F－3	1k	1k	－	1k	1k	－	－	－
R039	G－3	15k	15k	－	15k	15k	－	－	－
R051	F－5	－	－	－	220	220	220	－	220
R070	E－2	－	－	－	4.7k	4.7k	4.7k	－	4.7k
R071	E－2	－	－	－	4.7k	4.7k	4.7k	－	4.7k
R201	B－1	JW (5MM)	JW (5MM)	JW (5MM)	－	－	－	JW (5MM)	－
R202	B－1	680	680	680	－	－	－	680	－
R205	B－3	4.7k	－	－	－	－	－	4.7k	－
R208	C－3	－	4.7k	4.7k	－	－	－	－	－
R209	B－3	6.8k	6.8k	6.8k	－	－	－	6.8k	－
R210	A－3	220	220	220	－	－	－	220	－
R211	B－3	1k	1k	1k	－	－	－	1k	－
R212	B－2	－	－	－	4.7k	4.7k	4.7k	－	4.7k
R252	B－10	－	－	－	6.8k	6.8k	6.8k	－	6.8k
R253	B－10	4.7k	4.7	4.7k	6.8k	6.8k	6.8k	4.7k	6.8k
R256	B－11	－	－	－	39	39	.9	－	39
R259	B－11	－	－	－	1.2k	1.2k	1.2k	－	1.2k
R260	B－11	0	0	0	－	－	－	0	－
R262	C－11	－	－	－	12k	12k	12k	－	12k
R269	B－11	－	－	－	2.2	2.2	2.2	－	2.2
R271	C－11	－	1k	1k	－	1k	1k	－	－
R272	C－11	－	330	330	－	330	330	－	－
R273	C－11	－	330	330	－	330	330	－	－
R276	C－11	－	－	－	－	1k	1k	－	－
R405	A－5	－	15k	15k	－	15k	15k	－	－
R406	A－5	－	5.6k	5.6k	－	5.6k	5.6k	－	－
R407	B－5	100	－	－	100	－	－	100	100
R408	B－6	－	0	0	－	0	0	－	－
R409	B－6	－	0	0	－	0	0	－	－
R410	B－6	－	1k	1k	－	1k	1k	－	－
R411	A－6	－	470	470	－	470	470	－	－
R412	A－6	－	470	470	－	470	470	－	－
R413	B－6	－	100k	100k	－	100k	100k	－	－
R414	B－6	－	100k	100k	－	100k	100k	－	－
R415	B－6	－	0	0	－	220	220	－	－
R416	C－6	－	－	－	220	－	－	－	220
R418	A－7	－	1k	1k	－	1k	1k	－	－
R419	A－7	－	82	82	－	82	32	－	－
R420	C－7	－	1k	1k	－	1k	1k	－	－
R421	C－8	－	－	－	220	－	－	－	220
R422	B－7	0	0	0	－	－	－	0	－
R423	B－7	－	1k	1k	－	1k	1k	－	－
R424	B－8	－	－	－	－	220	220	－	－
R425	B－7	－	3.3k	3.3k	－	3.3k	3.3k	－	－
R426	A－7	－	470k	470k	－	470k	470k	－	－
R427	A－7	－	－	－	－	470k	470k	－	－
R428	B－7	0	0	0	－	－	－	0	－
R430	D－6	3.3k	3.3k	3.3k	10k	10k	10k	3.3k	10k
R432	D－6	－	－	－	10k	10k	10k	－	10k
R436	D－5	2.2k	2.2k	2.2k	6.8k	6.8k	6.8k	2.2k	6.8k
R438	B－9	－	－	－	6.8k	6.8k	6.8k	－	6.8k
R441	B－7	－	100	100	－	100	100	－	－
R445	B－7	－	22k	22k	－	－	－	－	－
TU101	A－2	BTF-LA401	BTF-LA401	BTF-LA401	BTF-WA402	BTF-WA402	BTF-LA401	BTF-LA401	BTF-WA402

○:TO BE MOUNT
－: NOT MOUNT

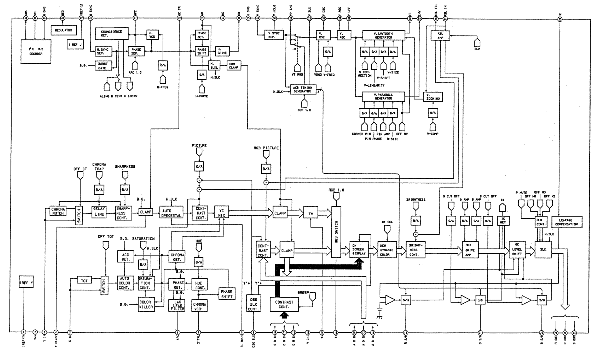
A BOARD IC401 MC14053BCP

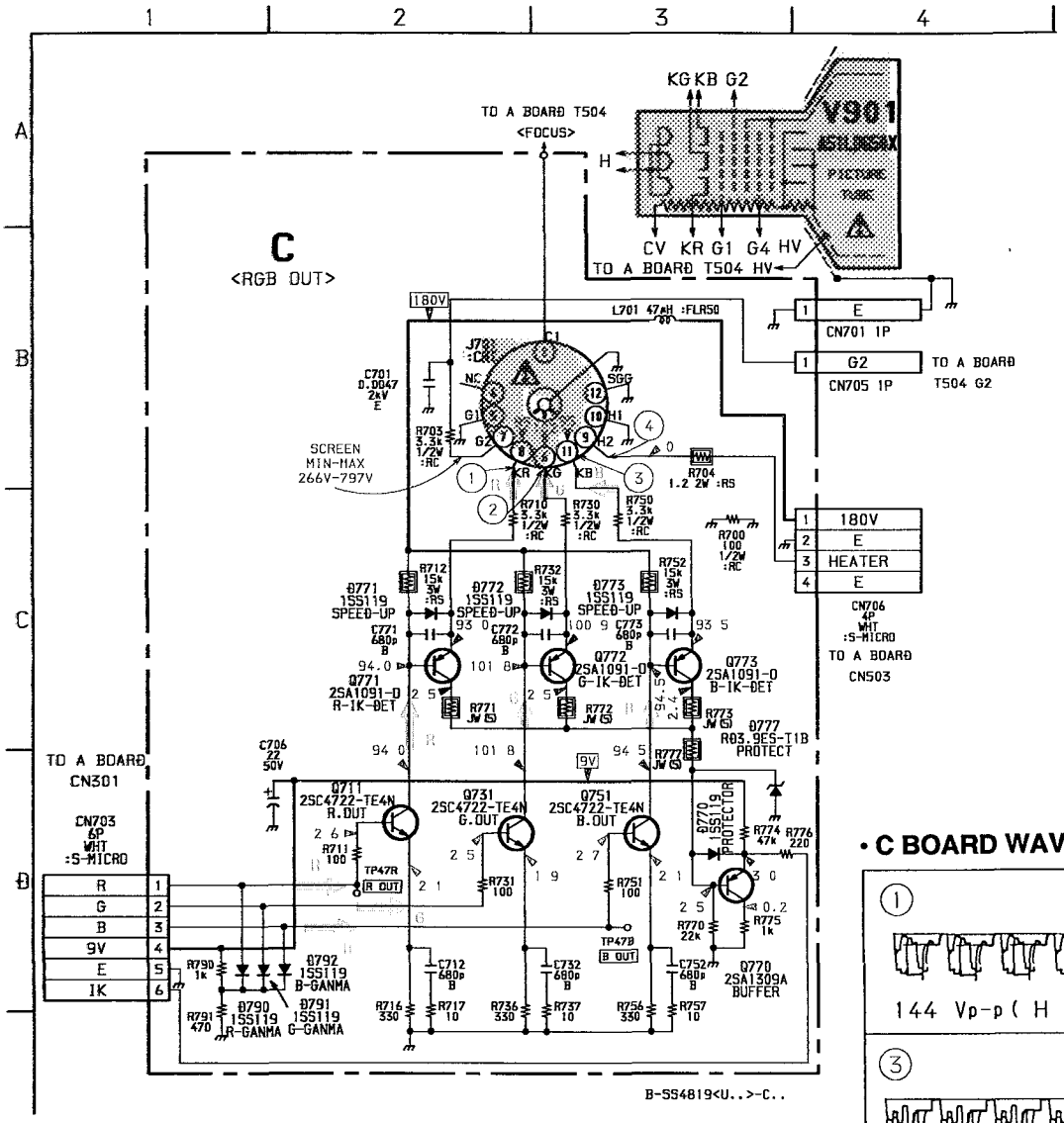


A BOARD IC406 μPC1406HA

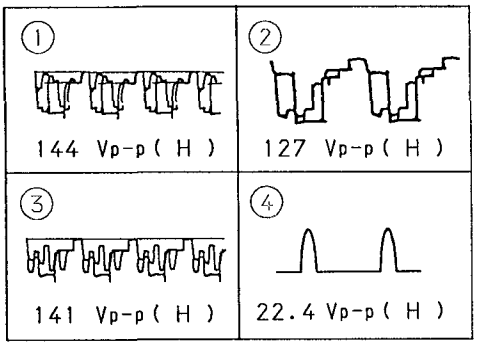


A BOARD IC301 CXA1465AS



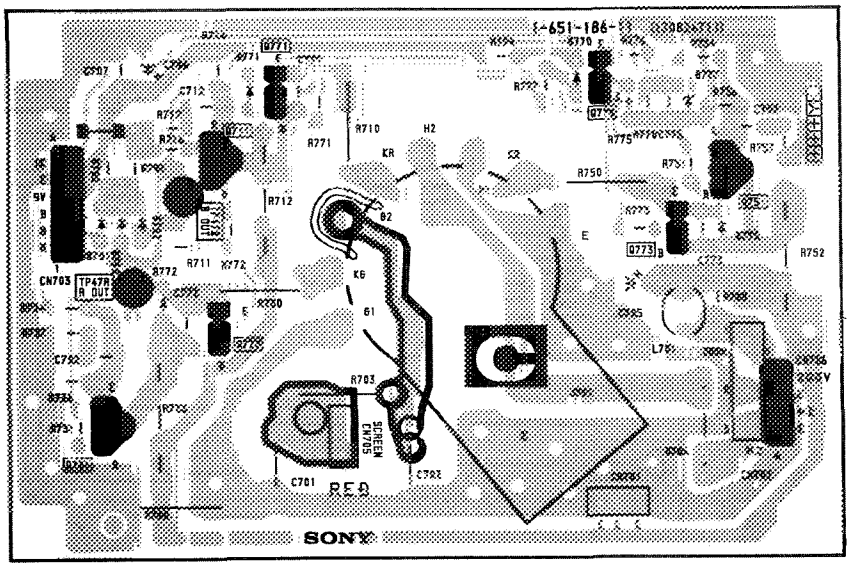


• C BOARD WAVEFORMS



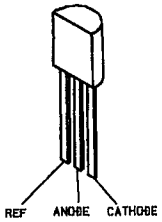
C [R. G. B. OUT]

– C BOARD –

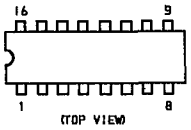


6-4. SEMICONDUCTONS

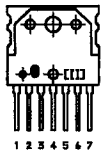
AN1431T



BU4053BC
HC14053BFP
MC14053BCP
μPD4053BC

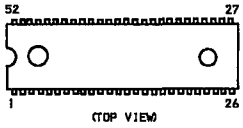


LA7830

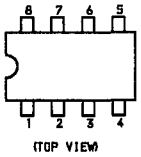


L78LR05D-MA

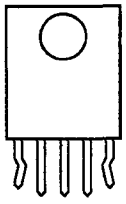
M37265M4-SV4812



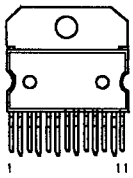
RC4558P
ST24C01B1
μPC4558P



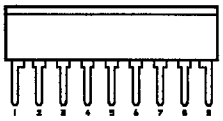
SBX1790-51



TDA2009A

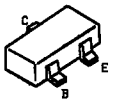


μPC1406HA

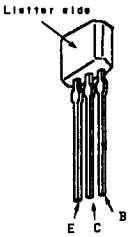


2SA1091-O

2SA1037K
2SA1162-G/2SA
2SB709A-QRS-TX
2SD601A-Q



2SA1175
2SA1309A



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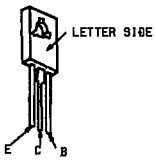
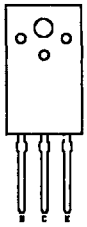
2SB733-34
2SC3209LK
2SD774-34

2SC2611
2SC3271F-N



2SC4663NPR-F



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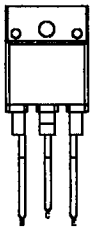
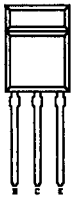
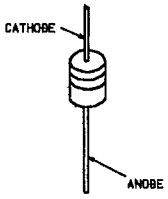


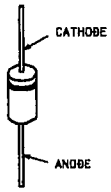
2SD2137-OP



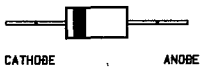
DIN20R RD3.9ESB2
RD10ESB2 RD5.1ESB1
RD13ESB1 RD5.6ESB2
RD13ESB2 RD6.8ESB2
RD30ESB2 1SS119
RD30ESB4 1SS119TD
RD36ESB2



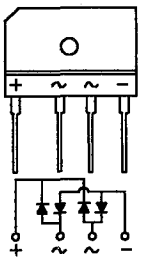
DINL20
EL1Z
GP08D
RGP02-17PKG23



D2S4MF



D3SB60F



SECTION 7
EXPLODED VIEW

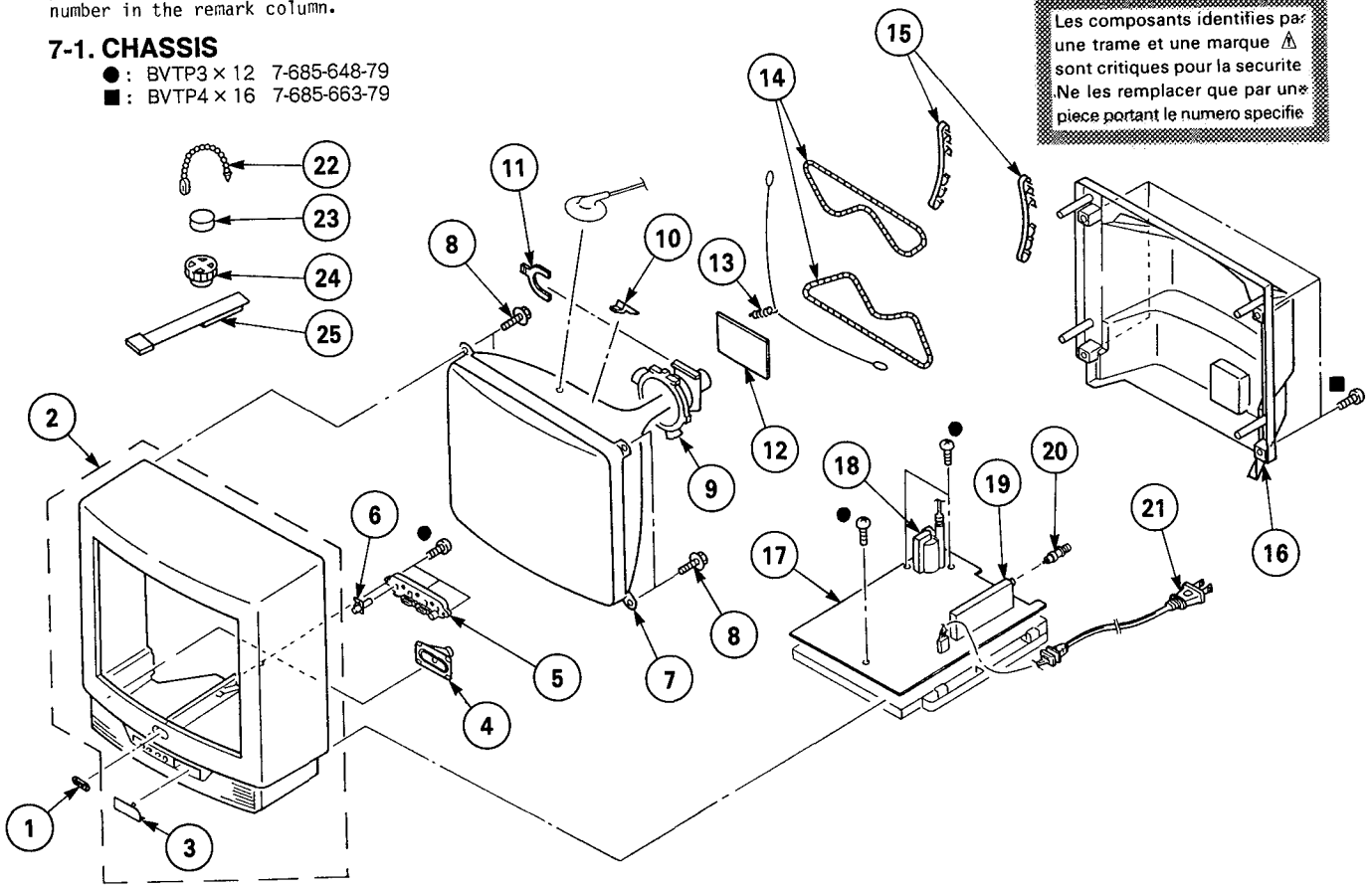
NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite
Ne les remplacer que par une piece portant le numero specifie

7-1. CHASSIS

● : BVTP3 × 12 7-685-648-79
■ : BVTP4 × 16 7-685-663-79



REF.NO.	PART NO.	DESCRIPTION	REMARK
1	4-394-072-01	EMBLEM (NO.8), SONY	
2	X-4031-910-1	CABINET ASSY (WITH BEZEL ASSY) 3 (KV-2190RS)	
	X-4031-919-1	CABINET ASSY (WITH BEZEL ASSY) 3 (KV-20M10)	
	X-4031-920-1	CABINET ASSY (WITH BEZEL ASSY) 3 (KV-20S10)	
	X-4031-932-1	CABINET ASSY (WITH BEZEL ASSY) 3 (KV-21R10)	
	X-4031-934-1	CABINET ASSY (WITH BEZEL ASSY) 3 (KV-21RS10)	
	X-4031-962-1	CABINET ASSY (WITH BEZEL ASSY) 3 (KV-MT2000/2180R)	
	X-4031-964-1	CABINET ASSY (WITH BEZEL ASSY) 3 (KV-ST2050)	
3	4-039-576-01	PANEL (KV-MT2000/ST2050/2180R/2190RS)	
	4-044-734-01	DOOR, CONTROL (KV-20M10/20S10/21R10/21RS10)	
4	1-504-311-11	SPEAKER (9X5CM) (KV-20M10/MT2000/21R10/2180R/2190RS)	
	1-504-607-11	SPEAKER (9X5CM) (KV-20S10/ST2050/21RS10)	
5	4-039-595-01	BUTTON, MULTI (KV-MT2000/ST2050/2180R/2190RS)	
	4-044-879-01	BUTTON, MULTI (KV-20M10/20S10/21R10/21RS10)	
6	4-044-616-01	FILTER, REMOTE (KV-MT2000/ST2050/2180R/2190RS)	
	4-044-877-01	FILTER, REMOTE (KV-20M10/20S10/21R10/21RS10)	
7	⚠ A-738-768-05	PICTURE TUBE (A51LDG50X)	
8	4-041-267-01	SCREW (5), TAPPING	
9	⚠ A-451-440-11	DEFLECTION YOKE (A21MXA)	
10	4-041-361-01	SPACER, DY	
11	1-452-277-00	MAGNET, BMC	
12	*A-1331-336-A	C BOARD, COMPLETE	
13	*4-375-394-01	SPRING, TENSION	
14	⚠ 1-403-787-31	COIL, DEMAGNETIZATION	
15	*4-369-319-00	BAND, COIL	
16	4-044-645-01	COVER, REAR (KV-MT2000/ST2050/2180R/2190RS)	
	4-044-723-01	COVER, REAR (KV-20M10/20S10/21R10/21RS10)	
17	*A-1297-262-A	A BOARD, COMPLETE (KV-20S10)	
	*A-1297-294-A	A BOARD, COMPLETE (KV-2190RS)	
	*A-1297-308-A	A BOARD, COMPLETE (KV-2180R)	
	*A-1297-309-A	A BOARD, COMPLETE (KV-20M10)	
	*A-1297-310-A	A BOARD, COMPLETE (KV-21R10)	
	*A-1297-312-A	A BOARD, COMPLETE (KV-21RS10)	
	*A-1297-362-A	A BOARD, COMPLETE (KV-ST2050)	
	*A-1297-363-A	A BOARD, COMPLETE (KV-MT2000)	
18	⚠ A-598-938-08	TRANSFORMER ASSY, FLYBACK (MX-1661//A4E)	
19	⚠ A-598-047-00	TUNER BTF-LA401 (KV-20M10/MT2000/21R10/2180R)	
	⚠ A-598-254-00	TUNER BTF-*A402 (KV-20S10/ST2050/21RS10/2190RS)	
20	1-766-374-11	PLUG, F-PIN	
21	⚠ 1-765-486-11	CORD, POWER (WITH CONNECTOR) 18-0A/125V	
22	4-308-870-00	CLIP, LEAD WIRE	
23	1-452-032-00	MAGNET, DISK; 10MM ϕ	
24	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM ϕ	
25	X-4308-815-0	PERMALLOY ASSY, CONVERGENCE	

SECTION 8
ELECTRICAL PARTS LIST

A

NOTE:

The components identified by shading and mark ⚠ are critical for safety
Replace only with part number specified

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite
Ne les remplacer que par une piece portant le numero specifie

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

- The components identified by ⊠ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation Should replacement be required, replace only with the value originally used

REF.NO.	PART NO	DESCRIPTION	REMARK
	*A-1297-262-A	A BOARD, COMPLETE (KV-20S10)	
		**********	
	*A-1297-294-A	A BOARD, COMPLETE (KV-2190RS)	
		**********	
	*A-1297-308-A	A BOARD, COMPLETE (KV-2180R)	
		**********	
	*A-1297-309-A	A BOARD, COMPLETE (KV-20M10)	
		**********	
	*A-1297-310-A	A BOARD, COMPLETE (KV-21R10)	
		**********	
	*A-1297-312-A	A BOARD, COMPLETE (KV-21RS10)	
		**********	
	*A-1297-362-A	A BOARD, COMPLETE (KV-ST2050)	
		**********	
	*A-1297-363-A	A BOARD, COMPLETE (KV-MT2000)	
		**********	
	1-533-223-11	CLIP, FUSE	
	4-382-854-11	SCREW (M3X10), P, SW (+)	
		<CAPACITOR>	
C001	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C008	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C010	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V (KV-20M10/20S10/21R10/21RS10)	
C011	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V (KV-20S10/ST2050/21RS10/2190RS)	
	1-216-295-91	METAL GLAZE 0 5% 1/10W (KV-20M10/MT2000/21R10/2180R)	
C012	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V (KV-20S10/ST2050/21RS10/2190RS)	
	1-216-295-91	METAL GLAZE 0 5% 1/10W (KV-20M10/MT2000/21R10/2180R)	
C014	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C017	1-124-903-11	ELECT 1MF 20% 50V (KV-20M10/20S10/MT2000/ST2050)	
C019	1-163-135-00	CERAMIC CHIP 560PF 5% 50V (KV-20M10/20S10/MT2000/ST2050)	
C020	1-137-399-11	FILM 0.1MF 5% 50V (KV-20M10/20S10/MT2000/ST2050)	
C023	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C024	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C025	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C026	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C027	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C028	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C030	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C034	1-163-037-11	CERAMIC CHIP 0.022MF 10% 25V	
C037	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	
C038	1-126-935-11	ELECT 470MF 20% 16V	
C040	1-163-125-00	CERAMIC CHIP 220PF 5% 50V	
C041	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
C042	1-124-903-11	ELECT 1MF 20% 50V	
C043	1-216-295-91	METAL GLAZE 0 5% 1/10W	
C045	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V (KV-20M10/20S10/MT2000/ST2050)	
C046	1-104-664-11	ELECT 47MF 20% 25V (KV-20M10/20S10/MT2000/ST2050)	
C047	1-163-125-00	CERAMIC CHIP 220PF 5% 50V (KV-20M10/20S10/MT2000/ST2050)	
C048	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V (KV-20M10/20S10/MT2000/ST2050)	
C050	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C051	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C052	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C053	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C101	1-124-927-11	ELECT 4.7MF 20% 50V	
C201	1-126-934-11	ELECT 220MF 20% 16V (KV-20M10/MT2000/21R10/2180R)	
C202	1-126-964-11	ELECT 10MF 20% 50V	
C204	1-126-933-11	ELECT 100MF 20% 16V	
C205	1-126-233-11	ELECT 22MF 20% 50V (KV-20M10/MT2000/21R10/2180R)	
C206	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V	
C208	1-124-903-11	ELECT 1MF 20% 50V (KV-20M10/MT2000/21R10/2180R)	
C209	1-124-925-11	ELECT 2.2MF 20% 50V (KV-20M10/MT2000/21R10/2180R)	
C251	1-124-925-11	ELECT 2.2MF 20% 50V (KV-20S10/ST2050/21RS10/2190RS)	
C254	1-126-933-11	ELECT 100MF 20% 16V	
C255	1-126-233-11	ELECT 22MF 20% 50V	
C256	1-126-933-11	ELECT 100MF 20% 16V (KV-20S10/ST2050/21RS10/2190RS)	
C257	1-124-925-11	ELECT 2.2MF 20% 50V (KV-20S10/ST2050/21RS10/2190RS)	
C258	1-136-169-00	FILM 0.22MF 5% 50V (KV-20S10/ST2050/21RS10/2190RS)	
C259	1-136-173-00	FILM 0.47MF 5% 50V	
C260	1-126-964-11	ELECT 10MF 20% 50V	
C261	1-126-952-11	ELECT 1000MF 20% 16V (KV-20S10/ST2050/21RS10/2190RS)	
C262	1-124-925-11	ELECT 2.2MF 20% 50V	
C263	1-136-169-00	FILM 0.22MF 5% 50V	
C270	1-126-964-11	ELECT 10MF 20% 50V (KV-20M10/20S10/21R10/21RS10)	
C271	1-126-964-11	ELECT 10MF 20% 50V (KV-20S10/21RS10)	
C272	1-126-935-11	ELECT 470MF 20% 16V	
C273	1-126-935-11	ELECT 470MF 20% 16V (KV-20S10/ST2050/21RS10/2190RS)	
C301	1-163-113-00	CERAMIC CHIP 68PF 5% 50V	

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The components identified by shading and mark ⚠ are critical for safety
Replace only with part number specified

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO	PART NO	DESCRIPTION			REMARK
C304	1-126-964-11	ELECT	10MF	20%	50V
C305	1-124-903-11	ELECT	1MF	20%	50V
C306	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C307	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C308	1-124-902-00	ELECT	0.47MF	20%	50V
C309	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C310	1-126-233-11	ELECT	22MF	20%	50V
C311	1-137-399-11	FILM	0.1MF	5%	50V
C312	1-137-399-11	FILM	0.1MF	5%	50V
C313	1-137-399-11	FILM	0.1MF	5%	50V
C314	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C315	1-126-934-11	ELECT	220MF	20%	16V
C318	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C319	1-124-902-00	ELECT	0.47MF	20%	50V
C320	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C321	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C322	1-163-011-11	CERAMIC CHIP	0.0015MF	10%	50V
C323	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C324	1-124-903-11	ELECT	1MF	20%	50V
C325	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C326	1-137-370-11	FILM	0.01MF	5%	50V
C327	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C328	1-124-902-00	ELECT	0.47MF	20%	50V
C330	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C332	1-136-169-00	FILM	0.22MF	5%	50V
C333	1-136-169-00	FILM	0.22MF	5%	50V
C334	1-137-372-11	FILM	0.022MF	5%	50V
C335	1-124-903-11	ELECT	1MF	20%	50V
C336	1-126-964-11	ELECT	10MF	20%	50V
C341	1-124-902-00	ELECT	0.47MF	20%	50V
C342	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C345	1-126-933-11	ELECT	100MF	20%	16V
C347	1-126-933-11	ELECT	100MF	20%	16V
C348	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C401	1-124-903-11	ELECT	1MF	20%	50V
			(KV-20S10/ST2050/21RS10/2190RS)		
C402	1-124-903-11	ELECT	1MF	20%	50V
			(KV-20M10/20S10/ST2050/21R10/21RS10)		
C403	1-126-964-11	ELECT	10MF	20%	50V
			(KV-20M10/20S10/21R10/21RS10)		
C404	1-126-933-11	ELECT	100MF	20%	16V
			(KV-20M10/20S10/21R10/21RS10)		
C406	1-124-903-11	ELECT	1MF	20%	50V
			(KV-20M10/20S10/21R10/21RS10)		
C407	1-124-903-11	ELECT	1MF	20%	50V
				(KV-20S10/21RS10)	
C408	1-126-964-11	ELECT	10MF	20%	50V
C409	1-126-964-11	ELECT	10MF	20%	50V
C410	1-126-964-11	ELECT	10MF	20%	50V
			(KV-20S10/ST2050/21RS10/2190RS)		
C412	1-126-964-11	ELECT	10MF	20%	50V
			(KV-20S10/ST2050/21RS10/2190RS)		
C501	1-137-399-11	FILM	0.1MF	5%	50V
C502	1-126-233-11	ELECT	22MF	20%	50V
C504	1-130-489-00	FILM	0.033MF	5%	50V
C505	1-164-058-11	CERAMIC	33PF	5%	50V
C506	1-126-233-11	ELECT	22MF	20%	50V
C507	1-102-038-00	CERAMIC	0.001MF		500V
C508	1-102-038-00	CERAMIC	0.001MF		500V
C509	1-126-948-11	ELECT	100MF	20%	35V
C510	1-108-702-11	MYLAR	0.068MF	10%	100V
C511	1-124-927-11	ELECT	4.7MF	20%	50V
C512	1-164-096-11	CERAMIC	0.01MF		50V

REF.NO	PART NO.	DESCRIPTION			REMARK
C513	1-126-964-11	ELECT	10MF	20%	50V
C514	1-104-664-11	ELECT	47MF	20%	25V
C515	1-126-941-11	ELECT	470MF	20%	25V
C516	1-102-244-00	CERAMIC	220PF	10%	500V
C517	1-126-935-11	ELECT	470MF	20%	16V
C518	1-126-941-11	ELECT	470MF	20%	25V
C519	1-102-244-00	CERAMIC	220PF	10%	500V
C520	1-107-652-91	ELECT	10MF	20%	250V
C521	1-102-244-00	CERAMIC	220PF	10%	500V
C522	1-123-024-21	ELECT	33MF		160V
C523	1-136-105-00	FILM	0.33MF	5%	200V
C525	1-106-387-00	MYLAR	0.068MF	10%	200V
C527	1-126-233-11	ELECT	22MF	20%	50V
C528	1-107-635-91	ELECT	4.7MF	20%	160V
C530	1-104-664-11	ELECT	47MF	20%	25V
C531	1-104-664-11	ELECT	47MF	20%	25V
C553	1-102-228-00	CERAMIC	470PF	10%	500V
C554 ⚠	1-108-882-11	FILM	0.0057MF	3%	2KV
C558	1-106-371-00	MYLAR	0.015MF	10%	100V
C559 ⚠	1-162-115-91	CERAMIC	330PF	10%	2KV
C575	1-106-371-00	MYLAR	0.015MF		200V
C579 ⚠	1-108-423-91	MYLAR	0.01MF	10%	200V
C601 ⚠	1-161-741-71	CERAMIC	0.0010MF	10%	400V
C602 ⚠	1-136-311-51	FILM	0.47MF	20%	125V
C603 ⚠	1-161-741-71	CERAMIC	0.0010MF	10%	400V
C605 ⚠	1-161-741-71	CERAMIC	0.0010MF	10%	400V
C609	1-104-759-11	ELECT	470MF	20%	200V
C610	1-164-625-11	CERAMIC	680PF	10%	500V
C611	1-164-625-11	CERAMIC	680PF	10%	500V
C612	1-136-169-00	FILM	0.22MF	5%	50V
C613	1-136-169-00	FILM	0.22MF	5%	50V
C614	1-129-719-91	FILM	0.027MF	10%	630V
C615	1-164-625-11	CERAMIC	680PF	10%	500V
C616	1-165-127-11	CERAMIC	470PF	10%	500V
C617	1-137-366-11	FILM	0.0022MF	5%	50V
C618	1-165-127-11	CERAMIC	470PF	10%	500V
C619	1-106-367-00	MYLAR	0.01MF	10%	200V
C620	1-165-127-11	CERAMIC	470PF	10%	500V
C621	1-165-127-11	CERAMIC	470PF	10%	500V
C622	1-126-952-11	ELECT	1000MF	20%	16V
C623	1-123-024-21	ELECT	33MF		160V
C624 ⚠	1-161-741-71	CERAMIC	0.0010MF	10%	400V
C625	1-126-933-11	ELECT	100MF	20%	16V
C628	1-104-664-11	ELECT	47MF	20%	25V
C631	1-104-664-11	ELECT	47MF	20%	25V
C632	1-126-964-11	ELECT	10MF	20%	50V
C636 ⚠	1-161-741-71	CERAMIC	0.0010MF	10%	400V
C637 ⚠	1-161-741-71	CERAMIC	0.0010MF	10%	400V
C638 ⚠	1-161-741-71	CERAMIC	0.0010MF	10%	400V
C639 ⚠	1-161-741-71	CERAMIC	0.0010MF	10%	400V
C640 ⚠	1-136-311-51	FILM	0.47MF	20%	125V
C641	1-137-374-11	FILM	0.047MF	5%	50V
C642	1-137-374-11	FILM	0.047MF	5%	50V
C690	1-124-902-00	ELECT	0.47MF	20%	50V
C691	1-126-935-11	ELECT	470MF	20%	16V
C692	1-104-664-11	ELECT	47MF	20%	25V
C693	1-136-173-00	FILM	0.47MF	5%	50V

<FILTER>

CF001	1-579-952-21	VIBRATOR, CERAMIC	

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The components identified by shading and mark ⚠ are critical for safety
Replace only with part number specified.

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REF.NO.	PART NO.	DESCRIPTION	REMARK
		<CONNECTOR>	
CN201	1-564-505-11	PLUG, CONNECTOR 2P (KV-20S10/ST2050/21RS10/2190RS)	
CN202	1-564-505-11	PLUG, CONNECTOR 2P	
CN301	*1-564-509-11	PLUG, CONNECTOR 6P	
CN401	*1-560-124-00	PLUG, CONNECTOR (2.5MM) 4P	
CN501	*1-580-798-11	CONNECTOR PIN (DY) 6P	
CN503	*1-564-507-11	PLUG, CONNECTOR 4P	
CN601	*1-580-843-11	PIN, CONNECTOR (POWER)	
CN602	1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P	
CN603	1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P	
		<DIODE>	
D001	8-719-109-84	DIODE RD5.1ESB1	
D003	8-719-911-19	DIODE 1SS119	
D201	8-719-110-72	DIODE RD30ESB2	
D202	8-719-110-35	DIODE RD13ESB1 (KV-20M10/MT2000/21R10/2180R)	
D302	8-719-109-84	DIODE RD5.1ESB1	
D306	8-719-109-97	DIODE RD6.8ESB2	
D307	8-719-911-19	DIODE 1SS119	
D401	8-719-110-36	DIODE RD13ESB2 (KV-20M10/20S10/21R10/21RS10)	
D402	8-719-110-36	DIODE RD13ESB2 (KV-20S10/21RS10)	
D403	8-719-911-19	DIODE 1SS119	
D405	8-719-110-36	DIODE RD13ESB2 (KV-20M10/20S10/21R10/21RS10)	
D502	8-719-908-03	DIODE GP08D	
D503	8-719-911-19	DIODE 1SS119	
D504	8-719-302-43	DIODE EL1Z	
D505	8-719-911-19	DIODE 1SS119	
D506	8-719-110-08	DIODE RD8.2ESB2	
D507	8-719-911-19	DIODE 1SS119	
D509	8-719-302-43	DIODE EL1Z	
D510 ⚠	8-719-302-44	DIODE EL1Z-V1	
D512	8-719-302-43	DIODE EL1Z	
D514	8-719-911-19	DIODE 1SS119	
D515	8-719-908-03	DIODE GP08D	
D601 ⚠	8-719-510-51	DIODE B3SB60Z	
D602	8-719-911-19	DIODE 1SS119	
D603	8-719-510-48	DIODE D1N20R	
D604	8-719-510-48	DIODE D1N20R	
D605	8-719-022-97	DIODE D2S4MF	
D606	8-719-022-97	DIODE D2S4MF	
D607	8-719-510-26	DIODE D1NL20	
D608	8-719-510-26	DIODE D1NL20	
D609	8-719-510-26	DIODE D1NL20	
D610	8-719-510-26	DIODE D1NL20	
D611	8-719-110-17	DIODE RD10ESB2	
D612	8-719-109-90	DIODE RD5.6ESB3	
D613	8-719-303-49	DIODE R2M	
D614	8-719-510-48	DIODE D1N20R	
D615	8-719-510-48	DIODE D1N20R	
		<FUSE>	
F601 ⚠	1-576-193-11	FUSE 6.3A/125V	
		<FERRITE BEAD>	
FB501	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
FB601	1-412-911-11	INDUCTOR, FERRITE BEAD	
FB602	1-412-911-11	INDUCTOR, FERRITE BEAD	
FB603	1-412-911-11	INDUCTOR, FERRITE BEAD	
FB604	1-412-911-11	INDUCTOR, FERRITE BEAD	
FB605	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
FB606	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
FB607	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
		<IC>	
IC101	8-759-274-78	IC M37265M4-A11SP	
IC102	8-759-280-75	IC ST24C01CB1	
IC103	8-741-790-11	IC SBX1790-11	
IC251	8-759-980-43	IC TDA2009A	
IC301	8-752-059-67	IC CXA1465AS	
IC401	8-759-140-53	IC UPD4053BC (KV-20M10/20S10/21R10/21RS10)	
IC406	8-759-145-27	IC UPC1406HA (KV-20S10/ST2050/21RS10/2190RS)	
IC501	8-759-801-98	IC LA7830	
IC502	8-759-145-58	IC UPC4558C	
IC601 ⚠	8-759-198-31	IC UPC1093J-E2	
IC690	8-759-805-37	IC L78LR05D-MA	
		<JACK>	
J251	1-568-267-21	JACK (KV-20M10/20S10/21R10/21RS10)	
J402	1-695-239-11	JACK BLOCK, PIN 2P (KV-20M10/21R10)	
	1-695-583-11	JACK BLOCK, PIN (L TYPE) 3P (KV-20S10/21RS10)	
		<COIL>	
L001	1-408-409-00	INDUCTOR 10UH	
L002	1-408-421-00	INDUCTOR 100UH	
L003	1-408-421-00	INDUCTOR 100UH (KV-20M10/20S10/MT2000/ST2050)	
L202	1-408-408-00	INDUCTOR 8.2UH	
L501	1-412-553-11	INDUCTOR 3.3MMH	
L502	1-410-669-31	INDUCTOR 33UH	
L503 ⚠	1-412-531-61	INDUCTOR 33UH	
L551	1-412-533-21	INDUCTOR 47UH	
L602	1-410-670-31	INDUCTOR 39UH	
		<IC LINK>	
PS201 ⚠	1-532-637-31	LINK, IC 1.6A	
		<TRANSISTOR>	
Q001	8-729-216-22	TRANSISTOR 2SA1162-G	
Q201	8-729-140-96	TRANSISTOR 2SD774-34 (KV-20M10/MT2000/21R10/2180R)	
Q261	8-729-216-22	TRANSISTOR 2SA1162-G	
Q262	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q301	8-729-216-22	TRANSISTOR 2SA1162-G	
Q310	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q401	8-729-216-22	TRANSISTOR 2SA1162-G (KV-20M10/20S10/21R10/21RS10)	
Q402	8-729-216-22	TRANSISTOR 2SA1162-G (KV-20M10/20S10/21R10/21RS10)	
Q403	8-729-216-22	TRANSISTOR 2SA1162-G (KV-20M10/20S10/21R10/21RS10)	
Q404	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q504	8-729-105-08	TRANSISTOR 2SA1330-06	
Q550	8-729-140-96	TRANSISTOR 2SD774-34	
Q551	8-729-810-49	TRANSISTOR 2SD1877S-SONY-CA	

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REF NO	PART NO	DESCRIPTION	REMARK
Q554	8-729-216-22	TRANSISTOR 2SA1162-G	
Q555	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q601	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q602	8-729-025-77	TRANSISTOR 2SC4663NPR-F	
Q603	8-729-025-77	TRANSISTOR 2SC4663NPR-F	
Q604	8-729-140-93	TRANSISTOR 2SB733-34	
Q605	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q606	8-729-423-99	TRANSISTOR 2SD2137-OP	
Q607	8-729-140-96	TRANSISTOR 2SD774-34	
Q608	8-729-216-22	TRANSISTOR 2SA1162-G	
Q609	8-729-422-27	TRANSISTOR 2SD601A	
		<RESISTOR>	
R001	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R002	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R003	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R004	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R005	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R007	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R008	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R009	1-216-033-00	METAL GLAZE 220 5% 1/10W	(KV-20M10/20S10/21R10/21RS10)
R010	1-216-033-00	METAL GLAZE 220 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R011	1-216-033-00	METAL GLAZE 220 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R012	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R013	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R014	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R015	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R016	1-216-041-00	METAL GLAZE 470 5% 1/10W	(KV-20M10/20S10/MT2000/ST2050)
R017	1-216-121-00	METAL GLAZE 1M 5% 1/10W	(KV-20M10/20S10/MT2000/ST2050)
R018	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R019	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R020	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	
R021	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R022	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R023	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R025	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R026	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R027	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R028	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R029	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R030	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R031	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R032	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R033	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R034	1-216-295-91	METAL GLAZE 0 5% 1/10W	
R036	1-216-295-91	METAL GLAZE 0 5% 1/10W	
R038	1-216-049-00	METAL GLAZE 1k 5% 1/10W	(KV-20M10/20S10/MT2000/ST2050)
R039	1-216-077-00	METAL GLAZE 15K 5% 1/10W	(KV-20M10/20S10/MT2000/ST2050)
R041	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R044	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R045	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R046	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R047	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R048	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R049	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R050	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R051	1-216-033-00	METAL GLAZE 220 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R052	1-216-295-91	METAL GLAZE 0 5% 1/10W	
R054	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R056	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R057	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R058	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R060	1-216-295-91	METAL GLAZE 0 5% 1/10W	
R061	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R062	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R063	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R064	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R065	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R067	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R070	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R071	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R101	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R202	1-249-415-11	CARBON 680 5% 1/4W	(KV-20M10/MT2000/21R10/2180R)
R203	1-215-899-11	METAL OXIDE 15K 5% 2W F	
R205	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	(KV-MT2000/2180R)
R206	1-216-689-11	METAL GLAZE 39K 5% 1/10W	
R207	1-216-083-00	METAL GLAZE 27K 5% 1/10W	
R208	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	(KV-20M10/21R10)
R209	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	(KV-20M10/MT2000/21R10/2180R)
R210	1-216-033-00	METAL GLAZE 220 5% 1/10W	(KV-20M10/MT2000/21R10/2180R)
R211	1-216-049-00	METAL GLAZE 1K 5% 1/10W	(KV-20M10/MT2000/21R10/2180R)
R212	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R252	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R253	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	(KV-20M10/MT2000/21R10/2180R)
	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R254	1-216-015-00	METAL GLAZE 39 5% 1/10W	
R256	1-216-015-00	METAL GLAZE 39 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R258	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R259	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R260	1-216-295-91	METAL GLAZE 0 5% 1/10W	(KV-20M10/MT2000/21R10/2180R)
R262	1-216-075-00	METAL GLAZE 12K 5% 1/10W	(KV-20S10/ST2050/21RS10/2190RS)
R263	1-216-075-00	METAL GLAZE 12K 5% 1/10W	
R264	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R265	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R266	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R267	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R268	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R269	1-249-385-11	CARBON 2.2 5% 1/4W	(KV-20S10/ST2050/21RS10/2190RS)
R270	1-249-385-11	CARBON 2.2 5% 1/4W	
R271	1-249-417-11	CARBON 1K 5% 1/4W	(KV-20M10/20S10/21R10/21RS10)
R272	1-249-411-11	CARBON 330 5% 1/4W	(KV-20M10/20S10/21R10/21RS10)

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety Replace only with part number specified.

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REF.NO	PART NO	DESCRIPTION				REMARK
R273	1-249-411-11	CARBON	330	5%	1/4W	
			(KV-20M10/20S10/21R10/21RS10)			
R276	1-249-417-11	CARBON	1K	5%	1/4W	
			(KV-20S10/21RS10)			
R301	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R302	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R311	1-216-678-11	METAL CHIP	13K	0.50%	1/10W	
R312	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R313	1-216-653-11	METAL CHIP	1.2K	0.50%	1/10W	
R314	1-216-117-00	METAL GLAZE	680K	5%	1/10W	
R315	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R321	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R322	1-216-295-91	METAL GLAZE	0	5%	1/10W	
R323	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R324	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R325	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R326	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R327	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R328	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R333	1-216-295-91	METAL GLAZE	0	5%	1/10W	
R334	1-216-295-91	METAL GLAZE	0	5%	1/10W	
R336	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R338	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R339	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R341	1-216-687-11	METAL CHIP	33K	0.50%	1/10W	
R343	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R345	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R346	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R347	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R351	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R356	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R360	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R363	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R364	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R366	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R367	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R405	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R406	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R407	1-216-025-00	METAL GLAZE	100	5%	1/10W	
			(KV-MT2000/ST2050/2180R/2190RS)			
R408	1-216-295-91	METAL GLAZE	0	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R409	1-216-295-91	METAL GLAZE	0	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R410	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R411	1-216-041-00	METAL GLAZE	470	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R412	1-216-041-00	METAL GLAZE	470	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R413	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R414	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R415	1-216-033-00	METAL GLAZE	220	5%	1/10W	
					(KV-20S10/21R10)	
	1-216-295-91	METAL GLAZE	0	5%	1/10W	
					(KV-20M10/21R10)	
R416	1-216-033-00	METAL GLAZE	220	5%	1/10W	
					(KV-ST2050/2190RS)	
R418	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R419	1-216-023-00	METAL GLAZE	82	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R420	1-249-417-11	CARBON	1K	5%	1/4W	
			(KV-20M10/20S10/21R10/21RS10)			
R421	1-216-033-00	METAL GLAZE	220	5%	1/10W	
					(KV-ST2050/2190RS)	
R422	1-216-295-91	METAL GLAZE	0	5%	1/10W	
			(KV-20M10/MT2000/21R10/2180R)			
R423	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R424	1-216-033-00	METAL GLAZE	220	5%	1/10W	
					(KV-20S10/21RS10)	
R425	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R426	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R427	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
					(KV-20S10/21RS10)	
R428	1-216-295-91	METAL GLAZE	0	5%	1/10W	
			(KV-20M10/MT2000/21R10/2180R)			
R430	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
			(KV-20M10/MT2000/21R10/2180R)			
	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
			(KV-20S10/ST2050/21RS10/2190RS)			
R431	1-216-295-91	METAL GLAZE	0	5%	1/10W	
R432	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
			(KV-20S10/ST2050/21RS10/2190RS)			
R433	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R436	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
			(KV-20M10/MT2000/21R10/2180R)			
	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
			(KV-20S10/ST2050/21RS10/2190RS)			
R438	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
			(KV-20S10/ST2050/21RS10/2190RS)			
R439	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R441	1-216-025-00	METAL GLAZE	100	5%	1/10W	
			(KV-20M10/20S10/21R10/21RS10)			
R442	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R445	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
					(KV-20M10/21R10)	
R501	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R505	1-216-349-00	METAL OXIDE	1	5%	1W	F
R506	1-216-429-00	METAL OXIDE	270	5%	1W	F
R507	1-247-891-00	CARBON	330K	5%	1/4W	
R508	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R509	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R510	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R511	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R512	1-215-445-00	METAL	10K	1%	1/4W	
R513	1-216-645-11	METAL CHIP	560	0.50%	1/10W	
R515	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R518	1-215-431-00	METAL	2.7K	1%	1/4W	
R519	1-216-443-11	METAL OXIDE	56K	5%	1W	F
R520	1-216-647-11	METAL CHIP	680	0.50%	1/10W	
R523	1-215-470-00	METAL	110K	1%	1/4W	
■R525 ⚠		METAL CHIP			1/10W	
R527	1-216-678-11	METAL CHIP	13K	0.50%	1/10W	
R531	1-216-349-00	METAL OXIDE	1	5%	1W	F
R532	1-215-457-00	METAL	33K	1%	1/4W	
R533	1-216-421-71	METAL OXIDE	12	5%	1W	F
R534	1-215-457-00	METAL	33K	1%	1/4W	
R536	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R538	1-215-864-00	METAL OXIDE	150	5%	1W	F
R540	1-249-441-11	CARBON	100K	5%	1/4W	

• The components identified by ■ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation Should replacement be required, replace only with the value originally used

The components identified by shading and mark ⚠ are critical for safety
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION				REMARK
R542	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R543	1-218-764-11	METAL CHIP	330K	0.50%	1/10W	
R544	1-216-656-11	METAL CHIP	1.6K	0.50%	1/10W	
R545	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R547	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R548	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R549	1-216-369-00	METAL OXIDE	1	5%	2W	F
R554	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R555	1-215-897-11	METAL OXIDE	6.8K	5%	2W	F
R557	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R558	1-216-065-00	METAL GLAZE	1.7K	5%	1/10W	
R559	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R560	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R563 ⚠	1-215-888-11	METAL OXIDE	68	5%	2W	F
R601 ⚠	1-202-893-91	SOLID	4.7M	20%	1/2W	
R602	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R605	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R606	1-260-288-11	CARBON	0.47	5%	1/2W	
R607	1-247-889-00	CARBON	270K	5%	1/4W	
R608	1-247-889-00	CARBON	270K	5%	1/4W	
R609	1-216-355-11	METAL OXIDE	3.3	5%	1W	F
R610	1-216-355-11	METAL OXIDE	3.3	5%	1W	F
R611	1-247-889-00	CARBON	270K	5%	1/4W	
R612	1-247-889-00	CARBON	270K	5%	1/4W	
R613	1-249-409-11	CARBON	220	5%	1/4W	
R614	1-247-891-00	CARBON	330K	5%	1/4W	
R615	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R616	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R617 ⚠	1-216-661-91	METAL CHIP	2.7K	0.50%	1/10W	
R618 ⚠	1-215-871-91	METAL	1.2K	1%	1/4W	
R619	1-247-811-31	CARBON	150	5%	1/4W	
R620	1-249-430-11	CARBON	12K	5%	1/4W	
R621	1-260-099-11	CARBON	1K	5%	1/2W	
R622	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R623	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R625	1-216-355-11	METAL OXIDE	3.3	5%	1W	F
R626	1-247-811-31	CARBON	150	5%	1/4W	
R628	1-249-415-11	CARBON	680	5%	1/4W	
R629	1-216-687-11	METAL CHIP	33K	0.50%	1/10W	
R630	1-216-687-11	METAL CHIP	33K	0.50%	1/10W	
R631	1-249-431-11	CARBON	15K	5%	1/4W	
R632	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R634	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R635	1-212-857-00	FUSIBLE	10	5%	1/4W	F
R636	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R637	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R690	1-216-355-11	METAL OXIDE	3.3	5%	1W	F

<RELAY>

RY601 ⚠	1-755-018-11	RELAY

<SWITCH>

S001	1-571-532-21	SWITCH, TACTIL
S002	1-571-532-21	SWITCH, TACTIL
S003	1-571-532-21	SWITCH, TACTIL
S004	1-571-532-21	SWITCH, TACTIL
S005	1-571-532-21	SWITCH, TACTIL
S006	1-571-532-21	SWITCH, TACTIL

<TRANSFORMER>

REF NO.	PART NO.	DESCRIPTION	REMARK
T504 ⚠	8-598-935-00	TRANSFORMER ASSY, FLYBACK(MX-1661/848)	
T551	1-437-195-11	TRANSFORMER, HORIZONTAL DRIVE	
T601 ⚠	1-423-895-11	TRANSFORMER, LINE FILTER (LFT)	
T602 ⚠	1-423-895-11	TRANSFORMER, LINE FILTER (LFT)	
T605 ⚠	1-426-819-11	TRANSFORMER, CONVERTER (PIT)	
T604 ⚠	1-423-906-31	TRANSFORMER, CONVERTER (PRT)	

<THERMISTOR>

THP601	810-511-21	THERMISTOR, POSITIVE

<TUNER>

TU101 ⚠	8-598-047-00	TUNER BTF-LA401	(KV-20M10/MT2000/21R10/2180R)
⚠	8-598-254-00	TUNER BTF-KA402	(KV-20S10/ST2050/21RS10/2190RS)

<VARISTOR>

VDR601	1-810-551-21	VARISTOR

<CRYSTAL>

X301	1-760-190-41	VIBRATOR, CRYSTAL

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	*A-1331-336-A	C BOARD, COMPLETE			
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<CAPACITOR>

C701	1-162-114-00	CERAMIC	0.0047MF		2KV
C706	1-126-233-11	ELECT	22MF	20%	50V
C712	1-164-083-11	CERAMIC	680PF	10%	50V
C732	1-164-083-11	CERAMIC	680PF	10%	50V
C752	1-164-083-11	CERAMIC	680PF	10%	50V
C771	1-164-083-11	CERAMIC	680PF	10%	50V
C772	1-164-083-11	CERAMIC	680PF	10%	50V
C773	1-164-083-11	CERAMIC	680PF	10%	50V

<CONNECTOR>

CN701	1-695-915-11	TAB (CONTACT)
CN703	*1-564-509-11	PLUG, CONNECTOR 6P
CN705	1-695-915-11	TAB (CONTACT)
CN706	*1-564-507-11	PLUG, CONNECTOR 4P

<DIODE>

D770	8-719-911-19	DIODE 1SS119
D771	8-719-911-19	DIODE 1SS119
D772	8-719-911-19	DIODE 1SS119
D773	8-719-911-19	DIODE 1SS119
D777	8-719-109-72	DIODE RD3.9ESB2
D790	8-719-911-19	DIODE 1SS119
D791	8-719-911-19	DIODE 1SS119
D792	8-719-911-19	DIODE 1SS119

<JACK>

J701 ⚠	1-251-182-11	SOCKET, PICTURE TUBE

C

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety Replace only with part number specified

REF.NO.	PART NO.	DESCRIPTION				REMARK
		<COIL>				
L701	1-410-671-31	INDUCTOR	47UH			
		<TRANSISTOR>				
Q711	8-729-326-11	TRANSISTOR 2SC2611				
Q731	8-729-326-11	TRANSISTOR 2SC2611				
Q751	8-729-326-11	TRANSISTOR 2SC2611				
Q770	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q771	8-729-200-17	TRANSISTOR 2SA1091-O				
Q772	8-729-200-17	TRANSISTOR 2SA1091-O				
Q773	8-729-200-17	TRANSISTOR 2SA1091-O				
		<RESISTOR>				
R700	1-260-087-11	CARBON	100	5%	1/2W	
R703	1-260-105-11	CARBON	3.3K	5%	1/2W	
R704	1-216-370-11	METAL OXIDE	1.2	5%	2W	F
R710	1-260-105-11	CARBON	3.3K	5%	1/2W	
R711	1-247-807-31	CARBON	100	5%	1/4W	
R712	1-215-924-00	METAL OXIDE	15K	5%	3W	F
R716	1-249-411-11	CARBON	330	5%	1/4W	
R717	1-249-393-11	CARBON	10	5%	1/4W	
R730	1-260-105-11	CARBON	3.3K	5%	1/2W	
R731	1-247-807-31	CARBON	100	5%	1/4W	
R732	1-215-924-00	METAL OXIDE	15K	5%	3W	F
R736	1-249-411-11	CARBON	330	5%	1/4W	
R737	1-249-393-11	CARBON	10	5%	1/4W	
R750	1-260-105-11	CARBON	3.3K	5%	1/2W	
R751	1-247-807-31	CARBON	100	5%	1/4W	
R752	1-215-924-00	METAL OXIDE	15K	5%	3W	F
R756	1-249-411-11	CARBON	330	5%	1/4W	
R757	1-249-393-11	CARBON	10	5%	1/4W	
R770	1-249-433-11	CARBON	22K	5%	1/4W	
R774	1-249-437-11	CARBON	47K	5%	1/4W	
R775	1-249-417-11	CARBON	1K	5%	1/4W	
R776	1-249-409-11	CARBON	220	5%	1/4W	
R790	1-249-417-11	CARBON	1K	5%	1/4W	
R791	1-249-413-11	CARBON	470	5%	1/4W	

****

MISCELLANEOUS
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⚠	1-409-707-31	COIL, DEMAGNETIZATION	
	1-452-277-00	MAGNET, BMC	
	1-504-311-11	SPEAKER (9X5CM) (KV-20M10/MT2000/21R10/2180R/2190RS)	
	1-504-607-11	SPEAKER (9X5CM) (KV-20S10/ST2050/21RS10)	
⚠	1-765-486-11	CORD, POWER (WITH CONNECTOR) 10.0A/125V	
	1-766-374-11	PLUG, F-P1M	
⚠	3-451-440-11	DEFLECTION YOKE (Y21MXA)	
V901	⚠ 3-736-768-05	PICTURE TUBE (A51LGX50X)	

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ACCESSORIES AND PACKING MATERIALS
****

	1-417-182-11	CONVERTER (EAC-25) (KV-20M10/20S10/21R10/21RS10/2180R/2190RS)
	1-501-372-41	ANTENNA, TELESCOPIC (KV-20M10/20S10/21R10/21RS10/2180R/2190RS)
	3-758-850-21	MANUAL, INSTRUCTION
	3-758-850-31	MANUAL, INSTRUCTION (KV-20S10(CND)/MT2000/ST2050/20M10(CND))
	3-758-850-41	MANUAL, INSTRUCTION (KV-21R10/21RS10/2180R/2190RS)
	*4-039-627-01	INDIVIDUAL CARTON (KV-MT2000/ST2050)
	*4-039-628-01	CUSHION (UPPER) (ASSY) (KV-MT2000/ST2050/2180R/2190RS)
	*4-039-629-01	CUSHION (LOWER) (ASSY) (KV-MT2000/ST2050/2180R/2190RS)
	*4-040-688-03	INDIVIDUAL CARTON (KV-2180R/2190RS)
	*4-041-254-01	BAG, PROTECTION
	*4-044-875-01	CUSHION (UPPER) (ASSY) (KV-20M10/20S10/21R10/21RS10)
	*4-044-876-01	CUSHION (LOWER) (ASSY) (KV-20M10/20S10/21R10/21RS10)
	*0-513-790-00	INDIVIDUAL CARTON (KV-21R10/21RS10)
	*4-044-878-01	INDIVIDUAL CARTON (KV-20M10/20S10)

REMOTE COMMNDER

	1-466-966-11	REMOTE COMMANDER (RM-Y116) (KV-20M10/20S10 21R10/21RS10)
	9-903-826-01	COVER, BATTERY (FOR RM-Y116) (KV-20M10/20S10 21R10/21RS10)
	1-467-738-11	REMOTE COMMANDER (RM-Y123) (KV-MT2000/ST2050/2180R/2190RS)
	9-907-089-01	COVER, BATTERY (FOR RM-Y123) (KV-MT2000/ST2050/2180R/2190RS)

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