KV-20TR23/2160WR/2150R

RM-Y116

SERVICE MANUAL

US Model

KV-20TR23 Chassis No. SCC-F78C-A

Canadian Model

KV-20TR23 Chassis No. SCC-F79B-A

WP Model

KV-2160WR Chassis No. SCC-F81B-A

E Model

KV-2150R Chassis No. SCC-F80B-A





RM-Y116

BA-1 CHASSIS

MODELS OF THE SAME SERIES	
KV-20TR23/2160WR/2150R	
KV-20TS29/20TS32	
KV-21STR2/2170RS	

SPECIFICATIONS

Television system	American TV standards
Channel coverage	VHF: 2-13 UHF: 14-69 CABLE TV: 1-125
Picture tube	Hi-Black Trinitron® tube 20-inch picture measured diagonally 21-inch picture tube measured diagonally
Antenna	75 ohm external antenna terminal for VHF/UHF
Input	VIDEO Video (phono jacks) : 1 Vp-p, 75-ohms unbalanced, sync negative Audio (phono jacks) : 500 mVrms (100% modulation) Impedance : 47 kilohms
Speaker output	2W (8 ohms)
Speaker size	Full range 50×90 mm (2×3 5/8 in.)
Audio frequency response	50Hz-20kHz
Power requirements	120 V AC, 60Hz 110-127V or 220-240V AC, 50-60Hz (KV-2160WR only)
Power consumption	115W
Standby mode	4W 5.5W (KV-2160WR only)
Dimensions (w/h/d)	526×488×471.5 mm (20 3/4×19 1/4×18 5/8 inches)
Weight	22.4 kg (49 lbs 6 oz)

- Continued on next page -

MICROFILM

TRINITRON® COLOR TV

SONY®

Supplied accessories	Remote Commander RM-Y116 (1) with 2 size AA (R6) EVEREADY batteries Dipole antenna (1) Antenna connector (1) Power cord plug adaptor * (KV-2160WR only)
Recommended accessories	U/V mixer EAC-66 Connecting cord VMC-810S/820S, VMC-720M YC-15V/30V, RK-74A

* AC power cord connection
If the power cord plug cannot be inserted into the wall outlet, use the supplied power cord plug adaptor.

Design and specifications are subject to change without notice.

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.

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!!

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

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.

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 0.5 mA (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 0.75 V, 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 2 V 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)

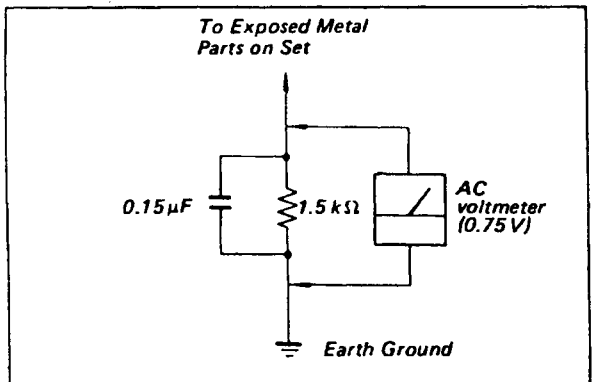


Fig. A. Using an AC voltmeter to check AC leakage.

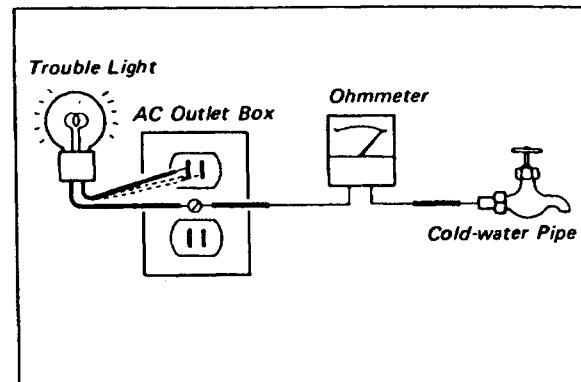


Fig. B. Checking for earth ground.

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SECTION 1
GENERAL

This section is extracted from instruction manual.

1-1. IDENTIFYING YOUR TV

Identifying Your TV

Check the model number of your TV set.
This manual covers 11 models and there are slight differences among them. Check the table below to see what your TV is equipped with before you start operating it.

Table of models **YES: equipped** **NO: not equipped**

	KV-20TR23 KV-2150R KV-2160WR
MTS stereo	NO
Headphones jack	YES*
S video input jack	NO
Front panel A/V jacks	NO

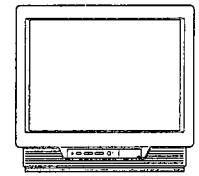
* Monaural sound is output by both headphone speakers.

	KV-20TR23	KV-2150R KV-2160WR
Model destination	U.S.A./Canda	Central South America and other area
Closed caption	YES**	NO
Dual Language	NO	YES

** U.S.A. models only.

Design

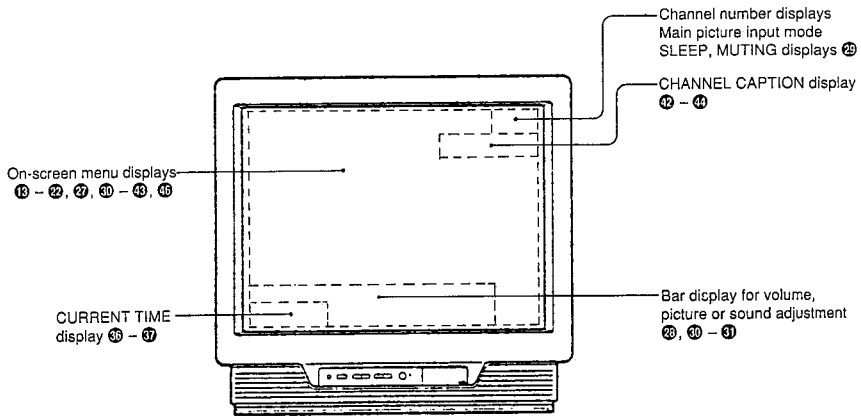
KV-20TR23 KV-2150R
KV-2160WR



1-2. LOCATING THE CONTROLS

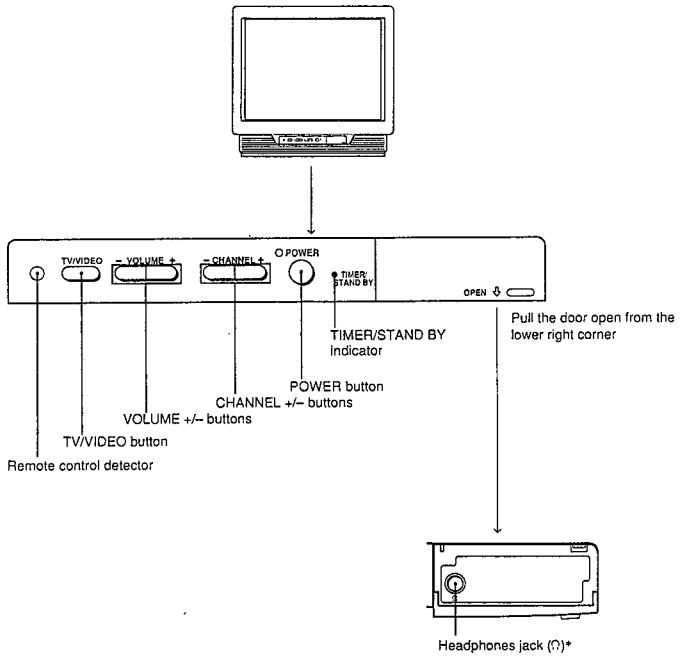
Screen Displays

For details, see the pages indicated by the numbered black circles ●.



Front Panel

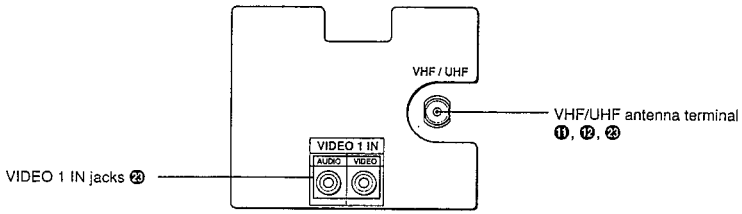
KV-20TR23
KV-2150R
KV-2160WR



* Monaural sound is output by both headphone speakers.

Rear Panel

For details, see the pages indicated by the numbered black circles ●.

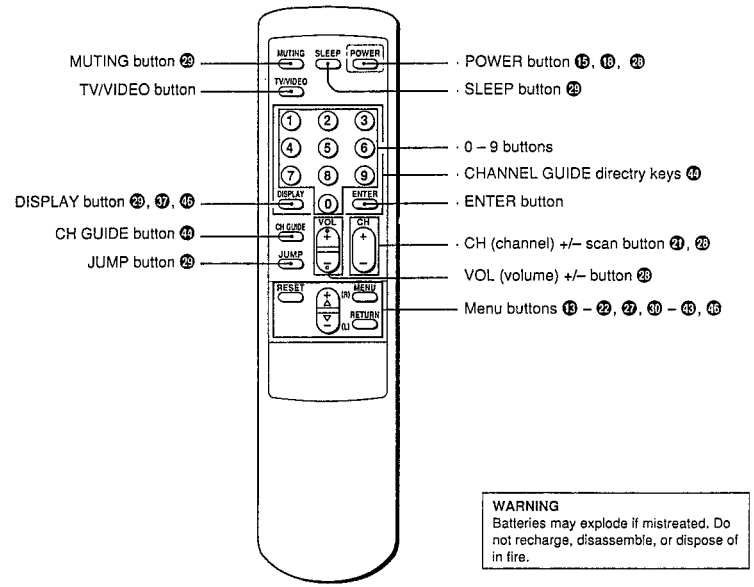


These models are equipped with only one set of video input jacks.

Remote Commander

For details, see the pages indicated by the numbered black circles ●

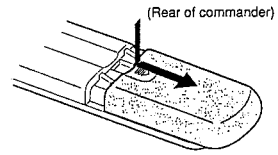
RM-Y116



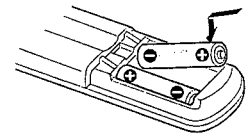
WARNING
Batteries may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Installing batteries

1 Remove the battery compartment cover.



2 Insert two size AA (R6) batteries in correct polarity.



Battery life
With normal operation, batteries will last up to half a year. If the Remote Commander dose not operate properly, the batteries might be exhausted. Replace both of them with new ones.

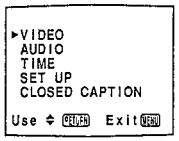
To avoid damage from possible battery leakage
Remove the batteries if you do not plan to use the Remote Commander for a fairly long time.

1-3. USING THE ON-SCREEN MENUS

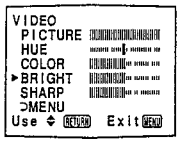
The following flow chart shows the different levels of on-screen menus that you can use to make various adjustments and settings. See the indicated pages for instructions on using each feature.

For picture quality adjustment

Main menu



VIDEO menu (pp. 30-31)

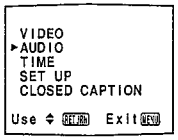


Adjustment bar

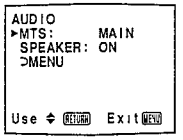


For sound quality adjustment

Main menu

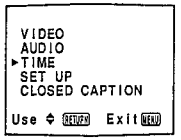


AUDIO menu (pp. 32-34)

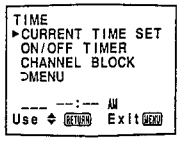


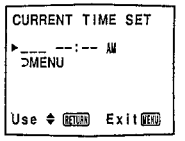
For time-related setting

Main menu

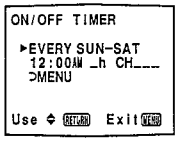


TIME menu





CURRENT TIME SET screen (pp. 36-37)



ON/OFF TIMER screen (pp. 38-39)



CHANNEL BLOCK screen (pp. 40-41)

For language setting (pp. 15-16)

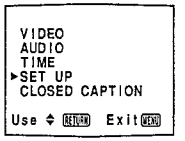
Main menu



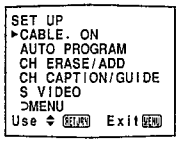
(KV-2150R/2160WR only)

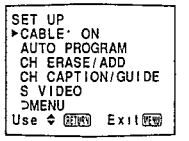
For presetting and other functions

Main menu



SET UP menu

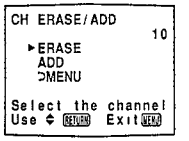




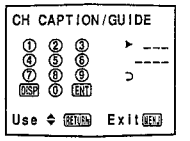
CABLE ON/OFF screen (p. 17)



AUTO PROGRAM screen (pp. 18-19)



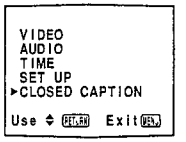
CHANNEL ERASE/ADD screen (pp. 20-22)



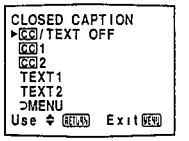
CHANNEL CAPTION/GUIDE screen (pp. 42-43)

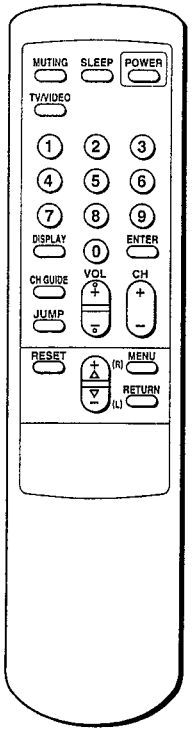
For closed caption setting (p. 35)

Main menu



CLOSED CAPTION screen





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Navigating Through the Menus

To display the main menu
Press MENU.

To return to the previous menu
Press △+ or ▽– to select ⊃ MENU.
Then press RETURN.

To return to the main menu
Repeat the above, until you reach the main menu.

To return to the normal screen
Press MENU on the Remote Commander.

Note

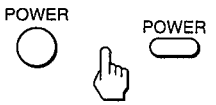
The menus disappear automatically if you do not press a button within 90 seconds

Changing the Menu Language

(KV-2150R/2160WR only)

The menu language is factory-set to ENGLISH. Follow these instructions to change the menu language to Spanish or back to English.

1 Press POWER on the TV or the Remote Commander to turn the TV on

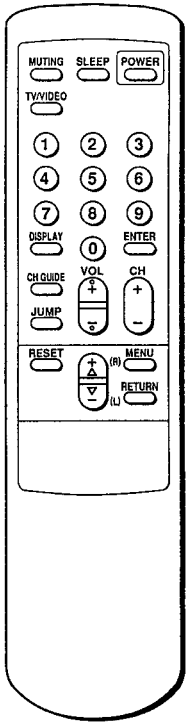


2 Press MENU.
The main menu appears



3 Press the △+ or ▽– to select ENGLISH
Then press RETURN

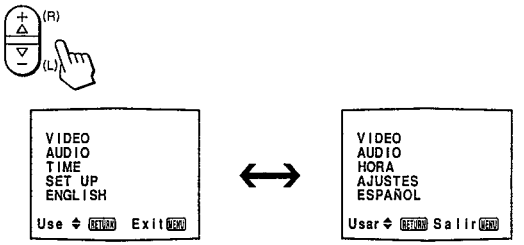




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To return to the normal screen
Press MENU

4 Press △+ or ▽– to select the language
Each time you press △+ or ▽–, the ESPAÑOL and ENGLISH menus appear



Note

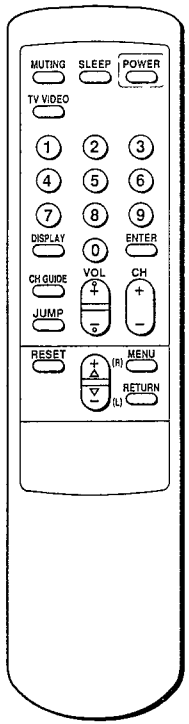
Certain parts of the ESPAÑOL menus remain in English

5 Press RETURN
The language is selected



1-4. TURNING THE CABLE MODE ON OR OFF

All of the controls are on the Remote Commander



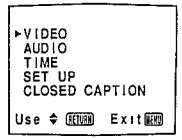
RM-Y116

To return to the normal screen
Press MENU

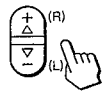
If you have cable connected to your TV (p 11), follow the steps below to turn the cable connection on or off CABLE is preset to ON when you use your TV for the first time Turn CABLE to OFF to preset or watch VHF or UHF channels (pp 18–22, 28)

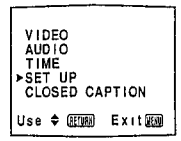
1 Press MENU
The main menu appears

MENU



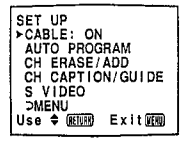
2 Press △+ or ▽– to select SET UP





Press RETURN
The SET UP menu appears, and the cursor points to CABLE

RETURN



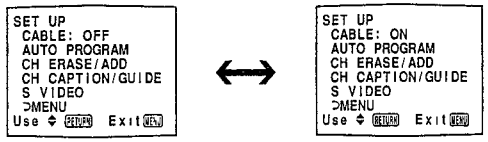
Note

If the CABLE display appears in black, the TV is in video mode and you cannot select CABLE Press TV/VIDEO to change to TV mode

3 Press RETURN again

RETURN

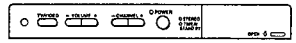
Press △+ or ▽– to select ON or OFF alternately.

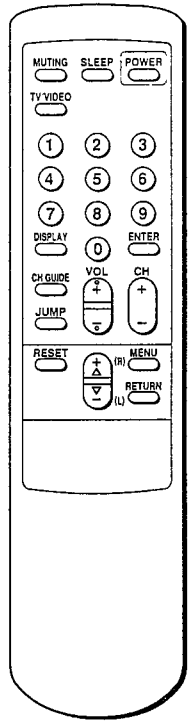


Press RETURN
The setting is completed

1-5. PRESETTING TV CHANNELS

By presetting TV channels to the TV, you can select channels by pressing CHANNEL +/– on the TV or CH +/– on the Remote Commander





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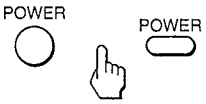
Presetting TV Channels Automatically

Note

Perform auto programming during the day rather than late at night when some channels may not be broadcasting

1 Press POWER on the TV or the Remote Commander to turn the TV on

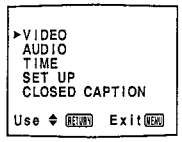
POWER



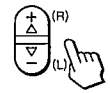
2 Turn the cable connection on or off to select the type of channel you want to preset, VHF/UHF or cable TV
(Follow the steps in "Turning the Cable Mode On or Off," p 17)

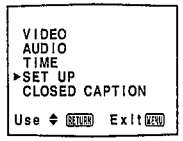
3 Press MENU
The main menu appears

MENU



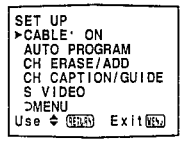
4 Press △+ or ▽– to select SET UP





Press RETURN
The SET UP menu appears

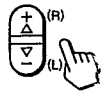
RETURN

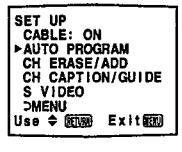


Note

If the AUTO PROGRAM display appears in black the TV is in video mode and you cannot select AUTO PROGRAM Press TV/VIDEO to change to TV mode

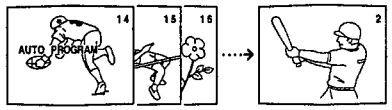
5 Press Δ+ or ∇– to select AUTO PROGRAM.





Press RETURN.





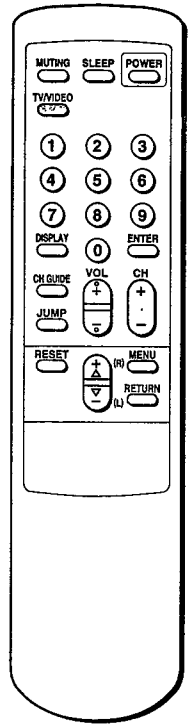
"AUTO PROGRAM" appears on the screen and receivable channels (other than the channels already preset) are preset in numerical sequence. The channels previously preset will not remain in the TV's memory
When no more channels can be found, the programming stops and the lowest numbered channel is displayed

Receivable channels for this TV
VHF: 2 – 13
UHF. 14 – 69
Cable: 1 – 125

To select TV channels without presetting
Press 0 – 9 and ENTER.

To return to the normal screen
Press MENU.

To erase unnecessary channels, or to add channels that could not be preset automatically because their signal was too weak, follow the steps in "Erasing Unnecessary Channels – CHANNEL ERASE" (pp. 20–21) and "Presetting Only Desired Channels – CHANNEL ADD" (p. 22).



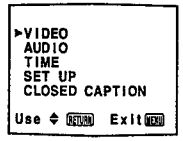
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Erasing Unnecessary Channels—CHANNEL ERASE

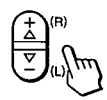
Use this feature to erase unnecessary TV channels, so that when you press CH +/–, the channel(s) are skipped.

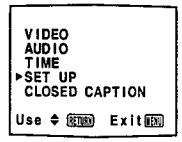
1 Press MENU.
The main menu appears

MENU



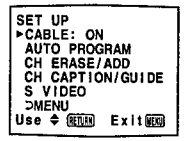
2 Press Δ+ or ∇– to select SET UP.



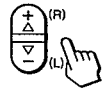


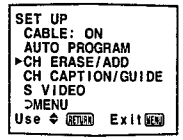
Press RETURN
The SET UP menu appears

RETURN



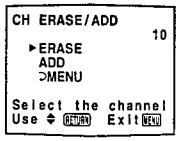
3 Press Δ+ or ∇– to select CH ERASE/ADD





Press RETURN
The CH ERASE/ADD screen appears, and the cursor points to ERASE

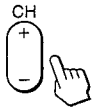
RETURN

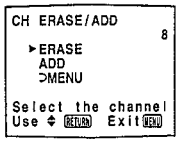


Note

If the CHANNEL ERASE/ADD display appears in black, the TV is in video mode and you cannot select CHANNEL ERASE/ADD Press TV/VIDEO to change to TV mode

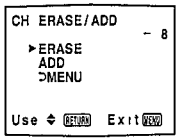
4 Press the CH +/– button to select the channel you want to erase
For example, to erase channel 8, press CH + or – until 8 appears





Press RETURN.
A "–" sign appears in front of the channel number display showing that the channel is erased from the channel scan memory





The next time you press the CH +/– buttons, channel 8 will be skipped

To erase other channels
Repeat step 4

To return to the normal screen
Press MENU

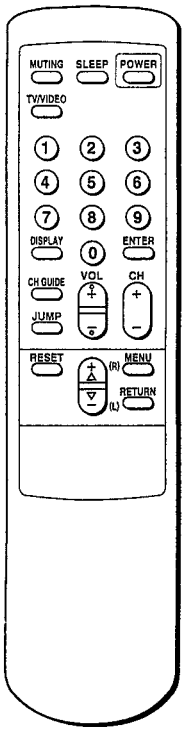
Note

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

Cable TV channel chart*
Cable TV systems use letters or numbers to designate channels To tune in a channel, refer to the chart below

Number on this TV	Corresponding cable TV channel
1	A-8
5	A-7
6	A 6
14	A
15	B
16	C
17	D
18	E
19	F
20	G
21	H
22	I
23	J
24	K
25	L
26	M
27	N
28	O
29	P
30	Q
31	R
32	S
33	T
34	U
35	V
36	W
37	W+1
38	W+2
39	W+3
⋮	⋮
93	W+57
94	W+58
95	A-5
96	A-4
97	A-3
98	A-2
99	A-1
100	W+59
101	W+60
102	W+61
⋮	⋮
123	W+82
124	W+83
125	W+84

* This designation of cable TV channels conforms to the EIA/NCTA recommendation
Check with your local cable TV company for more complete information on the available channels



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To return to the normal screen
Press MENU

Note

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

Presetting Only Desired Channels—CHANNEL ADD

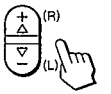
Use this feature to add channels one by one to the channel scan memory

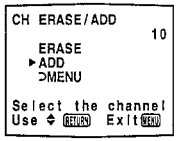
1-3 (Follow steps 1-3 in "Erasing Unnecessary Channels – CHANNEL ERASE," p 20)

Note

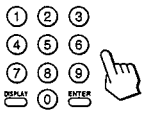
If CH ERASE/ADD display appears in black, the TV is in viedo mode and you cannot select CH ERASE/ADD Press TV/VIDEO to change to TV mode

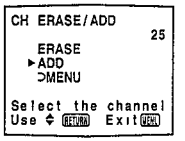
4 Press △+ or ▽– to select ADD





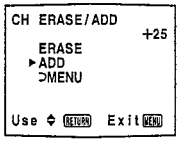
5 Press 0–9 and ENTER to select the channel you want to add For example, to add channel 25, press 2, 5 and ENTER





Press RETURN
A "+" sign appears in front of the channel number display showing that the channel is added to the channel scan memory





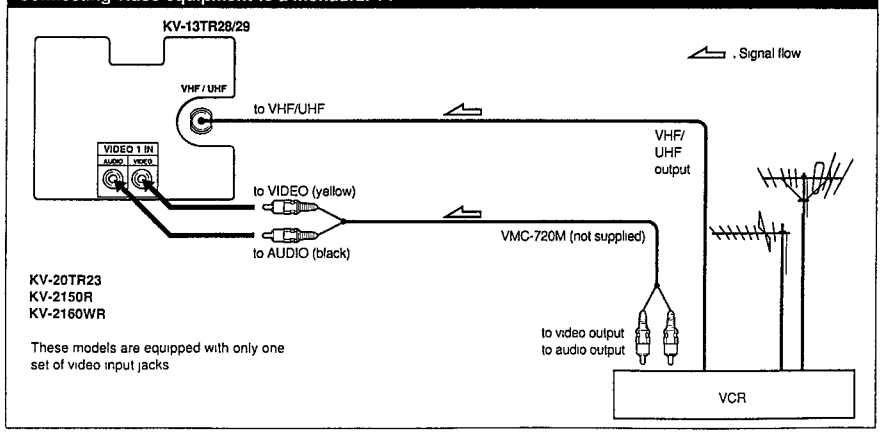
To add other channels
Repeat step 5

1-6. CONNECTING OTHER EQUIPMENT

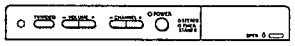
Connecting Video Equipment

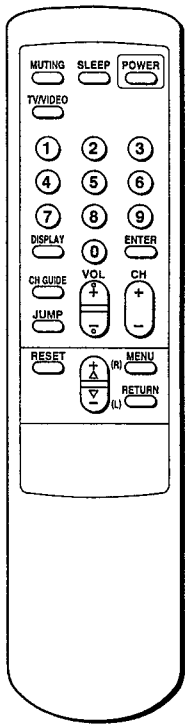
After connecting, you will be able to play back video tapes.

Connecting video equipment to a monaural TV



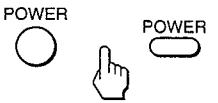
1-7. WATCHING TV PROGRAMS





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1 Press POWER on the TV or the Remote Commander to turn the TV on



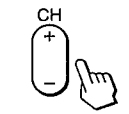
The TIMER/STAND BY indicator blinks until the picture appears on the screen

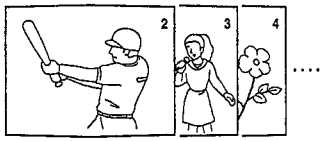
2 Turn the cable mode on or off to select the type of channel you want to watch, VHF/UHF or cable TV
(Follow the steps in "Turning the Cable Mode On or Off," p 17)

If "VIDEO" or "S VIDEO" is displayed on the screen, press the TV/VIDEO button on the TV or on the Remote Commander so that the channel number appears

3 Select a channel in one of the following two ways:

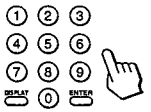
To scan the preset channels* in numerical sequence
Press CH +/–.

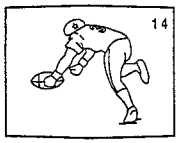




* For more information on presetting channels, see pp 18 – 22

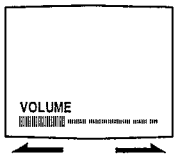
To select a channel directly
Press 0 – 9 and ENTER.
For example, to select channel 14, press 1, 4 and ENTER.





4 Press VOL +/– to adjust the volume.



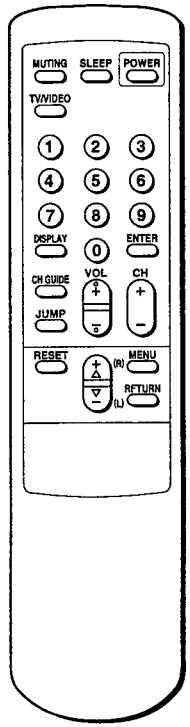


The display will disappear automatically after 3 seconds

Press + to increase the volume
Press – to decrease the volume

To turn off the TV
Press POWER on the TV or the Remote Commander again.

1-8. USING CONVENIENT FEATURES



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Muting the Sound — MUTING

Press MUTING
The display "MUTING" will appear on the screen

MUTING

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

Keeping the Displays On-Screen — DISPLAY

To display the channel
Press DISPLAY.
All the existing displays appear channel number, channel caption (if set), MTS mode (SAP only) and the current time ("AM" or "PM" disappears after about three seconds)

DISPLAY

To cancel the display
Press DISPLAY again.
The channel display will disappear

Setting the Sleep Timer — SLEEP

The sleep timer turns off the TV automatically after the amount of time you select

Press SLEEP
Each time you press SLEEP, the time increments 30, 60, 90 and OFF mode appear in sequence

SLEEP

SLEEP 30
SLEEP 60
SLEEP 90
SLEEP OFF

The SLEEP display appears about one minute before the TV turns off

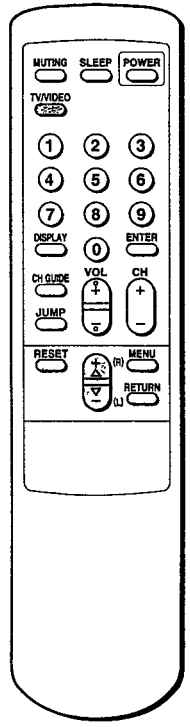
To cancel the setting
Press SLEEP until OFF mode appears
The "SLEEP OFF" display appears for about three seconds
OR
Turn the TV off.
The sleep timer setting is cancelled

Switching Quickly Between Two Channels — JUMP

Press JUMP once to recall the channel you were watching previously. Press JUMP again to switch back Use this feature to keep track of two programs alternately

JUMP

1-9. ADJUSTING PICTURE AND SOUND QUALITY



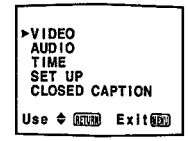
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Adjusting Picture Quality

You can adjust the picture for each input mode (TV, VIDEO) by pressing TV/VIDEO to select the input mode before making the adjustments.
These adjustments are retained in memory even when you turn off the TV until you change the adjustments again.

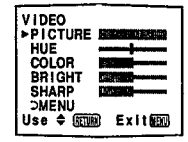
1 Press MENU.
The main menu appears, and the cursor points to VIDEO

MENU

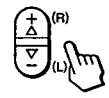


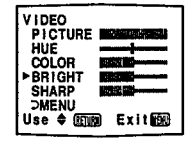
2 Press RETURN.
The VIDEO menu appears

RETURN



3 Press △+ or ▽– to select the item you want to adjust.
For example, to adjust the picture brightness, select BRIGHT.





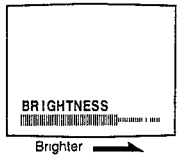
Press RETURN.
The adjustment bar appears.

RETURN



4 Press Δ+ or ∇– to make the adjustment



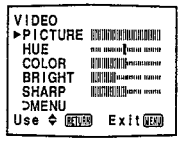






Press RETURN.
The new setting appears in the VIDEO menu





To adjust other items
Repeat steps 3 – 4.

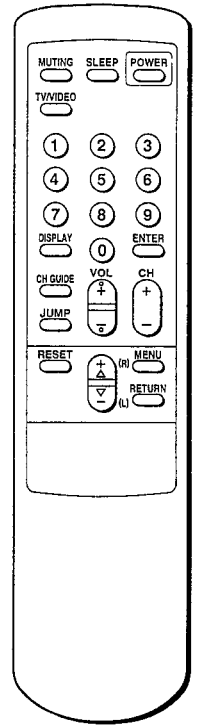
	Press ∇– to	Press Δ+ to
PICTURE	decrease picture contrast with soft color	increase picture contrast with vivid color
HUE	make skin tones become purplish	make skin tones become greenish
COLOR	decrease color intensity	increase color intensity
BRIGHTNESS	darken the picture	brighten the picture
SHARPNESS	soften the picture	sharpen the picture

To return to the normal screen
Press MENU

To restore the factory (mid-level) setting
Go to the VIDEO menu and press RESET
All the settings except for PICTURE will be restored to the mid-level setting

Note

The menus and adjustment bars will disappear automatically after 90 seconds if you do not press any other buttons during that time



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To return to the normal screen
Press MENU

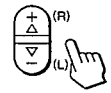
1-10. USING CLOSED CAPTION (U.S.A. models only)

1 Press MENU.
The main menu appears

MENU



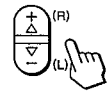
2 Press Δ+ or ∇– to select CLOSED CAPTION
Then press RETURN
The CLOSED CAPTION screen appears



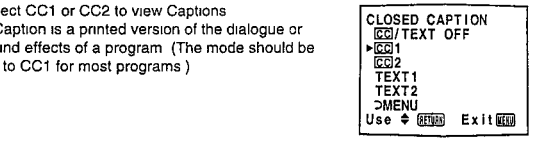
RETURN



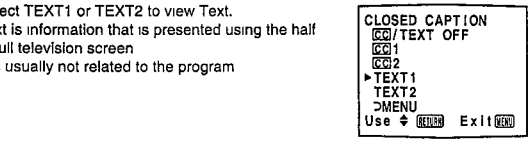
3 Press Δ+ or ∇– to select closed caption mode



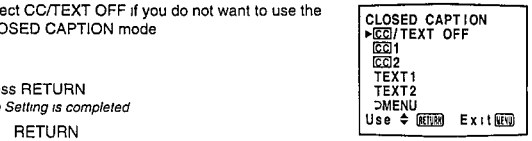
Select CC1 or CC2 to view Captions
A Caption is a printed version of the dialogue or sound effects of a program (The mode should be set to CC1 for most programs)



Select TEXT1 or TEXT2 to view Text.
Text is information that is presented using the half to full television screen
It is usually not related to the program



Select CC/TEXT OFF if you do not want to use the CLOSED CAPTION mode

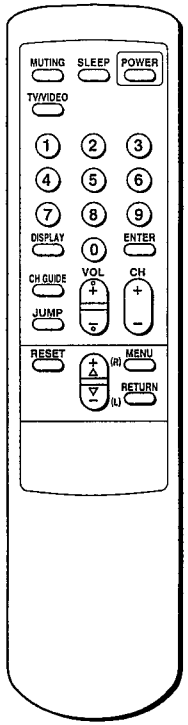


Press RETURN
The Setting is completed

RETURN



1-11. USING THE TIMER-ACTIVATED FUNCTIONS



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Setting the Clock – CURRENT TIME SET

Follow these instructions to set the current time. The correct time must be set in order to use the other timer-activated functions (ON/OFF TIMER, CHANNEL BLOCK).

EXAMPLE. Set the time to 3:15 PM, Monday.

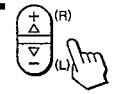
1 Press MENU.
The main menu appears

MENU



```
▸VIDEO
 AUDIO
 TIME
 SET UP
 CLOSED CAPTION
Use ◆ RETURN  Exit MENU
```

2 Press △+ or ▽– to select TIME




```
 VIDEO
 AUDIO
▸TIME
 SET UP
 CLOSED CAPTION
Use ◆ RETURN  Exit MENU
```

Press RETURN
The TIME menu appears, and the cursor points to CURRENT TIME SET

RETURN



```
TIME
▸CURRENT TIME SET
 ON/OFF TIMER
 CHANNEL BLOCK
 ↻MENU
 ___ --:-- AM
Use ◆ RETURN  Exit MENU
```

3 Press RETURN.
The CURRENT TIME SET screen appears

RETURN



```
CURRENT TIME SET
▸___ --:-- AM
 ↻MENU

Use ◆ RETURN  Exit MENU
```

4 Press RETURN again.
"Set the day" appears on the screen

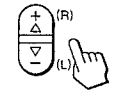
RETURN



```
CURRENT TIME SET
  SUN 12:00 AM
 ↻MENU

Set the day.
Use ◆ RETURN  Exit MENU
```

5 Press △+ or ▽– to set the day
Each time you press △+ or ▽– the day changes consecutively



Press RETURN
'Set the time' appears on the screen

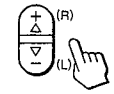
RETURN



```
CURRENT TIME SET
  MON 12:00 AM
 ↻MENU

Set the time.
Use ◆ RETURN  Exit MENU
```

6 Press △+ or ▽– to set the hour
Each time you press △+ or ▽–, the hour changes starting with "12 00 AM"



Press RETURN

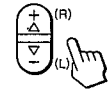
RETURN



```
CURRENT TIME SET
  MON 3:00 PM
 ↻MENU

Set the time.
Use ◆ RETURN  Exit MENU
```

7 Press △+ or ▽– to set the minutes
Each time you press △+ or ▽–, the minutes change in sequence




```
CURRENT TIME SET
  MON 3:15 PM
 ↻MENU

Set the time.
Use ◆ RETURN  Exit MENU
```

Press RETURN.
The setting is completed, and the clock starts

RETURN



```
CURRENT TIME SET
▸MON 3:15 PM
 ↻MENU

Use ◆ RETURN  Exit MENU
```

To reset the time
Press RESET while in the CURRENT TIME screen, and repeat steps 4–7

To display the time
Press DISPLAY

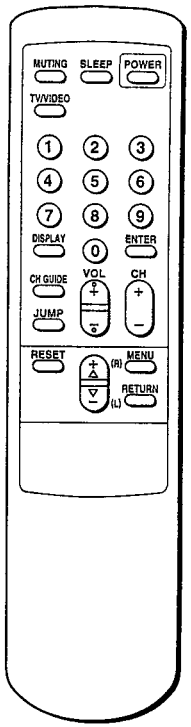
To return to the normal screen
Press MENU

Notes

- The internal clock of this TV operates on a 12-hour cycle. If a 24-hour cycle number (for instance, 13:00) is entered, it will be cleared when you press RETURN.

  12:00 AM stands for midnight
  12:00 PM stands for noon

- All the settings including CURRENT TIME SET will be erased if you unplug the TV or a power failure occurs. Reset the current time by following steps 1–7.



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Setting the ON/OFF TIMER

With this function you can set your favorite program to appear on the screen at the time that you set.

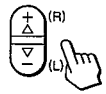
EXAMPLE: Set the timer to turn on the TV every Monday through Friday at 3:15 PM for 2 hours, on channel 21.

1 Press MENU.
The main menu appears



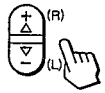

```
▸VIDEO
 AUDIO
 TIME
 SET UP
 CLOSED CAPTION
Use ◆ RETURN  Exit MENU
```

2 Press △+ or ▽– to select TIME.
Then press RETURN.
The TIME menu appears




```
TIME
▸CURRENT TIME SET
 ON/OFF TIMER
 CHANNEL BLOCK
 ⊃MENU
 MON  3:15 PM
Use ◆ RETURN  Exit MENU
```

3 Press △+ or ▽– to select ON/OFF TIMER.
Then press RETURN.
The ON/OFF TIMER screen appears




```
ON/OFF TIMER
▸EVERY SUN-SAT
 12:00AM –h CH---
 ⊃MENU
Use ◆ RETURN  Exit MENU
```

Note

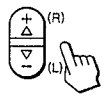
If the ON/OFF TIMER display appears in black, the current time has not been set and you cannot select ON/OFF TIMER. To set the clock, see "Setting the Clock – CURRENT TIME SET," pp. 36-37.

4 Press RETURN again
"Set the day" appears on the screen



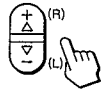

```
ON/OFF TIMER
 EVERY SUN-SAT
 12:00AM –h CH---
 ⊃MENU
Set the day.
Use ◆ RETURN  Exit MENU
```

5 Press △+ or ▽– to set the day.
Each time you press △+ or ▽–, the days of the week change as shown in Fig. 1
Then press RETURN
"Set the time" appears on the screen



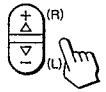

```
ON/OFF TIMER
 EVERY MON-FRY
 12:00AM –h CH---
 ⊃MENU
Set the time.
Use ◆ RETURN  Exit MENU
```

6 Press △+ or ▽– to set the hour that you want the TIMER to start.
Each time you press △+ or ▽–, the hour changes in sequence
Then press RETURN.



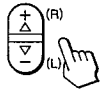

```
ON/OFF TIMER
 EVERY MON-FRY
 3:00PM –h CH---
 ⊃MENU
Set the time.
Use ◆ RETURN  Exit MENU
```

7 Press △+ or ▽– to set the minutes.
Each time you press △+ or ▽–, the minutes change in sequence
Then press RETURN
"Set the duration" appears on the screen.



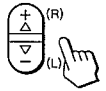

```
ON/OFF TIMER
 EVERY MON-FRY
 3:15PM –h CH---
 ⊃MENU
Set the duration.
Use ◆ RETURN  Exit MENU
```

8 Press △+ or ▽– to set the duration of time.
Each time you press △+ or ▽–, the duration changes from "1" to "6" in sequence.
Then press RETURN
"Select the channel" appears on the screen




```
ON/OFF TIMER
 EVERY MON-FRY
 3:15PM 2h CH---
 ⊃MENU
Select the channel
Use ◆ RETURN  Exit MENU
```

9 Press △+ or ▽– to set the channel that you want the TV to tune in
Each time you press △+ or ▽–, the channel number changes from 1 to 125 in sequence




```
ON/OFF TIMER
 EVERY MON-FRY
 3:15PM 2h CH 21
 ⊃MENU
Select the channel
Use ◆ RETURN  Exit MENU
```

Press RETURN
The setting is completed, and the TIMER indicator on the front of the TV lights up




```
ON/OFF TIMER
▸EVERY MON-FRY
 3:15PM 2h CH 21
 ⊃MENU
Use ◆ RETURN  Exit MENU
```

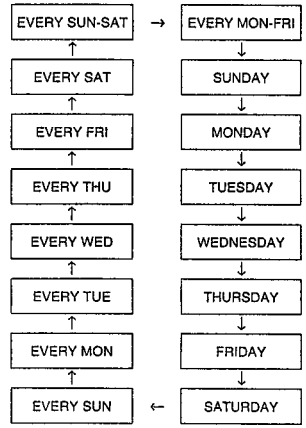
To clear the ON/OFF TIMER setting
Press RESET while in the ON/OFF TIMER screen

To return to the normal screen
Press MENU.

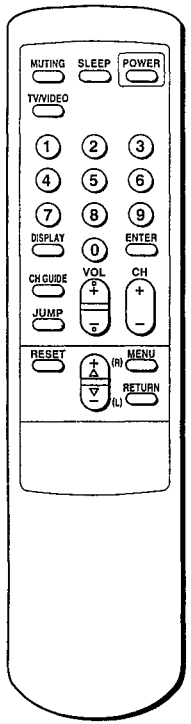
Notes

- While the TIMER is set, the TIMER indicator on the TV is on
- One minute before the timer goes off, the "TV will turn off" display will appear on the screen
- If you have not set the clock correctly, the ON/OFF TIMER will not operate at the proper time. To set the clock, see "Setting the Clock-CURRENT TIME SET," pp. 36-37.
- All the settings including ON/OFF TIMER will be erased if you unplug the TV or a power failure occurs. Reset the TIMER by following steps 1-9

Fig. 1
Selecting the day(s) of the week
When you press △+, the days of the week appear in the following order.



(▽–, reverse order)



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Setting CHANNEL BLOCK

Use this function to block a channel from appearing on the screen during the time you specify You can use this function to prevent children from watching undesirable programs

EXAMPLE Set CHANNEL BLOCK every Sunday at 8 45 PM for one hour, on channel 38

1 Press MENU
The main menu appears

MENU

```
►VIDEO
 AUDIO
 TIME
 SET UP
 CLOSED CAPTION
Use ♦ RETURN  Exit MENU
```

2 Press Δ+ or ∇– to select TIME.
Then press RETURN.
The TIME menu appears

(R) (L) RETURN

```
TIME
►CURRENT TIME SET
 ON/OFF TIMER
 CHANNEL BLOCK
 >MENU

 MON  3:15 PM
Use ♦ RETURN  Exit MENU
```

3 Press Δ+ or ∇– to select CHANNEL BLOCK
Then press RETURN
The CHANNEL BLOCK screen appears

(R) (L) RETURN

```
CHANNEL BLOCK
►EVERY SUN-SAT
 12:00AM –h CH---
 >MENU

Use ♦ RETURN  Exit MENU
```

Note

If the CHANNEL BLOCK display appears in black, the current time has not been set and you cannot select CHANNEL BLOCK To set the clock, see 'Setting the Clock – CURRENT TIME SET," pp 36-37

4 Press RETURN again.
'Set the day" appears on the screen

RETURN

```
CHANNEL BLOCK
 EVERY SUN-SAT
 12:00AM –h CH---
 >MENU

Set the day.
Use ♦ RETURN  Exit MENU
```

5 Press Δ+ or ∇– to set the day
Each time you press Δ+ or ∇–, the days of the week change as shown in Fig 1 (See p 39)
Then press RETURN
'Set the time " appears on the screen

(R) (L) RETURN

```
CHANNEL BLOCK
 SUNDAY
 12:00AM –h CH---
 >MENU

Set the time.
Use ♦ RETURN  Exit MENU
```

6 Press Δ+ or ∇– to set the hour
Each time you press Δ+ or ∇–, the hour changes in sequence
Then press RETURN

(R) (L) RETURN

```
CHANNEL BLOCK
 SUNDAY
 8:00PM –h CH---
 >MENU

Set the time.
Use ♦ RETURN  Exit MENU
```

7 Press Δ+ or ∇– to set the minutes
Each time you press Δ+ or ∇–, the minutes change in sequence
Then press RETURN
"Set the duration " appears on the screen.

(R) (L) RETURN

```
CHANNEL BLOCK
 SUNDAY
 8:45PM –h CH---
 >MENU

Set the duration
Use ♦ RETURN  Exit MENU
```

8 Press Δ+ or ∇– to set the duration of time that you want the TV remain blocked
Each time you press Δ+ or ∇–, the duration changes from "1" to "6" in sequence
Then press RETURN
"Select the channel' appears on the screen

(R) (L) RETURN

```
CHANNEL BLOCK
 SUNDAY
 8:45PM 1h CH---
 >MENU

Select the channel
Use ♦ RETURN  Exit MENU
```

9 Press Δ+ or ∇– to set the channel that you want to block.
Each time you press Δ+ or ∇–, the channel number changes from 1 to 125 in sequence

(R) (L)

```
CHANNEL BLOCK
 SUNDAY
 8:45PM 1h CH 38
 >MENU

Select the channel
Use ♦ RETURN  Exit MENU
```

Press RETURN
The setting is completed

RETURN

```
CHANNEL BLOCK
►SUNDAY
 8:45PM 1h CH 38
 >MENU

Use ♦ RETURN  Exit MENU
```

If you select a channel which has been blocked the message of BLOCKED appears

```
BLOCKED
```

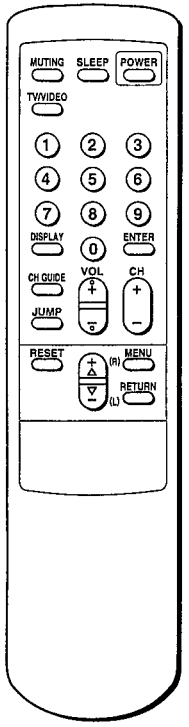
To clear the BLOCK setting
Press RESET while in the CHANNEL BLOCK screen

To return to the normal screen
Press MENU

Notes

- If you set a new CHANNEL BLOCK by following steps 1-9 the original setting will be erased
- If you have not set the clock correctly CHANNEL BLOCK will not operate at the proper time To set the current time, see "Setting the Clock – CURRENT TIME SET," pp 36-37

1-12. CUSTOMIZING THE SCREEN DISPLAY



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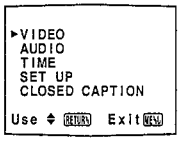
Setting Channel Captions – CH CAPTION

Use this feature to caption up to 12 channel number displays with the matching channel call letters.

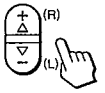
EXAMPLE Caption channel 20 with ESPN at the caption position number 4

1 Press MENU
The main menu appears

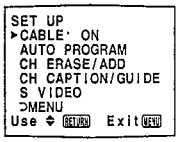




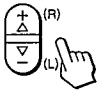
2 Press Δ+ or ∇– to select SET UP.
Then press RETURN
The SET UP menu appears



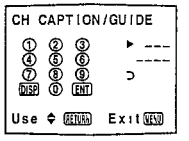




3 Press Δ+ or ∇– to select CH CAPTION/GUIDE.
Then press RETURN
The CH CAPTION/GUIDE screen appears





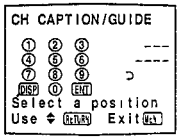


Note

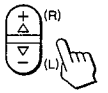
If the CH CAPTION/GUIDE display appears in black, the TV is in video mode and you cannot select CH CAPTION/GUIDE Press TV/VIDEO to change to TV mode

4 Press RETURN again
"Select a position" appears on the screen

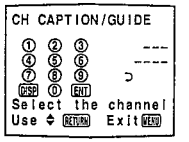




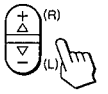
5 Press Δ+ or ∇– to select a caption position number
Each time you press Δ+ or ∇–, the caption position number is marked in sequence
Then press RETURN
'Select the channel' appears on the screen



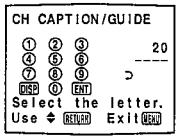




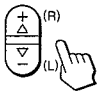
6 Press Δ+ or ∇– to select the channel you want to caption.
Each time you press Δ+ or ∇–, the channel number changes from 1 to 125
Then press RETURN.
"Select the letter" appears on the screen



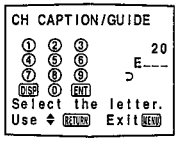




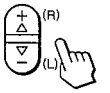
7 Press Δ+ or ∇– to select the first letter
Each time you press Δ+ or ∇–, "0-9," "A-Z," &," "/," "-," and "_(blank space)" appear in sequence
Then press RETURN



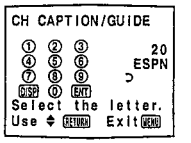




8 Repeat step 7 to select each remaining letter
(For a 3-letter caption, leave a space by pressing RETURN only)

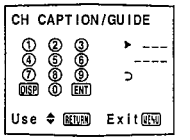






9 Press RETURN
The setting is completed

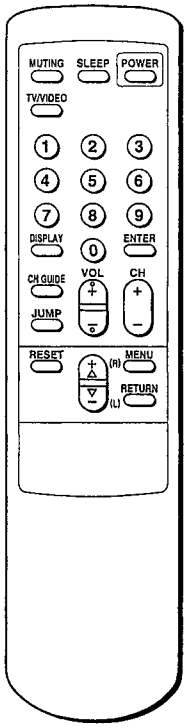




To caption other channels
Repeat steps 4-9

To erase unneeded captions
Call the caption setting screen by following steps 1 5, and press RESET

To return to the normal screen
Press MENU



RM-Y116

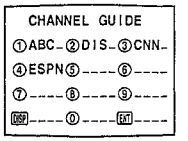
Viewing the Captioned Channels – CHANNEL GUIDE

Use this feature to display the captions you set, and to select a channel directory for viewing

1 Press CH GUIDE.
A directory appears, corresponding to the directory keys on the Remote Commander

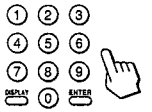
CH GUIDE

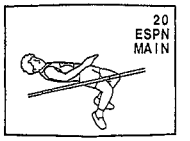




To cancel the CHANNEL GUIDE screen
Press CH GUIDE again

2 Press the directory key of the channel you want to watch





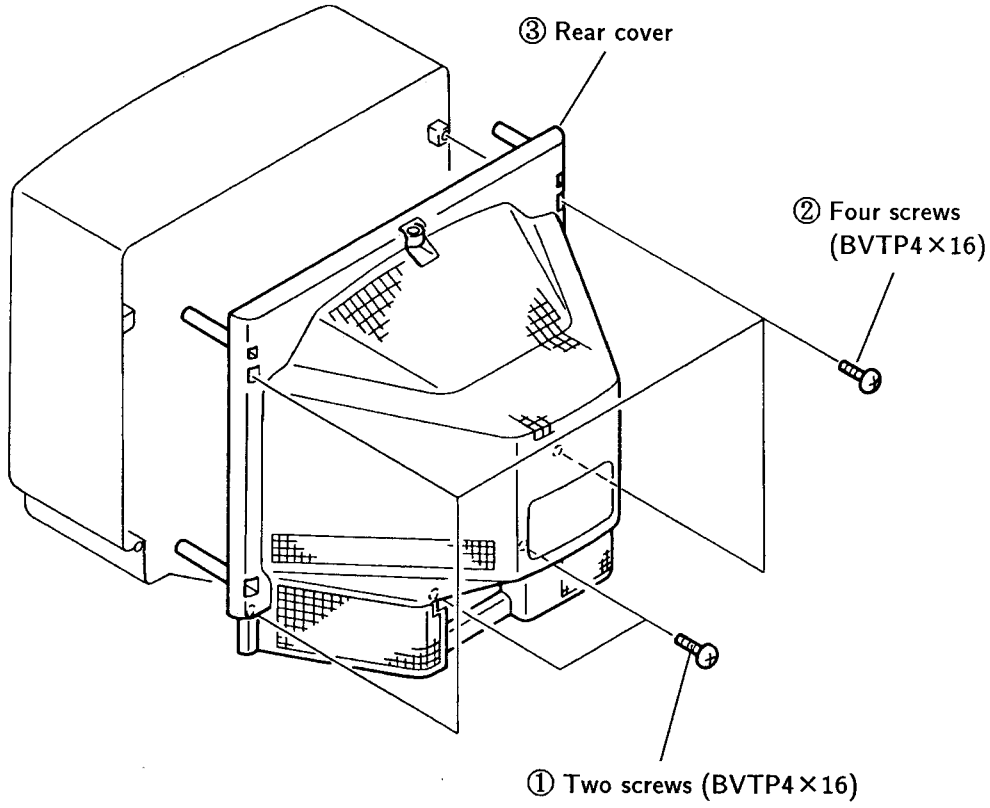
1-13. TROUBLESHOOTING

Symptom	Possible causes and remedies
Poor or no picture (screen not lit), good sound	• Adjust PICTURE. • Adjust BRIGHTNESS. • Check antenna/cable connections
Good picture, no sound	• Press VOLUME + on the TV or VOL + on the Remote Commander • Press MUTING on the Remote Commander. • Check that the MTS setting is set correctly. • Check that the TV/VIDEO button is set correctly. • Check that "SPEAKER ON" is set.
Good picture, no sound from the cordless headphones	• Is the battery used up? • Is the cordless headphones power turned on? • Adjust the cordless headphones volume control. • Make sure HEADPHONES is set to ON.
Good picture, noisy sound from the cordless headphones	• Is the battery used up? • Remove obstacles between the infrared emitter and the cordless headphones. • Is the infrared detector covered by your hands, hair, etc? • Adjust the direction and the position of the infrared emitter.
No picture (screen not lit), no sound	• Is POWER switched on? • Plug the unit into a wall outlet. • Check that the TV/VIDEO button is set correctly. • Make sure S VIDEO is set to on.
No color	• Is it a color program? • Adjust COLOR.
Snow and noise only	• Is it an active or the correct channel? • Check the CABLE setting. • Check antenna/cable connections.
 Dotted lines or stripes	This is often caused by local interference. (e.g. cars, neon signs, hairdryers etc) Adjust the antenna for minimum interference.
 Double images or ghosts	Reflections from nearby mountains or buildings often cause this problem. A highly directional outdoor antenna or a CATV cable may improve the picture
Try another channel. It could be station trouble.	

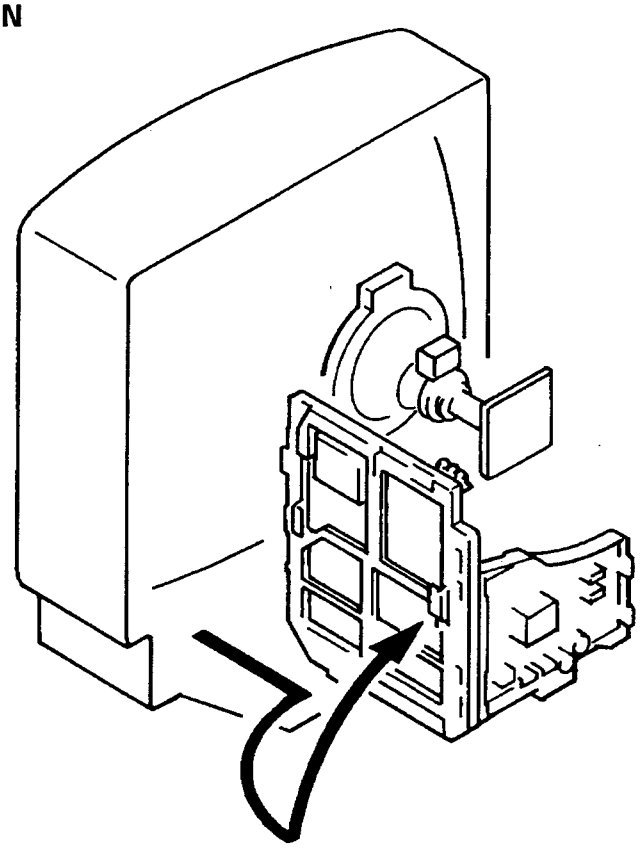
If the problem persists, contact your nearest service facility

SECTION 2
DISASSEMBLY

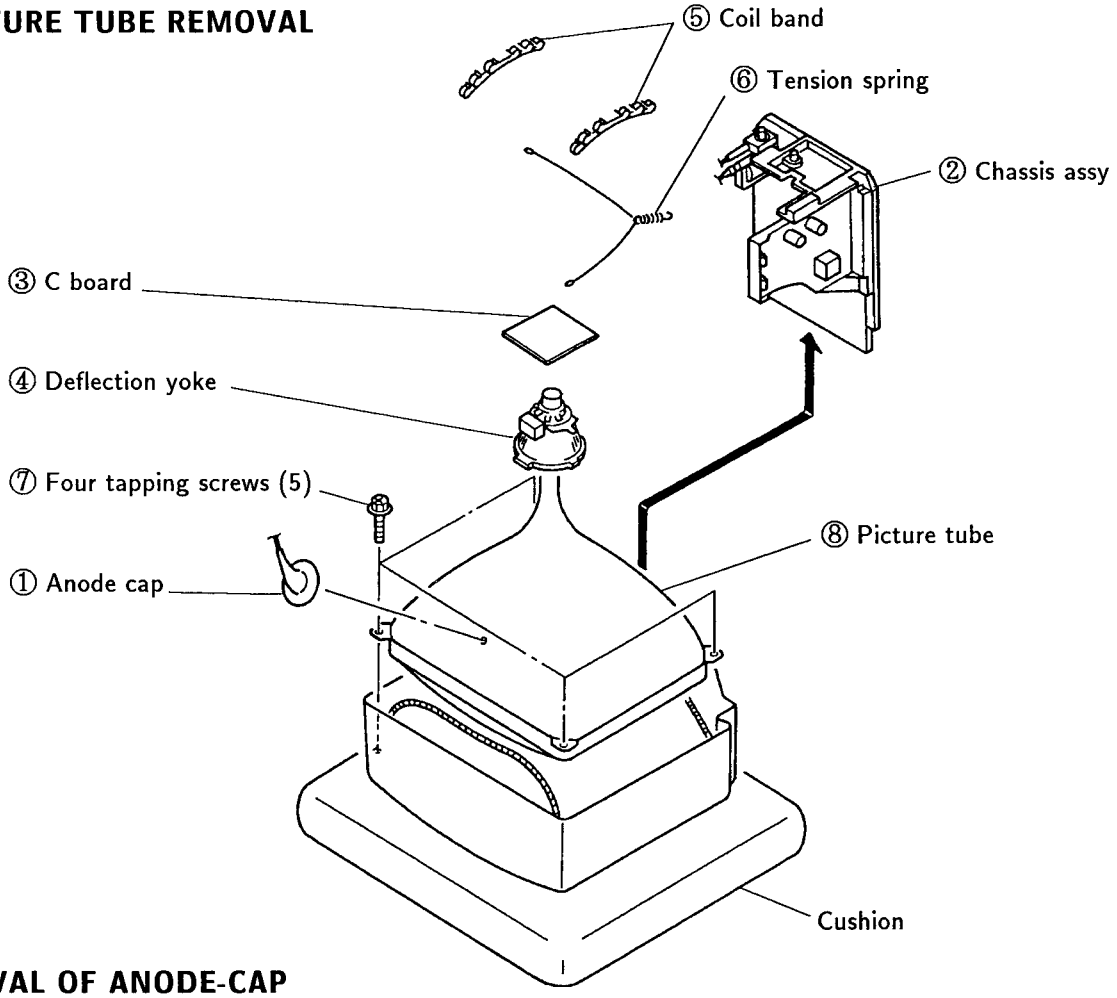
2-1. REAR COVER REMOVAL



2-2. SERVICE POSITION



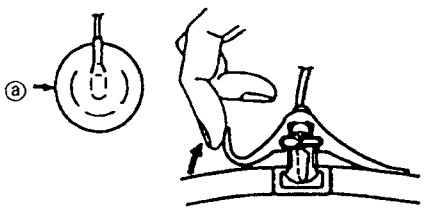
2-3. PICTURE TUBE REMOVAL



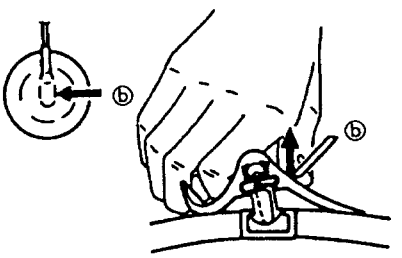
• REMOVAL OF ANODE-CAP

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.

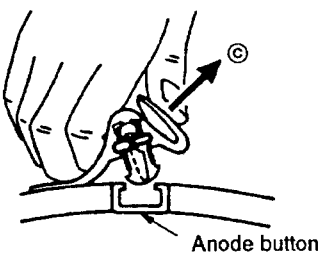
• REMOVING PROCEDURES



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 ⓑ.



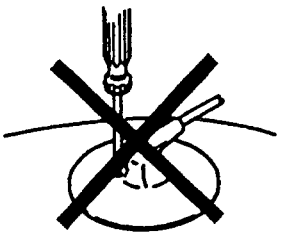
③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow ⓒ.

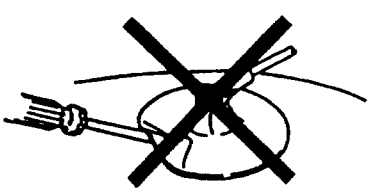
• HOW TO HANDLE AN ANODE-CAP

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

Perform the adjustments in order as follows:

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

Note: Test Equipment Required.

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

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)

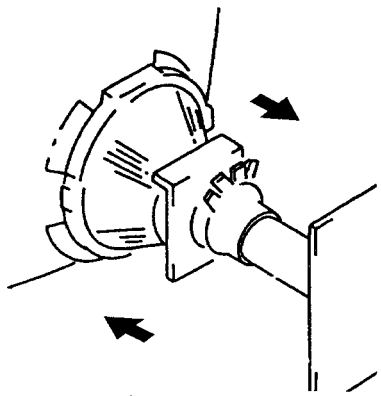


Fig.1

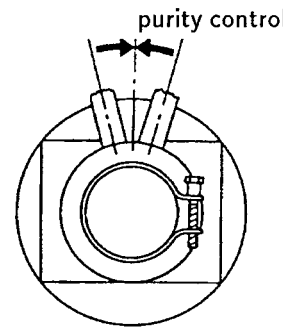


Fig.2

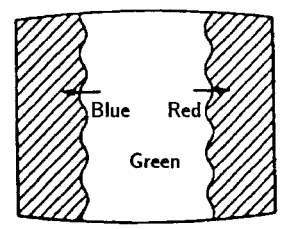


Fig.3

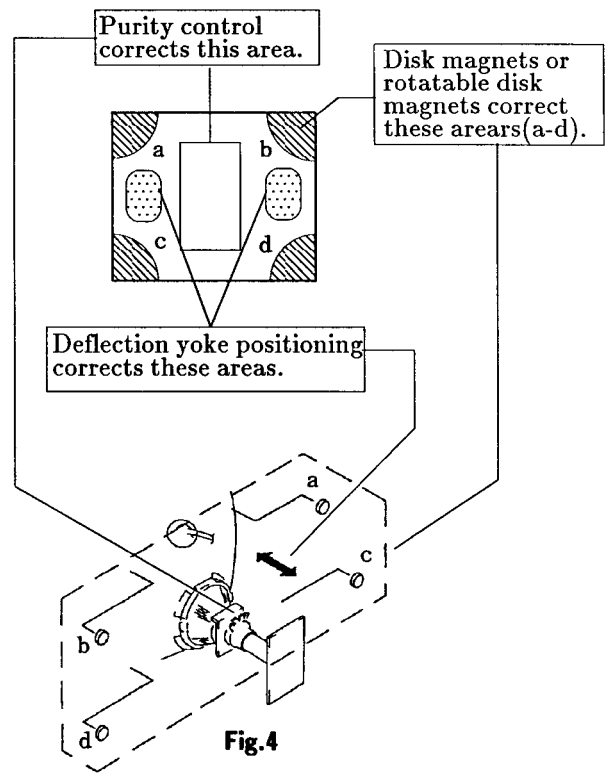


Fig.4

3-2. CONVERGENCE

Preparation:

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

(1) Horizontal and Vertical Static Convergence

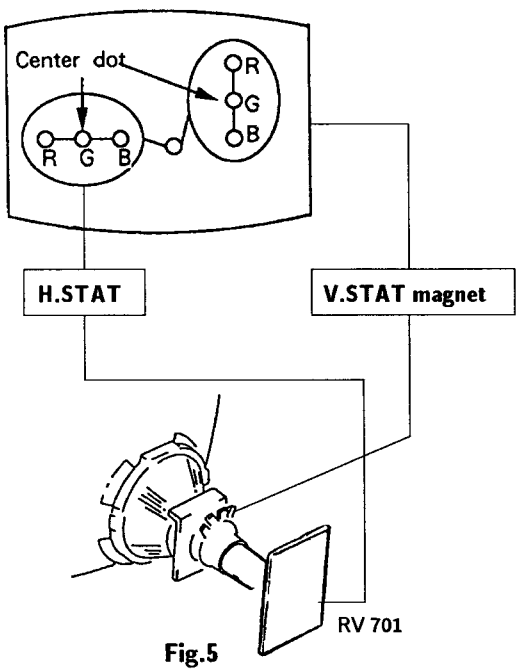
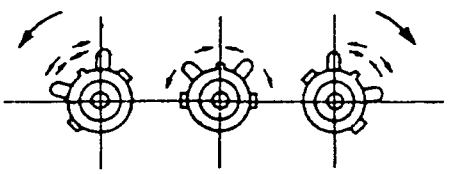


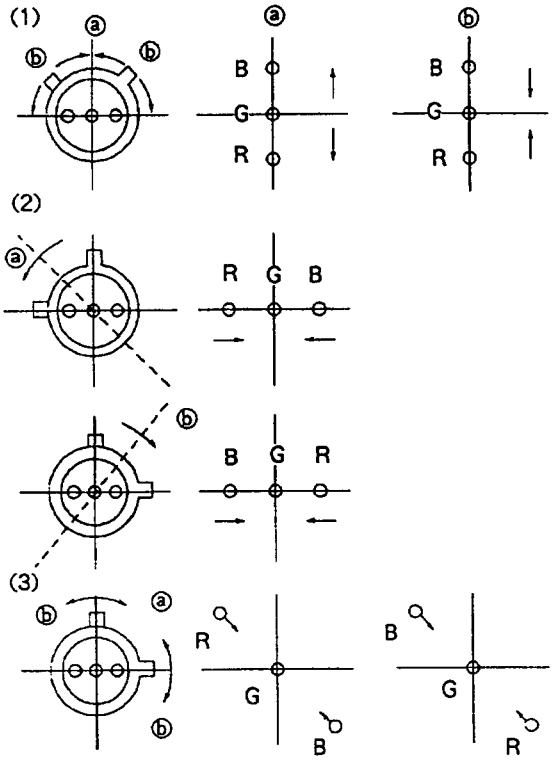
Fig.5

1. Adjust H.STAT VR to converge red, green and blue dots the in center of the screen.(Horizontal movement)
2. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen. (Vertical movement)
3. If the red, green and blue dots do not converge on the center of screen with H.STAT VR, perform horizontal convergence adjustment using H.STAT VR and V.STAT magnet as shown below. (In this case, H.STAT VR and V.STAT magnet effect each other.)

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



4.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.

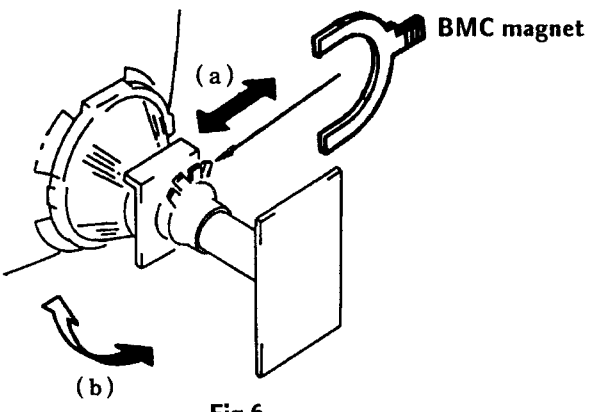


Fig.6

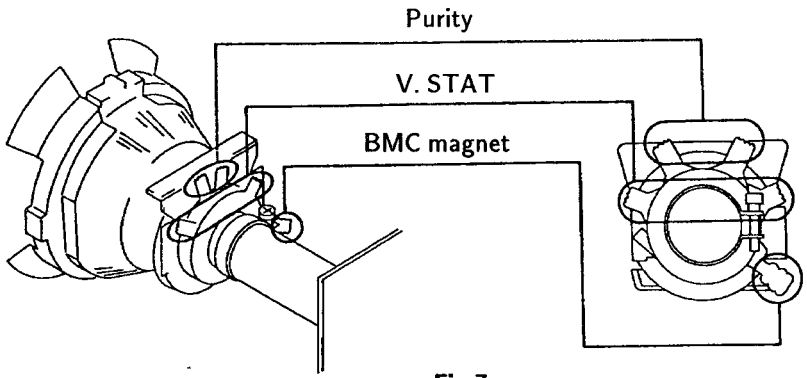


Fig.7

(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.

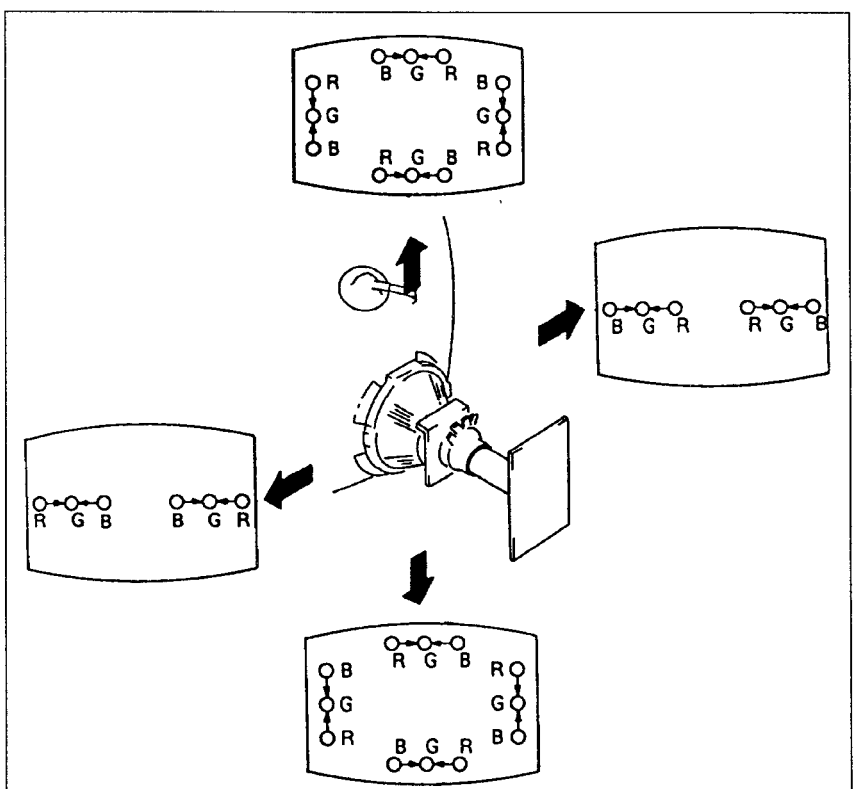


Fig.8

(3) Screen-corner Convergence

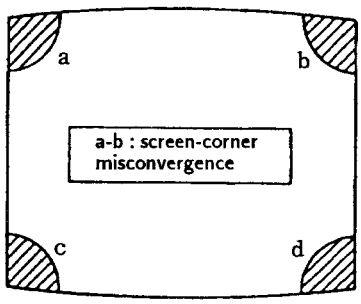
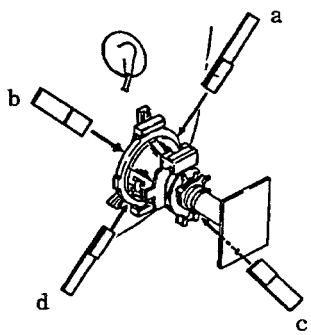


Fig.9

Affix a Permalloy ass'y corresponding to the misconverged areas



Permalloy assembly

3-3. FOCUS

Adjust FOCUS control for best picture.

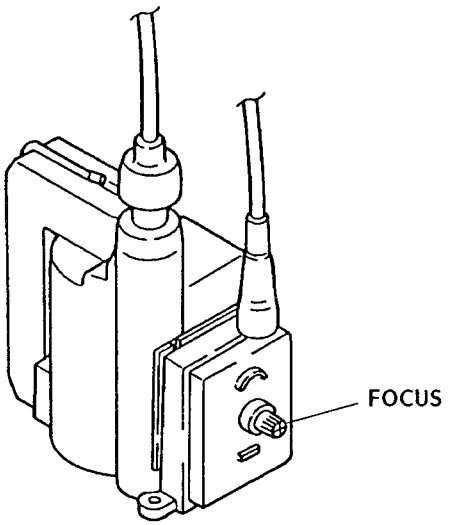


Fig.10

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 BKG VRs so that voltages on the red, green and blue cathodes are 170 V dc with an oscilloscope as shown in Fig.11.
4. Observe the screen and adjust SCREEN (G 2)RV 702 to obtain the faintly visible background of dot signal.

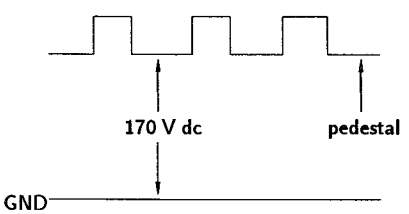


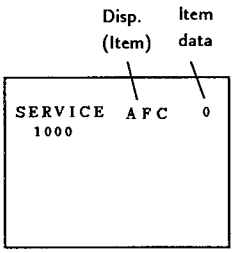
Fig.11

3-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

SERVICE MODE PROCEDURE

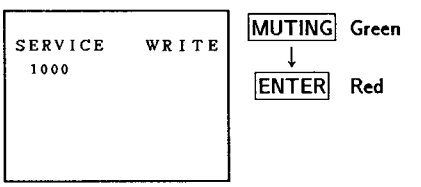
1. Standby mode.(Power off)
2. DISPLAY → 5 → VOL (+) → POWER on the Remote Commander. (Press each button within a second.)

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

⊠ R537 CONFIRMATION METHOD (HV HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

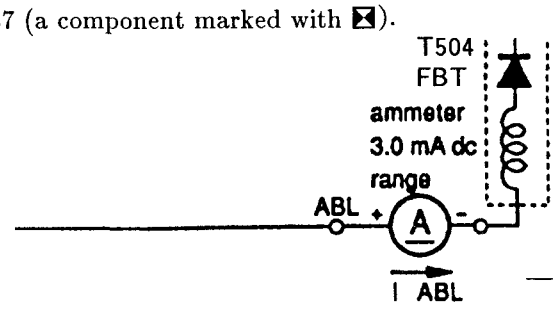
The following adjustments should always be performed when replacing the following components (marked with ◪ on the schematic diagram).
IC602, D511, C523, C524, R534, R535, R537, R549, R565, R637, PM501, T504, DY

①

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 100VDC when the set is operating normaly with 120.0±2.0VAC supply.

2. Hold-down operation confirmation (HV)
   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.
      1450 ± 100μA
   3) Connect the Digital Voltmeter to pin8 of PM501 then read the voltage as A.
   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 volymeter indication.
   7) Turn DC power Source off immediatery.
      STANDARD
      Less or equal to A + 16.5 VDC
   8) Receive Dot Signal and adjust the ABL current to follows, with the PIX and the BRT controls.
      150 ± 100 μA
   9) Repeat steps from (3) to (7).
      STANDARD
      Less or equal to A + 16.5 VDC

3. Hold-down readjustment
   When step 2 is not satisfied, readjustment should be performed by altering the resistance value of R537 (a component marked with ⊠).



A BOARD

⊠ R511 CONFIRMATION METHOD (B+ HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components (marked with ◪ on the schematic diagram).
IC602, C524, R511, R534, R549, R565, R637, PM501

②

1. Hold-Down Operation Voltage (B+)
   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.
      1450 ± 100μA
   3) Connect the Digital Voltmeter and DC power Supply via 1SS 119 to pin8 of PM501.
   4) Increase the DC power voltage gradually until the Picture just blanks out.
   5) Read the digital voltmeter indication.
   6) Turn DC power Source off immediatery.
      STANDARD
      Less or equal to 130.0 VDC
   7) Receive Dot Signal and adjust the ABL current to follows, with the PICTURE and the BRIGHT controls.
      150 ± 100 μA
   8) Repeat steps from (4) to (6).
      STANDARD
      Less or equal to 132.5 VDC

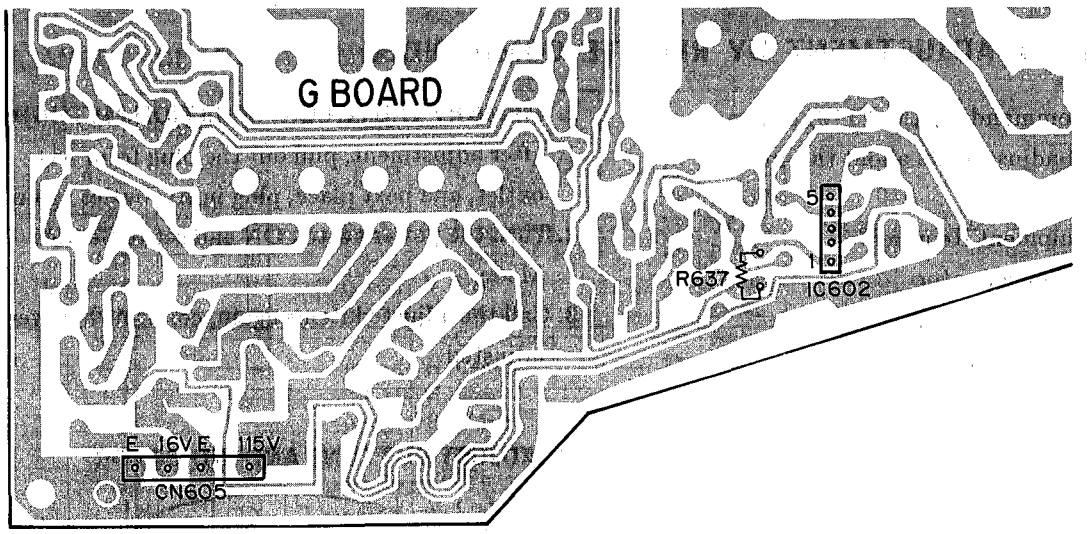
2. Hold-down readjustment
   When step 2 is not satisfied, readjustment should be performed by altering the resistance value of R511 (a component marked with ⊠).

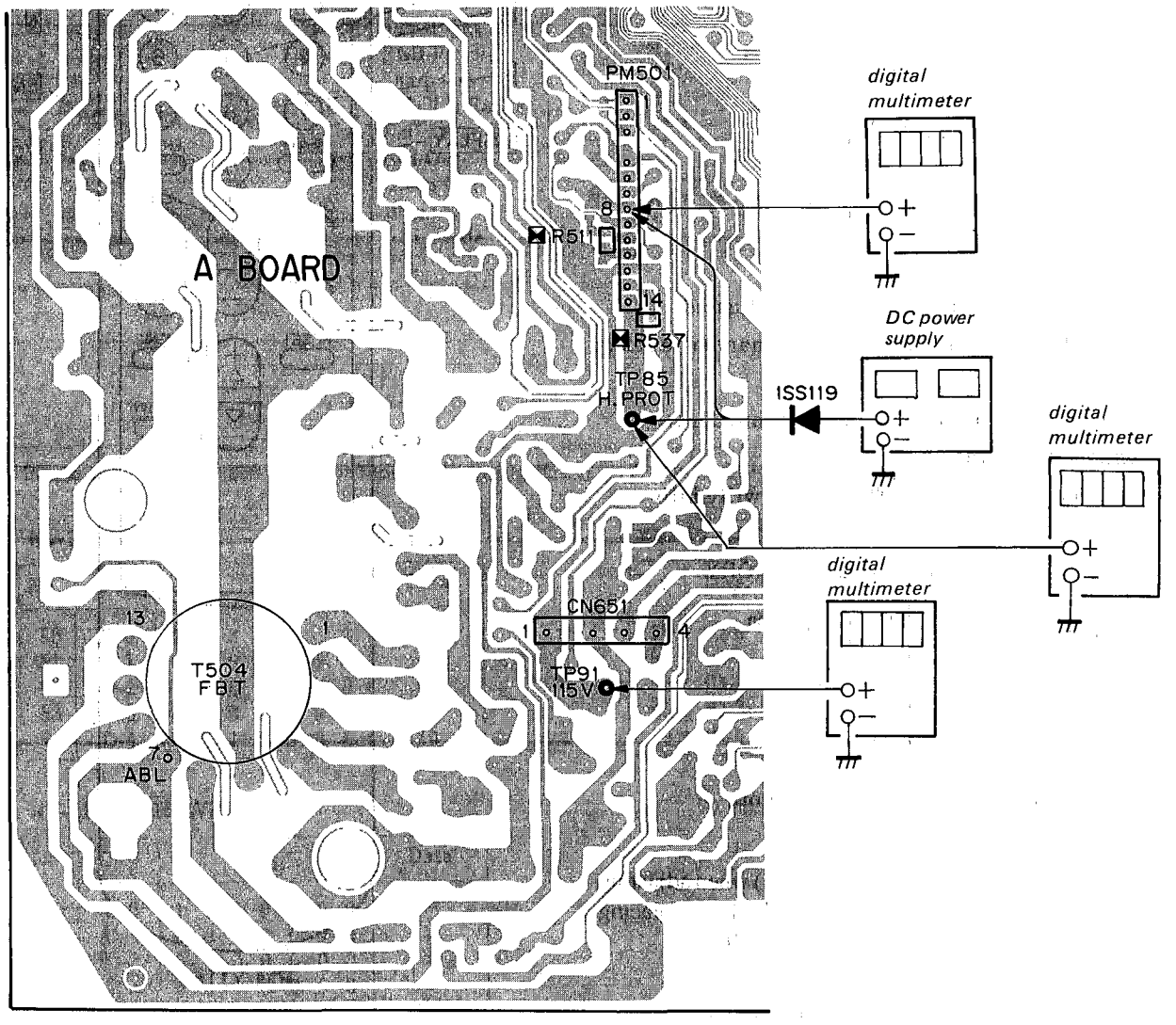
G BOARD

B+ VOLTAGE CONFIRMATION

The following adjustments should always be performed when replacing IC602 or R637.

1) Supply 130±$^{2}_{0}$V AC to with variable autotransformer.
2) Input an entirely monoscope signal.
3) Set the PICTURE control and the BRIGHT controls in to initial reset.
4) Confirm the voltage of A BOARD ① pin CN651 connecter is less than 116.5V DC.
5) If step 4) is not satisfied, replace IC602 and R637 repeat above steps.


G BOARD
5
1
R637
IC602
E 16V E 115V
CN605


A BOARD
PM501
8
14
R511
R537
TP85
H. PROT
1SS119
CN651
1
4
TP91
115V
13
T504
FBT
ABL
digital
multimeter
DC power
supply
digital
multimeter
digital
multimeter

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.

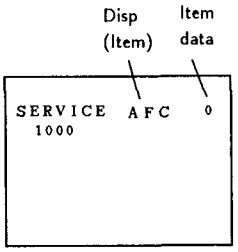
1. Pattern Generator
2. Frequency counter
3. Digital multimeter
4. Audio OSC

1. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

SERVICE MODE PROCEDURE

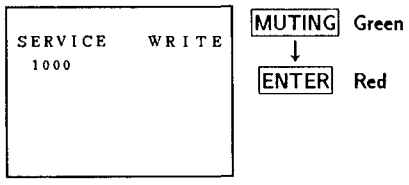
1. Standby mode.(Power off)
2. [DISPLAY] → [5] → [VOL (+)] → [POWER] on the Remote Commander. (Press each button within a second.)

SERVICE ADJUSTMENT MODE IN

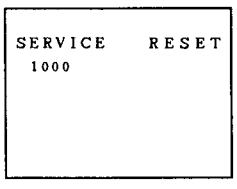


3. The CRT displays the item Being adjusted.
4. Press [1] or [4] on the Remote Commander to select the item.
5. Press [3] or [6] on the Remote Commander to change the data.
6. Press [MUTING] then [ENTER] to write into memory.

SERVICE ADJUSTMENT MODE MEMORY



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.

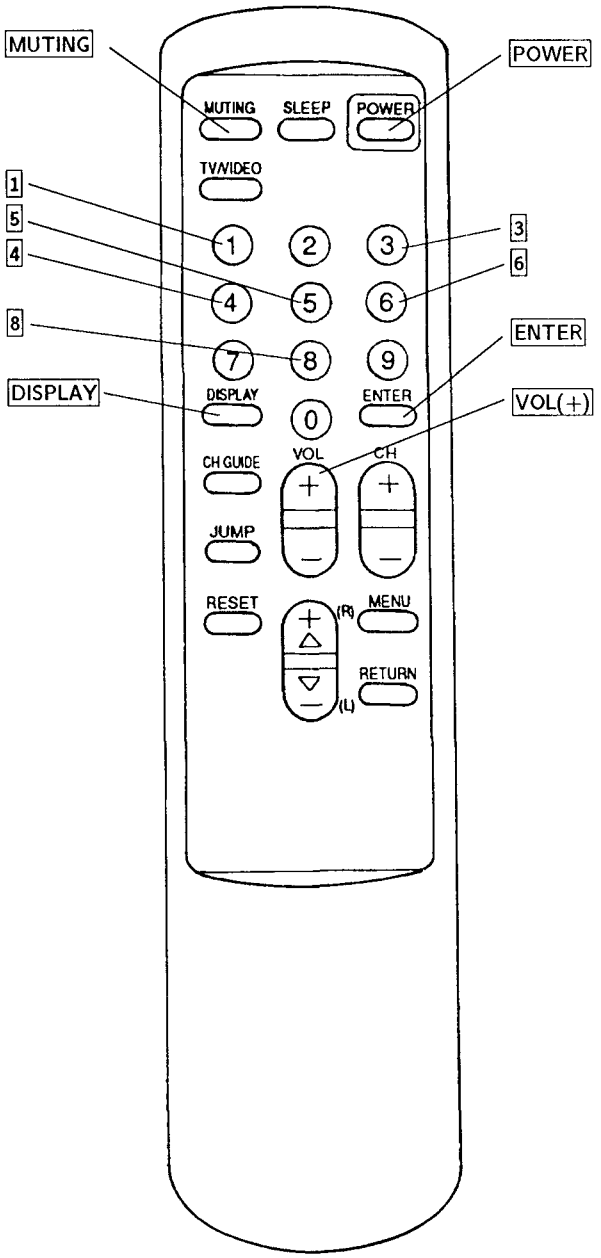
Factory original setting

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



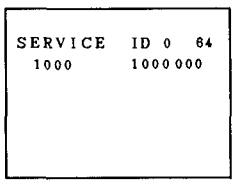
RM-Y116

4. AN ITEM OF ADJUSTMENTS

No.	Disp.	Ave. data	Data range	Item
1	AFC	* 0	0~3	AFC Loop Gain
2	HFRE	78	0~127	H. Frequency
3	VFRE	15	0~31	V. Frequency
4	VPOS	20	0~31	V. Center
5	VSIZ	31	0~63	V. Size
6	VLIN	8	0~15	V. Linearity
7	VSCO	6	0~15	V. Correction
8	HPOS	6	0~15	H. Center
9	HSIZ	16	0~31	H. Size
10	PAMP	23	0~31	Pin Amp
11	CPIN	4	0~7	Corner Pin
12	PPHA	7	0~15	Pin Phase
13	VCOM	* 2	0~7	V. Compensation
14	GAMP	21	0~31	Green Amp
15	BAMP	16	0~31	Blue Amp
16	GCUT	6	0~15	Green Cut Off
17	BCUT	7	0~15	Blue Cut Off
18	CROM	26	0~63	Chroma Trap
19	SPIX	32	0~63	Sub Contrast
20	SHUE	25	0~63	Sub Hue
21	SCOL	30	0~63	Sub Color
22	SBRT	34	0~63	Sub Bright
23	RGBP	* 18	0~63	RGB Picture
24	SHAP	* 7	0~15	Sharpness
25	VSMO	* 0	0, 1	V Pull in Range
26	REF	* 2	0~3	Refference line
27	ROFF	1	0, 1	Red Out
28	GOFF	1	0, 1	Green Out
29	BOFF	1	0, 1	Blue Out
30	ABLM	* 0	0, 1	ABL Mode
31	NOTC	* 0	0, 1	Notch On/Off
32	DRGB	* 0	0, 1	OSD intensity
33	VANG	not use	0~63	V. Angle
34	DISP	40	0~63	Display Position
35	SVOL	* 0	0~7	Sub Volume
36	SBAL	not use	0~7	Sub Balance
37	BASS	not use	0~15	Sub Bass
38	TRE	not use	0~15	Sub Treble
39	UYBO	not use	0~63	Upper Y. Bow
40	LYBO	not use	0~63	Lower Y. Bow
41	HAMP	not use	0~63	H. Amp
42	HTIL	not use	0~63	H. Tilt
43	UCBO	not use	0~63	Upper C. Bow
44	UTIL	not use	0~63	Upper Tilt
45	LCBO	not use	0~63	Lower C. Bow
46	LTIL	not use	0~63	Lower Tilt
47	DCSH	not use	0~63	DC. Shift
48	PHPO	not use	0~127	PinP H Position
49	PHUE	not use	0~63	PinP Hue
50	ID-0	* 64	0~127	Model ID
51	ID-1	* 0	0~127	Model ID
52	ID-2	* 64	0~127	KV-20TR23 (US)
	ID-2	* 0	0~127	KV-20TR23 (CND)
	ID-2	* 32	0~127	KV-2150R/2160WR
53	ID-3	* 0	0~127	Model ID
54	ID-4	* 16	0~127	Model ID

* : Set-up value

Note : No.from 1 to 54 is to show adjusment order.



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

KV-20TR23 (US)

No	Disp.	Disp.	Data
50	ID-0	1 0 0 0 0 0 0	64
51	ID-1	0 0 0 0 0 0 0	0
52	ID-2	1 0 0 0 0 0 0	64
53	ID-3	0 0 0 0 0 0 0	0
54	ID-4	0 0 1 0 0 0 0	16

KV-20TR23 (CND)

No.	Disp.	Disp.	Data
50	ID-0	1 0 0 0 0 0 0	64
51	ID-1	0 0 0 0 0 0 0	0
52	ID-2	0 0 0 0 0 0 0	0
53	ID-3	0 0 0 0 0 0 0	0
54	ID-4	0 0 1 0 0 0 0	16

KV-2150R/2160WR

No.	Disp.	Disp.	Data
50	ID-0	1 0 0 0 0 0 0	64
51	ID-1	0 0 0 0 0 0 0	0
52	ID-2	0 1 0 0 0 0 0	32
53	ID-3	0 0 0 0 0 0 0	0
54	ID-4	0 0 1 0 0 0 0	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)

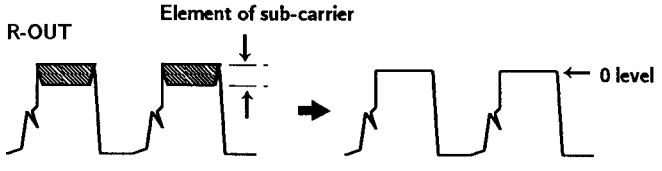
1. Input a color-bar signal.
2. Set to Service adjustment Mode.
3. Connect a frequency counter to base of Q550 (TP-86 H.DRIVE).
4. Call the item of AFC, set to 3 level (free run).
5. Select HFRE with 1 and 4.
6. Adjust with 3 and 6 for the 15734± 60Hz.
7. Call the item of AFC again, adjust the level" 0 ".
8. Write into the memory by pressing MUTING then ENTER.

V.FREQUENCY ADJUSTMENT (VFRE)

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 .

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.



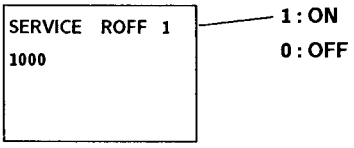
6. Write the memory by pressing MUTING then ENTER .

SUB CONTRAST ADJUSTMENT (SPIX)

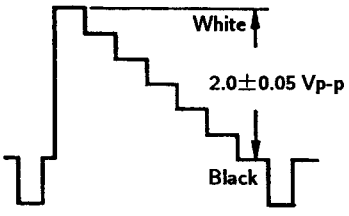
1. Input a color-bar signal.
2. Set to Service adjustment Mode.
3. Set the conditions as follows.

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

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 2.0±0.05Vp-p.

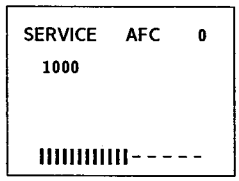


7. Write the memory by pressing MUTING then ENTER .
8. Return the following back to normal after adjustment.

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 .

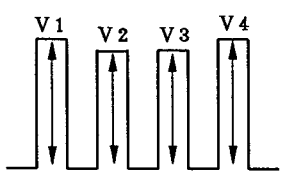


SUB BRIGHT ADJUSTMENT (SBRT)

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).

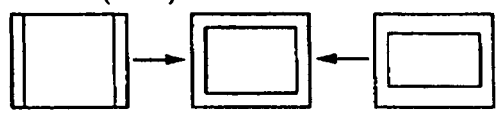


6. Write into the memory by pressing MUTING then ENTER .

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 .

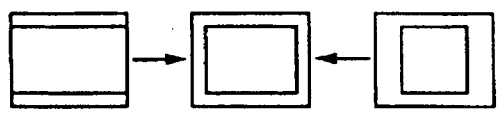
V. SIZE (VSIZ)



H.SIZE ADJUSTMENT (HSIZ)

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

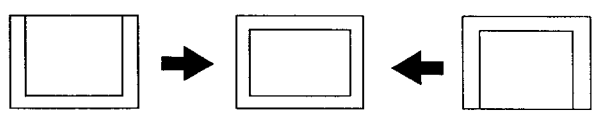
H. SIZE (HSIZ)



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)

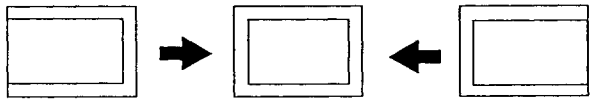


H.CENTER ADJUSTMENT (H POS)

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.

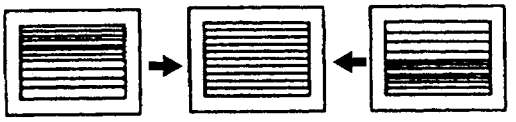
H. CENTER (HPOS)



V LINEARITY(VLIN), VS CORRECTION(VSCO), PIN AMP(PAMP), CORNER PIN(CPIN), AND PIN PHASE(PPHA) ADJUSTMENTS

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

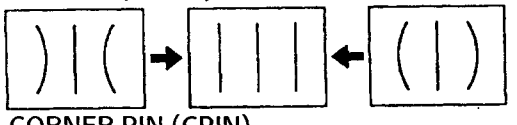
V LINEARITY (VLIN)



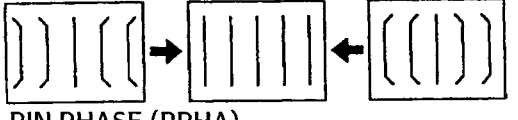
VS CORRECTION (VSCO)



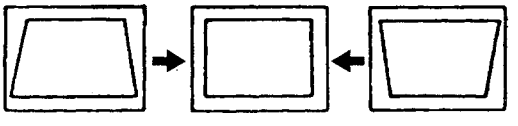
PIN AMP (PAMP)



CORNER PIN (CPIN)



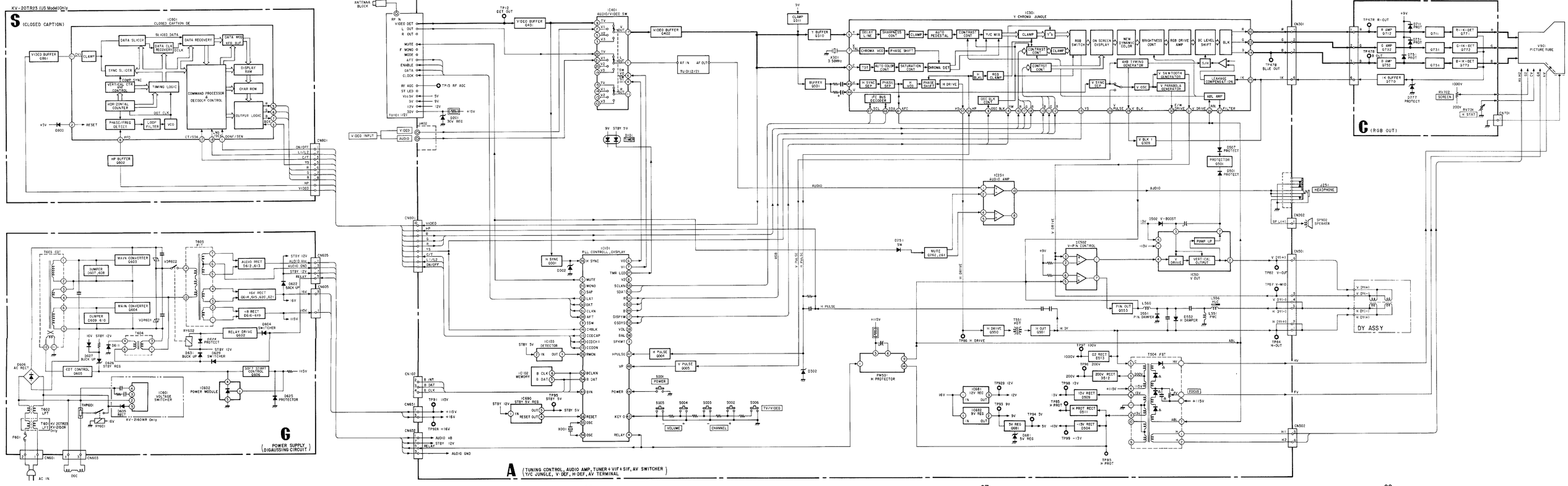
PIN PHASE (PPHA)



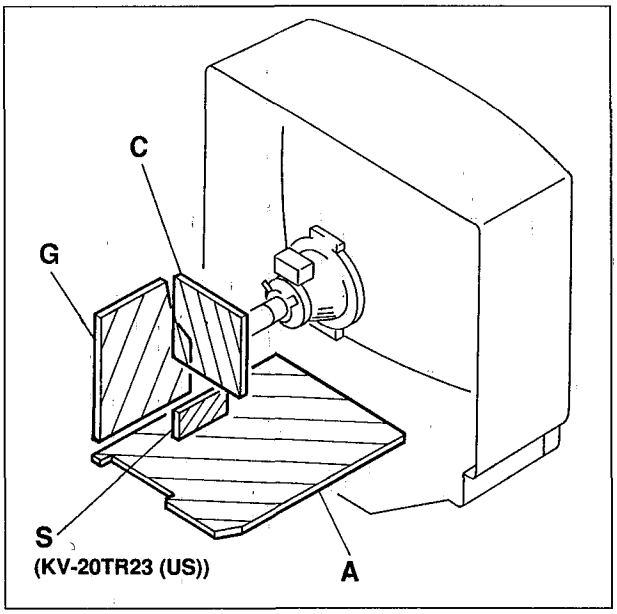
KV-20TR23/2160WR/2150R RM-Y116 KV-20TR23/2160WR/2150R RM-Y116

SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM



6-2. CIRCUIT BOARDS LOCATION



(KV-20TR23 (US))

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 R511 and R537 on page 27,28)
- When replacing the part in below table be sure to parform the related adjustment.

Part replaced (◪)		Adjustment (⧓)
C524, R511, R534, R549, R565, PM501 IC602, R637	A BOARD G BOARD	B+ HOLD-DOWN (R511)
D511, C523, C524, R534, R535, R537 R549, R565, T504 PM501 IC602, R637 DY	A BOARD G BOARD	HV HOLD-DOWN (R537)

- 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.

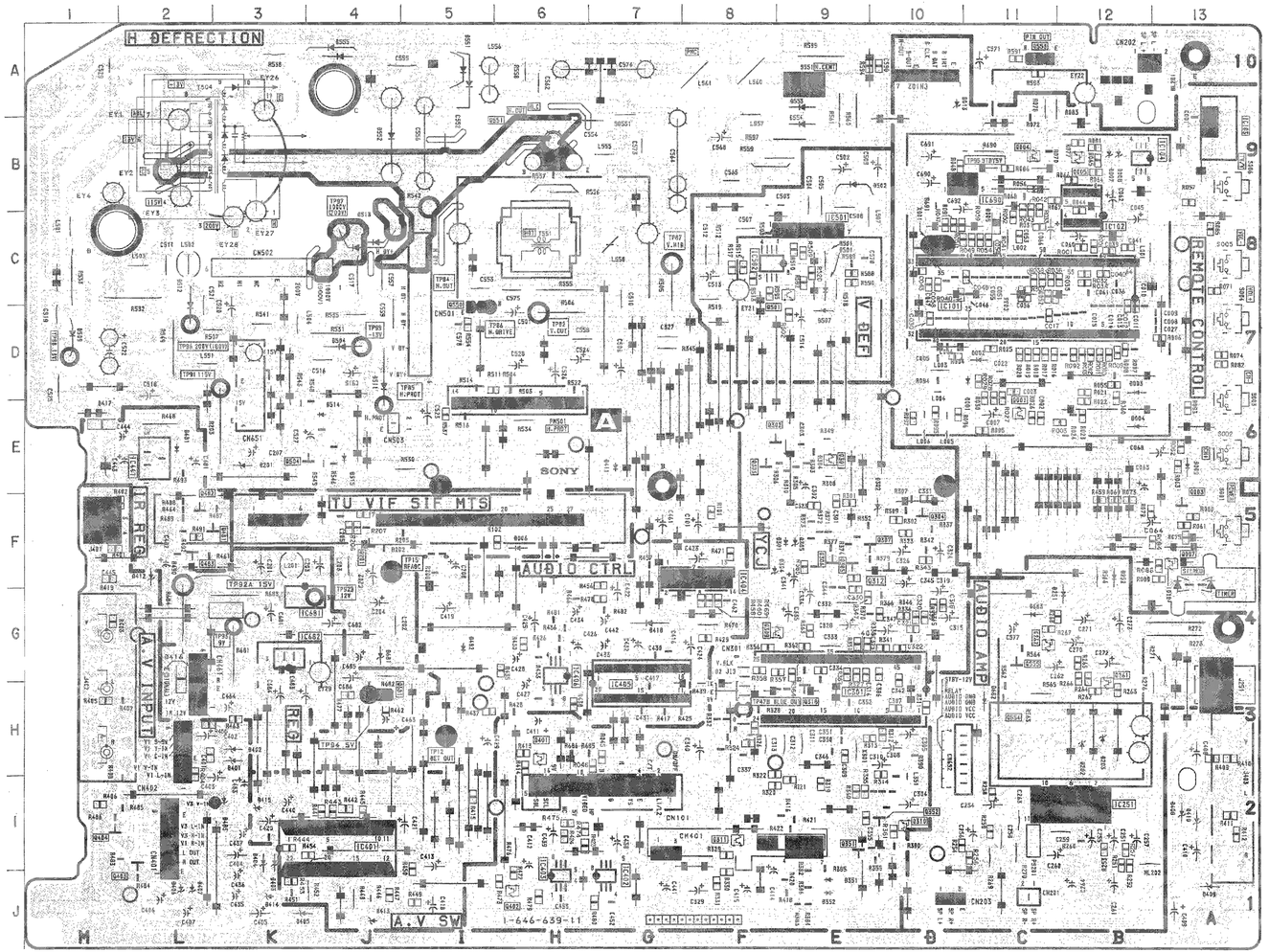
The symbol indicate fast operating fuse. Replace only with fuse of same rating as marked.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. 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.

A TUNING CONTROL, Y/C JUNGLE, TUNER + VIF + MTS
VERTICAL DEFLECTION, HORIZONTAL DEFLECTION, AUDIO AMP
AV SWITCHER, AV TERMINAL

— A Board —



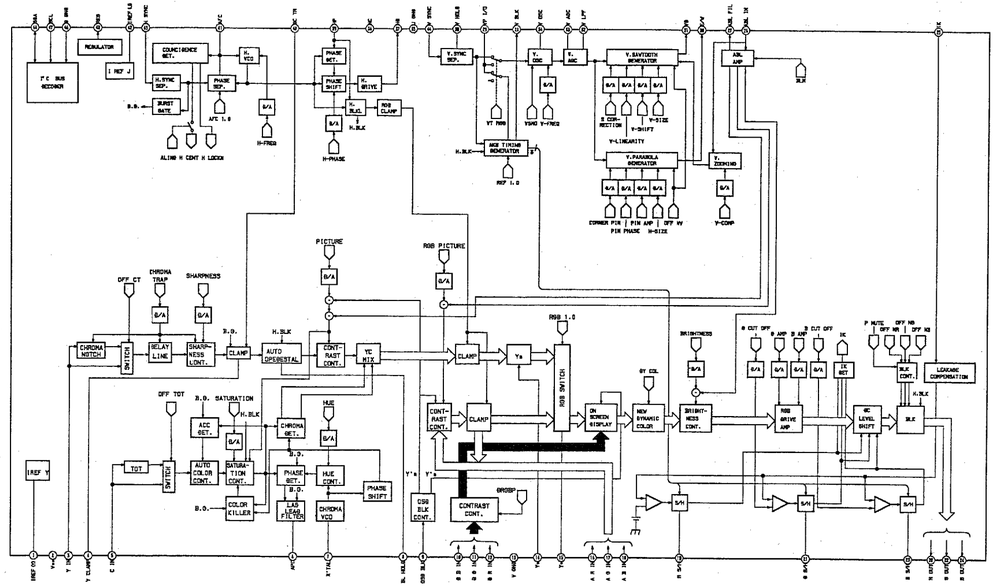
KV-20TR23/2160WR/2150R
RM-Y116

— A BOARD —

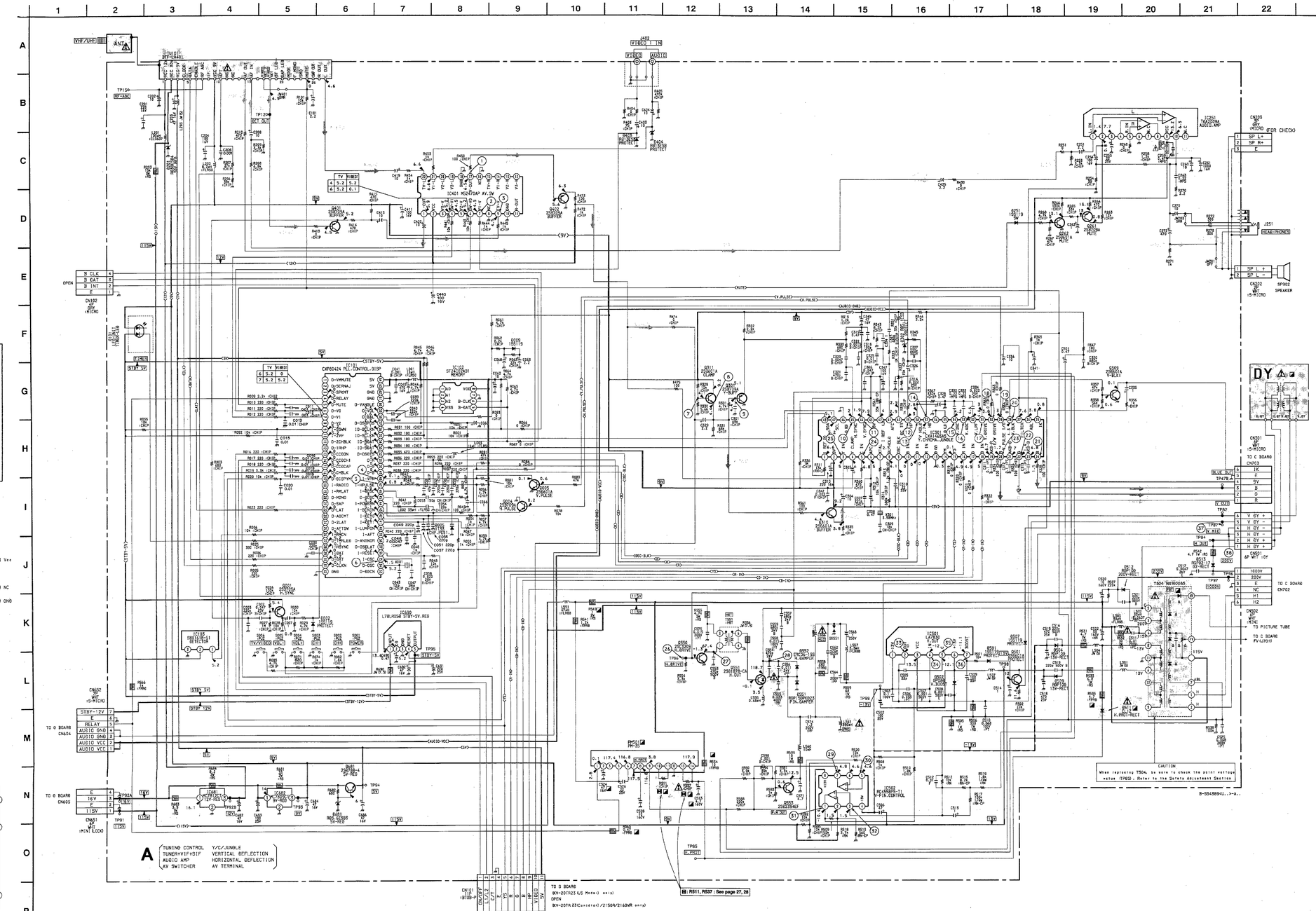
IC		DIODE	
IC101	D-11	D002	D-11
IC102	B-12	D005	C-11
IC103	B-13	D006	F-6
IC251	I-12	D101	F-13
IC301	H-6	D201	E-3
IC401	I-4	D251	G-12
IC501	C-9	D302	F-10
IC502	C-8	D403	I-3
IC681	G-3	D404	I-3
IC682	G-3	D501	C-9
IC690	B-11	D502	B-9
PM501	E-6	D504	D-4
		D507	D-9
		D509	D-11
TRANSISTOR		D511	D-4
		D512	D-2
Q001	E-11	D513	C-4
Q004	B-11	D551	A-4
Q005	B-12	D552	B-4
Q261	G-12	D681	G-4
Q262	G-11		
Q301	E-9	TEST POINT	
Q309	C-8		
Q310	I-10	TP15	F-5
Q311	I-8	TP82	D-6
Q401	H-6	TP84	C-5
Q402	J-6	TP85	E-5
Q501	C-9	TP86	D-5
Q550	C-5	TP87	C-7
Q551	B-6	TP89	D-1
Q553	A-11	TP91	D-2
Q581	H-6	TP92A	G-2
		TP92B	G-4
		TP93	G-3
		TP94	H-4
		TP96	D-2
		TP97	C-4
		TP99	D-4

KV-20TR23/2160WR/2150R
RM-Y116

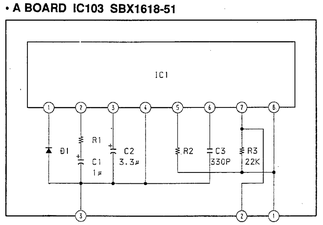
• A BOARD IC301 CXA1465AS



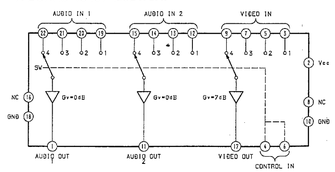
NOTE:
The circuit indicated as left contains high voltage of over 600Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.



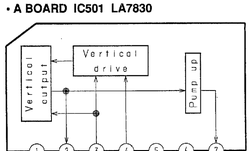
• A BOARD IC103 SBX1618-51



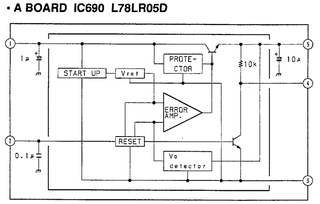
• A BOARD IC401 M52470AP



• A BOARD IC501 LA7830

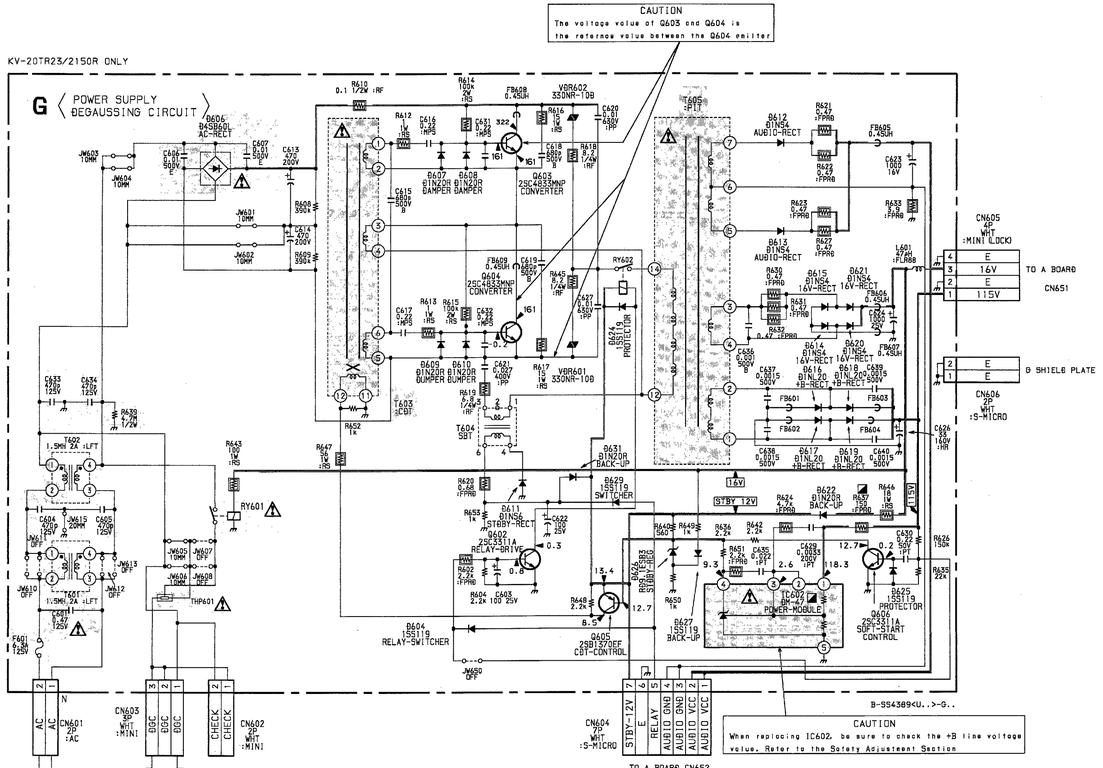


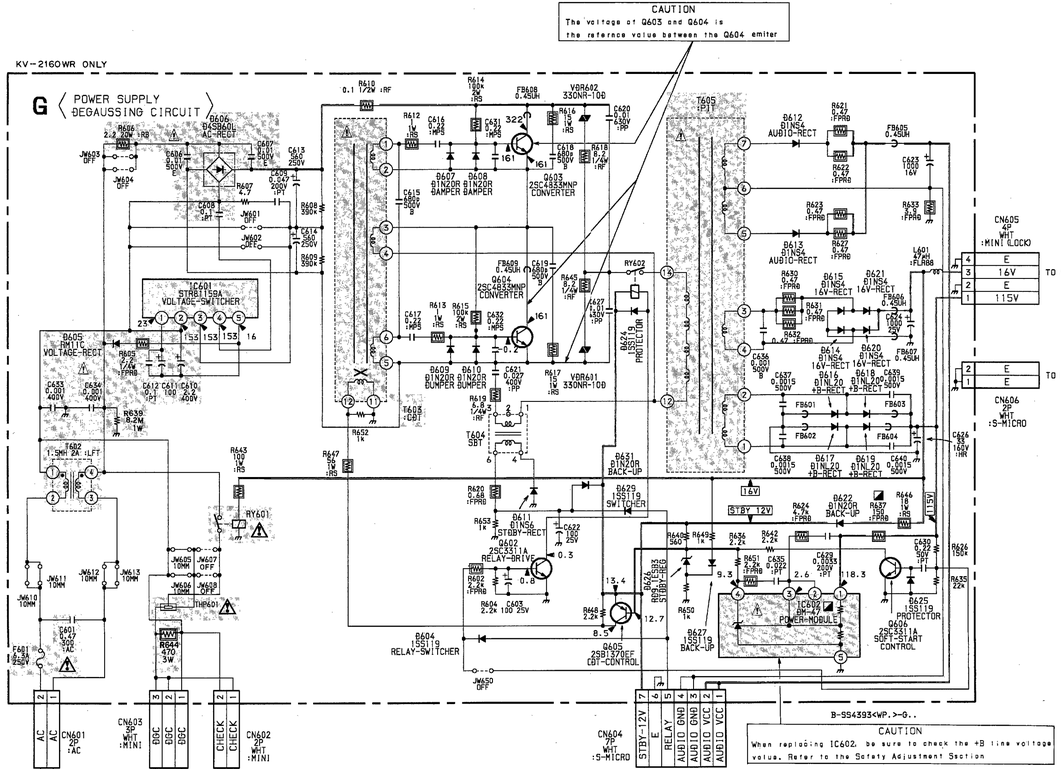
• A BOARD IC690 L78LR05D



— A Board —

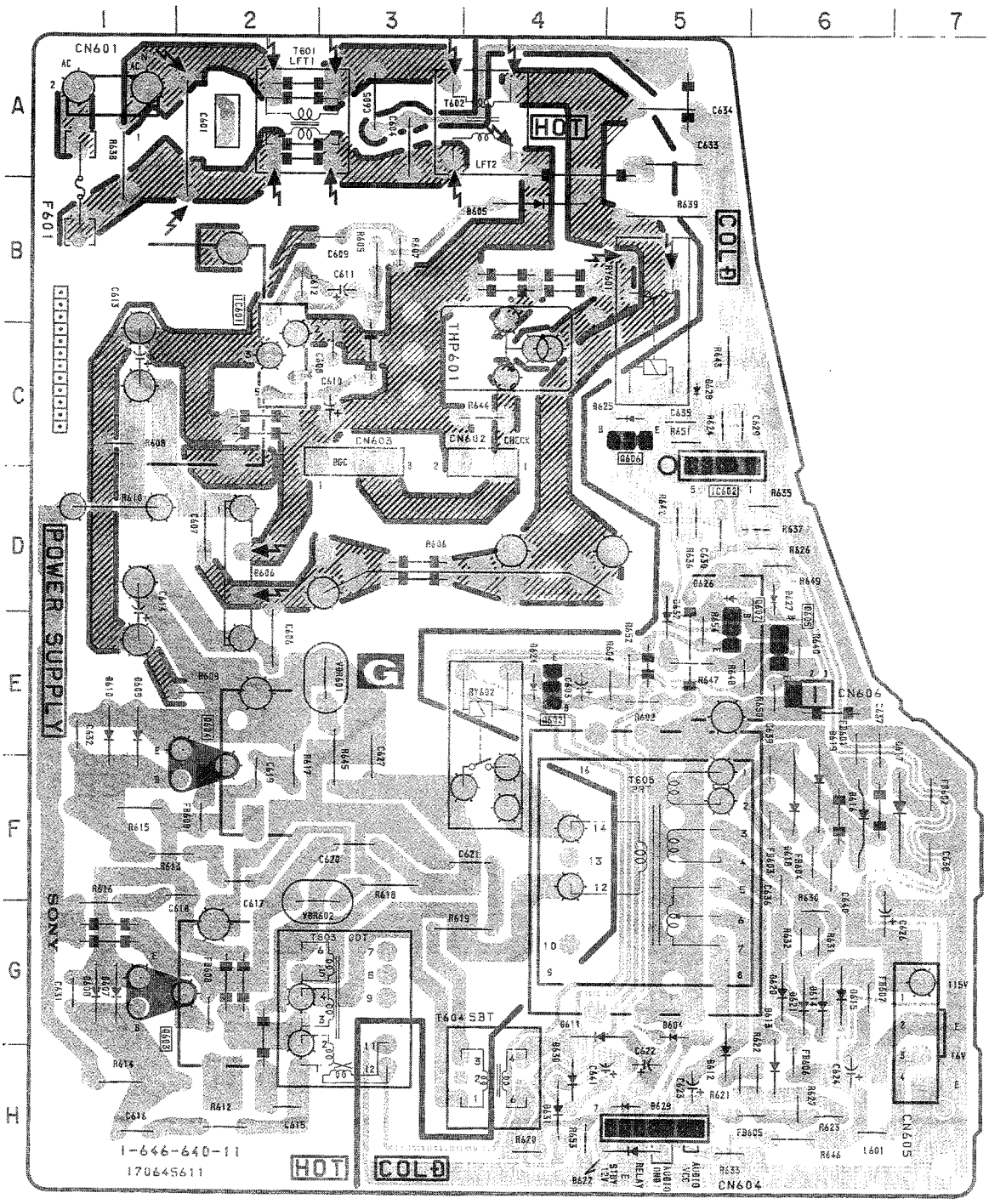
① TV IN 2.6 Vp-p (H)	① VIDEO IN 2.2 Vp-p (H)	② VIDEO 1 1 Vp-p (H)
③ TV IN 1.2 Vp-p (H)	④ 5 Vp-p (V)	⑤ 5 Vp-p (H)
⑥ 5 Vp-p (4.2MHz)	⑦ 0.8Vp-p (H)	⑧ 2.3 Vp-p (H)
⑨ 2 Vp-p (H)	⑩ 1.6 Vp-p (H)	⑪ 1.6 Vp-p (H)
⑫ 5.3 Vp-p (H)	⑬ 0.35Vp-p (V)	⑭ 4 Vp-p (H)
⑮ 1.6 Vp-p (V)	⑯ 2 Vp-p (V)	⑰ 1.3 Vp-p (V)
⑱ 2 Vp-p (V)	⑲ 3.6 Vp-p (V)	⑳ 4.6 Vp-p (V)
㉑ 4.2 Vp-p (H)	㉒ 4 Vp-p (H)	㉓ 4.2 Vp-p (H)
㉔ 2.4 Vp-p (H)	㉕ 2.4Vp-p (H)	㉖ 3.5 Vp-p (H)
㉗ 150 Vp-p (H)	㉘ 880 Vp-p (H)	㉙ 17 Vp-p (V)
㉚ 1 Vp-p (V)	㉛ 4 Vp-p (V)	㉜ 0.5 Vp-p (V)
㉝ 52 Vp-p (V)	㉞ 3.2 Vp-p (V)	㉟ 4.3 Vp-p (V)
㊱ 4.3Vp-p (V)	㊲ 3 Vp-p (V)	㊳ 1.5 Vp-p (V)


KV-20TR23/2150R ONLY
G POWER SUPPLY DEGAUSSING CIRCUIT
CAUTION
The voltage value of Q605 and Q604 is the reference value between the Q604 emitter
CAUTION
When replacing IC602, be sure to check the +B line voltage value. Refer to the Safety Adjustment Section
B-SS4389<U..>-G..
TO A BOARD CN652
CAUTION (US MODEL ONLY)
This set is equipped with a polarized ac power cord plug (one blade of the plug is wider than the other). When replacing the ac power cord, be sure to connect it with specified part number as shown in this diagram.
120V AC 60Hz
CN605 4P WHT :MINI CLOCK
TO A BOARD CN651
TO SHIELD PLATE
CN606 2P WHT :S-MICRO


KV-2160WR ONLY
G POWER SUPPLY DEGAUSSING CIRCUIT
CAUTION
The voltage of Q605 and Q604 is the reference value between the Q604 emitter
CAUTION
When replacing IC602, be sure to check the +B line voltage value. Refer to the Safety Adjustment Section
B-SS4393<WP.>-G..
TO A BOARD CN652
110-127V AC 220-240V AC 50/60Hz
CN605 4P WHT :MINI CLOCK
TO A BOARD CN651
TO PICTURE TUBE
CN606 2P WHT :S-MICRO

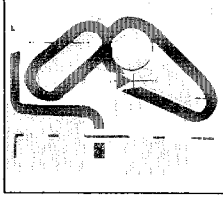
G [POWER SUPPLY, DEGAUSSING CIRCUIT]

— G Board —



— G Board —

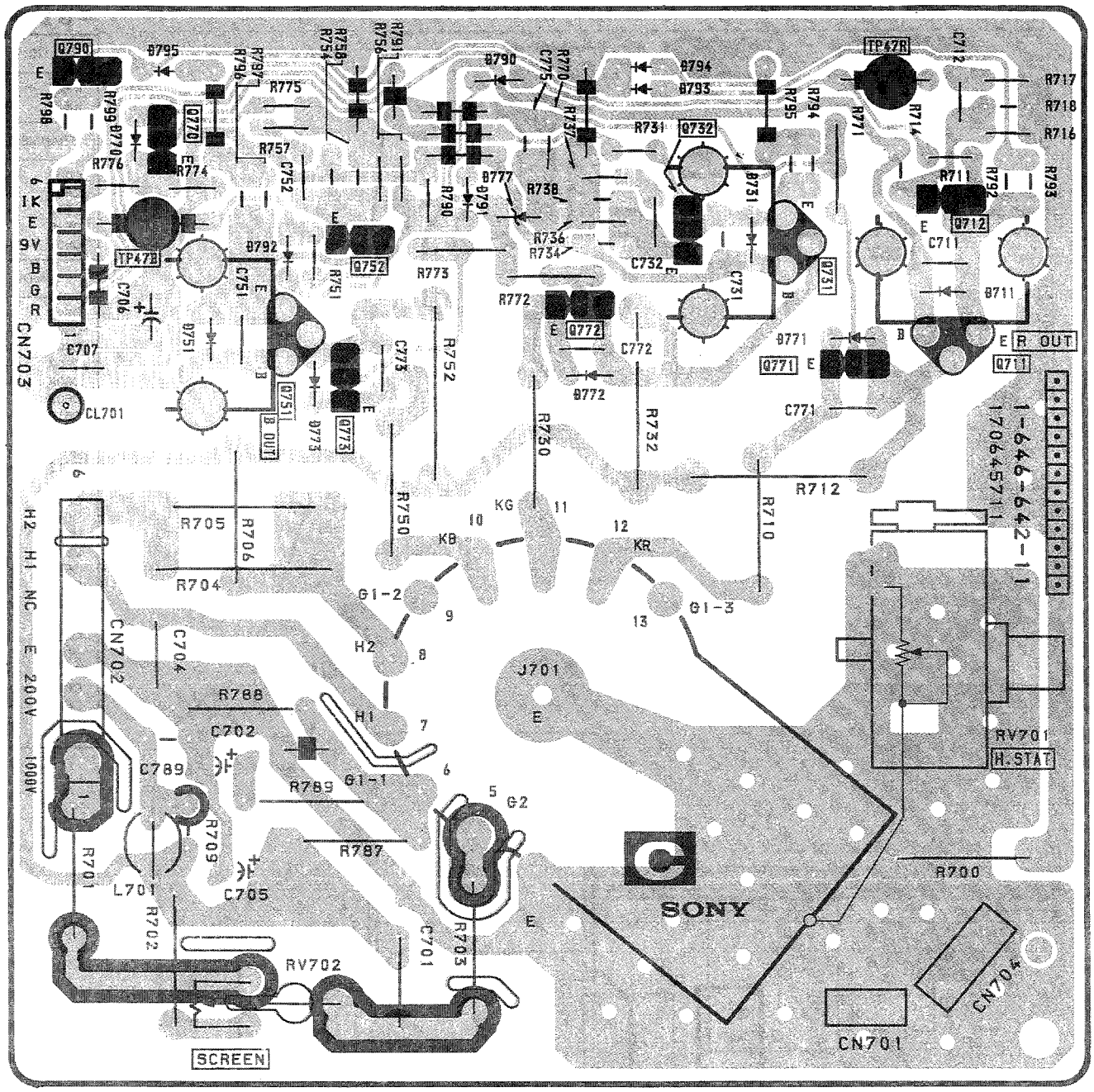
IC	
IC601	B-3
IC602	C-5
TRANSISTOR	
Q602	E-4
Q603	G-1
Q604	F-2
Q605	E-6
Q606	C-5
DIODE	
D604	G-5
D605	B-4
D606	D-2
D607	G-1
D608	G-1
D609	E-1
D610	E-1
D611	G-4
D612	H-5
D613	H-6
D614	G-6
D615	G-6
D616	F-6
D617	F-7
D618	F-6
D619	F-6
D620	G-6
D621	G-6
D622	H-5
D624	E-4
D625	C-5
D626	E-5
D627	D-6
D629	H-5
D631	H-4



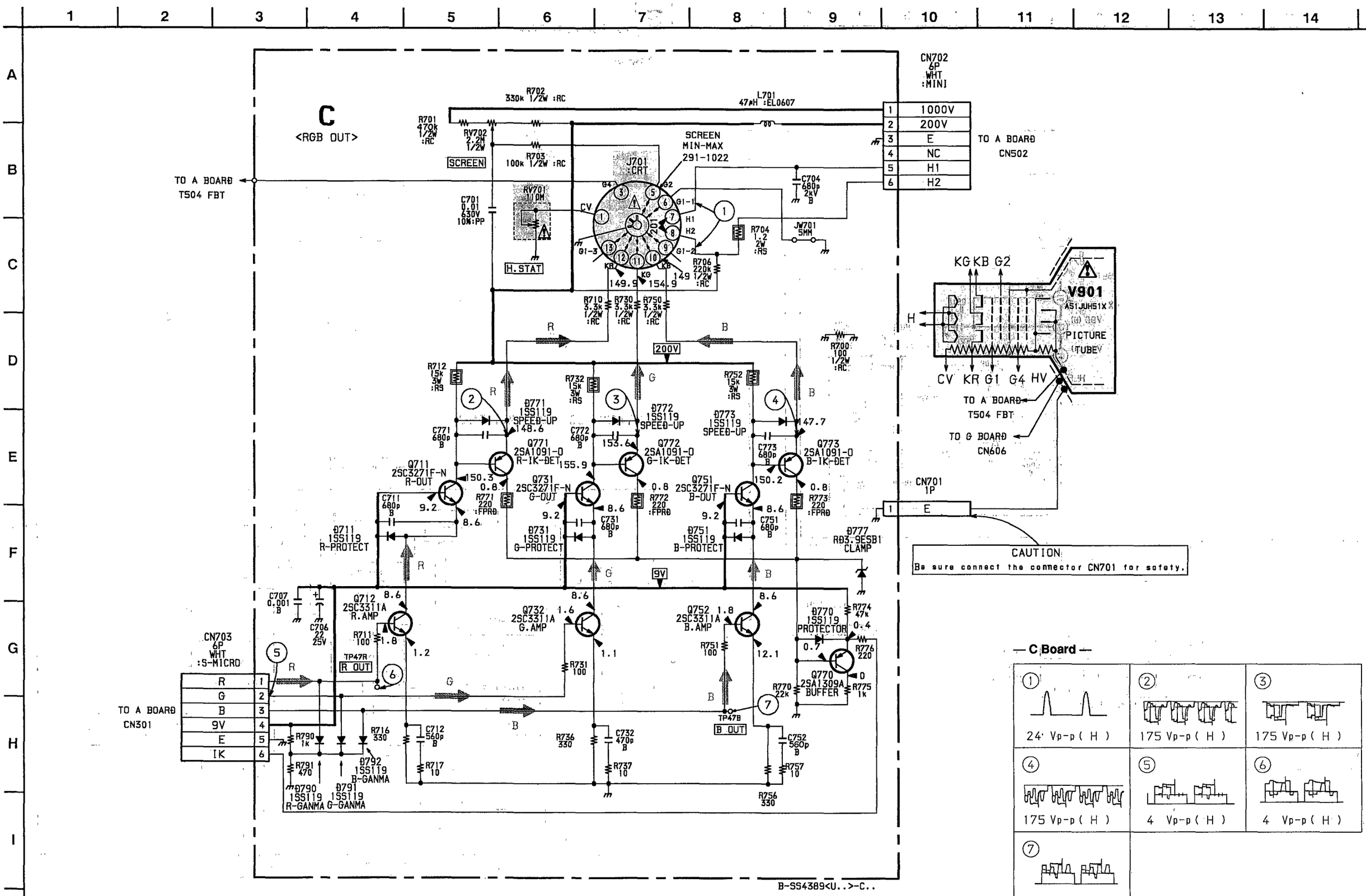
NOTE:
The circuit indicated as left contains high voltage of over 600Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

C [R.G.B. OUT]

— C Board —



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

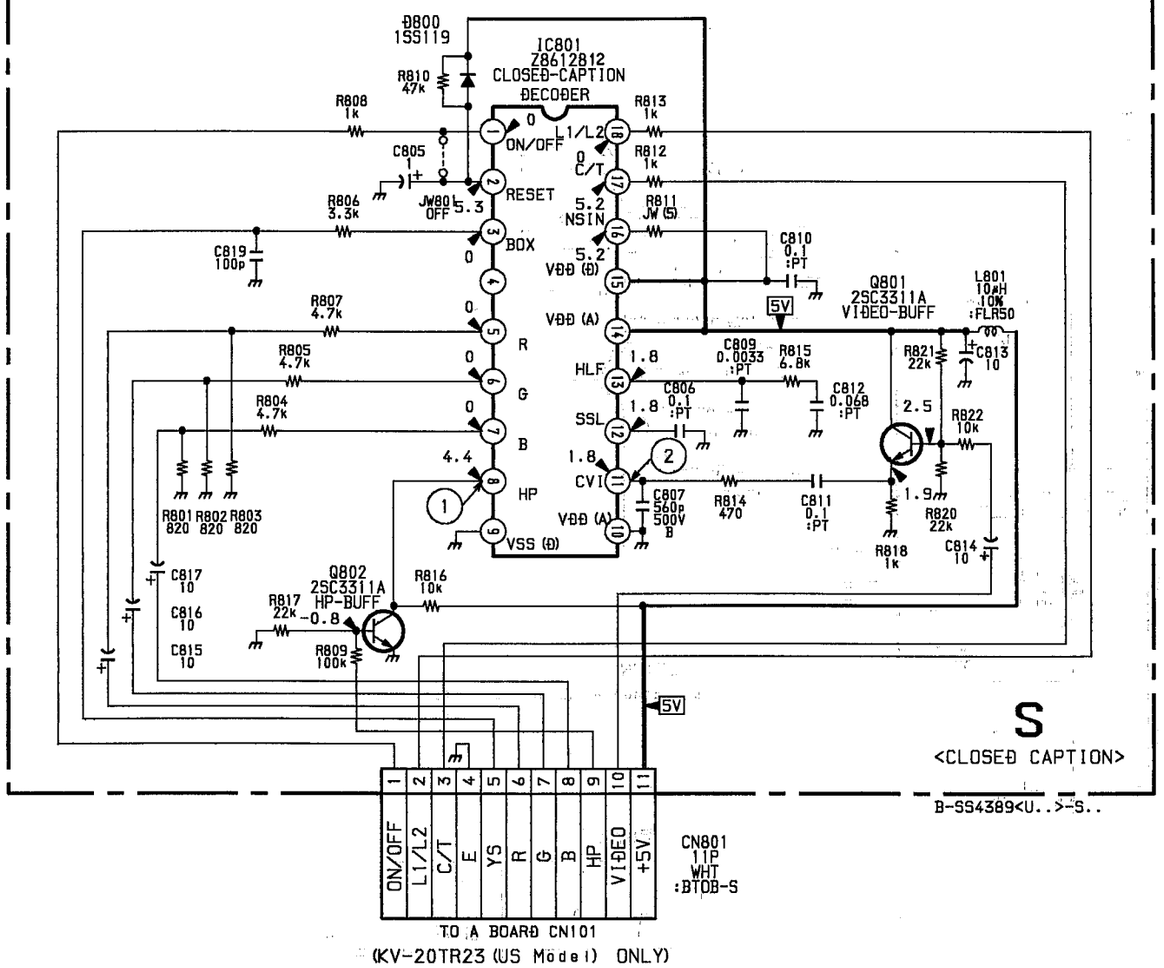


— C Board —

① 24 Vp-p (H)	② 175 Vp-p (H)	③ 175 Vp-p (H)
④ 175 Vp-p (H)	⑤ 4 Vp-p (H)	⑥ 4 Vp-p (H)
⑦ 4 Vp-p (H)		

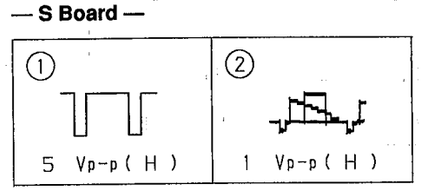
KV-20TR23/2160WR/2150R
RM-Y116

KV-20TR23 (US Model) ONLY



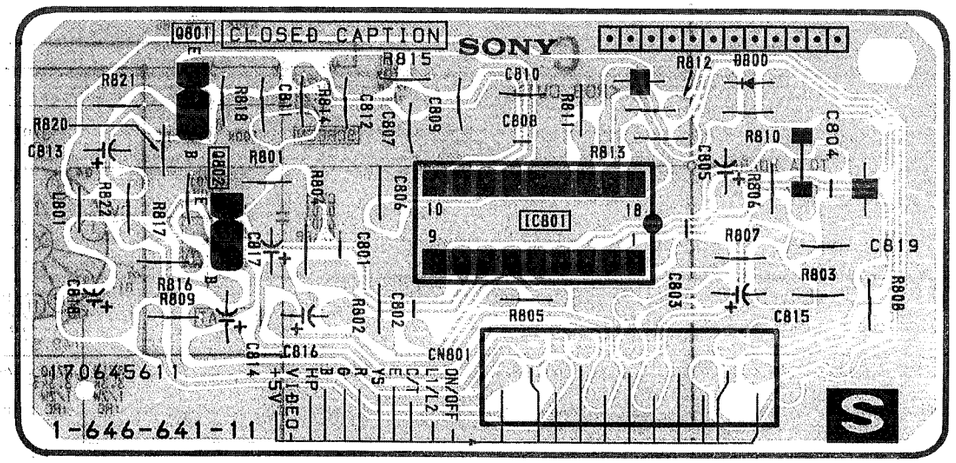
S
<CLOSED CAPTION>
B-SS4389<U..>-S..

— S Board —

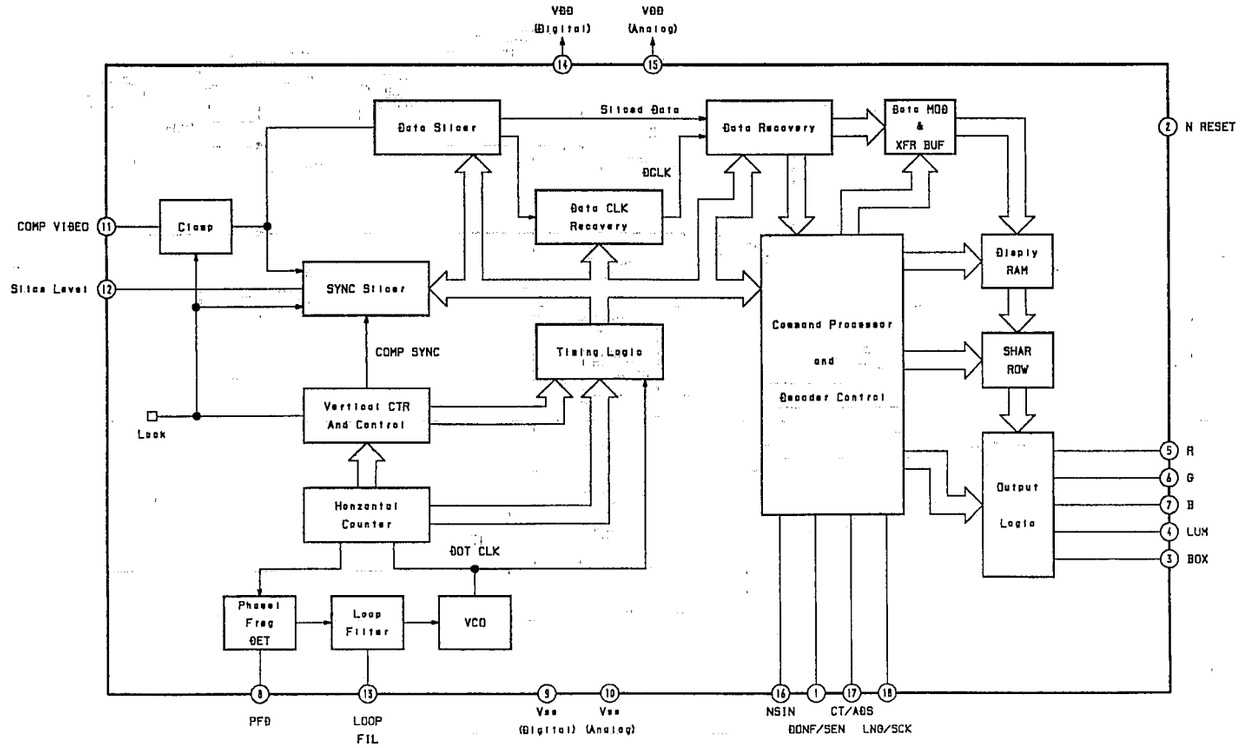


S [CLOSED CAPTION]

— S Board —

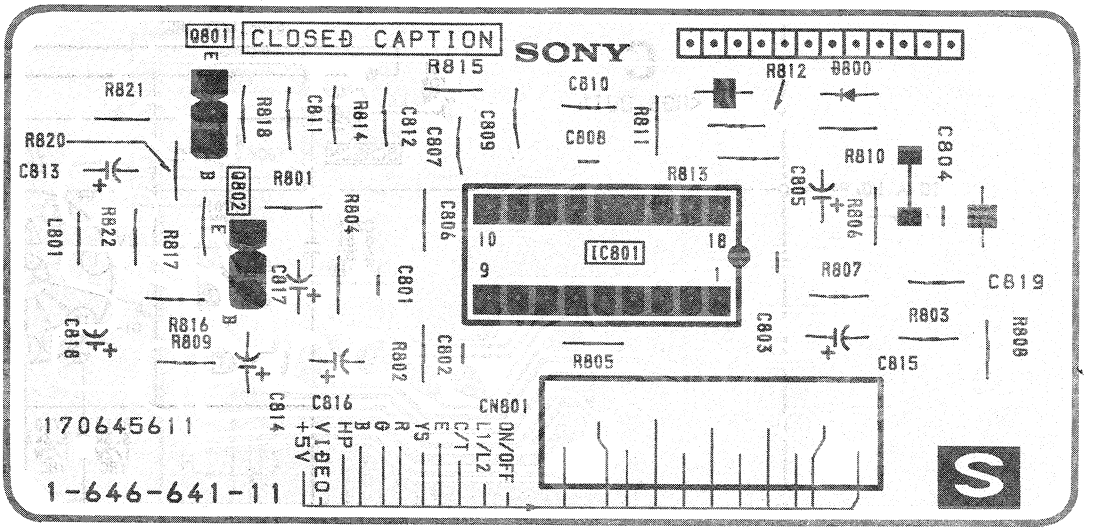


• S BOARD IC801 Z8612812PSC

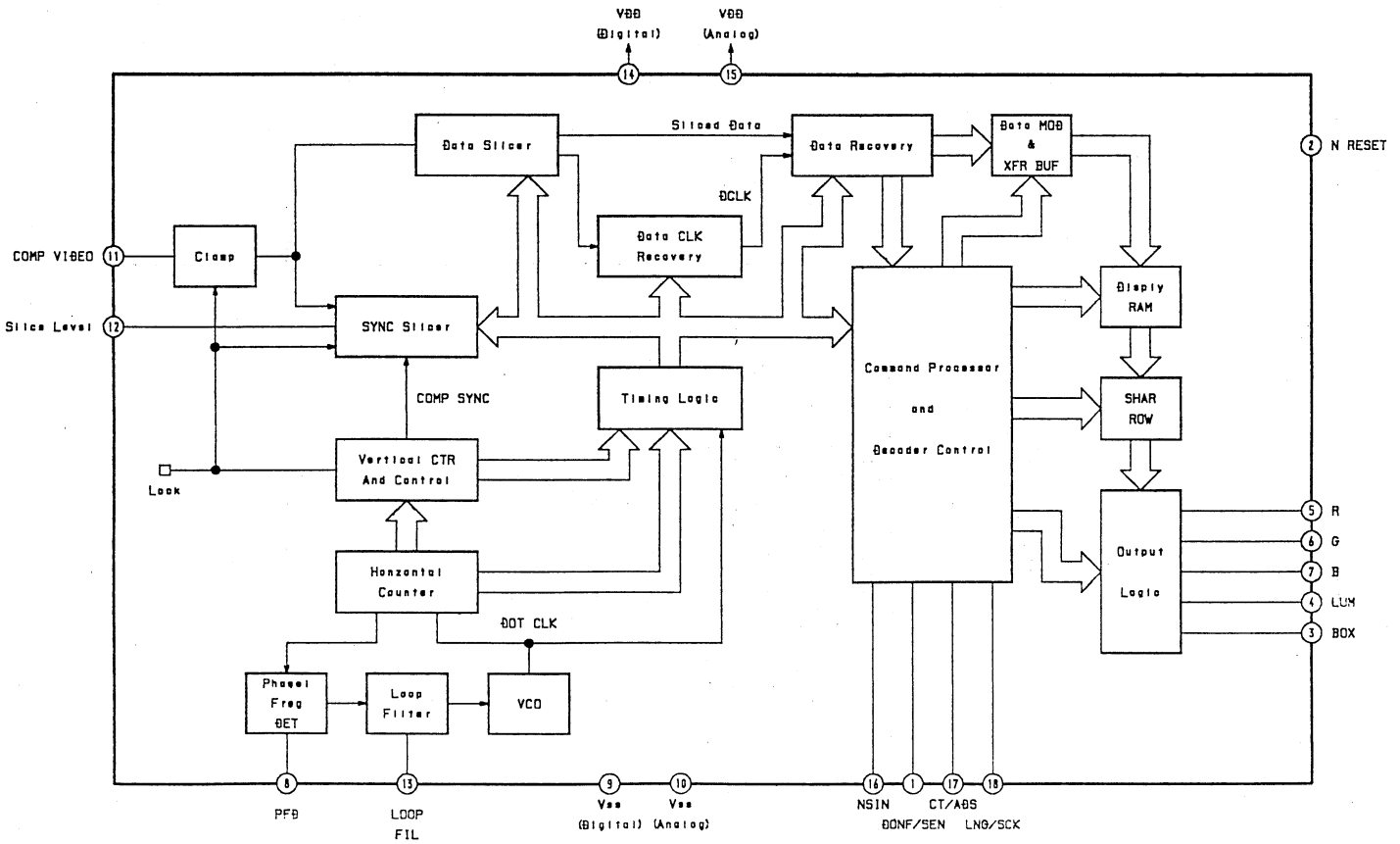


S [CLOSED CAPTION]

— S Board —



• S BOARD IC801 Z8612812PSC



SECTION 7
EXPLODED VIEW

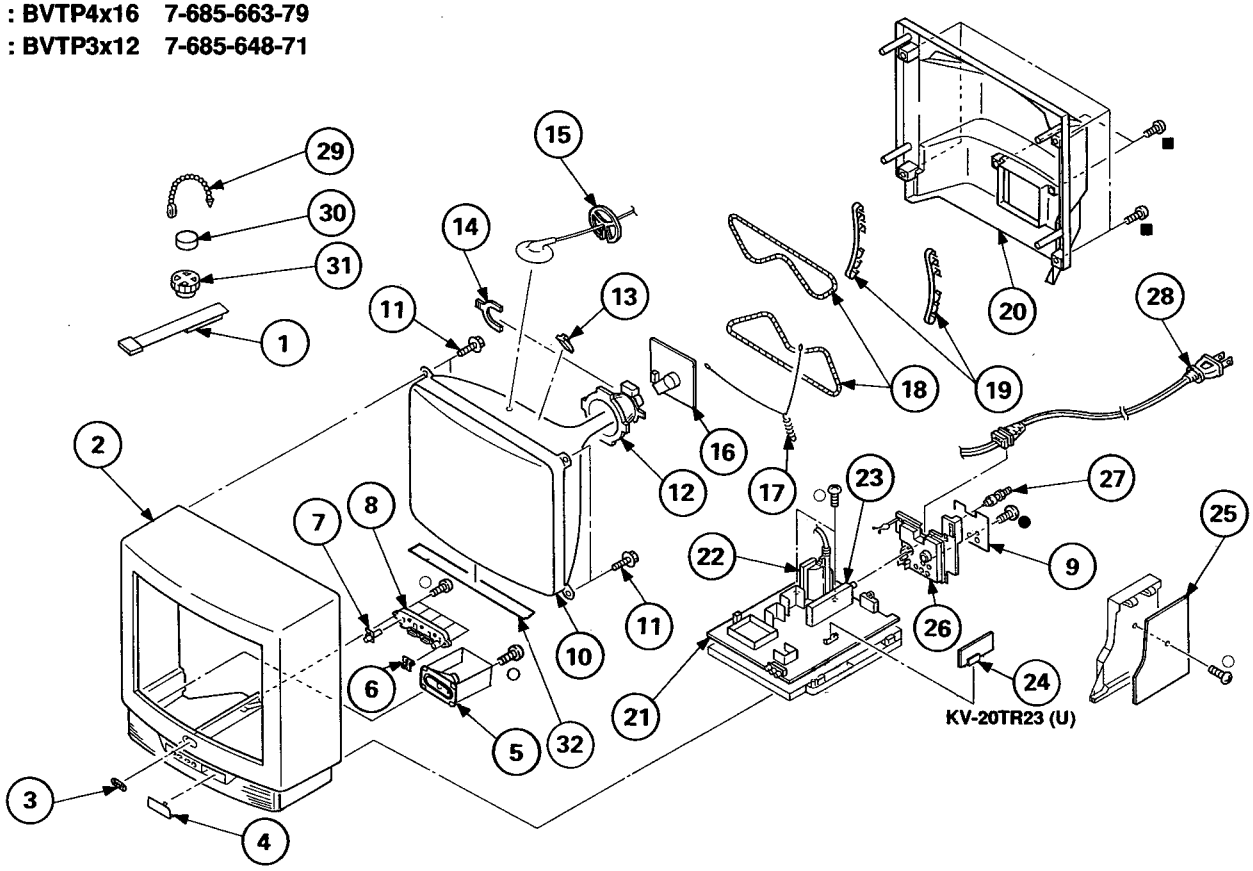
NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine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

● : BVTP3x12 7-685-648-79 (BLACK)
■ : BVTP4x16 7-685-663-79
○ : BVTP3x12 7-685-648-71



REF.NO.	PART NO.	DESCRIPTION	REMARK
1	X-4308-815-0	PERMALLOY ASSY, CONVERGENCE	
2	4-039-678-01	CABINET (WITH BEZEL)	
3	4-394-072-01	EMBLEM (NO.8), SONY	
4	4-039-596-01	DOOR, CONTROL	
5	1-504-252-11	SPEAKER (9X5CM)	
6	4-039-594-11	GUIDE, LED	
7	4-039-589-01	FILTER, REMOTE	
8	4-039-595-01	BUTTON, MULTI	
9	4-039-677-01	LABEL, TERMINAL	
10	⚠.8-738-764-05	PICTURE TUBE (A51JUH51X)	
11	4-365-808-01	SCREW (5), TAPPING	
12	⚠.1-451-280-11	DEFLECTION YOKE (Y21PXA2)	
13	3-704-495-01	SPACER, DY	
14	1-452-277-00	MAGNET, BMC	
15	*3-704-372-01	HOLDER, HV CABLE	
16	*A-1331-246-A	C BOARD, COMPLETE	
17	*4-375-394-01	SPRING, TENSION	
18	⚠.1-426-358-31	COIL, DEMAGNETIZATION (KV-20TR23(U/C),2150R)	
	⚠.1-426-368-11	COIL, DEMAGNETIZATION (KV-2160WR)	
19	*4-369-319-00	BAND, COIL	
20	4-039-603-01	COVER, REAR	
21	*A-1297-059-A	A BOARD, COMPLETE	
22	⚠.1-453-141-11	TRANSFORMER ASSY, FLYBACK (NX-1600A5)	
23	⚠.8-598-047-00	TUNER (BTF-LA401)	
24	*A-1394-414-A	S BOARD, COMPLETE (KV-20TR23(U))	
25	*A-1316-146-A	G BOARD, COMPLETE (KV-20TR23(U/C),2150R)	
	*A-1316-148-A	G BOARD, COMPLETE (KV-2160WR)	
26	⚠ 4-039-601-01	TERMINAL BOARD, ANTENNA	
27	1-573-657-11	PLUG, F-PIN	
28	⚠.1-751-057-11	CORD, POWER (WITH CONNECTOR) (KV-20TR23(U/C),2150R)	
	⚠.1-751-056-11	CORD, POWER (WITH CONNECTOR) (KV-2160WR)	
29	4-308-870-00	CLIP, LEAD WIRE	
30	1-452-032-00	MAGNET, DISK; 10MM φ	
31	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM φ	
32	4-385-725-01	SHEET BLOTTING	

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-1297-059-A	A BOARD, COMPLETE			
		**********			
	4-382-854-11	SCREW (M3X10), P, SW (+)			
		<CAPACITOR>			
C002	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C003	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C007	1-124-903-11	ELECT 1MF	20%	50V	
C011	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C012	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C013	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C014	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C015	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C016	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C017	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C018	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C019	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C020	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C030	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C039	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C040	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C041	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C043	1-163-159-00	CERAMIC CHIP 12PF	2%	50V	
C045	1-126-103-11	ELECT 470MF	20%	16V	
C046	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V	
C047	1-104-896-91	CERAMIC CHIP 24PF	2%	50V	
C048	1-216-049-00	METAL GLAZE 1K 5%	1/10W		
C049	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C050	1-163-109-00	CERAMIC CHIP 47PF	5%	50V	
C051	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C052	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C053	1-163-121-00	CERAMIC CHIP 150PF	5%	50V	
C054	1-163-253-11	CERAMIC CHIP 120PF	5%	50V	
C055	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C056	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C057	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C058	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V	
C059	1-163-125-00	CERAMIC CHIP 220PF	5%	50V	
C060	1-124-903-11	ELECT 1MF	20%	50V	
C062	1-124-907-11	ELECT 10MF	20%	50V	
C063	1-124-925-11	ELECT 2.2MF	20%	50V	
C066	1-124-903-11	ELECT 1MF	20%	50V	
C101	1-124-925-11	ELECT 2.2MF	20%	50V	
C201	1-124-120-11	ELECT 220MF	20%	16V	
C202	1-124-907-11	ELECT 10MF	20%	50V	
C203	1-124-477-11	ELECT 47MF	20%	16V	
C204	1-126-101-11	ELECT 100MF	20%	16V	
C206	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	
C208	1-124-907-11	ELECT 10MF	20%	50V	
C251	1-124-925-11	ELECT 2.2MF	20%	50V	
C254	1-126-101-11	ELECT 100MF	20%	16V	
C255	1-124-916-11	ELECT 22MF	20%	25V	
C259	1-136-173-00	FILM 0.47MF	5%	50V	
C260	1-124-907-11	ELECT 10MF	20%	50V	
C261	1-124-360-00	ELECT 1000MF	20%	16V	
C262	1-124-925-11	ELECT 2.2MF	20%	50V	
C263	1-136-169-00	FILM 0.22MF	5%	50V	
C270	1-124-907-11	ELECT 10MF	20%	50V	
C272	1-126-103-11	ELECT 470MF	20%	16V	
C301	1-163-113-00	CERAMIC CHIP 68PF	5%	50V	
C304	1-124-907-11	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	1-124-916-11	ELECT 22MF	20%	25V	
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	1-124-120-11	ELECT 220MF	20%	16V	
C318	1-163-117-00	CERAMIC CHIP 100PF	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	1-124-903-11	ELECT 1MF	20%	50V	
C327	1-102-244-00	CERAMIC 220PF	10%	500V	
C328	1-124-902-00	ELECT 0.47MF	20%	50V	
C329	1-124-925-11	ELECT 2.2MF	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	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V	
C335	1-124-903-11	ELECT 1MF	20%	50V	
C336	1-124-907-11	ELECT 10MF	20%	50V	
C340	1-126-101-11	ELECT 100MF	20%	16V	
C341	1-124-903-11	ELECT 1MF	20%	50V	
C342	1-163-033-00	CERAMIC CHIP 0.022MF		50V	
C345	1-124-477-11	ELECT 47MF	20%	16V	
C347	1-126-101-11	ELECT 100MF	20%	16V	
C403	1-124-907-11	ELECT 10MF	20%	50V	
C404	1-124-903-11	ELECT 1MF	20%	50V	
C413	1-124-907-11	ELECT 10MF	20%	50V	
C419	1-124-903-11	ELECT 1MF	20%	50V	
C420	1-124-907-11	ELECT 10MF	20%	50V	

A

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
C425	1-124-925-11	ELECT	2.2MF	20%	50V
C440	1-126-101-11	ELECT	100MF	20%	16V
C461	1-124-907-11	ELECT	10MF	20%	50V
C501	1-124-902-00	ELECT	0.47MF	20%	50V
C502	1-124-916-11	ELECT	22MF	20%	50V
C504	1-130-489-00	FILM	0.033MF	5%	50V
C505	1-164-058-11	CERAMIC	33PF	5%	50V
C506	1-124-916-11	ELECT	22MF	20%	50V
C507	1-102-038-00	CERAMIC	0.001MF		500V
C508	1-102-038-00	CERAMIC	0.001MF		500V
C509	1-124-122-11	ELECT	100MF	20%	35V
C510	1-137-421-91	FILM	0.068MF	10%	100V
C511 ⚠	1-108-421-91	MYLAR	0.01MF	10%	200V
C512	1-164-096-11	CERAMIC	0.01MF		50V
C513	1-124-903-11	ELECT	1MF	20%	50V
C514	1-124-903-11	ELECT	1MF	20%	50V
C515	1-124-480-11	ELECT	470MF	20%	25V
C516	1-102-244-00	CERAMIC	220PF	10%	500V
C517	1-162-114-00	CERAMIC	0.0047MF		2KV
C518	1-124-480-11	ELECT	470MF	20%	25V
C519	1-102-244-00	CERAMIC	220PF	10%	500V
C520	1-124-046-00	ELECT	10MF	20%	160V
C521	1-102-244-00	CERAMIC	220PF	10%	500V
C522	1-123-024-21	ELECT	33MF		160V
C523	1-123-932-00	ELECT	4.7MF	20%	160V
C524	1-124-477-11	ELECT	47MF	20%	16V
C525	1-106-387-00	MYLAR	0.068MF	10%	200V
C526	1-124-916-11	ELECT	22MF	20%	25V
C528	1-124-046-00	ELECT	10MF	20%	160V
C553	1-102-228-00	CERAMIC	470PF	10%	500V
C554 ⚠	1-162-134-91	CERAMIC	470PF	10%	2KV
C555 ⚠	1-104-750-91	FILM	0.033MF	5%	400V
C556 ⚠	1-136-080-11	FILM	0.011MF	3%	2KV
C557	1-162-116-00	CERAMIC	680PF	10%	2KV
C558	1-137-417-91	FILM	0.015MF	10%	100V
C559	1-162-116-00	CERAMIC	680PF	10%	2KV
C562	1-102-228-00	CERAMIC	470PF	10%	500V
C564	1-136-111-00	FILM	1MF	5%	200V
C568	1-124-634-11	ELECT	1MF	20%	250V
C571	1-124-927-11	ELECT	4.7MF	20%	50V
C574	1-136-569-11	FILM	1.2MF	5%	200V
C575	1-106-371-00	MYLAR	0.015MF		200V
C590	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C682	1-124-477-11	ELECT	47MF	20%	16V
C683	1-124-478-11	ELECT	100MF	20%	25V
C684	1-124-477-11	ELECT	47MF	20%	16V
C686	1-124-477-11	ELECT	47MF	20%	16V
C690	1-124-902-00	ELECT	0.47MF	20%	50V
C691	1-124-120-11	ELECT	220MF	20%	25V
C692	1-124-477-11	ELECT	47MF	20%	16V

<CONNECTOR>

CN101	*1-573-978-11	CONNECTOR, BOARD TO BOARD 11P
CN102	*1-560-124-00	PLUG, CONNECTOR (2.5MM) 4P
CN202	*1-564-505-11	PLUG, CONNECTOR 2P
CN203	*1-560-123-00	PLUG, CONNECTOR (2.5MM) 3P
CN301	*1-564-509-11	PLUG, CONNECTOR 6P
CN501	*1-580-798-11	CONNECTOR PIN (DY) 6P
CN502	*1-508-768-00	PIN, CONNECTOR (5MM PITCH) 6P
CN651	*1-691-135-11	PIN, CONNECTOR (PC BOARD) 4P
CN652	*1-564-510-11	PLUG, CONNECTOR 7P

<DIODE>

D002	8-719-911-19	DIODE 1SS119
D005	8-713-300-57	DIODE 1T33
D009	8-719-911-19	DIODE 1SS119
D101	1-810-039-21	LED UNIT
D201	8-719-110-72	DIODE RD30ES-B2
D251	8-719-911-19	DIODE 1SS119
D302	8-719-109-84	DIODE RD5.1ES-B1
D403	8-719-110-36	DIODE RD13ES-B2
D404	8-719-110-36	DIODE RD13ES-B2
D501	8-719-911-19	DIODE 1SS119
D502	8-719-936-82	DIODE GP08DPKG3
D504	8-719-936-84	DIODE RGP10GPKG3
D507	8-719-911-19	DIODE 1SS119
D509	8-719-936-84	DIODE RGP10GPKG3
D511 ⚠	8-719-302-43	DIODE EL1Z
D512	8-719-936-84	DIODE RGP10GPKG3
D513	8-719-976-64	DIODE RGP02-17
D551	8-719-979-85	DIODE EGP20G
D552	8-719-945-80	DIODE ERC06-15S
D681	8-719-109-90	DIODE RD5.6ES-B3

<IC>

IC101	8-752-841-16	IC CXP80424-065S
IC102	8-759-043-86	IC ST24C02AB1
IC103	8-741-100-62	IC SBX1618-51
IC251	8-759-980-43	IC TDA2009A
IC301	8-752-059-67	IC CXA1465AS
IC401	8-759-634-69	IC M52470P
IC501	8-759-801-98	IC LA7830
IC502	8-759-996-43	IC RC4558PS
IC681	8-759-701-79	IC NJM7812FA
IC682	8-759-982-10	IC RC7809FA
IC690	8-759-805-37	IC L78LR05D-MA

<JACK>

J251	1-750-264-21	JACK
J402	1-750-518-11	JACK BLOCK, PIN 2P

<COIL>

L001	1-410-470-11	INDUCTOR	10UH
L002	1-410-476-11	INDUCTOR	33UH
L003	1-410-470-11	INDUCTOR	10UH
L201	1-410-645-31	INDUCTOR	100UH
L202	1-408-408-00	INDUCTOR	8.2UH
L502	1-410-669-31	INDUCTOR	33UH
L503 ⚠	1-412-531-61	INDUCTOR	33UH
L551	1-412-533-61	INDUCTOR	47UH
L555	1-422-613-11	COIL, AIR CORE	
L556 ⚠	1-459-769-13	COIL, HORIZONTAL LINEARITY	
L557	1-412-553-61	INDUCTOR	3.3MMH
L560	1-459-104-00	COIL, WITH CORE	
L561 ⚠	1-459-390-31	COIL (WITH CORE)	

<MODULE>

PM501	1-810-040-11	PROTECTOR MODULE PM-35

<IC LINK>

PS201 ⚠	1-532-675-91	LINK, IC 1.5A

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REF.NO.	PART NO.	DESCRIPTION				REMARK
		<TRANSISTOR>				
Q001	8-729-422-36	TRANSISTOR 2SB709A-Q				
Q004	8-729-422-36	TRANSISTOR 2SB709A-Q				
Q005	8-729-422-27	TRANSISTOR 2SD601A-Q				
Q261	8-729-422-36	TRANSISTOR 2SB709A-Q				
Q262	8-729-422-27	TRANSISTOR 2SD601A-Q				
Q301	8-729-422-36	TRANSISTOR 2SB709A-Q				
Q309	8-729-422-27	TRANSISTOR 2SD601A-Q				
Q310	8-729-422-27	TRANSISTOR 2SD601A-Q				
Q311	8-729-422-27	TRANSISTOR 2SD601A-Q				
Q401	8-729-422-36	TRANSISTOR 2SB709A-Q				
Q402	8-729-422-36	TRANSISTOR 2SB709A-Q				
Q501	8-729-422-27	TRANSISTOR 2SD601A-Q				
Q550	8-729-140-50	TRANSISTOR 2SC3209LK				
Q551	8-729-821-87	TRANSISTOR 2SD1878-CA				
Q553	8-729-019-01	TRANSISTOR 2SD2394-EF				
Q681	8-729-378-84	TRANSISTOR 2SD788-5				
		<RESISTOR>				
R001	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R003	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R004	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R005	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R006	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R009	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R010	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R011	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R012	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R016	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R017	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R018	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R019	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R020	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R023	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R025	1-216-039-00	METAL GLAZE	390	5%	1/10W	
R026	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R027	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R028	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R029	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R030	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R031	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R032	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R033	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R034	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R035	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R036	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R037	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R038	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R040	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R041	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R042	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R043	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R044	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R045	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R046	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R047	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R048	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R049	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R050	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R051	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R052	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R054	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R055	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	
R059	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R061	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R062	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R063	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R064	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R065	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R066	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R067	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R069	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R071	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R074	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R078	1-249-429-11	CARBON	10K	5%	1/4W	
R081	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R082	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R083	1-249-437-11	CARBON	47K	5%	1/4W	
R085	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R086	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R091	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R092	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R093	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R095	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R096	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R097	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R101	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R203	1-215-924-00	METAL OXIDE	15K	5%	3W	F
R206	1-216-689-11	METAL GLAZE	39K	5%	1/10W	
R207	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R208	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R209	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R210	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R251	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R253	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R254	1-216-015-00	METAL GLAZE	39	5%	1/10W	
R258	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R260	1-216-295-00	METAL GLAZE	0	5%	1/10W	
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	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R268	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R270	1-249-385-11	CARBON	2.2	5%	1/4W	
R271	1-249-417-11	CARBON	1K	5%	1/4W	
R272	1-249-411-11	CARBON	330	5%	1/4W	
R273	1-249-411-11	CARBON	330	5%	1/4W	
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	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R319	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R320	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R321	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R322	1-216-295-00	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	
R326	1-216-025-00	METAL GLAZE	100	5%	1/10W	

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G (KV-20TR23(U/C)/2150R)

• 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.

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
R327	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R328	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R329	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R330	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R331	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R335	1-216-049-00	METAL GLAZE	1K	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	1-249-429-11	CARBON	10K	5%	1/4W	
R346	1-249-421-11	CARBON	2.2K	5%	1/4W	
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	
R357	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R358	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R360	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R361	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R362	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R363	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R364	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R365	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R367	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R403	1-216-022-00	METAL GLAZE	75	5%	1/10W	
R404	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R405	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R413	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R414	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R415	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R430	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R441	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R443	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R444	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R445	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R450	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R453	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R454	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R459	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R472	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R473	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R474	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R475	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R501	1-249-429-11	CARBON	10K	5%	1/4W	
R502	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	1-247-887-00	CARBON	220K	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 ⚠		METAL			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	1-216-673-11	METAL CHIP	8.2K	0.50%	1/10W	
R517	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R518	1-215-431-00	METAL	2.7K	1%	1/4W	
R519	1-215-427-00	METAL	1.8K	1%	1/4W	
R520	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R530	1-249-419-11	CARBON	1.5K	5%	1/4W	
R531	1-216-357-00	METAL OXIDE	4.7	5%	1W	F
R532 ⚠	1-215-880-91	METAL OXIDE	10	5%	2W	F
R533	1-216-359-00	METAL OXIDE	6.8	5%	1W	F
R534	1-249-393-11	CARBON	10	5%	1/4W	F
R535	1-249-389-11	CARBON	4.7	5%	1/4W	F
⊠R537 ⚠		METAL			1/10W	
R538	1-249-441-11	CARBON	100K	5%	1/4W	
R541	1-249-418-11	CARBON	1.2K	5%	1/4W	F
R542	1-216-357-00	METAL OXIDE	4.7	5%	1W	F
R549	1-216-369-00	METAL OXIDE	1	5%	2W	F
R554	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R555	1-215-896-00	METAL OXIDE	4.7K	5%	2W	F
R558	1-260-326-71	CARBON	680	5%	1/2W	
R559	1-215-862-11	METAL OXIDE	68	5%	1W	F
R565	1-249-377-11	CARBON	0.47	5%	1/4W	F
R566	1-249-417-11	CARBON	1K	5%	1/4W	F
R588	1-216-105-00	METAL GLAZE	220K	5%	1/10W	
R590	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R591	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R592	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R593	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R594	1-216-689-11	METAL GLAZE	39K	5%	1/10W	
R595	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R599	1-215-857-11	METAL OXIDE	10	5%	1W	F
R681	1-215-883-11	METAL OXIDE	33	5%	2W	F
R682	1-249-415-11	CARBON	680	5%	1/4W	
R683	1-216-356-00	METAL OXIDE	3.9	5%	1W	F
R684	1-216-380-11	METAL OXIDE	8.2	5%	2W	F

<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	

<SPARK GAP>

SG551	1-519-422-11	GAP, SPARK	

<TRANSFORMER>

T504 ⚠	1-453-141-11	TRANSFORMER ASSY, FLYBACK (NX-1600A5)	
T551	1-437-195-11	TRANSFORMER, HORIZONTAL DRIVE	

<TUNER>

TU101 ⚠	8-598-047-00	TUNER (BTF-LA401)	

<CRYSTAL>

X001	1-579-917-21	VIBRATOR, CRYSTAL	
X301	1-567-505-11	OSCILLATOR, CRYSTAL	

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*A-1316-146-A		G BOARD, COMPLETE (KV-20TR23(U/C),2150R)	
		**********	
1-533-223-11		CLIP, FUSE	
4-382-854-11		SCREW (M3X10), P, SW (+)	

<CAPACITOR>

C601 ⚠	1-136-311-51	FILM	0.47MF	20%	125V

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.

G (KV-20TR23(U/C)/2150R)

REF.NO.	PART NO.	DESCRIPTION			REMARK
C603	1-124-478-11	ELECT	100MF	20%	25V
C604 ⚠	1-162-677-51	CERAMIC	470PF	10%	125V
C605 ⚠	1-162-677-51	CERAMIC	470PF	10%	125V
C606 ⚠	1-102-050-51	CERAMIC	0.01MF		500V
C607 ⚠	1-102-050-51	CERAMIC	0.01MF		500V
C613	1-104-759-11	ELECT	470MF	20%	200V
C614	1-104-759-11	ELECT	470MF	20%	200V
C615	1-164-625-11	CERAMIC	680PF	10%	500V
C616	1-136-169-00	FILM	0.22MF	5%	50V
C617	1-136-169-00	FILM	0.22MF	5%	50V
C618	1-164-625-11	CERAMIC	680PF	10%	500V
C619	1-164-625-11	CERAMIC	680PF	10%	500V
C620	1-136-601-11	FILM	0.01MF	10%	630V
C621	1-129-744-91	FILM	0.027MF	10%	400V
C622	1-124-478-11	ELECT	100MF	20%	25V
C623	1-124-360-00	ELECT	1000MF	20%	16V
C624	1-124-557-11	ELECT	1000MF	20%	25V
C626	1-123-024-21	ELECT	33MF		160V
C627	1-136-601-11	FILM	0.01MF	10%	630V
C629	1-106-355-12	MYLAR	0.0033MF	10%	200V
C630	1-136-169-00	FILM	0.22MF	5%	50V
C631	1-136-169-00	FILM	0.22MF	5%	50V
C632	1-136-169-00	FILM	0.22MF	5%	50V
C633 ⚠	1-162-677-51	CERAMIC	470PF	10%	125V
C634 ⚠	1-162-677-51	CERAMIC	470PF	10%	125V
C635	1-137-372-11	FILM	0.022MF	5%	50V
C636	1-162-318-11	CERAMIC	0.001MF	10%	500V
C637	1-164-735-11	CAP, CERAMIC	1500PF		
C638	1-164-735-11	CAP, CERAMIC	1500PF		
C639	1-164-735-11	CAP, CERAMIC	1500PF		
C640	1-164-735-11	CAP, CERAMIC	1500PF		

<CONNECTOR>

CN601	*1-580-843-11	PIN, CONNECTOR (POWER)	
CN602	*1-508-786-00	PIN, CONNECTOR (5MM PITCH)	2P
CN603	*1-508-765-00	PIN, CONNECTOR (5MM PITCH)	3P
CN604	*1-564-510-11	PLUG, CONNECTOR	7P
CN605	*1-691-135-11	PIN, CONNECTOR (PC BOARD)	4P
CN606	*1-564-505-11	PLUG, CONNECTOR	2P

<DIODE>

D604	8-719-911-19	DIODE 1SS119
D606 ⚠	8-719-510-53	DIODE D4SB60L
D607	8-719-510-48	DIODE D1N20R
D608	8-719-510-48	DIODE D1N20R
D609	8-719-510-48	DIODE D1N20R
D610	8-719-510-48	DIODE D1N20R
D611	8-719-032-13	DIODE D1NS6-TA2
D612	8-719-510-02	DIODE D1NS4
D613	8-719-510-02	DIODE D1NS4
D614	8-719-510-02	DIODE D1NS4
D615	8-719-510-02	DIODE D1NS4
D616	8-719-510-26	DIODE D1NL20
D617	8-719-510-26	DIODE D1NL20
D618	8-719-510-26	DIODE D1NL20
D619	8-719-510-26	DIODE D1NL20
D620	8-719-510-02	DIODE D1NS4
D621	8-719-510-02	DIODE D1NS4
D622	8-719-510-48	DIODE D1N20R
D624	8-719-911-19	DIODE 1SS119
D625	8-719-911-19	DIODE 1SS119
D626	8-719-110-14	DIODE RD9.1ES-B3
D627	8-719-911-19	DIODE 1SS119
D629	8-719-911-19	DIODE 1SS119
D631	8-719-510-48	DIODE D1N20R

<FUSE>

F601 ⚠	1-532-748-11	FUSE, GLASS TUBE 6.3A/125V

<FERRITE BEAD>

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
FB606	1-410-396-41	FERRITE BEAD INDUCTOR
FB607	1-410-396-41	FERRITE BEAD INDUCTOR
FB608	1-410-396-41	FERRITE BEAD INDUCTOR
FB609	1-410-396-41	FERRITE BEAD INDUCTOR

<IC>

IC602 ⚠	1-810-050-11	POWER MODULE DM-47

<COIL>

L601	1-412-533-61	INDUCTOR	47UH

<TRANSISTOR>

Q602	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q603	8-729-016-15	TRANSISTOR 2SC4833MNP
Q604	8-729-016-15	TRANSISTOR 2SC4833MNP
Q605	8-729-924-90	TRANSISTOR 2SB1370-EF
Q606	8-729-119-78	TRANSISTOR 2SC2785-HFE

<RESISTOR>

R602	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R604	1-249-421-11	CARBON	2.2K	5%	1/4W	
R608	1-247-893-11	CARBON	390K	5%	1/4W	
R609	1-247-893-11	CARBON	390K	5%	1/4W	
R610	1-202-933-11	FUSIBLE	0.1	10%	1/2W	F
R612	1-216-349-00	METAL OXIDE	1	5%	1W	F
R613	1-216-349-00	METAL OXIDE	1	5%	1W	F
R614	1-215-904-71	METAL OXIDE	100K	5%	2W	F
R615	1-215-904-71	METAL OXIDE	100K	5%	2W	F
R616	1-215-858-71	METAL OXIDE	15	5%	1W	F
R617	1-215-858-71	METAL OXIDE	15	5%	1W	F
R618	1-217-386-00	FUSIBLE	8.2	5%	1/4W	F
R619	1-212-853-61	FUSIBLE	6.8	5%	1/4W	F
R620	1-249-379-11	CARBON	0.68	5%	1/4W	F
R621	1-249-377-11	CARBON	0.47	5%	1/4W	F
R622	1-249-377-11	CARBON	0.47	5%	1/4W	F
R623	1-249-377-11	CARBON	0.47	5%	1/4W	F
R624	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R626	1-247-883-00	CARBON	150K	5%	1/4W	
R627	1-249-377-11	CARBON	0.47	5%	1/4W	F
R630	1-249-377-11	CARBON	0.47	5%	1/4W	F
R631	1-249-377-11	CARBON	0.47	5%	1/4W	F
R632	1-249-377-11	CARBON	0.47	5%	1/4W	F
R633	1-249-388-11	CARBON	3.9	5%	1/4W	F
R635	1-249-433-11	CARBON	22K	5%	1/4W	

G (KV-20TR23(U/C)/2150R) **G** (KV-2160WR)

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
R636	1-249-421-11	CARBON	2.2K	5%	1/4W	
R637	1-249-407-11	CARBON	150	5%	1/4W	F
R639 ⚠	1-202-892-91	SOLID	4.7M	20%	1/2W	
R640	1-249-414-11	CARBON	560	5%	1/4W	
R642	1-249-421-11	CARBON	2.2K	5%	1/4W	
R643	1-215-863-71	METAL OXIDE	100	5%	1W	F
R645	1-217-386-00	FUSIBLE	8.2	5%	1/4W	F
R646	1-216-422-71	METAL OXIDE	18	5%	1W	F
R647	1-216-425-11	METAL OXIDE	56	5%	1W	F
R648	1-249-421-11	CARBON	2.2K	5%	1/4W	
R649	1-249-417-11	CARBON	1K	5%	1/4W	
R650	1-249-417-11	CARBON	1K	5%	1/4W	
R651	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R652	1-249-417-11	CARBON	1K	5%	1/4W	
R653	1-249-417-11	CARBON	1K	5%	1/4W	

<RELAY>

RY601 ⚠	1-515-684-31	RELAY	
RY602	1-515-684-31	RELAY	

<TRANSFORMER>

T601 ⚠	1-423-585-11	TRANSFORMER, LINE FILTER (LFT)	
T602 ⚠	1-423-585-11	TRANSFORMER, LINE FILTER (LFT)	
T603 ⚠	1-423-563-11	TRANSFORMER, CONVERTER DRIVE	
T604	1-423-582-11	TRANSFORMER, FERRITE (SBT)	
T605 ⚠	1-423-564-11	TRANSFORMER, CONVERTER (PIT)	

<THERMISTOR>

THP601 ⚠	1-808-081-14	THERMISTOR, POSITIVE	

<VARISTOR>

VDR601	1-810-052-21	VARISTOR	
VDR602	1-810-052-21	VARISTOR	

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*A-1316-148-A G BOARD, COMPLETE (KV-2160WR)
****

1-533-223-11	CLIP, FUSE		
4-382-854-11	SCREW (M3X10), P, SW (+)		

<CAPACITOR>

C601 ⚠	1-136-311-61	FILM	0.47MF	20%	300V
C603	1-124-478-11	ELECT	100MF	20%	25V
C606 ⚠	1-102-050-51	CERAMIC	0.01MF		500V
C607 ⚠	1-102-050-51	CERAMIC	0.01MF		500V
C608 ⚠	1-137-376-91	FILM	0.1MF	5%	50V
C609	1-106-383-00	MYLAR	0.047MF		200V
C610 ⚠	1-126-406-91	ELECT	2.2MF	20%	400V
C611 ⚠	1-124-122-91	ELECT	100MF	20%	50V
C612 ⚠	1-137-376-91	FILM	0.1MF	5%	50V
C613	1-104-758-11	ELECT	560MF	20%	250V
C614	1-104-758-11	ELECT	560MF	20%	250V
C615	1-164-625-11	CERAMIC	680PF	10%	500V
C616	1-136-169-00	FILM	0.22MF	5%	50V
C617	1-136-169-00	FILM	0.22MF	5%	50V
C618	1-164-625-11	CERAMIC	680PF	10%	500V
C619	1-164-625-11	CERAMIC	680PF	10%	500V
C620	1-136-601-11	FILM	0.01MF	10%	630V
C621	1-129-744-91	FILM	0.027MF	10%	400V
C622	1-124-478-11	ELECT	100MF	20%	25V
C623	1-124-360-00	ELECT	1000MF	20%	16V
C624	1-124-557-11	ELECT	1000MF	20%	25V
C626	1-123-024-21	ELECT	33MF		160V
C627	1-136-601-11	FILM	0.01MF	10%	630V
C629	1-106-355-12	MYLAR	0.0033MF	10%	200V
C630	1-136-169-00	FILM	0.22MF	5%	50V
C631	1-136-169-00	FILM	0.22MF	5%	50V
C632	1-136-169-00	FILM	0.22MF	5%	50V
C633 ⚠	1-164-502-51	CERAMIC	0.001MF	20%	400V
C634 ⚠	1-164-502-51	CERAMIC	0.001MF	20%	400V
C635	1-137-372-11	FILM	0.022MF	5%	50V
C636	1-162-318-11	CERAMIC	0.001MF	10%	500V
C637	1-164-735-11	CAP, CERAMIC	1500PF		
C638	1-164-735-11	CAP, CERAMIC	1500PF		
C639	1-164-735-11	CAP, CERAMIC	1500PF		
C640	1-164-735-11	CAP, CERAMIC	1500PF		

<CONNECTOR>

CN601	*1-580-843-11	PIN, CONNECTOR (POWER)
CN602	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P
CN603	*1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P
CN604	*1-564-510-11	PLUG, CONNECTOR 7P
CN605	*1-691-135-11	PIN, CONNECTOR (PC BOARD) 4P
CN606	*1-564-505-11	PLUG, CONNECTOR 2P

<DIODE>

D604	8-719-911-19	DIODE 1SS119
D605 ⚠	8-719-304-63	DIODE RM11C
D606 ⚠	8-719-510-53	DIODE D4SB60L
D607	8-719-510-48	DIODE D1N20R
D608	8-719-510-48	DIODE D1N20R
D609	8-719-510-48	DIODE D1N20R
D610	8-719-510-48	DIODE D1N20R
D611	8-719-032-13	DIODE D1NS6-TA2
D612	8-719-510-02	DIODE D1NS4
D613	8-719-510-02	DIODE D1NS4
D614	8-719-510-02	DIODE D1NS4
D615	8-719-510-02	DIODE D1NS4
D616	8-719-510-26	DIODE D1NL20
D617	8-719-510-26	DIODE D1NL20
D618	8-719-510-26	DIODE D1NL20
D619	8-719-510-26	DIODE D1NL20
D620	8-719-510-02	DIODE D1NS4
D621	8-719-510-02	DIODE D1NS4
D622	8-719-510-48	DIODE D1N20R
D624	8-719-911-19	DIODE 1SS119
D625	8-719-911-19	DIODE 1SS119
D626	8-719-110-14	DIODE RD9.1ES-B3
D627	8-719-911-19	DIODE 1SS119
D629	8-719-911-19	DIODE 1SS119
D631	8-719-510-48	DIODE D1N20R

<FUSE>

F601 ⚠	1-532-506-51	FUSE 6.3A/250V

<FERRITE BEAD>

FB601	1-412-911-11	INDUCTOR, FERRITE BEAD
FB602	1-412-911-11	INDUCTOR, FERRITE BEAD
FB603	1-412-911-11	INDUCTOR, FERRITE BEAD

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.

G (KV-2160WR) **C**

REF.NO.	PART NO.	DESCRIPTION				REMARK
FB604	1-412-911-11	INDUCTOR, FERRITE BEAD				
FB605	1-410-396-41	FERRITE BEAD INDUCTOR				
FB606	1-410-396-41	FERRITE BEAD INDUCTOR				
FB607	1-410-396-41	FERRITE BEAD INDUCTOR				
FB608	1-410-396-41	FERRITE BEAD INDUCTOR				
FB609	1-410-396-41	FERRITE BEAD INDUCTOR				
		<IC>				
IC601⚠	8-749-923-94	IC STR81159A				
IC602⚠	1-810-050-11	POWER MODULE DM-47				
		<COIL>				
L601	1-412-533-61	INDUCTOR	47UH			
		<TRANSISTOR>				
Q602	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q603	8-729-016-15	TRANSISTOR 2SC4833MNP				
Q604	8-729-016-15	TRANSISTOR 2SC4833MNP				
Q605	8-729-924-90	TRANSISTOR 2SB1370-EF				
Q606	8-729-119-78	TRANSISTOR 2SC2785-HFE				
		<RESISTOR>				
R602	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R604	1-249-421-11	CARBON	2.2K	5%	1/4W	
R605⚠	1-249-451-71	CARBON	2.2	5%	1/4W	F
R606⚠	1-208-294-11	WIREWOUND	2.2	5%	20W	
R607	1-249-389-11	CARBON	4.7	5%	1/4W	
R608	1-247-893-11	CARBON	390K	5%	1/4W	
R609	1-247-893-11	CARBON	390K	5%	1/4W	
R610	1-202-933-11	FUSIBLE	0.1	10%	1/2W	F
R612	1-216-349-00	METAL OXIDE	1	5%	1W	F
R613	1-216-349-00	METAL OXIDE	1	5%	1W	F
R614	1-215-904-71	METAL OXIDE	100K	5%	2W	F
R615	1-215-904-71	METAL OXIDE	100K	5%	2W	F
R616	1-215-858-71	METAL OXIDE	15	5%	1W	F
R617	1-215-858-71	METAL OXIDE	15	5%	1W	F
R618	1-217-386-00	FUSIBLE	8.2	5%	1/4W	F
R619	1-212-853-61	FUSIBLE	6.8	5%	1/4W	F
R620	1-249-379-11	CARBON	0.68	5%	1/4W	F
R621	1-249-377-11	CARBON	0.47	5%	1/4W	F
R622	1-249-377-11	CARBON	0.47	5%	1/4W	F
R623	1-249-377-11	CARBON	0.47	5%	1/4W	F
R624	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R626	1-247-883-00	CARBON	150K	5%	1/4W	
R627	1-249-377-11	CARBON	0.47	5%	1/4W	F
R630	1-249-377-11	CARBON	0.47	5%	1/4W	F
R631	1-249-377-11	CARBON	0.47	5%	1/4W	F
R632	1-249-377-11	CARBON	0.47	5%	1/4W	F
R633	1-249-388-11	CARBON	3.9	5%	1/4W	F
R635	1-249-433-11	CARBON	22K	5%	1/4W	
R636	1-249-421-11	CARBON	2.2K	5%	1/4W	
R637	1-249-407-11	CARBON	150	5%	1/4W	F
R639⚠	1-247-289-11	CARBON	8.2M	5%	1W	
R640	1-249-414-11	CARBON	560	5%	1/4W	
R642	1-249-421-11	CARBON	2.2K	5%	1/4W	
R643	1-215-863-71	METAL OXIDE	100	5%	1W	F
R644⚠	1-215-915-71	METAL OXIDE	470	5%	3W	F
R645	1-217-386-00	FUSIBLE	8.2	5%	1/4W	F
R646	1-216-422-71	METAL OXIDE	18	5%	1W	F
R647	1-216-425-11	METAL OXIDE	56	5%	1W	F
R648	1-249-421-11	CARBON	2.2K	5%	1/4W	
R649	1-249-417-11	CARBON	1K	5%	1/4W	
R650	1-249-417-11	CARBON	1K	5%	1/4W	
R651	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R652	1-249-417-11	CARBON	1K	5%	1/4W	
R653	1-249-417-11	CARBON	1K	5%	1/4W	
		<RELAY>				
RY601⚠	1-515-684-31	RELAY				
RY602	1-515-684-31	RELAY				
		<TRANSFORMER>				
T602⚠	1-423-585-11	TRANSFORMER, LINE FILTER (LFT)				
T603⚠	1-423-563-11	TRANSFORMER, CONVERTER DRIVE				
T604	1-423-582-21	TRANSFORMER, FERRITE (SBT)				
T605⚠	1-423-564-11	TRANSFORMER, CONVERTER (PIT)				
		<THERMISTOR>				
THP601⚠	1-808-059-32	THERMISTOR, POSITIVE				
		<VARISTOR>				
VDR601	1-810-052-21	VARISTOR				
VDR602	1-810-052-21	VARISTOR				
		**********				
	*A-1331-246-A	C BOARD, COMPLETE				
		**********				
		<CAPACITOR>				
C701	1-136-601-11	FILM	0.01MF	10%	630V	
C704	1-162-116-00	CERAMIC	680PF	10%	2KV	
C706	1-124-916-11	ELECT	22MF	20%	25V	
C707	1-164-085-11	CERAMIC	0.001MF	10%	50V	
C711	1-164-083-11	CERAMIC	680PF	10%	50V	
C712	1-164-082-11	CERAMIC	560PF	10%	50V	
C731	1-164-083-11	CERAMIC	680PF	10%	50V	
C732	1-164-081-11	CERAMIC	470PF	10%	50V	
C751	1-164-083-11	CERAMIC	680PF	10%	50V	
C752	1-164-082-11	CERAMIC	560PF	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)				
CN702	*1-508-768-00	PIN, CONNECTOR (5MM PITCH) 6P				
CN703	*1-564-509-11	PLUG, CONNECTOR 6P				
		<DIODE>				
D711	8-719-911-19	DIODE 1SS119				
D731	8-719-911-19	DIODE 1SS119				
D751	8-719-911-19	DIODE 1SS119				
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	8-719-109-71	DIODE RD3.9ES-B1				

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.

C S (KV-20TR23(U))

REF.NO.	PART NO.	DESCRIPTION				REMARK
D790	8-719-911-19	DIODE 1SS119				
D791	8-719-911-19	DIODE 1SS119				
D792	8-719-911-19	DIODE 1SS119				
		<JACK>				
J701 ⚠	1-540-071-13	SOCKET, PICTURE TUBE				
		<COIL>				
L701	1-410-671-31	INDUCTOR	47UH			
		<TRANSISTOR>				
Q711	8-729-926-73	TRANSISTOR 2SC3271F-N				
Q712	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q731	8-729-926-73	TRANSISTOR 2SC3271F-N				
Q732	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q751	8-729-926-73	TRANSISTOR 2SC3271F-N				
Q752	8-729-119-78	TRANSISTOR 2SC2785-HFE				
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	1-202-549-00	SOLID	100	20%	1/2W	
R701	1-202-846-00	SOLID	470K	20%	1/2W	
R702	1-202-844-00	SOLID	330K	20%	1/2W	
R703	1-202-838-00	SOLID	100K	20%	1/2W	
R704	1-216-370-11	METAL OXIDE	1.2	5%	2W	F
R706	1-202-842-11	SOLID	220K	20%	1/2W	
R710	1-202-824-00	SOLID	3.3K	20%	1/2W	
R711	1-249-405-11	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	1-202-824-00	SOLID	3.3K	20%	1/2W	
R731	1-249-405-11	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	1-202-824-00	SOLID	3.3K	20%	1/2W	
R751	1-249-405-11	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	
R771	1-249-409-91	CARBON	220	5%	1/4W	F
R772	1-249-409-91	CARBON	220	5%	1/4W	F
R773	1-249-409-91	CARBON	220	5%	1/4W	F
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	
		<VARIABLE RESISTOR>				
RV701 ⚠	1-241-656-21	RES, ADJ, METAL FILM 110M				
RV702	1-230-641-11	RES, ADJ, METAL GLAZE 2.2M				

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REF.NO.	PART NO.	DESCRIPTION				REMARK
	*A-1394-414-A	S BOARD COMPLETE (KV-20TR23(U))				
		**********				
		<CAPACITOR>				
C805	1-124-903-11	ELECT	1MF	20%	50V	
C806	1-137-399-11	FILM	0.1MF	5%	50V	
C807	1-102-157-00	CERAMIC	560PF	10%	500V	
C809	1-137-367-11	FILM	0.0033MF	5%	50V	
C810	1-137-399-11	FILM	0.1MF	5%	50V	
C811	1-137-399-11	FILM	0.1MF	5%	50V	
C812	1-137-375-11	FILM	0.068MF	5%	50V	
C813	1-124-907-11	ELECT	10MF	20%	50V	
C814	1-124-907-11	ELECT	10MF	20%	50V	
C815	1-124-907-11	ELECT	10MF	20%	50V	
C816	1-124-907-11	ELECT	10MF	20%	50V	
C817	1-124-907-11	ELECT	10MF	20%	50V	
C819	1-164-070-11	CERAMIC	100PF	5%	50V	
		<CONNECTOR>				
CN801	*1-573-979-11	CONNECTOR, BOARD TO BOARD 11P				
		<DIODE>				
D800	8-719-911-19	DIODE 1SS119				
		<IC>				
IC801	8-759-084-09	IC Z8612812PSC				
		<COIL>				
L801	1-410-470-11	INDUCTOR	10UH			
		<TRANSISTOR>				
Q801	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q802	8-729-119-78	TRANSISTOR 2SC2785-HFE				
		<RESISTOR>				
R801	1-249-416-11	CARBON	820	5%	1/4W	
R802	1-249-416-11	CARBON	820	5%	1/4W	
R803	1-249-416-11	CARBON	820	5%	1/4W	
R804	1-249-425-11	CARBON	4.7K	5%	1/4W	
R805	1-249-425-11	CARBON	4.7K	5%	1/4W	
R806	1-249-423-11	CARBON	3.3K	5%	1/4W	
R807	1-249-425-11	CARBON	4.7K	5%	1/4W	
R808	1-249-417-11	CARBON	1K	5%	1/4W	
R809	1-249-441-11	CARBON	100K	5%	1/4W	
R810	1-249-437-11	CARBON	47K	5%	1/4W	
R812	1-249-417-11	CARBON	1K	5%	1/4W	
R813	1-249-417-11	CARBON	1K	5%	1/4W	
R814	1-249-413-11	CARBON	470	5%	1/4W	
R815	1-249-427-11	CARBON	6.8K	5%	1/4W	
R816	1-249-429-11	CARBON	10K	5%	1/4W	
R817	1-249-433-11	CARBON	22K	5%	1/4W	
R818	1-249-417-11	CARBON	1K	5%	1/4W	
R820	1-249-433-11	CARBON	22K	5%	1/4W	
R821	1-249-433-11	CARBON	22K	5%	1/4W	
R822	1-249-429-11	CARBON	10K	5%	1/4W	

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REF.NO.	PART NO.	DESCRIPTION	REMARK
		MISCELLANEOUS	
		**********	
⚠	1-426-358-31	COIL, DEMAGNETIZATION (KV-20TR23(U/C),2150R)	
⚠	1-426-368-11	COIL, DEMAGNETIZATION (KV-2160WR)	
⚠	1-451-280-11	DEFLECTION YOKE (Y21PXA2)	
	1-452-032-00	MAGNET, DISK; 10MM ϕ	
	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM ϕ	
	1-452-277-00	MAGNET, BMC	
	1-573-657-11	PLUG, F-PIN	
⚠	1-751-057-11	CORD, POWER (WITH CONNECTOR) (KV-20TR23(U/C),2150R)	
⚠	1-751-056-11	CORD, POWER (WITH CONNECTOR) (KV-2160WR)	
SP902	1-504-252-11	SPEAKER (9X5CM)	
V901	⚠ 8-738-764-05	PICTURE TUBE (A51JUH51X)	

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		ACCESSORIES AND PACKING MATERIALS	
		**********	
	1-417-182-11	CONVERTER (EAC-25)	
	1-501-372-41	ANTENNA, TELESCOPIC	
	1-569-007-11	ADAPTER, CONVERSION 2P (KV-2160WR)	
	3-756-515-21	MANUAL, INSTRUCTION	
	3-756-515-31	MANUAL, INSTRUCTION (KV-20TR23(C))	
	3-756-515-41	MANUAL, INSTRUCTION (KV-2150R,2160WR)	
	*4-039-627-01	INDIVIDUAL CARTON (KV-20TR23(U/C))	
	*4-039-628-01	CUSHION (UPPER) (ASSY)	
	*4-039-629-01	CUSHION (LOWER) (ASSY)	
	*4-040-688-01	INDIVIDUAL CARTON (KV-2150R,2160WR)	
	*4-380-340-01	BAG, PROTECTION	
		REMOTE COMMANDER	
	1-466-966-11	REMOTE COMMANDER (RM-Y116)	
	9-903-826-01	COVER, BATTERY (FOR RM-Y116)	

Sony Corporation
TV Group

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