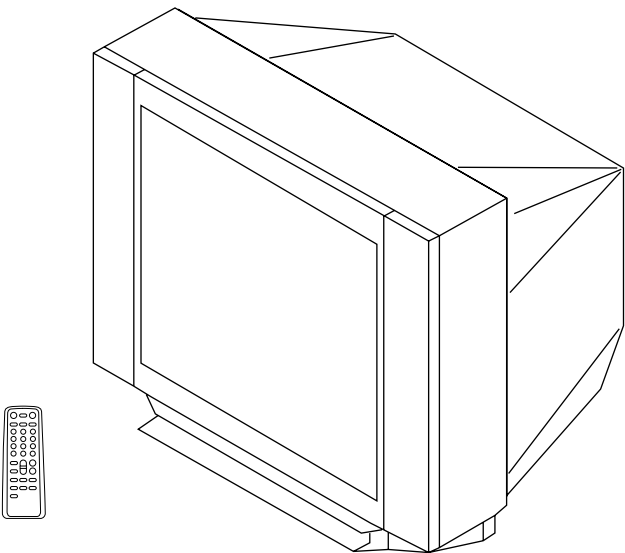


SERVICE MANUAL

BG-3S CHASSIS

<u>MODEL</u>	<u>COMMANDER</u>	<u>DEST.</u>	<u>CHASSIS NO.</u>	<u>MODEL</u>	<u>COMMANDER</u>	<u>DEST.</u>	<u>CHASSIS NO.</u>
KV-HF21M50	RM-952	Malaysia	SCC-U21GA				
KV-XF21M80	RM-952	India	SCC-U22G				



TRINITRON® COLOR TV
SONY®

SPECIFICATIONS

		Note
Power requirements	110-240 V AC, 50/60 Hz	For KV-XF21M80
	220-240 V AC, 50/60 Hz	For KV-HF21M50
Power consumption (W)	Indicated on the rear of the TV	
Television system	B/G, I, D/K, M	
Color system	PAL, PAL 60, SECAM, NTSC4.43, NTSC3.58	
Channel coverage		
B/G	VHF: E2 to E12 / UHF: E21 to E69 / CATV: S01 to S03, S1 to S41	
I	UHF: B21 to B68 / CATV: S01 to S03, S1 to S41	
D/K	VHF: C1 to C12, R1 to R12 / UHF: C13 to C57, R21 to R60 CATV: S01 to S03, S1 to S41, Z1 to Z39	
M	VHF: A2 to A13 / UHF: A14 to A79 / CATV: A-8 to A-2, A to W+4, W+6 to W+84	
⌋ (Antenna)	75-ohm external terminal	
Audio output	5W + 5W	
Number of terminal		
📺 (Video)	Input: 2 Output: 1	Phono jacks; 1 V _{P-P} , 75 ohms
🎵 (Audio)	Input: 2 Output: 1	Phono jacks; 500 mV _{rms}
🎧 (Headphone)	Output: 1	Minijack
Picture tube	21 inch	
Tube size (cm)	54	Measured diagonally
Screen size (cm)	51	Measured diagonally
Dimension (w/h/d, mm)	640 × 456 × 488	
Mass (kg)	27	

Design and specifications are subject to change without notice.

CAUTION

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

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.

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SELF DIAGNOSTIC FUNCTION

The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER lamp will automatically begin to flash.

The number of times the lamp flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER lamp flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the remote commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

1. DIAGNOSTIC TEST INDICATORS

When an errors occurs, the STANDBY/TIMER lamp will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the lamp will identify the first of the problem areas.

Result for all of the following diagnostic items are displayed on screen. No error has occurred if the screen displays a "0".

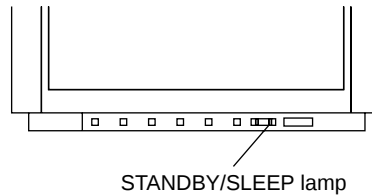
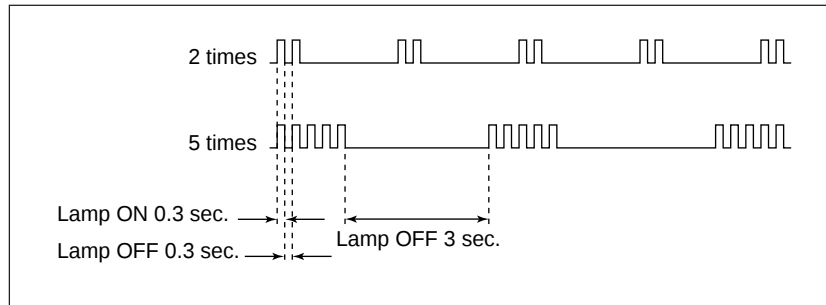
Diagnostic Item Description	No. of times STANDBY/TIMER lamp flashes	Self-diagnostic display/Diagnostic result	Probable Cause Location	Detected Symptoms
• Power does not turn on	Does not light	—	• Power cord is not plugged in. • Fuse is burned out F4601 (F)	• Power does not come on. • No power is supplied to the TV. • AC power supply is faulty.
• +B overcurrent (OCP) or overvoltage (OVP) • Vertical deflection stopped • Horizontal deflection overdrive	2 times	002:000 or 002:001~255 003:001~255 004:001~255 at the same time	• H.OUT Q511 is shorted. (A board) • IC1800 is shorted. (C5 board)(KV-XF21M80) • -13V is not supplied. (A board) • IC 503 faulty (A board) • IC 301 faulty (A board)	• Power does not come on. • Load on power line is shorted. • Has entered standby state after horizontal raster. • Vertical deflection pulse is stopped. • Power line is shorted or power supply is stopped.
• White balance failure (no PICTURE)	5 times	005:000 or 005:001~225	• G2 is improperly adjusted. (Note 2) • CRT problem. • Video OUT IC1800 is faulty. (C5 board)(KV-XF21M80) • IC301 is faulty. (A board) • No connection A board to C3 board (KV-HF21M50) & C5 board (KV-XF21M80).	• No raster is generated. • CRT cathode current detection reference pulse output is small.
• Micro reset	—	101:00 or 101:001~225	• Discharge CRT (C3 & C5 Board) • Static discharge • External noise	• Power is shut down shortly, after this return back to normal. • Detect Micro latch up.

Note 1: If a + B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously.

The symptom that is diagnosed first by the microcontroller is displayed on the screen.

Note 2: Refer to screen (G2) Adjustment in section 3-4 of this manual.

2. DISPLAY OF STANDBY/TIMER LIGHT FLASH COUNT



<u>Diagnostic Item</u>	<u>Flash Count*</u>
+B overcurrent/overvoltage Vertical deflection stopped	2 times
White balance failure	5 times

* One flash count is not used for self-diagnostic.

3. STOPPING THE STANDBY/TIMER FLASH

Turn off the power switch on the TV main unit or unplug the power cord from the outlet to stop the STANDBY/TIMER lamp from flashing.

4. SELF-DIAGNOSTIC SCREEN DISPLAY

For errors with symptoms such as “power sometimes shuts off” or “screen sometimes goes out” that cannot be confirmed, it is possible to bring up past occurrences of failure for confirmation on the screen:

[To Bring Up Screen Test]

In standby mode, press buttons on the remote commander sequentially in rapid succession as shown below:

Screen display ➡ channel 5 ➡ Sound volume - ➡ Power ON
↑

Note that this differs from entering the service mode (mode volume +).

Self-Diagnosis screen display

SELF DIAGNOSTIC

002 : 000 ←

003 : 000

004 : 000

005 : 001 ←

101 : 000

Numeral "0" means that no fault has been detected.

Numeral "1" means a fault has been detected.

5. HANDLING OF SELF-DIAGNOSTIC SCREEN DISPLAY

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen during repairs. When you have completed the repairs, clear the result display to “0”.

Unless the result display is cleared to “0”, the self-diagnostic function will not be able to detect subsequent faults after completion of the repairs.

[Clearing the result display]

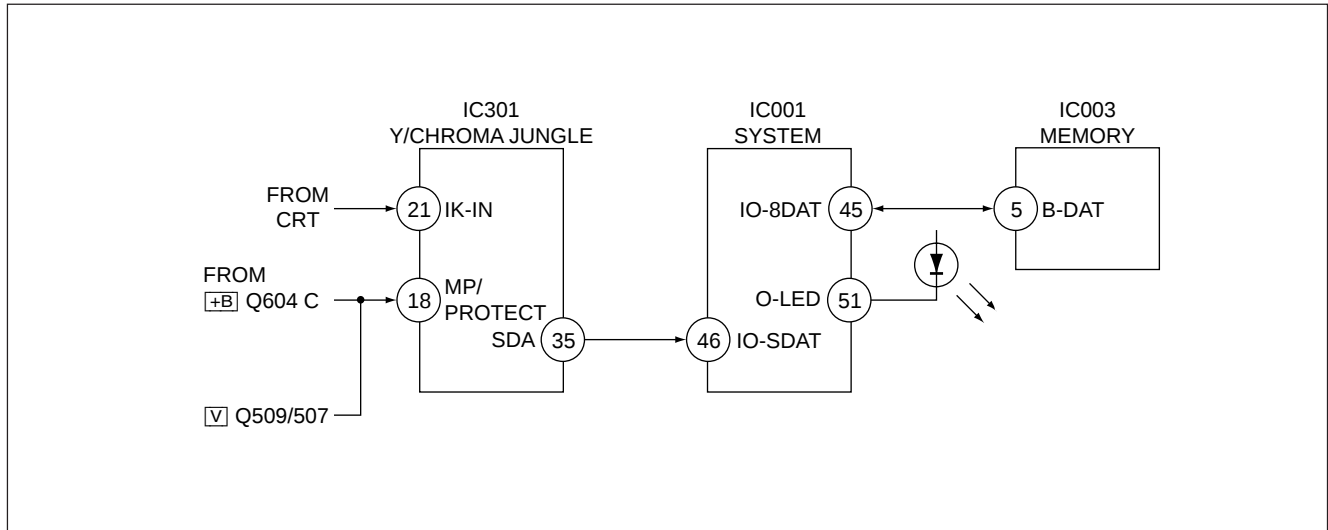
To clear the result display to “0”, press buttons on the remote commander sequentially as shown below when the diagnostic screen is being displayed.

Channel 8 ➡ 0

[Quitting Self-diagnostic screen]

To quit the entire self-diagnostic screen, turn off the power switch on the remote commander or the main unit.

6. SELF-DIAGNOSTIC CIRCUIT



+B overcurrent (OCP)

Occurs when an overcurrent on the +B(135) line is detected by Q604. If Q604 go to ON and the voltage to pin 18 of IC301 should go down when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.

Vertical deflection stopped

Occurs when an absence of the vertical deflection pulse is detected by Q509 and IC001 shut down the power supply.

Vertical deflection overcurrent

Occurs when an overcurrent on V drive line is detected by Q507. Power supply will be shut down when detect this by IC001.

White balance failure

If the RGB levels* do not balance or become low level within 5 seconds, this error will be detected by IC301. TV will stay on, but there will be no picture.

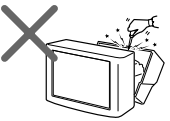
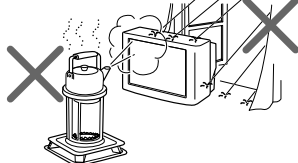
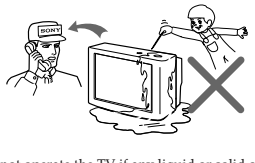
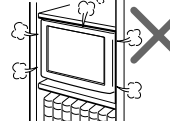
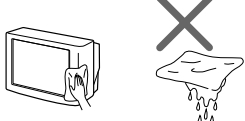
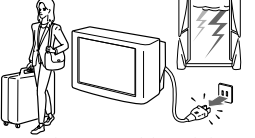
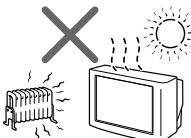
* (Refers to the RGB levels of the AKB detection Ref pulse that detects IK.)

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

SECTION 1 GENERAL

WARNING

- Dangerously high voltages are present inside the TV.
- Operate the TV only between 110 – 240 V AC. (For KV_XF21M80)/220-240V AC (For HF21M50)

 Do not open the cabinet and the rear cover of the TV. Refer servicing to qualified personnel.	 Install the TV in a stable position. Do not allow children to climb onto it.
 To prevent fire or shock hazard, do not expose the TV to rain or moisture.	 Do not operate the TV if any liquid or solid object falls into it. Have it checked immediately by qualified personnel only.
 Do not install the TV in a confined space, such as a bookcase or built-in cabinet. Do not block the ventilation openings of the TV.	 Clean the TV with a dry and soft cloth. Do not use benzene, thinner, or any other chemicals to clean the TV. Do not scratch the picture tube.
 Do not pull the power cord to disconnect the TV. Pull it out by the plug.	 Do not plug in too many appliances to the same power socket. Do not damage the power cord.
 Disconnect the power cord during lightning storms or if you are not going to use the TV for several days.	 Do not install the TV in hot, humid or excessively dusty places.

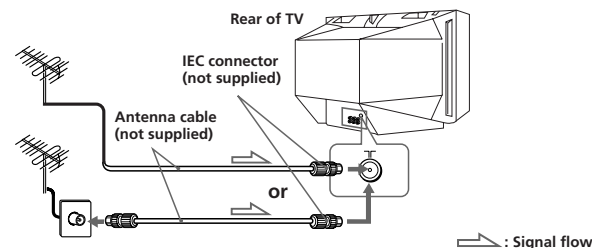
Using Your New TV

Getting Started

Step 1

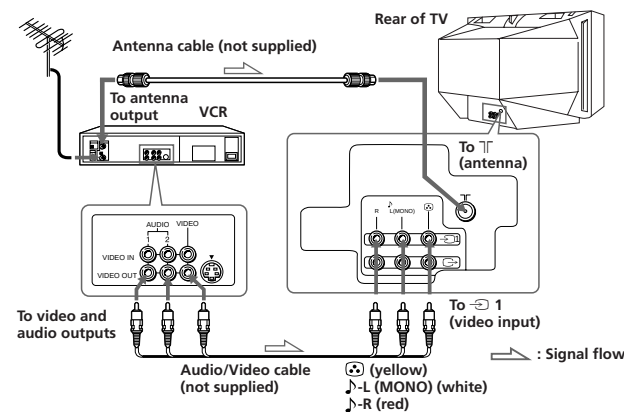
Connect the antenna (For KV-XF21M80)(India)

If you wish to connect a VCR, see the "Connecting a VCR" diagram below.



Connecting a VCR

To watch the video, press   (see page 12).

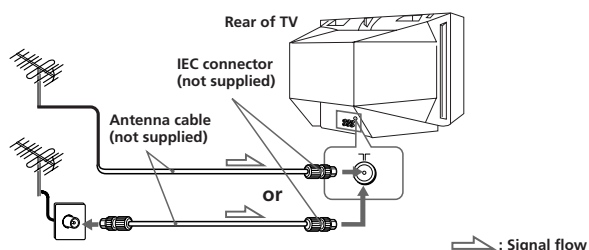


Getting Started

Step 1

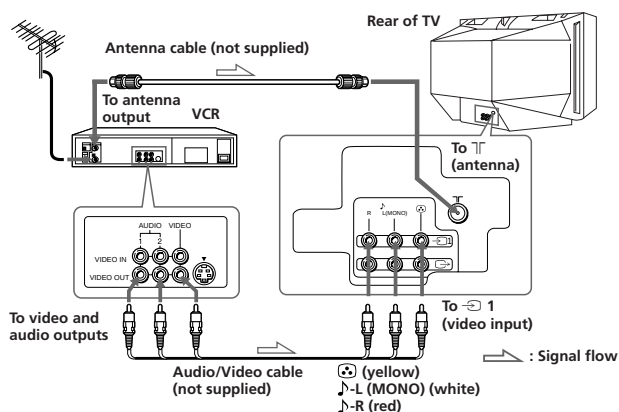
Connect the antenna (For KV-HF21M50)(Malaysia)

If you wish to connect a VCR, see the "Connecting a VCR" diagram below.



Connecting a VCR

To watch the video, press (see page 12).



Notes

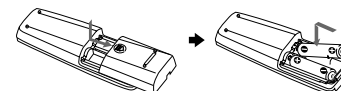
- If you connect a monaural VCR, connect the yellow plug to 1 (the yellow jack) and the black plug to 2-L (MONO) (the white jack).
- If you connect a VCR to the 1 (antenna) terminal, preset the signal output from the VCR to the program number 0 on the TV.
- When no signal is input to the connected video equipment, the TV screen becomes blue.

CAUTION

Do not connect the power cord until you have completed making all other connections; otherwise a minimum leakage current might flow through the antenna and other terminals to ground.

Step 2

Insert the batteries into the remote

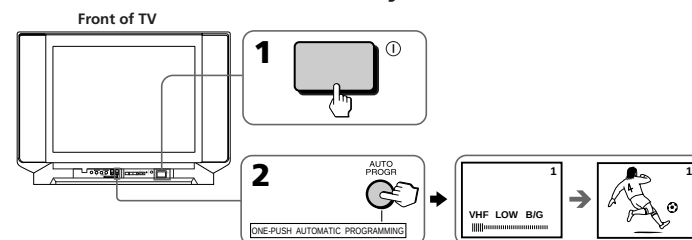


Note

- Do not use old batteries nor use different types of batteries together.

Step 3

Preset the channels automatically



Tips

- If you want to stop automatic channel presetting, press SELECT twice.
- If your TV has preset an unwanted channel or cannot preset a particular channel, then preset your TV manually (see page 9).

Note

- During automatic channel presetting, your TV screen will indicate "B/G", "I", "D/K" or "M" for the TV system.

Now You Are Ready. . .

To watch your TV, see page 11.



Connecting optional components

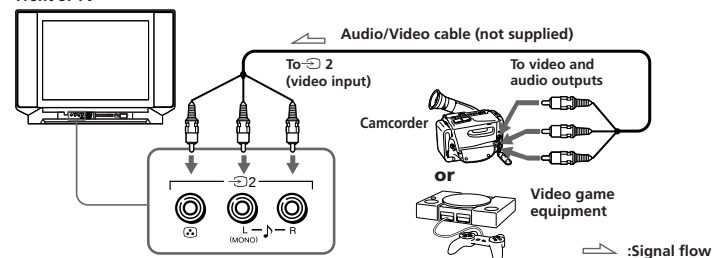
(For KV-XF21M80)

You can connect optional audio/video components, such as a VCR, multi disc player, camcorder, video game or stereo system.

To watch the picture of the connected equipment, press $\rightarrow$ $\oplus$ (see page 12).

Connecting a camcorder/video game equipment using the $\rightarrow$ 2 (video input) jacks

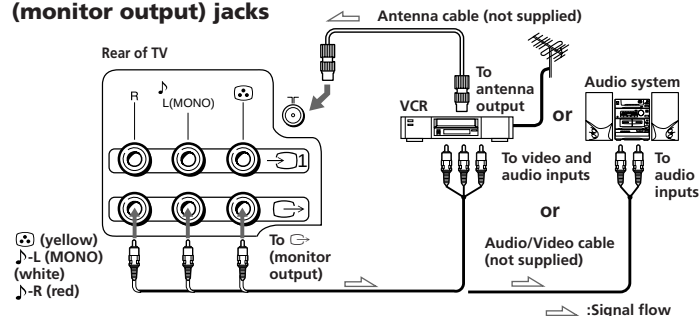
Front of TV



Note

- You can also connect video equipment to the $\rightarrow$ 1 (video input) jacks at the rear of your TV.

Connecting audio/video equipment using the $\rightarrow$ 1 (monitor output) jacks



Note

- When connecting a monaural VCR, connect the yellow plug to $\rightarrow$ 1 (the yellow jack) and the black plug to $\rightarrow$ L (MONO) (the white jack).

Connecting optional components

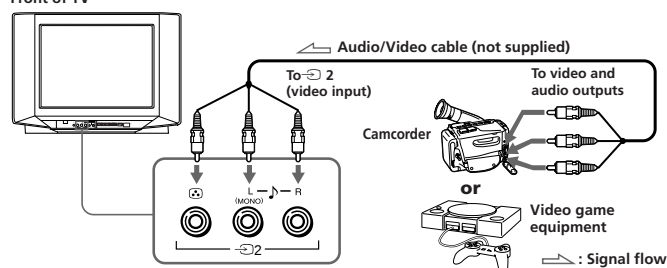
(For KV-HF21M50)

You can connect optional audio/video components, such as a VCR, multi disc player, camcorder, video game or stereo system.

To watch the picture of the connected equipment, press $\rightarrow$ $\oplus$ (see page 12).

Connecting a camcorder/video game equipment using the $\rightarrow$ 2 (video input) jacks

Front of TV



Note

- You can also connect video equipment to the $\rightarrow$ 1 (video input) jacks at the rear of your TV.

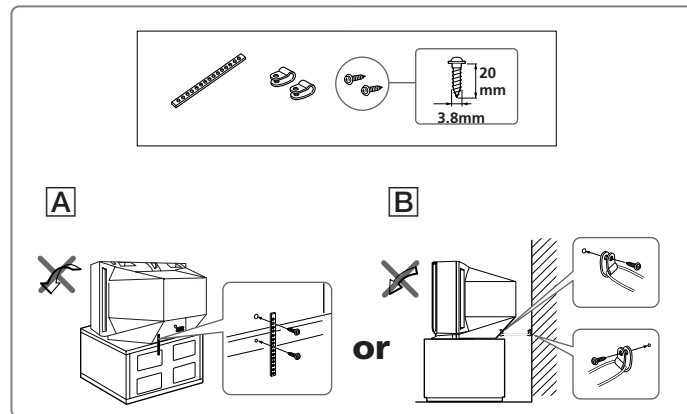
Securing the TV

To prevent the TV from falling, secure the TV using one of the following methods:

- A** With the supplied screws, attach the band to the TV stand and to the rear of the TV using the provided hole.

or

- B** Put the cord or chain through the clamps to secure the TV against a wall or pillar.



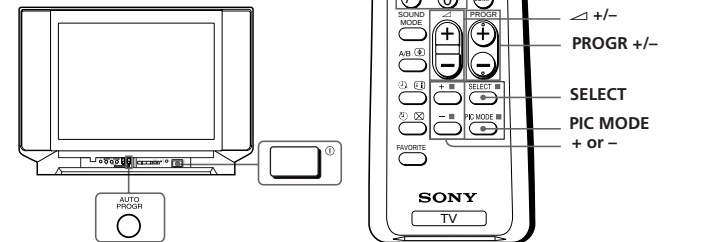
Note

- Use only the supplied screws. Use of other screws may damage the TV.

Using Your New TV

Presetting channels

You can preset up to 100 TV channels in numerical sequence from program number 1 using the remote and the buttons on your TV as well.



Presetting channels automatically

- 1** Press ① to turn on the TV.



- 2** Press AUTO PROGR.



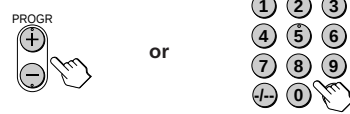
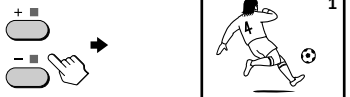
Note

- During automatic channel presetting, your TV screen will indicate "B/G", "I", "D/K" or "M" for the TV system.

To preset channels automatically from a specified program number

- Press SELECT until "AUTO PROGRAM" appears.
- Press + or -.
The on-screen display will start flashing.
- Press PROGR +/- or the number buttons until the desired program number appears.
- Press + or -.

Presetting channels manually

- 1 Press SELECT until "MANUAL PROGRAM" appears.
 
- 2 Press + or -.
 
- 3 Press PROGR +/- or the number buttons until the desired program number appears.
 
- 4 Press + or - until the desired channel picture appears.
 
- 5 Press SELECT.
 

Using Your New TV

To change the TV system setting

If the picture or sound is abnormal when receiving programs through the ㊦ (antenna) terminal

- (1) Press SELECT until "TV SYS" appears.

TV SYS: B/G

- (2) Press + or - to select the appropriate TV system until the picture or sound quality is optimal.

B/G → I → D/K → M

continued

Using Your New TV | 9

Presetting channels (continued)

To change the color system setting

If the color is abnormal when receiving programs through the ㊦ (antenna) terminal or the ㊤ (video input) jack

- (1) Press SELECT until "COL SYS" appears.

COL SYS: AUTO

- (2) Press + or - to select the appropriate color system until the color is optimal.

AUTO → PAL → SECAM → NTSC 3.58 → NTSC 4.43

Tip

- Normally set "COL SYS" to "AUTO".

Skipping program numbers

- 1 Press PROGR +/- or the number buttons until the unused or unwanted program number appears.
- 2 Press SELECT until "MANUAL PROGRAM" appears.
- 3 Press + or -.
- 4 Press PIC MODE.
- 5 Press SELECT.

To preset the skipped program number again

Preset the channel automatically or manually.

Tip

- You can also use SELECT and ㊤ +/- on the TV to preset channels and skip program numbers.

To use the fine tuning (FINE) function

The fine tuning (FINE) function may help to reduce the following problems: double images and lines moving across the TV screen.

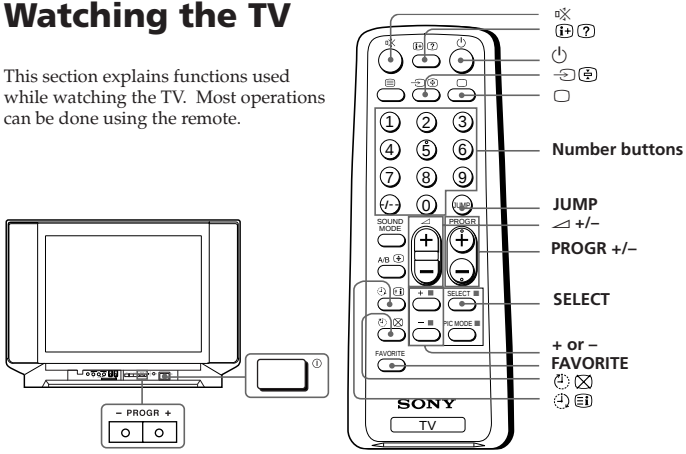
You can use the fine tuning function as below:

- 1) Select the program number you want to adjust.
- 2) Press SELECT until "MANUAL PROGRAM" appears on the screen.
- 3) Press + or - on the remote control once.
- 4) Press ㊤ ㊤ to display "FINE" on the screen.
- 5) Press + or - continuously until the above problems are minimized.
The + or - icon on the screen flashes while tuning.
- 6) Press SELECT to return to normal screen.

10 | Using Your New TV

Watching the TV

This section explains functions used while watching the TV. Most operations can be done using the remote.

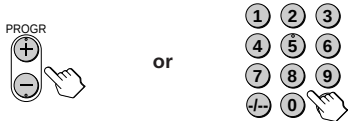


Using Your New TV

1 Press ① to turn on the TV.
When the TV is in the standby mode (the ① indicator on the TV is lit red), press ① on the remote or PROGR +/- on the TV.



2 Press PROGR +/- or the number buttons to select the TV program.
For double digit numbers, press +/-, then the number (e.g., for 25, press +/-, then 2 and 5).



3 Press +/- to adjust the volume.



Watching the TV (continued)

Additional tasks

To	Do this
Turn off temporarily	Press ①. The ① indicator on the TV lights up red.
Turn off completely	Press ① on the TV.
Mute the sound	Press ②.
Watch the video input (VCR, camcorder, etc.)	Press ③ to select "VIDEO 1" or "VIDEO 2". To return to the TV program, press ④.
Jump back to the previous channel	Press JUMP.
Display the on-screen information*	Press ⑤.
Adjust the volume of each TV program automatically	Press SELECT repeatedly until "INTELLIGENT VOL" appears, then press + or - to select "ON". To cancel, select "OFF".

* The picture, sound, and either the program number or video mode are displayed. The on-screen display for the picture and sound information disappears after about 3 seconds.

Changing the on-screen display language

1 Press SELECT until "LANGUAGE / اللغة : ENGLISH" appears on the screen.



2 Press + or - to select "عربي".



Tip
• You can also use SELECT and +/- on the TV to select the on-screen display language.

continued

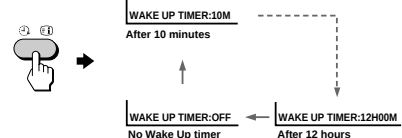
Watching the TV (continued)**Changing the on-screen display language
(For KV-HF21M50)**

- 1 Press SELECT until "LANGUAGE / 语言: ENGLISH" appears on the screen.
 
- 2 Press + or – to select "中文".
 

Tip

- You can also use SELECT and $\triangleleft$ +/– on the TV to select the on-screen display language.

Setting the Wake Up timer

- 1 Press $\odot$ $\boxtimes$ until the desired period of time appears.
 
- 2 Select the TV program or video mode you want to display when you wake up.
- 3 Press $\odot$ or set the Sleep timer if you want the TV to turn off automatically.

The $\odot$ indicator on the TV lights up orange.

To cancel the Wake Up timer

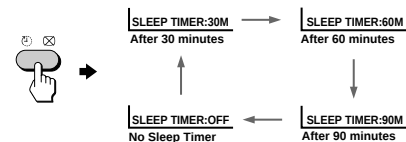
Press $\odot$ $\boxtimes$ until "WAKE UP TIMER: OFF" appears or turn off the TV's main power.

Notes

- The Wake Up timer starts immediately after the on-screen display disappears.
- If no buttons or controls are pressed for more than two hours after the TV is turned on using the Wake Up timer, the TV automatically goes into the standby mode. To continue watching the TV, press any button or control on the TV or the remote.

Setting the Sleep timer

Press $\odot$ $\boxtimes$ until the desired period of time appears.

**To cancel the Sleep timer**

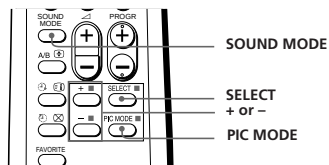
Press $\odot$ $\boxtimes$ until "SLEEP TIMER: OFF" appears or turn the TV off.

Advanced Operations

Customizing the picture and sound

You can customize the picture and sound by selecting the picture and sound modes or by adjusting its settings.

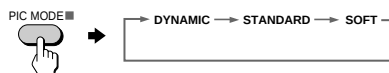
You can change the sound effect by selecting the surround mode.



Selecting the picture and sound modes

To select the picture mode

Press PIC MODE repeatedly until you get the desired picture mode.



Select	To
DYNAMIC	receive high contrast pictures.
STANDARD	receive normal contrast pictures.
SOFT	receive mild pictures.

To select the sound mode

Press SOUND MODE repeatedly until you get the desired sound mode.



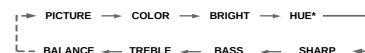
Select	To
DYNAMIC	listen to dynamic and clear sound that emphasizes the low and high sound.
DRAMA	listen to sound that emphasizes vocals and background music.
SOFT	receive soft sound.

Adjusting the picture and sound settings

- 1 Press SELECT until the desired setting appears.



Each time you press SELECT, the setting item will change as follows:



- 2 Press + or - to adjust the item.



- 3 To adjust other items, repeat steps 1 to 2.

* "HUE" can be adjusted for the NTSC system only.

Notes

- When you select a picture or sound mode, the adjusted settings will be reset according to the selected mode.
- You can also use SELECT and $\triangle$ +/- on the TV to adjust the sound and picture settings.

Selecting the surround mode

- 1 Press SELECT repeatedly until "SURROUND" appears.



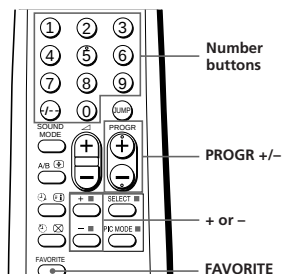
- 2 Press + or - to select the desired surround sound.



Select	To
MOVIE	listen to sound that spreads out over a large area, giving the feeling of being at a movie theatre.
MUSIC	listen to the sound that gives the feeling of being at a live concert.
OFF	turn off the surround sound.

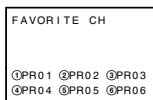
Viewing your favorite channels

You can display six of your favorite channels for quick and easy selection. You can change the favorite channel setting as well.

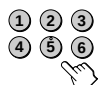


Selecting a favorite channel

- 1 Press FAVORITE.



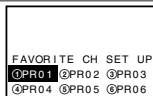
- 2 Press the number button from 1 to 6 to select the desired channel.



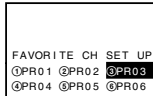
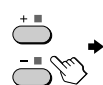
When you use the FAVORITE CH feature for the first time, six preset channels will appear.

Changing the favorite channel setting

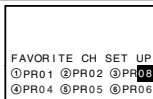
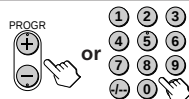
- 1 Press SELECT until "FAVORITE CH SET UP" appears.



- 2 Press + or - to select the favorite channel you want to change (e.g. ③ PR03).



- 3 Press PROGR +/-, or number buttons to change the program number.

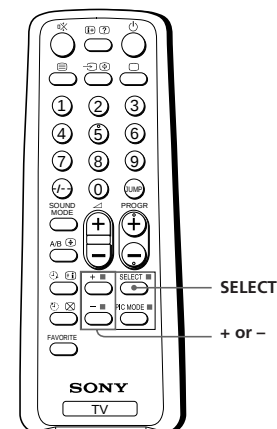


- 4 Repeat steps 2 and 3 to set other favorite channels.

- 5 Press SELECT.

Blocking the channels (CHILD LOCK)

You can prevent a child from watching certain programs by using the buttons on the remote control.



- 1 Select the TV program you want to lock.

- 2 Press SELECT until "CHILD LOCK" appears on the screen.

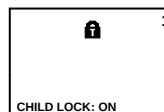
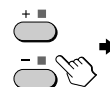


CHILD LOCK: OFF

- 3 Press + or - to select "ON".

The **i** symbol appears on the screen.

To unlock the channel, press + or - to select "OFF". The **i** symbol disappears from the screen.



Note

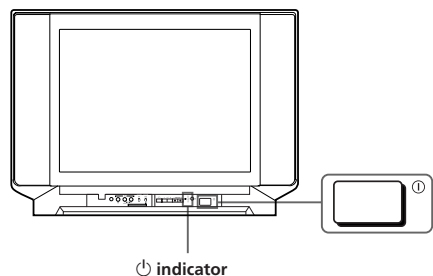
- If you preset a locked channel, that particular channel will be unlocked automatically.

Additional Information

Self-diagnosis function (For KV-XF21M80)

Your TV is equipped with a self-diagnosis function. If there is a problem with your TV, the  indicator flashes red. The number of times the  indicator flashes indicates the possible causes.

Front of TV



- 1 Check that the  indicator flashes red a number of times between 3-second intervals.
- 2 Count the number of times the  indicator flashes.
- 3 Press  (main power) to turn off your TV.
- 4 Inform your nearest Sony service center about the number of times the  indicator flashes.
Be sure to note the model name and serial number located on the rear of your TV.

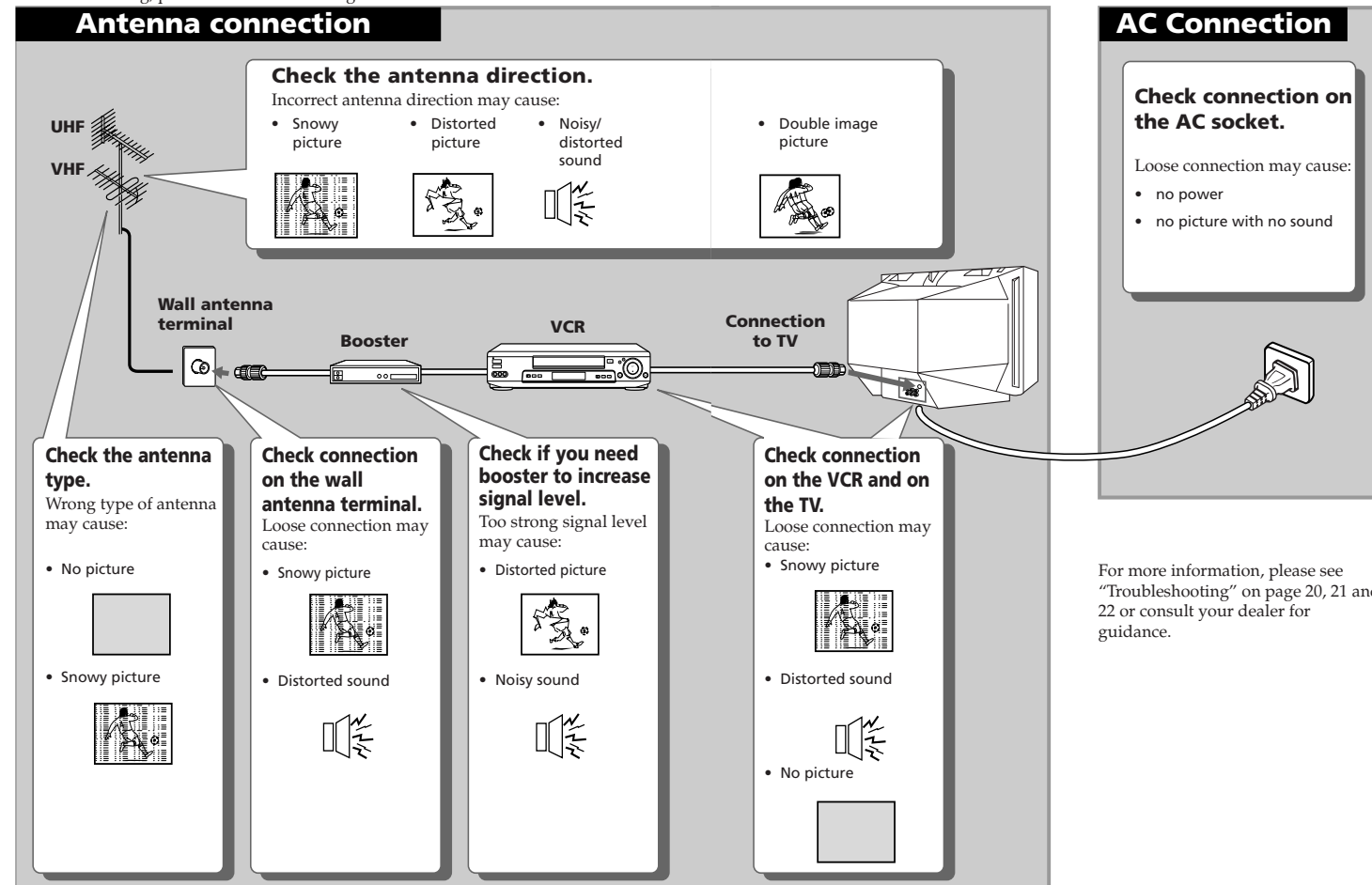
Additional Information

Troubleshooting Shortcuts

(For KV-HF21M50)

For better viewing, please check the following connections.

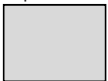
Antenna connection



Additional Information

Troubleshooting

If you find any problem while viewing your TV, please check the following guide. If any problem persists, contact your Sony dealer.

Symptom	Solutions	Possible cause
Snowy picture 	- Check the antenna cable and connection on the TV, VCR and on the wall. (page 4) - Press SELECT until "MANUAL PROGRAM" appears on the screen then preset the channel again. (page 9)	- Connection is loose or the cable is damaged. - Channel presetting is inappropriate or incomplete.
Noisy sound 	- Check the antenna type (VHF/UHF). Contact a Sony dealer for advice. - Adjust the antenna direction. Contact a Sony dealer for advice. - Try using a booster.	- The antenna type is inappropriate. - The antenna direction is inappropriate. - Signal transmission is low.
Distorted picture 	Turn off or disconnect the booster if it is in use.	Broadcast signals are too strong.
Noisy sound 		
Good picture 	- If the sound of all the channels are noisy, check the TV system (TV SYS) setting (page 9), then press AUTO PROGR to preset the channels again. (page 8) - If the sound of some channels are noisy, select the channel, then select the appropriate TV system (TV SYS). (page 9)	The TV system setting or channel presetting is inappropriate or incomplete.
Noisy sound 		
No picture 	- Check the power cord, antenna and the VCR connections. - Press (power). - Press (main power) on the TV to turn off the TV for about five seconds, then turn it on again.	- The power cord, antenna or VCR is not connected. - The TV is not turned on.
No sound 		

continued

Additional Information | 19

Troubleshooting (continued)

Symptom	Solutions	Possible cause
Good picture 	- Press $\triangleleft$ + to increase the volume level. - Press $\otimes$ to cancel the muting.	- The volume level is too low. - The sound is muted.
No sound 		
Dotted lines or stripes 	- Do not use a hair dryer or other equipment near the TV. - Adjust the antenna direction for minimum interference. Contact a Sony dealer for advice.	There is local interference from cars, neon signs, hair dryers, power generators, etc.
Double images or "ghosts" 	- Use a highly directional antenna. - Use the fine tuning (FINE) function. (page 10) - Adjust the antenna direction. Contact a Sony dealer for advice. - Turn off or disconnect the booster if it is in use.	- Broadcast signals are reflected by nearby mountains or buildings. - The antenna direction is inappropriate. - Use of a booster is inappropriate.
No color 	- Press SELECT until "COLOR" appears on the screen, then press + or - to adjust the color level. (page 15) - Press SELECT until "COL SYS" appears on the screen, then check the color system setting (usually set this to "AUTO"). (page 10). - Adjust the antenna direction. Contact a Sony dealer for advice.	- The color level setting is too low. - The color system setting is inappropriate. - The antenna direction is inappropriate.
Abnormal color patches 	Keep external speakers or other electrical equipment away from the TV. Do not move the TV while the TV is turned on. Press (main power) on the TV to turn off the TV for about five minutes, then turn it on again.	The magnetic disturbance from external speakers or other equipment, or the direction of the earth's magnetic field may affect the TV.

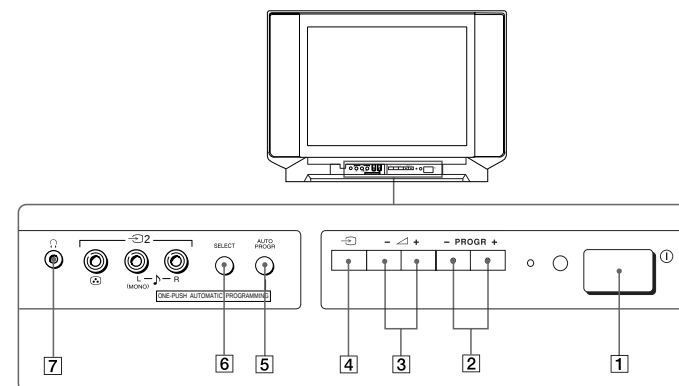
20 | Additional Information

Symptom	Solutions	Possible cause
Lines moving across the TV screen.	Use the fine tuning (FINE) function. (page 10)	There is interference from external sources, e.g., heavy machineries, nearby broadcast station.
The  (standby) indicator on your TV flashes red for about 3 seconds per interval.	Contact your nearest Sony service center.	Your TV may need service.
TV cabinet creaks.	—	Changes in room temperature sometimes make the TV cabinet expand or contract, making a noise. This does not indicate a malfunction.
A “boom” sound is heard when the TV is turned on.	—	The TV’s demagnetizing function is working. This does not indicate a malfunction.

Identifying parts and controls

Refer to the pages indicated in parentheses () for details.

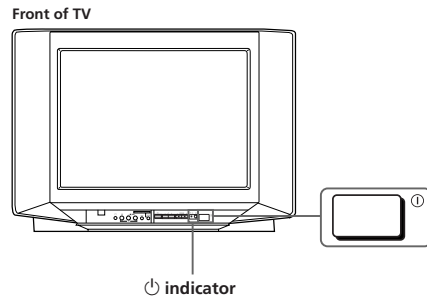
Front panel



- ① (main power) button (11)
- ② PROGR +/- (program) buttons (11)
- ③ +/- (volume) buttons (11)
- ④ TV/video button (12)
- ⑤ AUTO PROGR (program) button (5)
- ⑥ SELECT button (10)
- ⑦ (headphone) jack

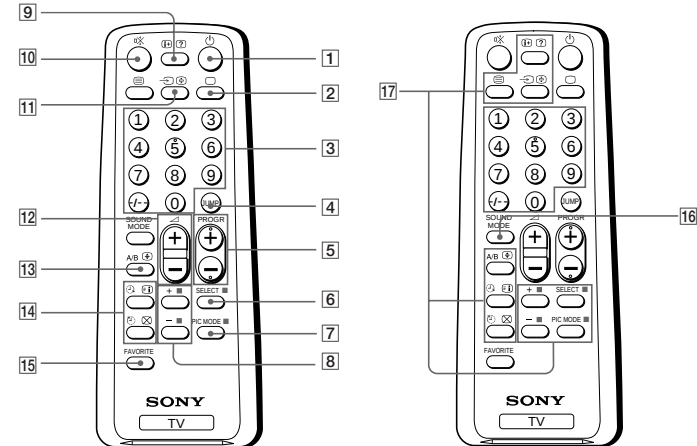
Self-diagnosis function (For KVHF21M50)

Your TV is equipped with a self-diagnosis function. If there is a problem with your TV, the  indicator flashes red. The number of times the  indicator flashes indicates the possible causes.



- 1** Check that the  indicator flashes red a number of times between 3-second intervals.
- 2** Count the number of times the  indicator flashes.
- 3** Press  (main power) to turn off your TV.
- 4** Inform your nearest Sony service center about the number of times the  indicator flashes.
Be sure to note the model name and serial number located on the rear of your TV.

Remote Control



- 1**  (power) button (11)
- 2**  (TV) button (12)
- 3** Number buttons (11)
- 4** JUMP button (12)
- 5** PROGR +/- buttons (11)
- 6** SELECT button (9)
- 7** PIC MODE button (14)
- 8** +/- buttons (9)
- 9**  (display) button (12)
- 10**  (muting) button (12)
- 11**  (video) button (12)
- 12**  +/- (volume) buttons (11)
- 13** A/B button (not used for this models)
- 14** Timer setting buttons (13)
 (wake up timer)
 (sleep timer)
- 15** FAVORITE button (16)

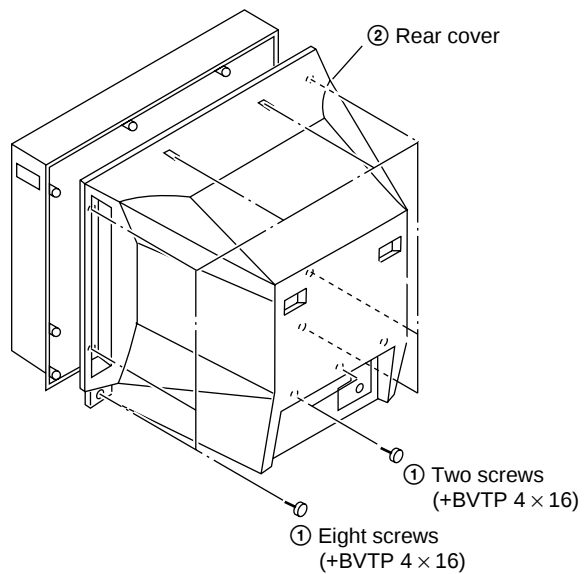
- 16** SOUND MODE button (14)
- 17** Teletext operation buttons (not used for this models)
 (text)  (enlarge)
 (reveal)  (hold)
 (index)  (text clear)
 (FASTEXT: red, green, yellow, blue)

Names/symbols of buttons on the remote are indicated in different colors to represent the available functions.

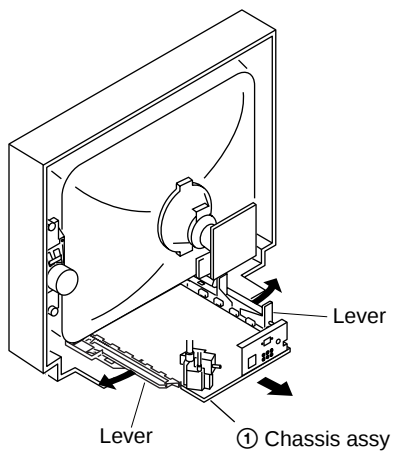
Label color	Button function
White	For general TV operations
Green	For Teletext operations

SECTION 2 DISASSEMBLY

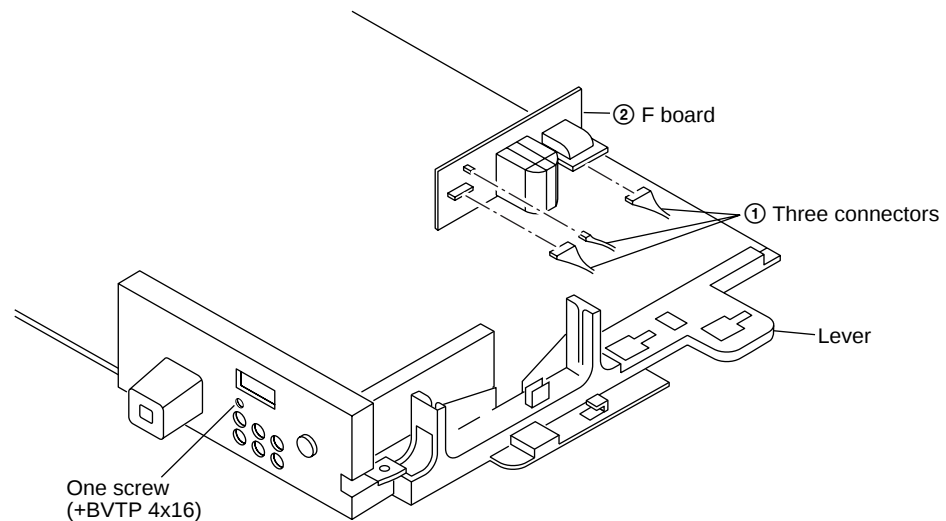
2-1. REAR COVER REMOVAL



2-2. CHASSIS ASSY REMOVAL

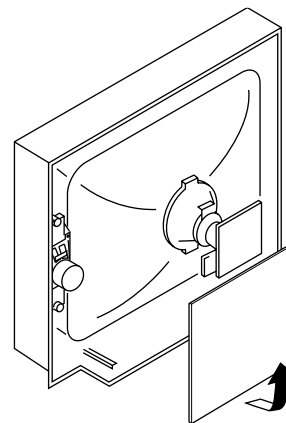


2-3. F BRACKET REMOVAL



2-4. SERVICE POSITION

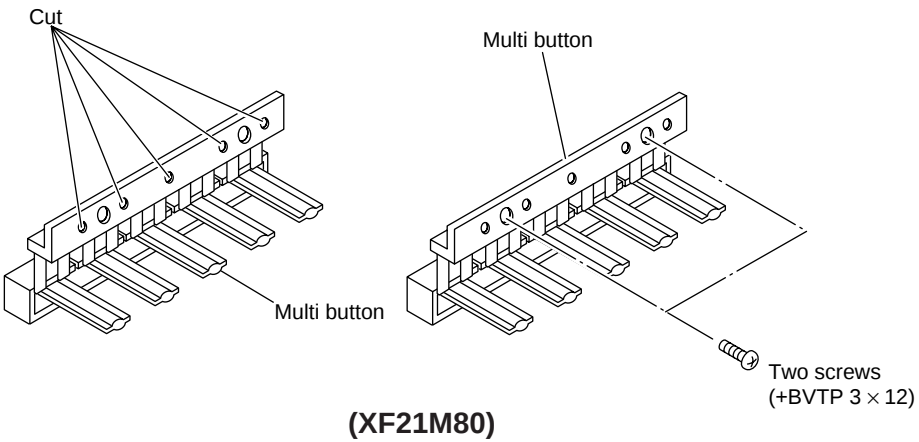
(Note: Remove F Bracket first.)



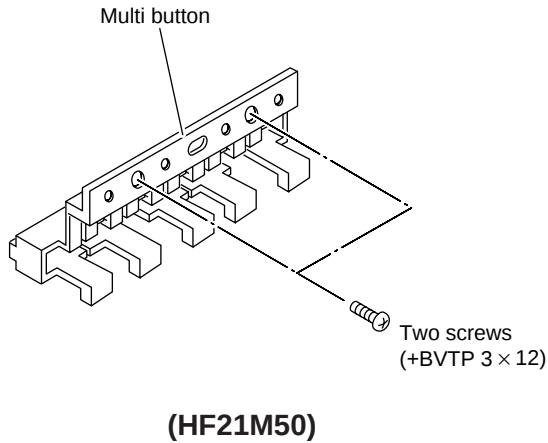
2-5. REPLACEMENT OF PARTS

For replacement of the Multi Button (KV-XF21M80), cut the welded portions from them, exchange with the new parts, and fix them with screws (+BVTP) respectively.

2-5-1. REPLACEMENT OF MULTI BUTTON

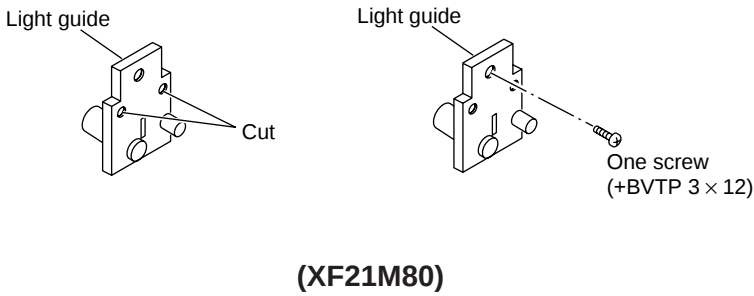


For replacement of the Multi Button (KV-HF21M50), unscrew it to exchange with new parts, and fix it with screws (+BVTP).

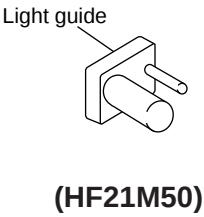


2-5-2. REPLACEMENT OF LIGHT GUIDE

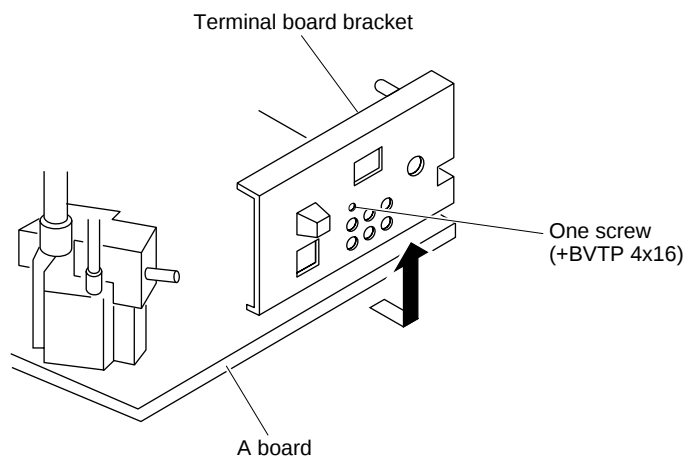
For replacement of light guide (KV-XF21M80), cut the welded portions from it, exchange with new parts, fix it with screw (+BVTP)



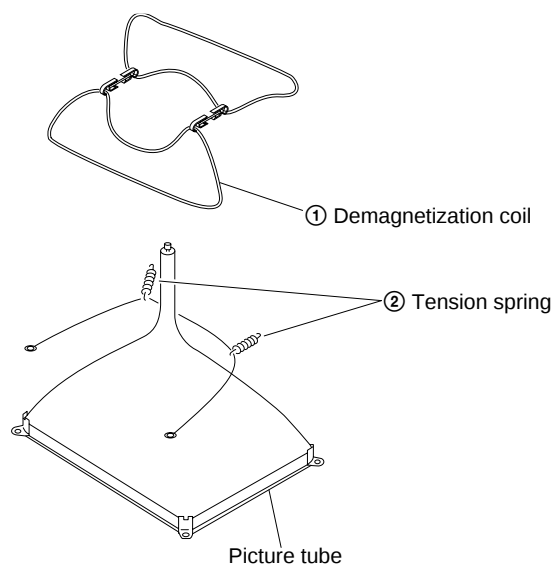
For replacement of Light Guide (KV-HF21M50), pull it out to exchange with the new part.



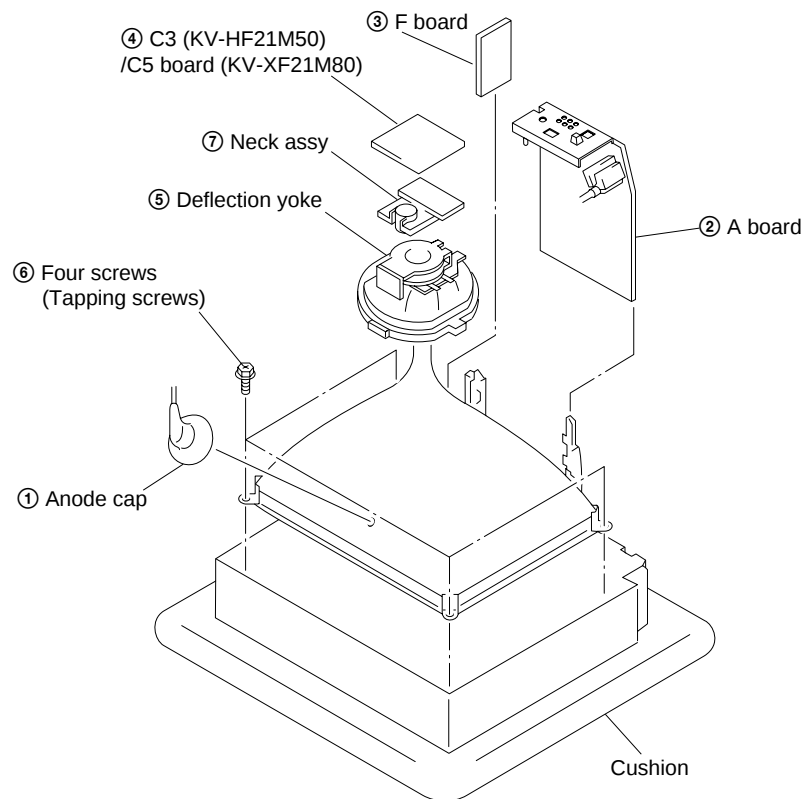
2-6. TERMINAL BRACKET REMOVAL



2-7. DEGAUSS COIL REMOVAL



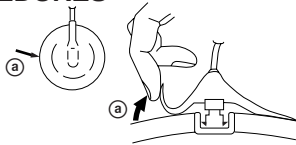
2-8. PICTURE TUBE REMOVAL



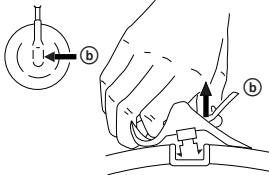
•REMOVAL OF ANODE-CAP

NOTE : After removing the anode, short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT.

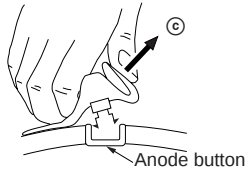
•REMOVING PROCEDURES



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



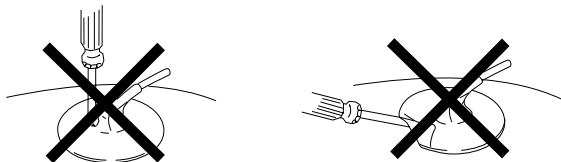
- ② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow (b).



- 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 it up in the direction of the arrow (c).

• HOW TO HANDLE AN ANODE-CAP

- ① Do not damage the surface of anode-caps with sharp shaped objects.
- ② Do not press the rubber too hard so as not to damage the inside of anode-cap.
A metal fitting called the shatter-hook terminal is built into the rubber.
- ③ Do not turn the foot of rubber over too hard.
The shatter-hook terminal will stick out or damage 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.

Controls and switches should be set as follows unless otherwise noted:

PICTURE control normal

BRIGHTNESS control normal

Perform the adjustments in the following order :

1. Beam Landing
2. Convergence
3. Focus
4. White Balance

Note : Test Equipment Required.

1. Color-bar/Pattern Generator
2. Degausser
3. Oscilloscope

Preparation :

- In order to reduce the influence of geomagnetism on the set's picture tube, face it east or west.
- Switch on the set's power and degauss with the degausser.

3-1. BEAM LANDING

1. Input a white signal with the pattern generator.

Contrast } normal
Brightness }

2. Position neck assy as shown in Fig3-2.
3. Set the pattern generator raster signal to a green raster.
4. Move the deflection yoke to the rear and adjust with the purity control so that the green is at the center and the blue and the red take up equally sized areas on each side.
(See Figures 3-1 through 3-3.)
5. Move the deflection yoke forward and adjust so that the entire screen is green. (See Figure 3-1.)
6. Switch the raster signal to blue, then to red and verify the condition.
7. When the position of the deflection yoke has been decided, fasten the deflection yoke with the screws and DY spacers.
8. If the beam does not land correctly in all the corners, use a magnet to adjust it.
(See Figure 3-4.)

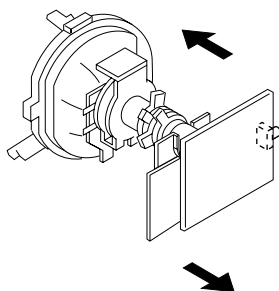
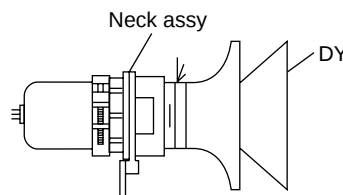


Fig. 3-1



Note:
Neck Assy is exactly behind
DY (no gap between Neck
Assy and DY)

Fig. 3-2

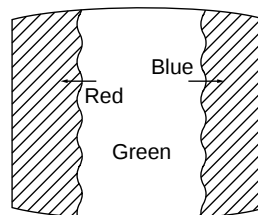


Fig. 3-3

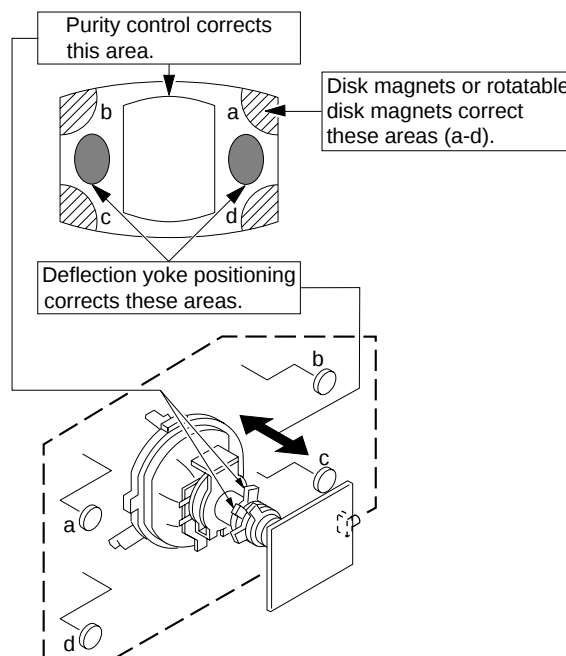


Fig. 3-4

Preparation :

- Before starting this adjustment, adjust the focus, horizontal size and vertical size.
- Minimize the brightness setting.
- Provide dot pattern.

Center dot

R G B

H. STAT VR

V. STAT Magnet

RV 702

C3 board (KV-HF21M50)
C5 board (KV-XF21M80)

(Moving vertically), adjust the V.STAT magnet so that the red, green and blue dots are on top of each other at the center of the screen.

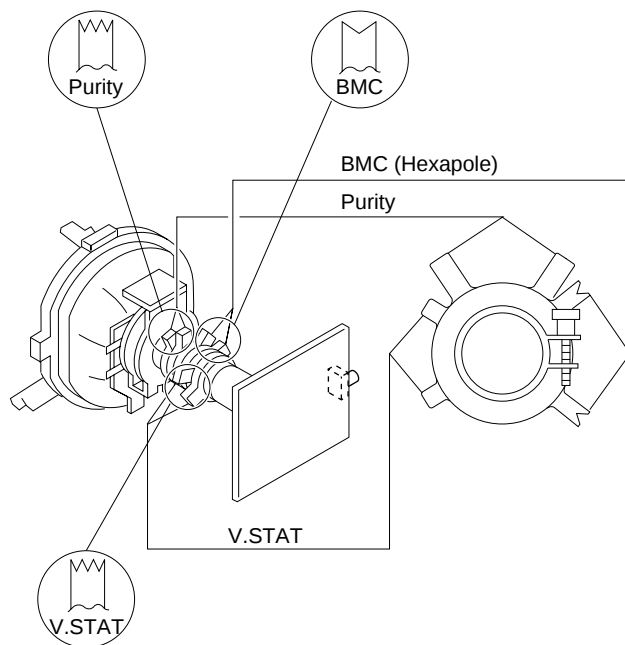
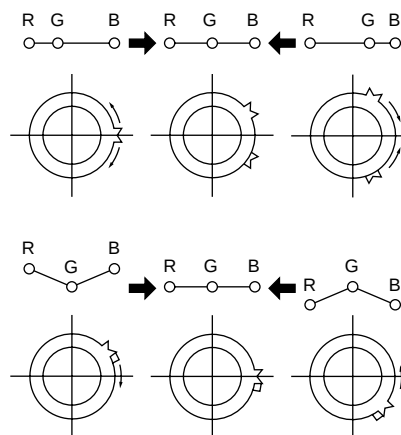


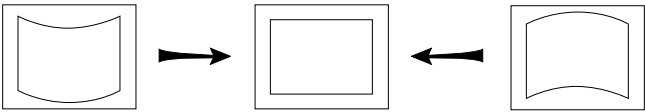
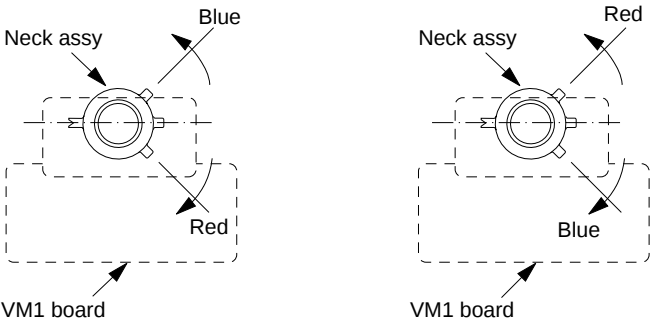
Figure 1 consists of two schematic diagrams. Diagram (a) is a top view of a microfluidic chip. It shows a central horizontal channel with a circular region in the middle. From this central region, three side channels branch out: one to the left and two to the right. Arrows indicate the flow direction: from the central channel into the side channels. Diagram (b) is a cross-sectional view of the chip. It shows a central channel (labeled 'G') and two side channels (labeled 'B' and 'R'). Arrows indicate the flow direction: from the central channel into the side channels.

If the red, green and blue dots are not balanced or aligned, then use the BMC magnet to adjust in the manner described below.



④ Y separation axis correction magnet adjustment.

1. Receive the cross-hatch signal and adjust [PICTURE] to [MIN] and [BRIGHTNESS] to [STANDARD] .
2. Adjust the Y separation axis correction magnet on the neck assembly so that the horizontal lines at the top and bottom of the screen are straight.



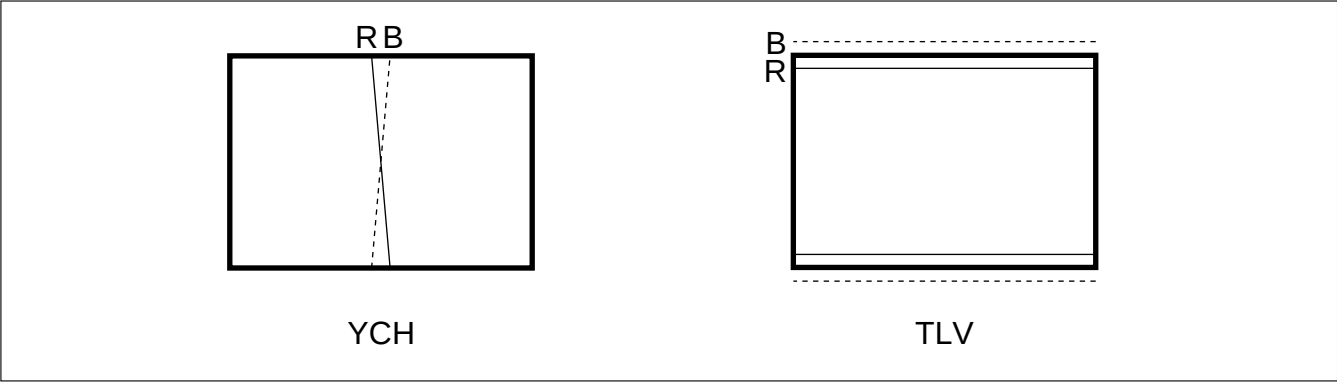
Note

1. The Red and Blue magnets should be equally far from the horizontal center line.
2. Do not separate the Red and Blue magnets too far. (Less than 8 mm)

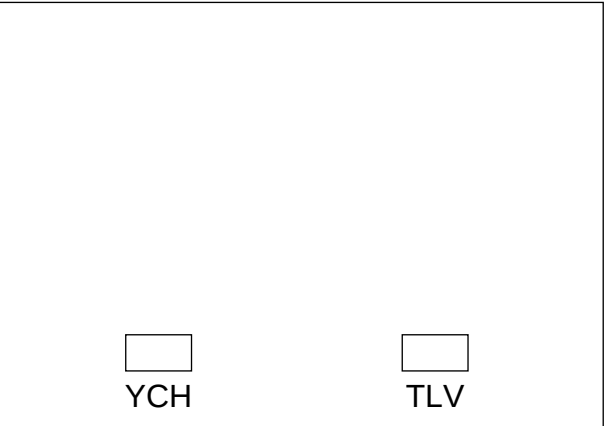
(2) Dynamic Convergence Adjustment

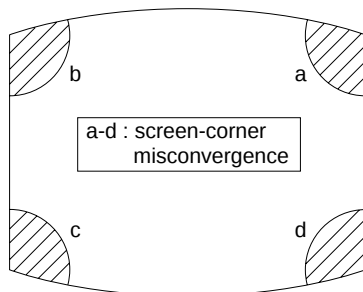
Preparation:

- Before starting this adjustment, adjust the horizontal static convergence and the vertical static convergence



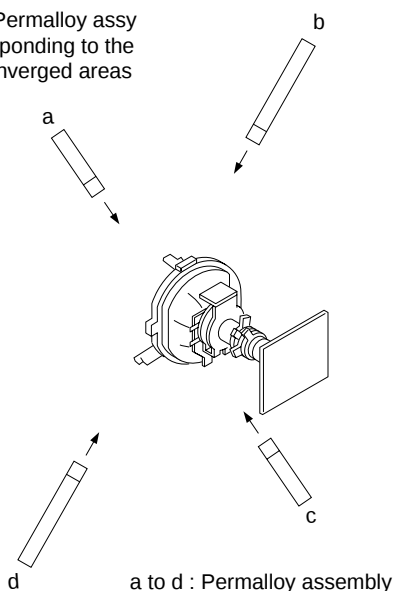
on DY



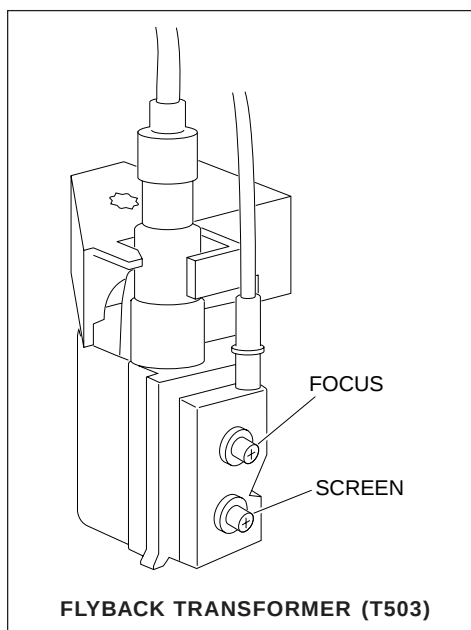
(3) Screen-corner Convergence

Fix a Permalloy assy corresponding to the misconverged areas.

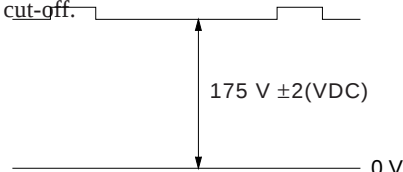
Fix a Permalloy assy corresponding to the misconverged areas

**3-3. FOCUS ADJUSTMENT**

Adjust FOCUS control on the flyback transformer for the best focus.

**3-4. G2 (SCREEN) AND WHITE BALANCE ADJUSTMENTS****1. G2 (SCREEN) ADJUSTMENT**

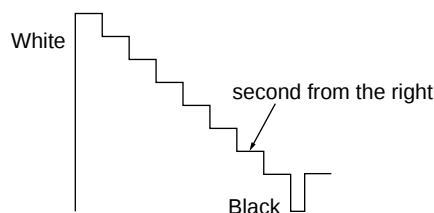
- 1) Set the PICTURE to normal.
- 2) Put to VIDEO input mode without signals.
- 3) Connect R, G and B of the C3/C5 board cathode to the oscilloscope.
- 4) Adjust BRIGHTNESS to obtain the cathode voltage to the value below.
- 5) Adjust G2 (Screen) on FBT until picture shows the point before cut-off.

**2. WHITE BALANCE ADJUSTMENT**

- 1) Set to Service Mode (Refer Section 5-1: ADJUSTMENTS WITH COMMANDER).
- 2) Input white raster signal.
- 3) Set the PICTURE to minimum.
- 4) Select GCT (WHB 4) and BCT (WHB 5) with [1] and [4], and adjust the level with [3] and [6] for the best white balance.
- 5) Set the PICTURE to maximum.
- 6) Select GDR (WHB 1) and BDR (WHB 2) with [1] and [4], and adjust the level with [3] and [6] for the best white balance.
- 7) Write into the memory by pressing [MUTING] then [0].

3. SUB BRIGHT ADJUSTMENT

- 1) Set to service mode.
- 2) Input a staircase signal of black to white from the pattern generator.
- 3) BRIGHTNESS 50%.
PICTURE MINIMUM
- 4) Select SBR (WHB7) with [1] and [4], and adjust SBR (WHB7) level with [3] and [6] so that the second stripe from the right is dimly lit.

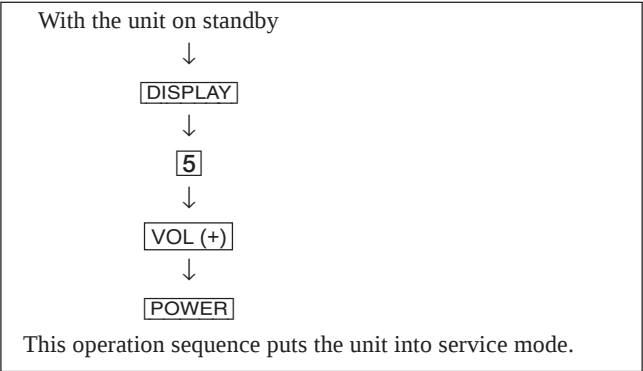


SECTION 4
CIRCUIT ADJUSTMENTS

4-1. ADJUSTMENTS WITH COMMANDER

Service adjustments are made with the RM-952 that comes with this unit.

a. ENTERING SERVICE MODE



b. METHOD OF CANCELLATION FROM SERVICE MODE

Set the standby condition (Press **POWER** button on the commander), then press **POWER** button again, hereupon it becomes TV mode.

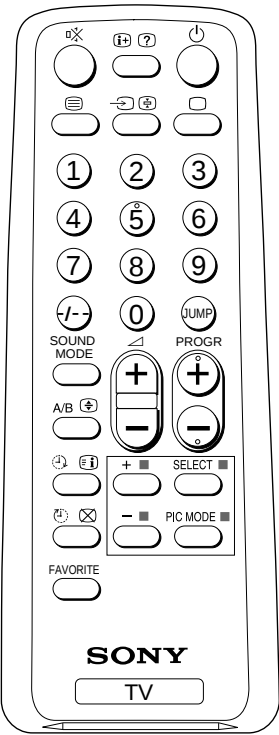
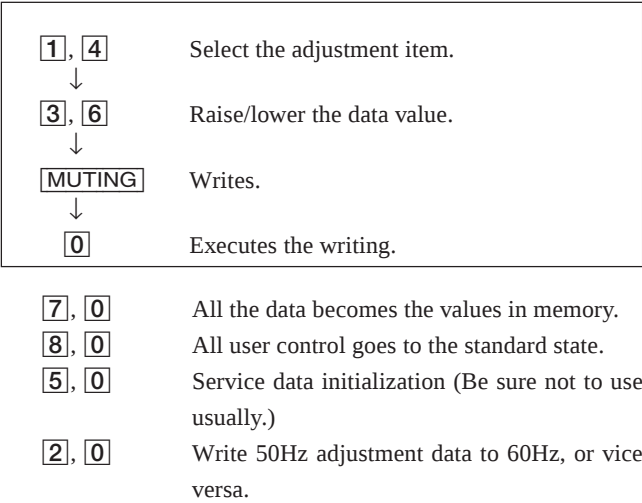
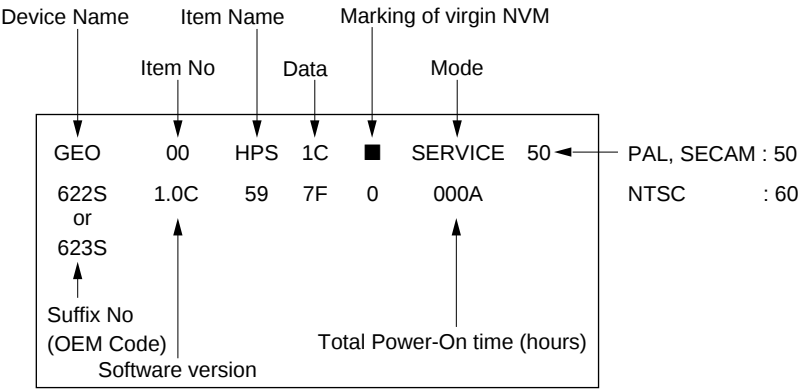
c. METHOD OF WRITE INTO MEMORY

- 1) Set to Service Mode.
- 2) Press **1** (UP) and **4** (DOWN), select an item of adjustment.
- 3) Press **MUTING** button and it will indicate WRITE on the screen.
- 4) Press **0** button to write into memory.

d. MEMORY WRITE CONFIRMATION METHOD

- 1) After adjustment, pull out the plug from AC outlet, and then plug into AC outlet again.
- 2) Turn the power switch ON and set to Service Mode.
- 3) Call the adjusted items again to confirm adjustments were made.

The screen display is :



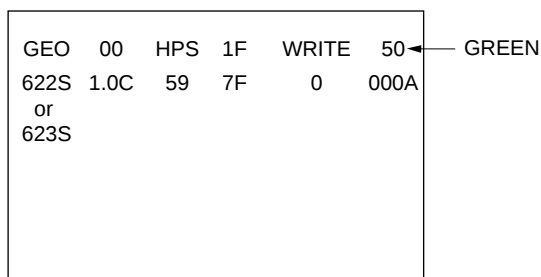
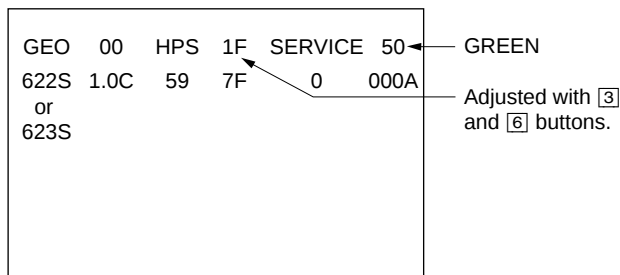
RM-952

4-2. ADJUSTMENT METHOD

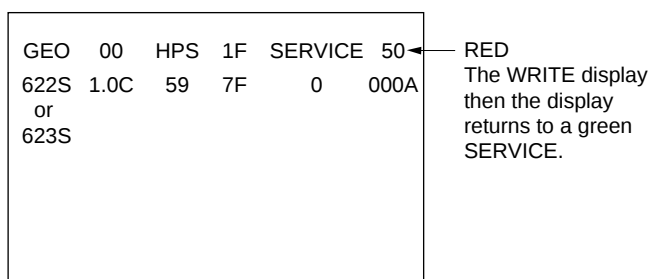
Item Number 00 of device GEO

This explanation uses H-Position as an example.

1. Select "GEO 00 HPS" with the **[1]** and **[4]** buttons.
2. Raise/lower the data with the **[3]** and **[6]** buttons.
3. Select the optimum state. (The standard is 1F for PAL reception.)
4. Write with the **[MUTING]** button. (The display changes to WRITE.)
5. Execute the writing with the **[0]** button. (The WRITE display will be changed to red color while excuting, and back to SERVICE.)



Written with **[MUTING]**



Write executed with **[0]**

Use the same method for all Items. Use **[1]** and **[4]** to select the adjustment item, use **[3]** and **[6]** to adjust, write with **[MUTING]**, then execute the write with **[0]**.

- Note :**
1. In **[WRITE]**, the data for all items are written into memory together.
 2. For adjustment items that have different standard data between 50Hz or 60Hz, be sure to use the respective input signal after adjustment.

Adjustment Item Table

Device Name	Functionality		Note	Data Range	Function	Note for Different Data	Register No. (bit)	Slava Address	RAM Address (bit)
	No	Name							
GEO	0	HPS	7	3F	H Position	50/60HZ	12 (7-2)	CXA2130S(88H) A	82 (7-2)
	1	HSZ	1F	3F	H Size	50/60HZ	11 (7-2)		81 (7-2)
	2	PAP	1F	3F	Pin Amp	50/60HZ	13 (7-2)		83 (7-2)
	3	TLT	7	0F	Trapezium	50/60HZ	15 (7-4)		85 (7-4)
	4	VPS	1F	3F	V Position	50/60HZ	0F (7-2)		7F (7-2)
	5	VSZ	1F	3F	V Size	50/60HZ	0E (7-2)		7E (7-2)
	6	SCO	7	0F	S Correction	50/60HZ	10 (7-4)		80 (7-4)
	7	VLN	7	0F	V Linearity	50/60HZ	10 (3-0)		80 (3-0)
	8	BOW	7	0F	AFC Bow	50/60HZ	16 (7-4)		86 (7-4)
	9	AGL	7	0F	AFC-Angle	50/60HZ	16 (3-0)		86 (3-0)
	10	UPN	1F	3F	Upper Pin	50/60HZ	14 (7-2)		84 (7-2)
	11	LPN	2F	3F	Lower Pin	50/60HZ	18 (7-2)		88 (7-2)
	12	HBL	1	1	H Blanking on/off		18 (1)		67 (1)
	13	LBL	7	0F	Left H Blanking	50/60HZ	17 (7-4)		87 (7-4)
	14	RBL	7	0F	Right H Blanking	50/60HZ	17 (3-0)		87 (3-0)
WHB	0	RDR	2A	3F	R Drive	DYNAMIC/others	09 (7-2)	CXA2130S(88H)	8F (7-2)
	1	GDR	2A	3F	G Drive	DYNAMIC/others	0A (7-2)		90 (7-2)
	2	BDR	2A	3F	B Drive	DYNAMIC/others	0B (7-2)		91 (7-2)
	3	RCT	7	0F	R Cutoff	SECAM/others	07 (3-0)		93 (3-0)
	4	GCT	7	0F	G Cutoff	SECAM/others	08 (7-4)		94 (7-4)
	5	BCT	7	0F	B Cutoff	SECAM/others	08 (3-0)		94 (3-0)
	6	BMN	15	1F	Brightness Minimum Data				97
	7	SBR	28	3F	Sub Brightness Control				98
SAJ	0	PMX	33	3F	Picture Maximum Data			CXA2130S(88H)	96
	1	SHU	8	0F	Sub Hue Control	TV/Video			99
	2	SSH	3	0F	Sub Sharpness Control	TV/Video			9A
	3	SCL	1F	3F	Sub Color Control	NTSC/others			9B
VP	0	EHT	4	0F	EHT Comp	50/60HZ	15 (3-0)	CXA2130S(88H)	85 (3-0)
	1	GMA	2	03	Gamma Correction	NTSC/others	0B (1-0)		1A3 (1-0)
	2	YDL	6	0F	Y Delay	PAL/SECAM/NTSC	0C (3-0)		8C (3-0)
	3	SST	1	03	SECAM ID Start Position		1B (1-0)		6A (1-0)
	4	SSP	1	03	SECAM ID Stop Position		1B (3-2)		6A (3-2)
	5	SLV	2	03	SECAM ID Level		1C (1-0)		6B (1-0)
	6	SBF	22	3F	SECAM BELL f0		1C (7-2)		6B (7-2)
	7	DYC	0	1	Dynamic Color on/off		0A (1)		59 (1)
	8	ABL	1	1	ABL Mode Switching (except STANDARD)		09 (1)		58 (1)
	9	VTH	1	1	ABL Detection Vth Switching		09 (0)		58 (0)
	10	SF0	1	1	FO Switching for Sharpness	NTSC/others	05 (1)		198 (1)
	11	DCX	1	1	DC Trans. Ratio Switching		06 (1)		55 (1)
	12	SHT	1	1	Pre-/Overshoot ratio Switch	NTSC/others	06 (0)		199 (0)

Adjustment Item Table

Device Name	Functionality		Note	Data Range	Function	Note for Different Data	Register No. (bit)	Slava Address	RAM Address (bit)	
	No	Name								
VP	13	HDW	0	1	H Drive Pulse Width Switch	TV/Video/Text	00 (6)		4F (6)	
	14	AFC	1	03	AFC Gain Control		0F (1-0)		8D (1-0)	
	15	HOS	7	0F	H Oscillation		0C (7-4)		5B (7-4)	
	16	HSS	0	1	Slice Level of H Sync Sep.		0D (1)		5C (1)	
	17	VSS	0	1	Slice Level of V Sync Sep.	50/60Hz	0D (0)		5C (0)	
	18	HMS	1	1	Macro Vision C/m off/on		0E (0)		7E (0)	
	19	YUV	0	1	YUV Switch Control		01 (0)		50 (0)	
	20	CDV	1	3	CD mode for Video		0D (5-4)		1A1 (5-4)	
	21	RON	1	1	R ON	Video only not memorized	01 (3)		50 (3)	
	22	GON	1	1	G ON	not memorized	01 (2)		50 (2)	
	23	BON	1	1	B ON	not memorized	01 (1)		50 (1)	
	24	PON	1	1	P ON	not memorized	00 (7)		4F (7)	
	25	BLK	0	1	BLK Off		12 (0)		61 (0)	
	26	VMC	0	1	VM Off		13 (0)		62 (0)	
AP	0	INF	0	3F	Input Attenuation When surround off		00 (5-0)	TDA7429	19D (5-0)	
	1	INS	0	3F	Input Attenuation When surround on		02		1A0 (5-0)	
	2	PH1	0	3	Phase 1 Register Selection				76 (1-0)	
	3	PH2	0	3	Phase 2 Register Selection				76 (3-2)	
	4	PH3	0	3	Phase 3 Register Selection		#4 (3-0)		76 (5-4)	
	5	PH4	0	3	Phase 4 Register Selection				76 (7-6)	
	6	BCS	2	3	Bass Center Shift				#5 (3-0)	1A8 (1-0)
	7	TCS	2	3	Treble Center Shift		#5 (3-0)		1A9 (1-0)	
8	TRF	2	3	RF Treble Offset		#5 (3-0)	1A9 (5-4)			
MSP	0	WST	15	FF	W/G Stereo Threshold			MSP3415D(84H) (844)	157 (7-0)	
	1	WBT	EA	FF	W/G Bilingual Threshold				158 (7-0)	
	2	WLL	5	FF	W/G Monaural Threshold				159 (7-0)	
	3	WAC	0	0F	W/G Agreement Count				15A (3-0)	
	4	WDL	30	FF	W/G Search Delay				15B (7-0)	
	5	NDL	20	FF	NICAM Search Delay				15C (7-0)	
	6	SDL	10	FF	Stereo status Read Delay				15D (7-0)	
	7	AGC	1	1	AGC Switch Auto/Constant		BB (7)		108 (7)	
	8	REL	28	3F	AGC Gain at Constant Mode		BB (6-1)		108 (6-1)	
	9	CRM	0	1	Carrier muting on/off		BB (9)		107 (9)	
	10	ACO	1	1	Audio Clock out on/off		83 (5)		10C (5)	
	11	FP	1B	7F	FM Prescale for non-M system		0E (7-0)		16C (6-0)	
	12	FPM	32	7F	FM Prescale for M system		0E (7-0)		16D (6-0)	
	13	FH	36	7F	FM Prescale for HDEV		0E (7-0)		16E (6-0)	
	14	FHM	65	7F	FM Prescale for HDEV and M		0E (7-0)		16F (6-0)	
	15	WGP	2A	7F	W/G Prescale		0E (7-0)		170 (6-0)	
	16	NIP	6D	7F	NICAM Prescale		10 (7-0)		138 (6-0)	
	17	ERR	50	FF	Auto FM switch Threshold		21 (10-3)		166 (7-0)	
18	VOL	6D	FF	Loud Speaker gain 7000h to 7f0h	0000 (15-4)	1A7 (7-0)				

Adjustment Item Table

Device Name	Functionality		Note	Data Range	Function	Note for Different Data	Register No. (bit)	Slava Address	RAM Address (bit)
	No	Name							
TXT	0	TXH	1	3	Teletext Horizontal Position			(58H)	18D (1-0)
	1	TXV	0	3	Teletext Vertical Position				18D (6-4)
OPM	0	OSH	0A	3F	OSD H Position	Option-Misc			AC (7-2)
	1	COM	0	03	Comb Selection				A5 (7-6)
	2	APC	1	1	APC Switch				A4 (5)
	3	TSY	0	03	TV Sys at Auto TV Sys				A4 (4-3)
	4	MUT	0	1	No Signal Mute				A4 (0)
	5	AFM	0	1	Auto FM switch				A4 (1)
	6	RFB	0	3	C-BPF Control				A5 (5-4)
	7	TVO	0	7	Tilt to V-Angle offset				A5 (2-0)
	8	DBL	0	1	Disable Blueback Function				A4 (2)
OPB	0	OP1	FF	FF	Optional Bits 1 (see below)	Option-Bits			45
	1	OP2	1	FF	Optional Bits 2 (see below)				46
	2	OP3	0	FF	Optional Bits 3 (see below)				47

NOTE

- shaded items are fixed data.
- Standard data listed on the Adjustment Item Table are reference values, therefore it may be different for each model and for each mode.
- Note for Different Data Those are the standard data values written on the microprocessor. Therefore, the data values of the modes and stored respectively in the memory.
In case of a device replacement, adjustment by rewriting the data value is necessary for some items.

ITEM INFORMATION.

No. OPB0 OP1

Item	XTAL 4.43	XTAL 3.58	SECAM	2nd. Lang	B/G	I	D/K	M
KV-HF21M50	1	1	1	1	1	1	1	1
KV-XF21M80	1	1	1	1	1	1	1	1

No. OPB1 OP2

Item	TOP	NICAM	HDEV	Thai Bil	Dis. Fav	DVD Input	AV Input	
KV-HF21M50	0	0	0	0	0	0	1	0
KV-XF21M80	0	0	0	0	0	0	1	0

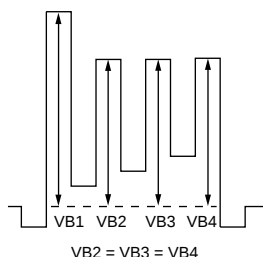
No. OPB2 OP3

Item	Pic Rot	2199	Auto PIC	Auto TV sys	US ST	AV Mono	11 KEY	Color SW
KV-HF21M50	0	0	1	0	0	0	0	0
KV-XF21M80	1	0	1	0	0	0	0	0

4-3. PICTURE QUALITY ADJUSTMENTS

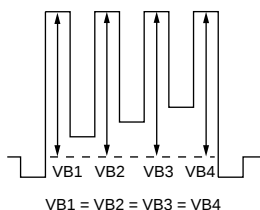
SUB COLOR ADJUSTMENT

1. Input a PAL color-bar.
2. Set to the following condition:
PICTURE 100%, BRIGHTNESS 50%, COLOR 50%
3. Connect an oscilloscope to pin ① (B OUT) of CN305, A board.
4. Set to Service Mode and select SAJ 3 'SCL' with [1] and [4] of the commander then adjust to VB2=VB3=VB4 with [3] and [6].
5. Press [MUTING] → [0] of the commander to write the data.
6. Adjust SAJ 3 'SCL' as step 2 to 5 when receiving NTSC color-bar.



SUB HUE ADJUSTMENT

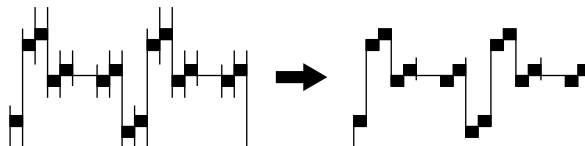
1. Select Video 1.
2. Input a NTSC color-bar, video into Video 1.
3. Set the following condition:
PICTURE 100%, BRIGHTNESS 50%, COLOR 50%
4. Connect an oscilloscope to pin ① (B OUT) of CN305, A board.
5. Select SAJ 1 'SHU' with [1] and [4] of the commander by setting to Service Mode and adjust to VB1=VB2=VB3=VB4 with [3] and [6].



6. Press [MUTING] → [0] of the commander to write the data.

BELL FILTER ADJUSTMENT

1. Input SECAM color-bar signal.
2. Connect the dual-trace oscilloscope to the pin ⑨ (R-Y) of CN303 (not mounted).
3. Adjust SERVICE MODE, ITEMS 'SBF' as shown below.



4-4. A BOARD ADJUSTMENT AFTER IC003 (MEMORY) REPLACEMENT

When replacing IC003 (MEMORY), be sure to change IC001 (μ-COM) to the following new IC at the same time.

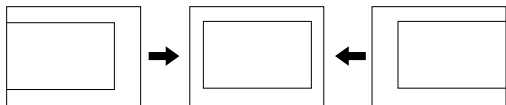
IC001(μ-CON):CXP86449-622S (KV-XF21M80)
CXP86449-623S (KV-HF21M50)

1. Enter to Service Mode.
2. Press commander buttons [5] and [0] (Data Initialize), and [2] and [0] (Data Copy) to initialize the data.
3. Call each item number and check if the respective screen shows the normal picture.
In cases where items are not well adjusted, rectify the items with fine adjustment.
Write the data per each item number ([MUTING] + [0]).
4. Select item numbers "OPB0" (OP1), "OPB1" (OP2) and "OPB2" (OP3) and respectively set the bit per model with command buttons [3] and [6].
5. Press commander buttons [8] and [0] (Test Normal) to return to the data that was set on the shipment from the factory.
(This will also cancel Service Mode.)

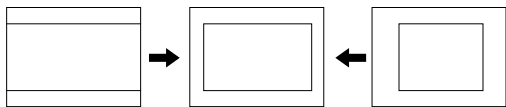
4-5. PICTURE DISTORTION ADJUSTMENT

Item Number 00 – 0B

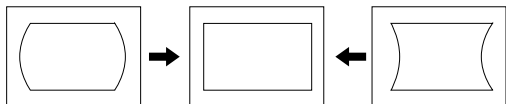
GEO 0 HSH (H POSITION)



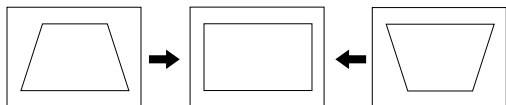
GEO 1 HSZ (H SIZE)



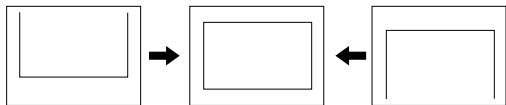
GEO 2 PAP (PIN AMP)



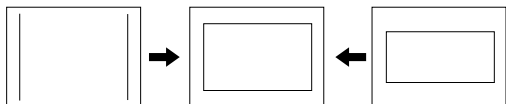
GEO 3 TILT (TRAPEZIUM)



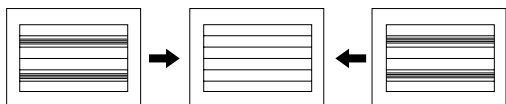
GEO 4 VSH (V POSITION)



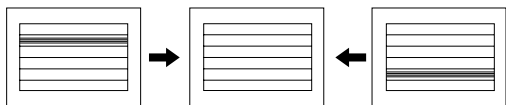
GEO 5 VSZ (V SIZE)



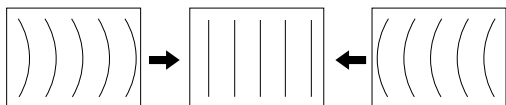
GEO 6 SCR (VERTICAL S-Correction)



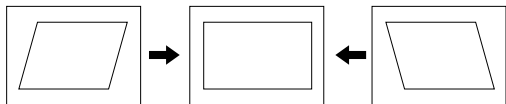
GEO 7 VLN (V LINEARITY)



GEO 8 VBOW (AFC.BOW)

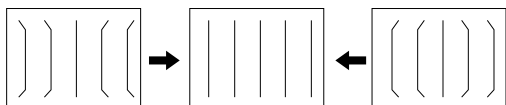


GEO 9 AGL (AFC.ANGLE)

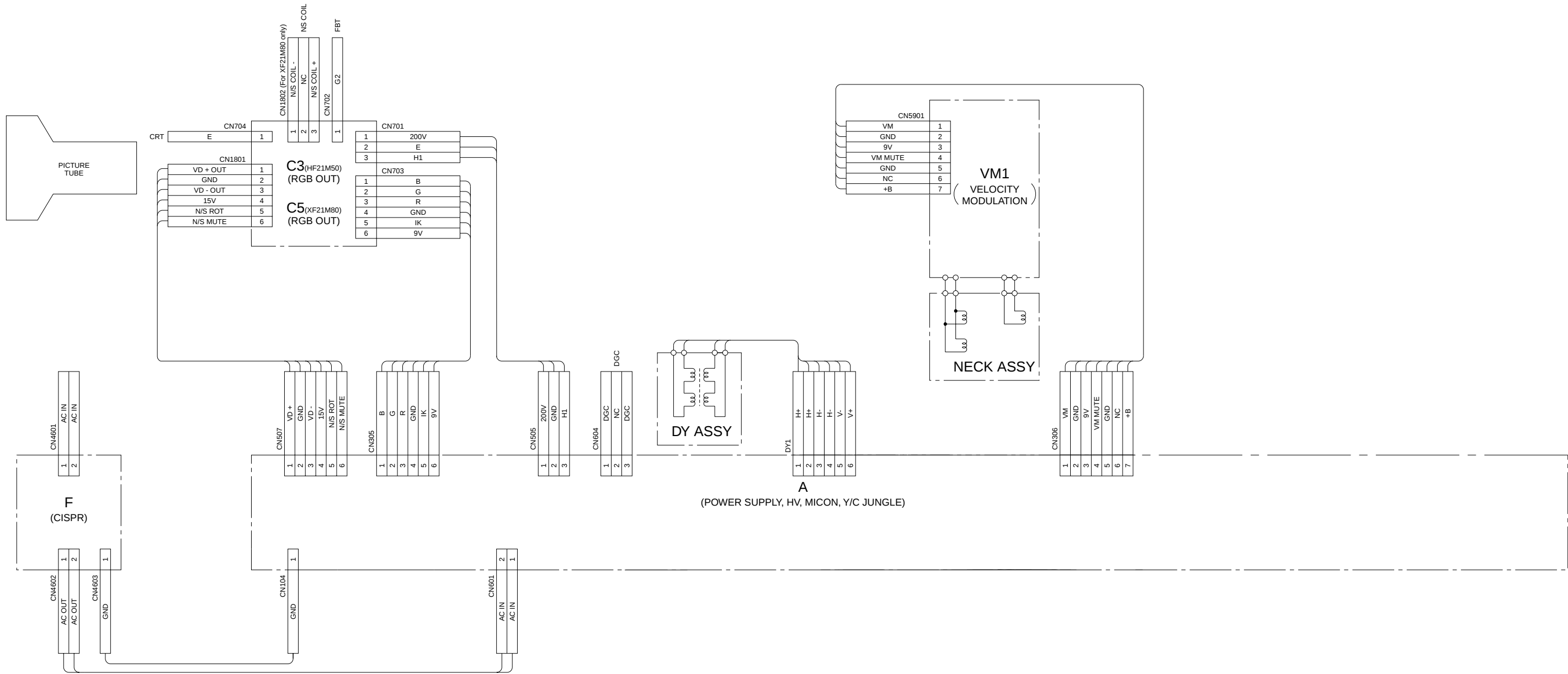


GEO 0A UCP (UPPER CORNER PIN)

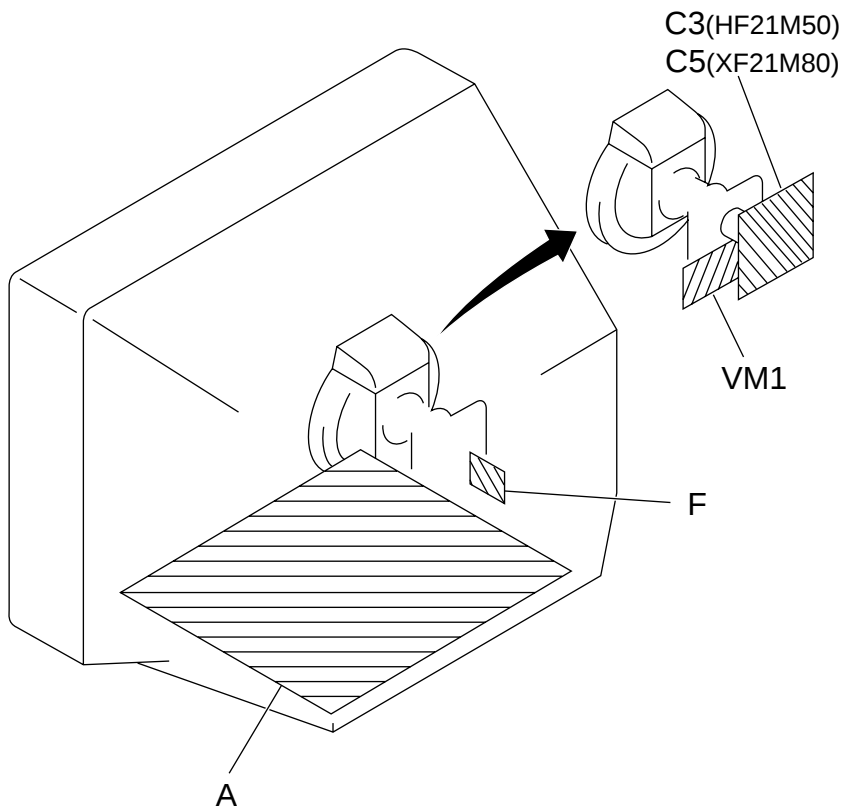
GEO 0B LCP (LOWER CORNER PIN)



5-2. FRAME SCHEMATIC DIAGRAM



5-3. CIRCUIT BOARDS LOCATION



5-4. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note:

- All capacitors are in μF unless otherwise noted.
- All electrolytic capacitors are rated at 50V unless otherwise noted.
- All resistors are in ohms.
 $\text{k}\Omega = 1000\Omega$, $\text{M}\Omega = 1000\text{k}\Omega$
- Indication of resistance which does not have rating electrical power is as follows.

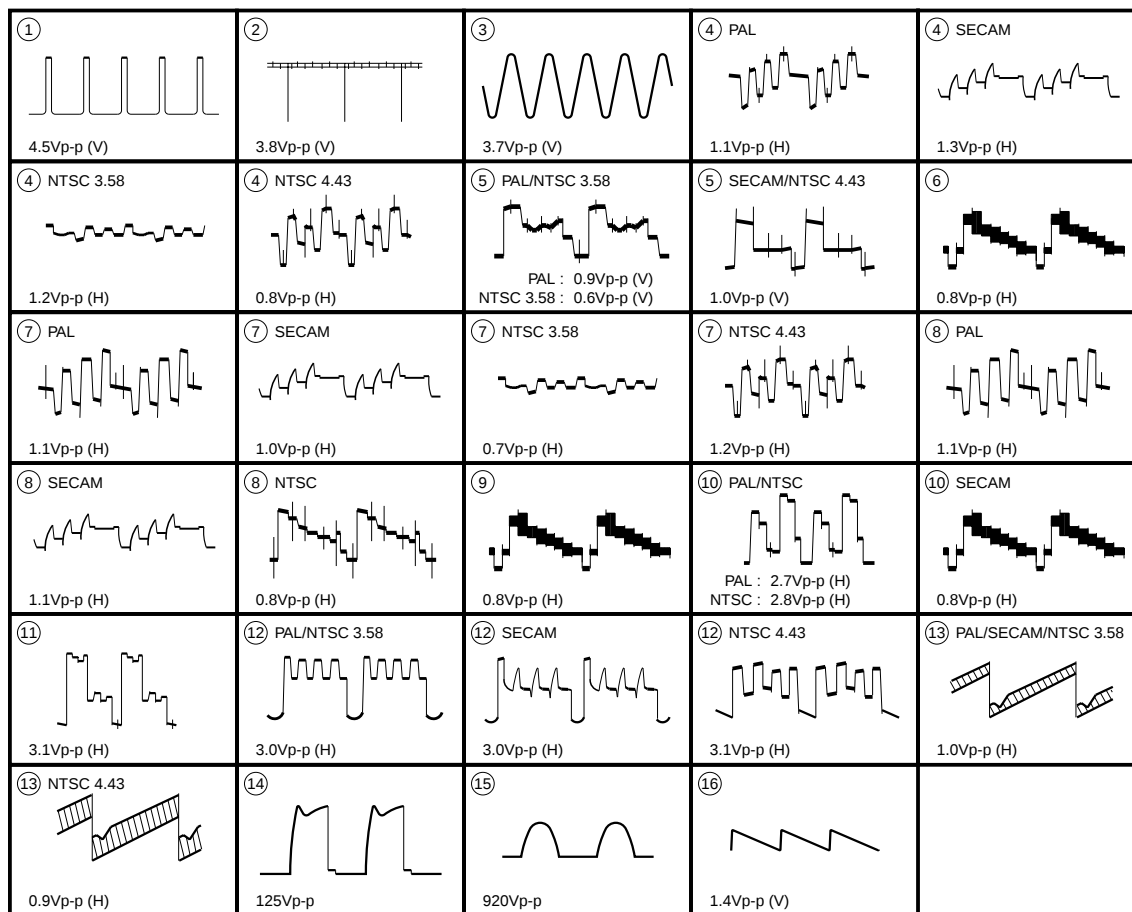
Pitch: 5 mm
Rating electrical power 1/4W (CHIP: 1/10W)
-  : nonflammable resistor.
-  : internal component.
-  : panel designation or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B unless otherwise noted.
- **Readings are taken with a color-bar signal input.**
no mark : PAL
() : SECAM
[] : NTSC 3.58
« » : NTSC 4.43
- **Readings are taken with a 10 M Ω digital multimeter.**
- **Voltage are dc with respect to ground unless otherwise noted.**
- **Voltage variations may be noted due to normal production tolerances.**
- **All voltages are in V.**
- * : Cannot be measured.
- **Circled numbers are waveform references.**
-  : B + bus.
-  : B – bus.
-  : signal path.

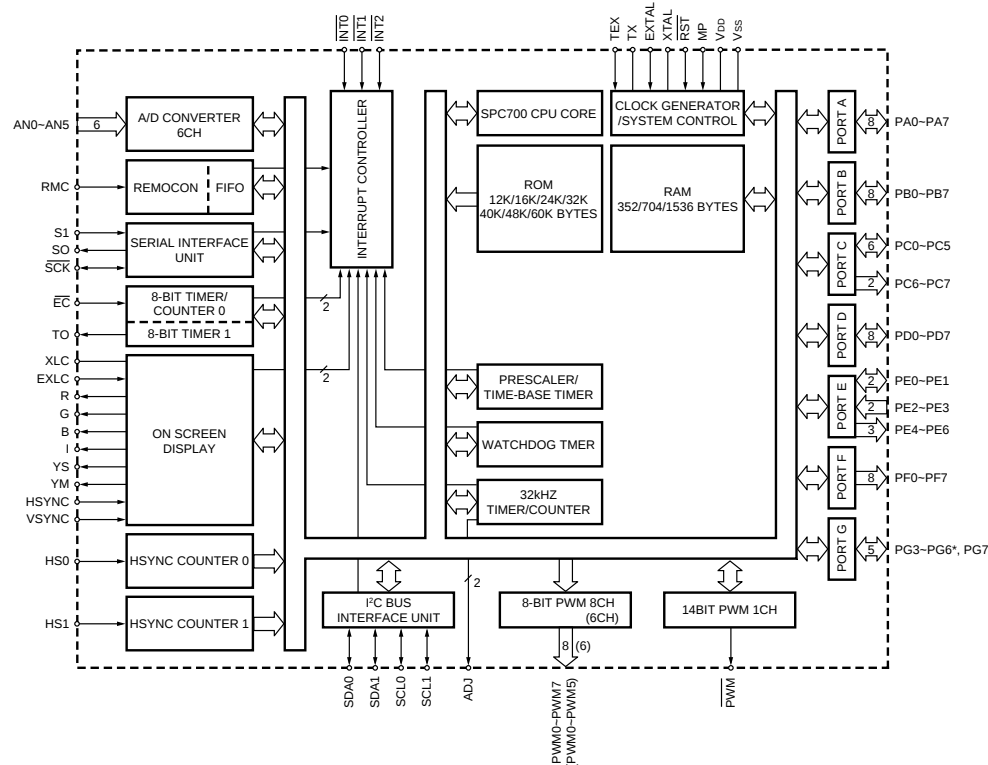
Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ✕	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 component identified by shading and mark  are critical for safety. Replace only with part number specified.

A BOARD WAVEFORMS



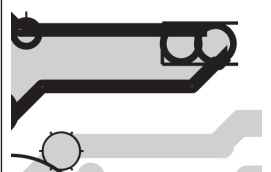
A BOARD IC001 CXP86449-622S (KV-XF21M80)
A BOARD IC001 CXP86449-623S (KV-HF21M50)

A BOARD * MARK LIST

	KV-HF21M50	KV-XF21M80
C003	100P :CHIP	#
C202	0.0082 :CHIP	0.01 :CHIP
C203	0.0082 :CHIP	0.01 :CHIP
C204	0.0033 :PP	0.082 :PP
C205	0.0033 :CHIP	0.0047 :CHIP
C206	0.0033 :CHIP	0.0047 :CHIP
C207	0.033 :PP	0.082 :PP
C323	#	22
C329	#	22
CN507	#	4P
CP301	#	COMB FILTER BLOCK
D320	UDZS-TE17-9.1B	#
D321	UDZS-TE17-9.1B	#
D401	UDZS-TE17-9.1B	RD9.1S-B
D402	UDZS-TE17-9.1B	RD9.1S-B
D403	UDZS-TE17-9.1B	RD9.1S-B
D404	UDZS-TE17-9.1B	RD9.1S-B
D405	UDZS-TE17-9.1B	RD9.1S-B
D406	UDZS-TE17-9.1B	RD9.1S-B
D901	UDZS-TE17-9.1B	RD9.1S-B
D902	UDZS-TE17-9.1B	RD9.1S-B
D903	UDZS-TE17-9.1B	RD9.1S-B
D904	UDZS-TE17-9.1B	RD9.1S-B
D905	UDZS-TE17-9.1B	RD9.1S-B
IC001	CXP86449-623S	CXP86449-622S
IC901	SBX1981-51	SBX1981-11

	KV-HF21M50	KV-XF21M80
Q003	UN2111	DTA114EKA-T146
Q004	UN2111	DTC114EK
Q205	UN2213	TR DTC144EKA
Q206	UN2213	TR DTC144EKA
Q207	UN2213	TR DTC144EKA
Q315	UN2213	TR DTC144EKA
Q511	2SD2578-CA	2SC4927-01
Q603	UN2111	DTA114EKA-T146
Q901	UN2213	TR DTC144EKA
Q902	UN2213	TR DTC144EKA
R003	0 :CHIP	10K :CHIP
R203	3.9K :CHIP	2.2K :CHIP
R204	3.3K :CHIP	6.8K :CHIP
R205	3.3K :CHIP	6.8K :CHIP
R206	3.9K :CHIP	2.2K :CHIP
R208	3.3K :CHIP	6.8K :CHIP
R209	3.3K :CHIP	6.8K :CHIP
R210	120 :CHIP	150 :CHIP
R212	120 :CHIP	150 :CHIP
R230	3.3K :CHIP	6.8K :CHIP
R346	#	1.2K :CHIP
R347	#	1.2K :CHIP
R622	33 3W :RS	8.2 3W :RS

Note) The parts indicated as “#” in this circuit diagram are not listed here, as they are not used for these models.



NOTE:
The circuit indicated at left contains high voltage of over 600 Vp-p. Please pay attention when inspecting or repairing it to prevent an electric shock.

A BOARD

IC		D004	D-8	D614	H-7
IC001	B-10	D005	B-8	D615	E-7
IC002	C-9	D006	A-3	D616	E-9
IC003	A-9	D203	C-11	D617	F-8
IC100	B-5	D300	A-9	D618	F-9
IC201	B-11	D301	B-9	D620	D-8
IC203	C-3	D302	B-6	D621	F-8
IC204	B-2	D303	B-5	D622	F-7
IC301	B-6	D304	B-5	D623	F-12
IC502	E-6	D305	B-5	D624	F-12
IC503	J-5	D306	C-5	D625	D-12
IC601	I-8	D307	C-5	D627	F-8
IC602	H-6	D308	B-5	D628	G-5
IC603	D-8	D309	B-6	D629	F-9
IC604	D-10	D310	A-6	D630	E-9
IC901	I-13	D311	C-6	D631	G-12
PH600	H-7	D312	C-6	D632	F-12
		D313	A-8	D633	E-12
		D315	B-7	D634	F-11
		D316	C-7	D635	F-12
		D317	B-9	D636	D-12
		D314	A-9	D637	F-11
		D319	C-6	D638	E-11
		D320	C-6	D901	C-13
		D321	B-6	D902	D-13
		D401	D-2	D903	C-13
		D402	C-3	D904	D-13
		D403	B-1	D905	F-13
		D404	C-2	D906	I-13
		D405	C-1		
		D406	B-1		
		D407	C-2		
		D408	C-1		
		D409	A-1		
		D504	D-5		
		D505	H-6		
		D506	F-6		
		D507	F-6		
		D508	I-5		
		D509	E-6		
		D510	F-5		
		D511	F-5		
		D512	G-5		
		D513	I-5		
		D517	F-2		
		D518	F-2		
		D519	F-2		
		D520	E-5		
		D521	I-4		
		D522	J-4		
		D525	F-5		
		D526	F-6		
		D527	F-3		
		D528	F-3		
		D529	F-5		
		D530	F-2		
		D531	E-6		
		D532	E-6		
		D533	D-2		
		D534	E-6		
		D600	G-13		
		D601	I-8		
		D602	G-13		
		D603	F-11		
		D604	J-7		
		D605	G-10		
		D606	E-11		
		D607	F-10		
		D608	E-11		
		D609	H-8		
		D610	J-8		
		D611	I-7		
		D612	F-8		
		D613	I-7		
TRANSISTOR					
Q001	B-8				
Q002	B-8				
Q003	C-9				
Q004	C-9				
Q101	A-4				
Q201	A-11				
Q202	A-11				
Q203	C-11				
Q204	C-11				
Q205	A-12				
Q206	A-11				
Q207	A-11				
Q301	B-8				
Q302	A-6				
Q303	A-6				
Q304	B-6				
Q305	B-5				
Q306	B-5				
Q307	C-7				
Q308	C-7				
Q309	C-7				
Q310	D-7				
Q311	D-9				
Q312	B-7				
Q313	B-8				
Q315	B-5				
Q401	D-2				
Q402	D-1				
Q403	D-2				
Q404	C-3				
Q501	D-6				
Q502	E-7				
Q503	F-6				
Q505	D-6				
Q506	D-2				
Q507	H-6				
Q509	F-6				
Q511	F-1				
Q600	C-12				
Q601	F-11				
Q602	J-7				
Q603	I-7				
Q604	H-6				
Q605	E-12				
Q606	F-11				
Q607	H-13				
Q901	H-13				
Q902	H-13				
DIODE					
D001	B-8				
D002	C-8				
D003	C-9				

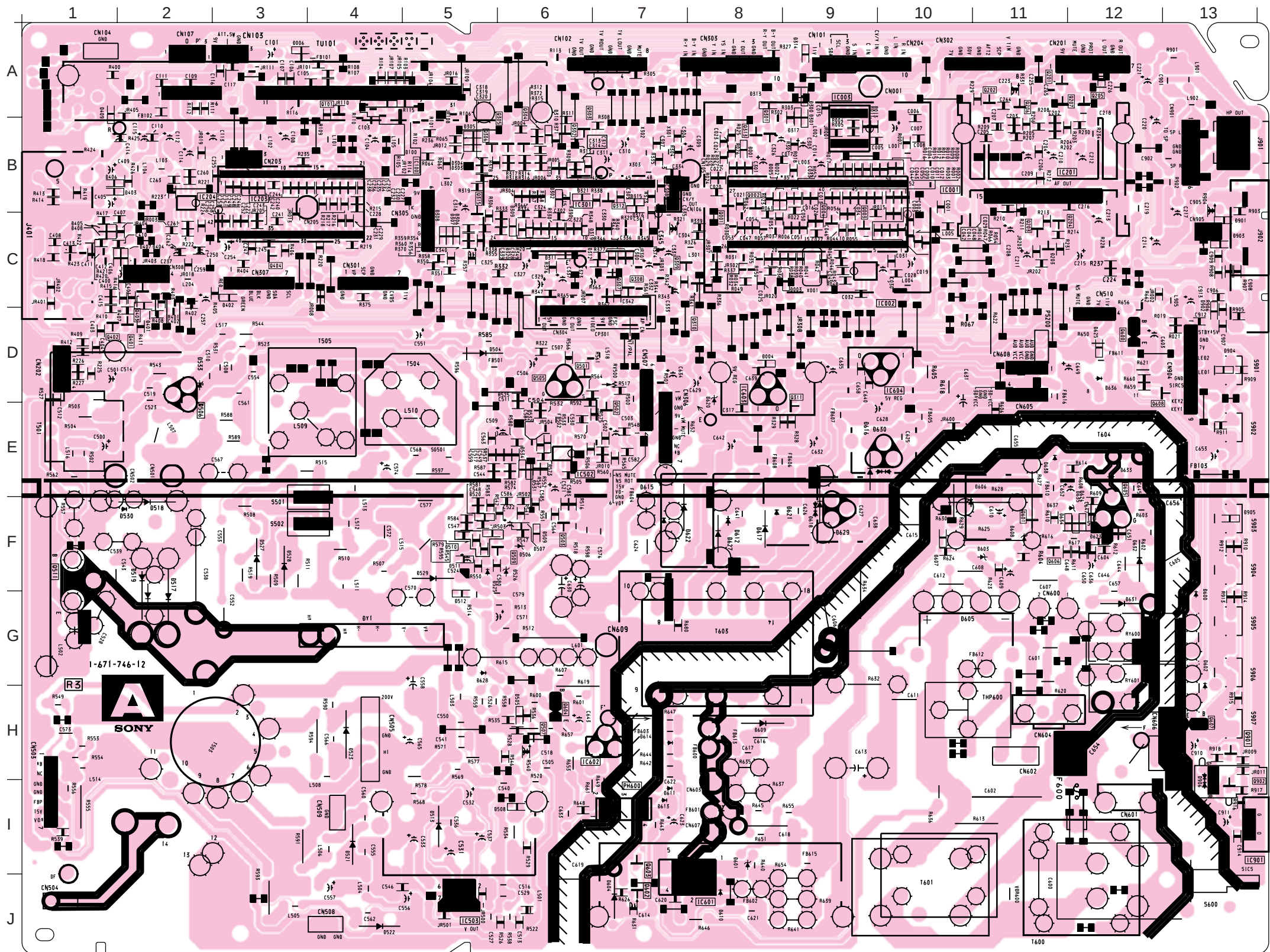
DIODE

D001	B-8
D002	C-8
D003	C-9

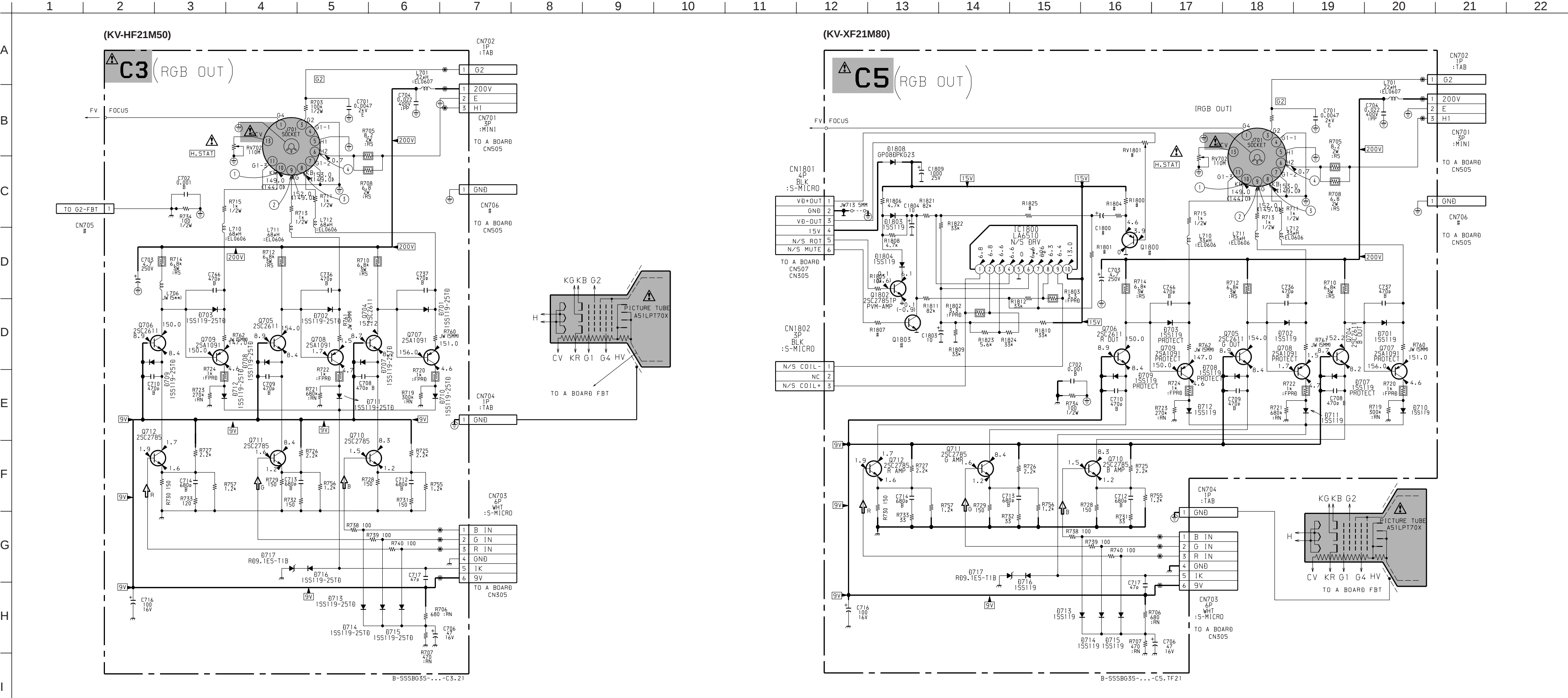
PRINTED WIRING BOARD

A [POWER SUPPLY, HV, MICON, Y/C JUNGLE]

- A Board -

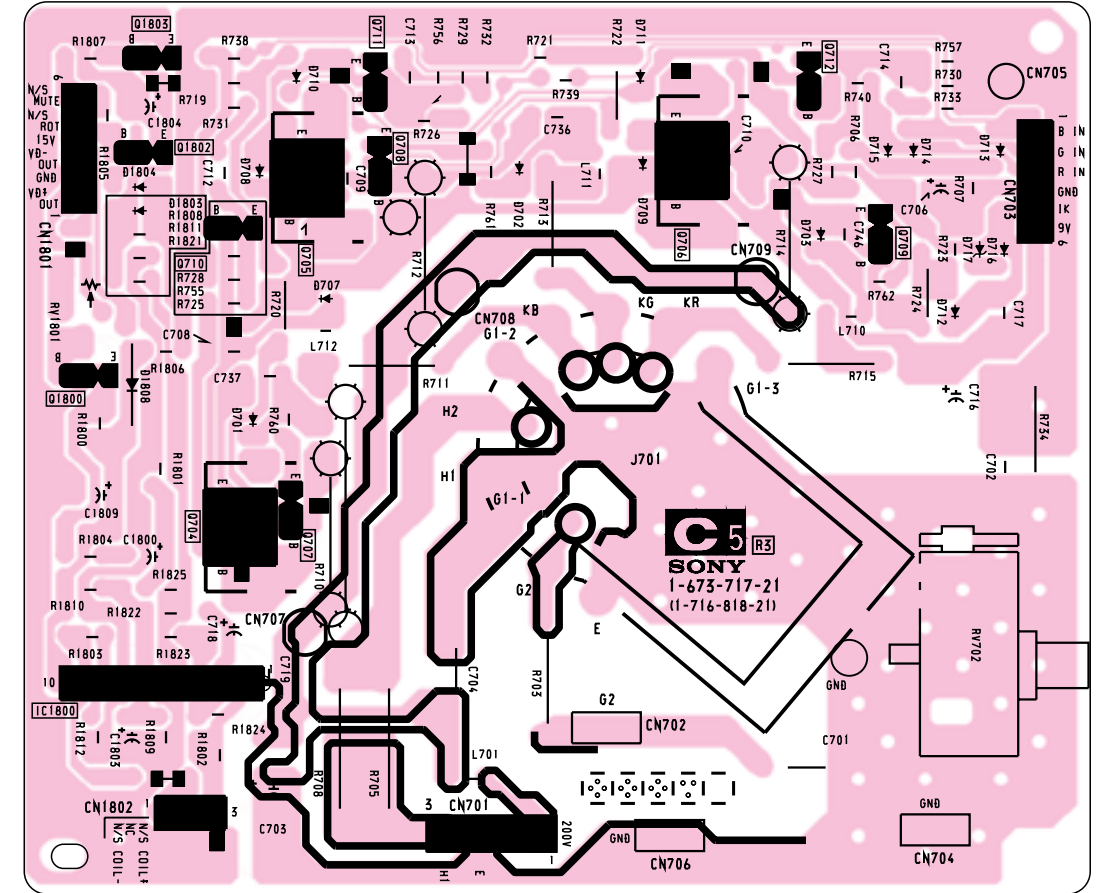
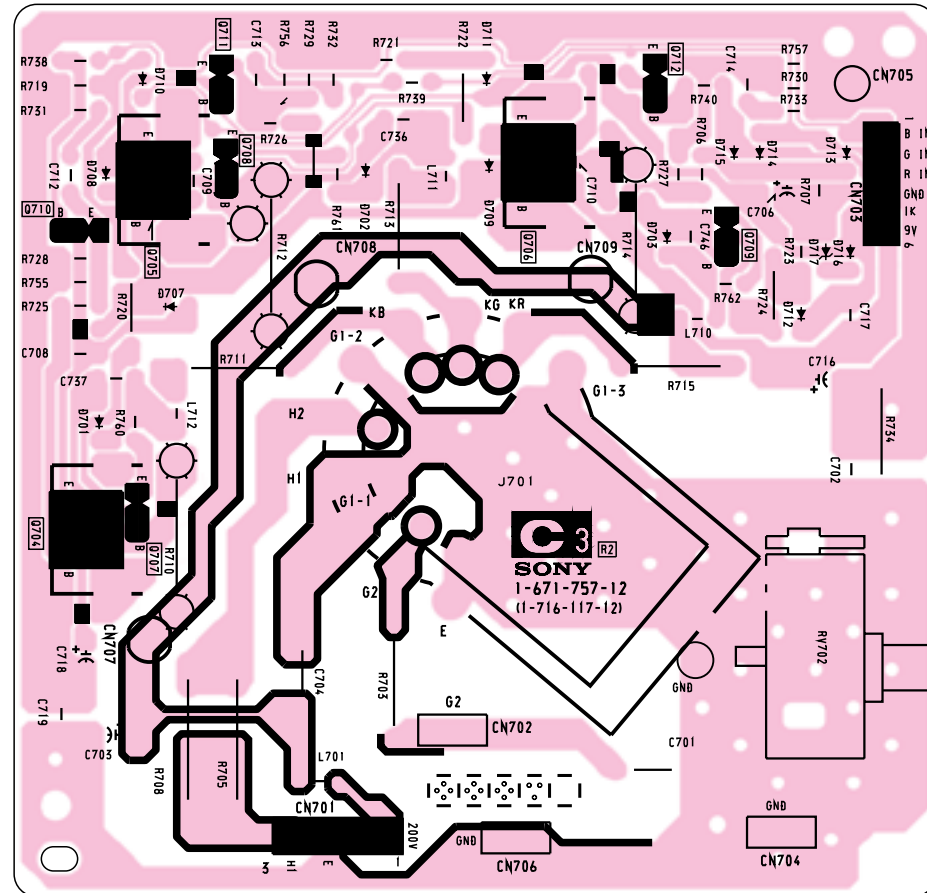


(3) Schematic Diagrams of C3 and C5 boards

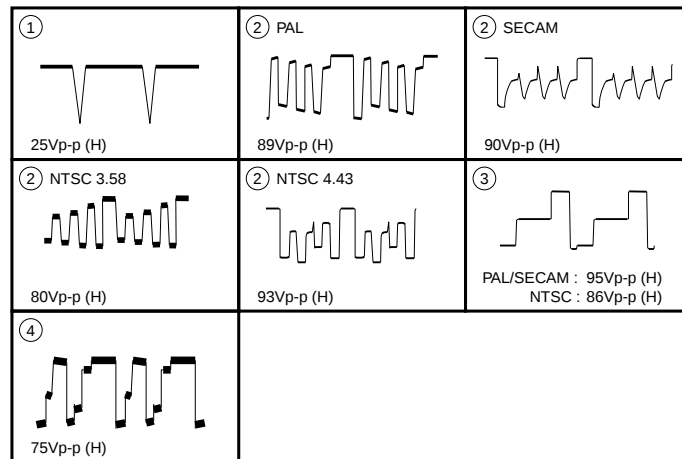


C₅ [RGB OUT]

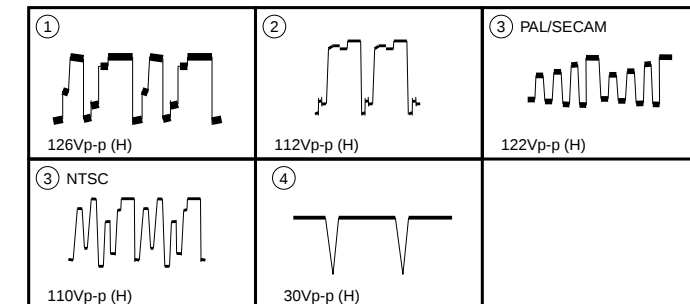
– C5 Board –



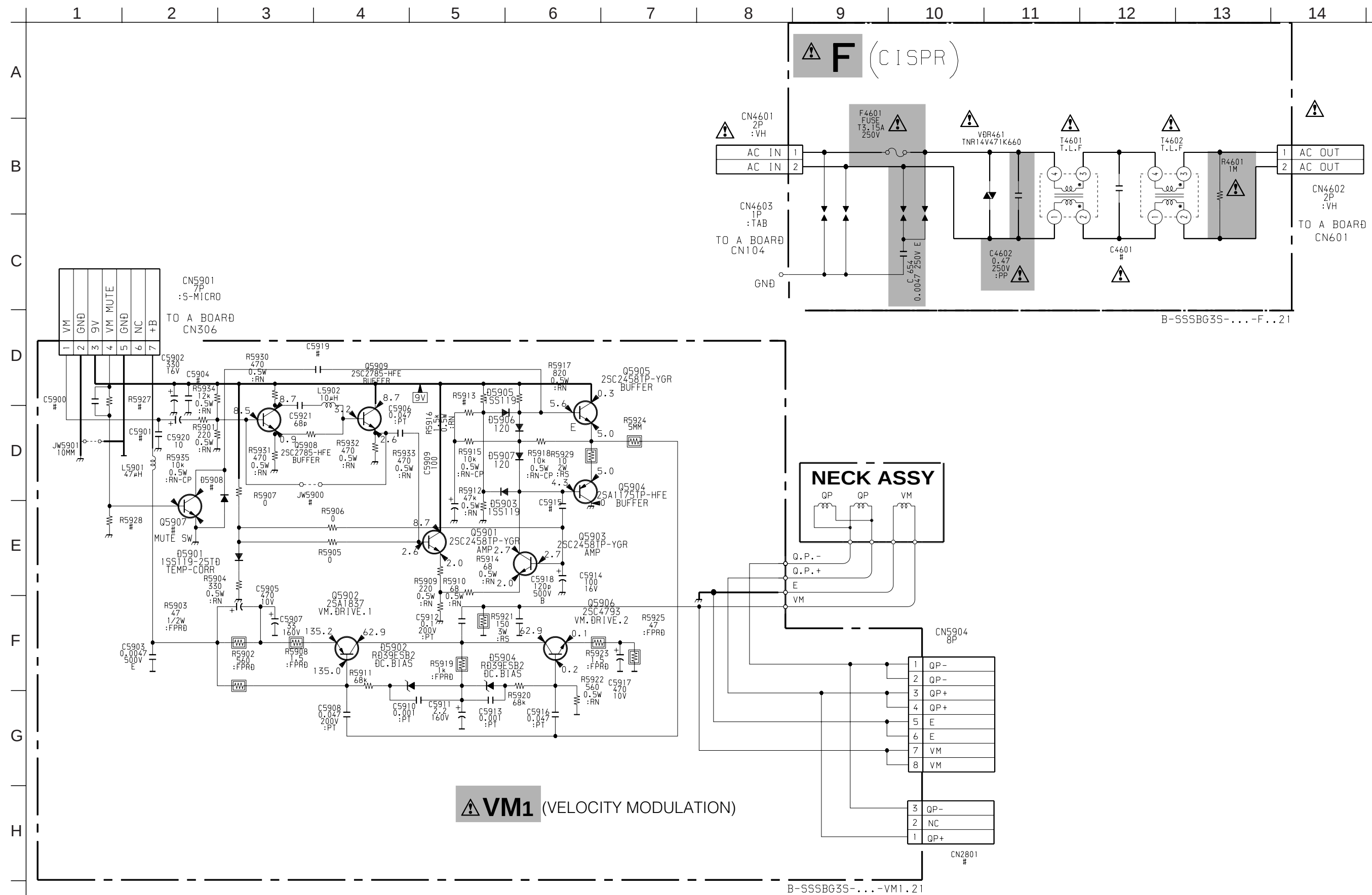
C3 BOARD WAVEFORMS



C5 BOARD WAVEFORMS



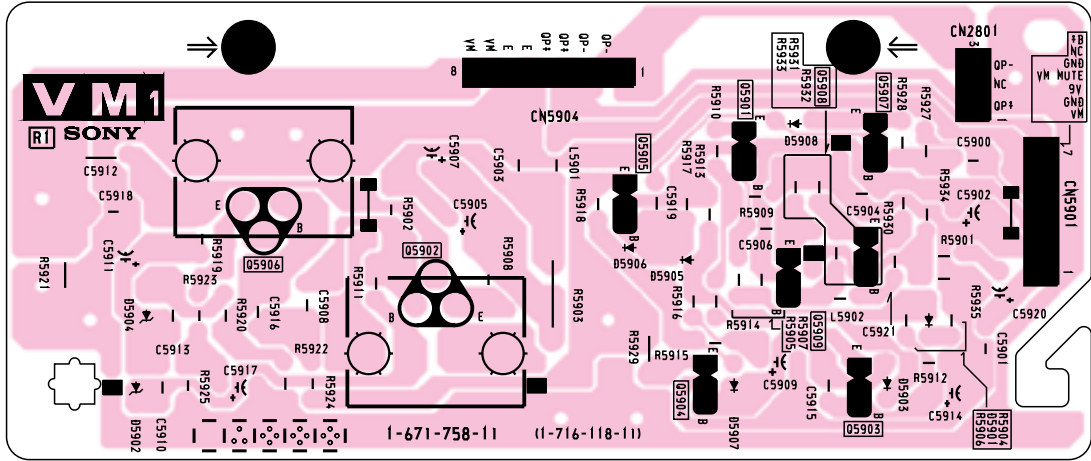
(4) Schematic Diagrams of VM1 and F boards



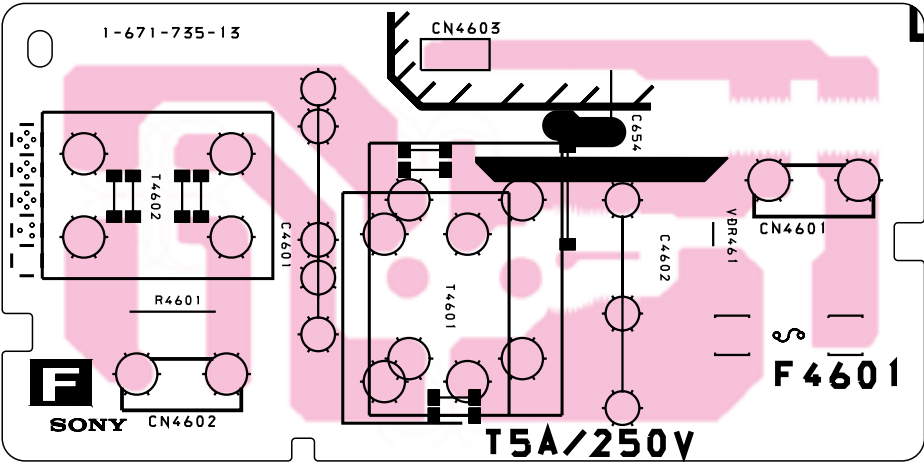


PRINTED WIRING BOARDS

– VM1 Board –



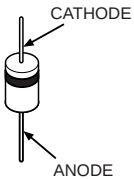
– F Board –



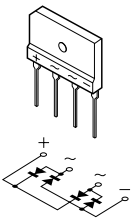
5-5. SEMICONDUCTORS

DIODE

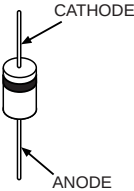
AK04V0
AU-01Z-V1
EL1Z
ERA22-08
GP08D
RD33EB3T
RGP02-17EL-6433



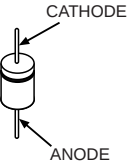
D4SB60L



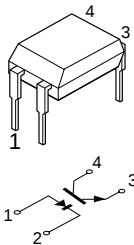
ERC04-06SE
ERC06-15S
RS3FS
RU-1P
31DQ06-FC5



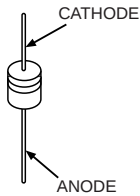
ERD29-08J



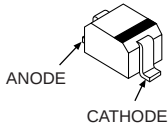
ON3171-R



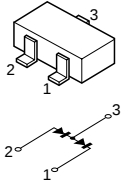
D1NS4
D1N20R
RD20ES-B2
RD30ESB2
RD39ES-B2
RD6.8ES-B1
RD9.1ES-L2
1SS119-25
11EFS2
11EQS04
11ES2-NTA2B



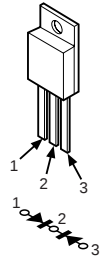
DTZ10B
DTZ-TT11-15B
MA111
UDZS-TE17-6.8B
UDZS-TE17-5.1B
UDZS-TE17.9B
RD10S-B
RD5.1SB-T2
RD9.1S-B
1SS355



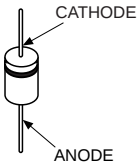
DA204K



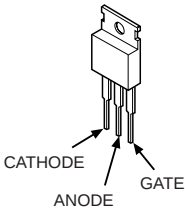
FMU-G26S



EG01CV0



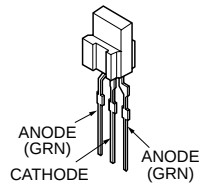
5P-6M



LED

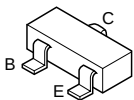
L204

SPB-26MVWF

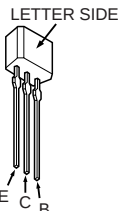


TRANSISTOR

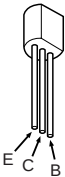
DTA114EKA-T146
DTC114EK
UN2111
UN2211
UN2213
UN2216
2SA1162-G
2SC2712-YG
2SD2114K



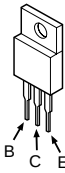
TR DTC144EKA
2SA1175-HFE
2SC2785-HFE



2SA1091-O



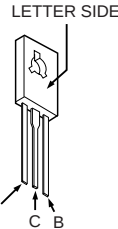
2SA1606-E
2SA1837
2SC4159
2SC4793



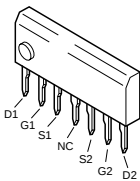
2SC2458-YGR
2SD2144S-UVW



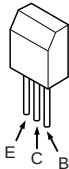
2SC2611



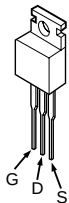
2SC4927-01



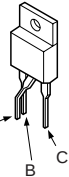
2SD774-34



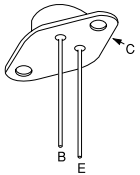
IRF614



2SK2845-LB102

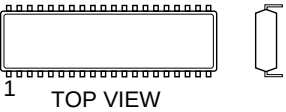


2SD2578-CA



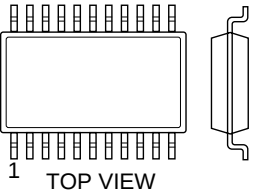
IC

CXA2130S (64PIN)
CXP86449-622S (64PIN)
CXP86449-623S (64PIN)
ST24C08FB6 (8PIN)
TDA7429S (42 PIN)



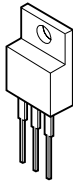
Dual In-line Package
Pin 6~98

MM1319AFBE (7PIN)
NJM2903M (8PIN)



Single In-line Package
Pin 6~98

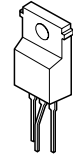
NJM78M09FA
TA7805S



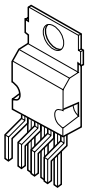
SBX1981-11(12)



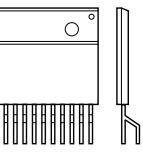
SE-135N



TDA8172

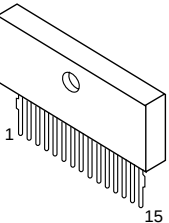


STR-F6654
MARKING SIDE VIEW

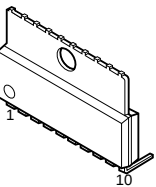


Zig-zag In-line Package
Pin 6~99

TA8223K



LA6510



SECTION 6
EXPLODED VIEWS

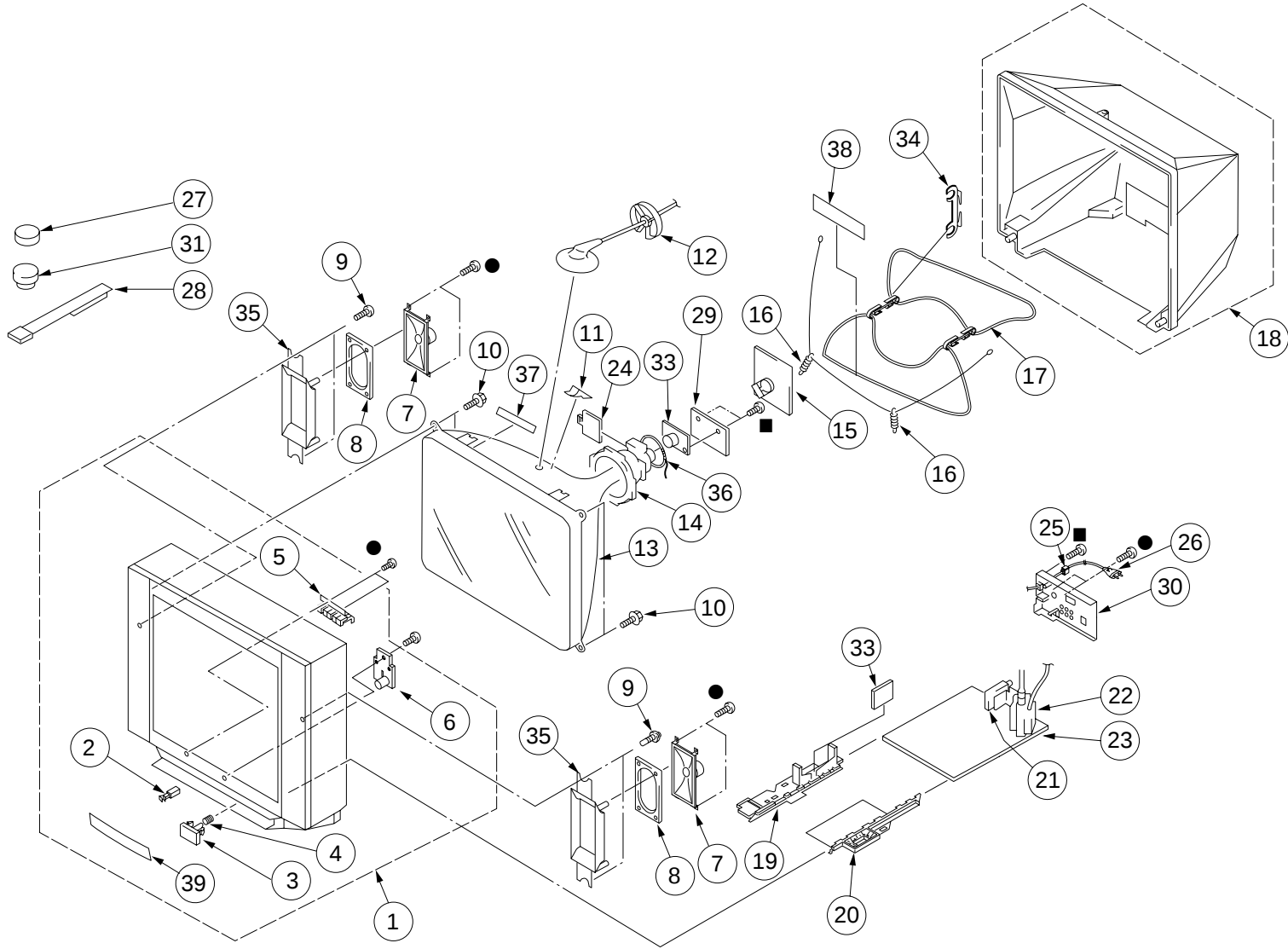
NOTE:

- 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 $\triangle$ are critical for safety.
Replace only with part number specified.

6-1. CHASSIS (KV-XF21M80)

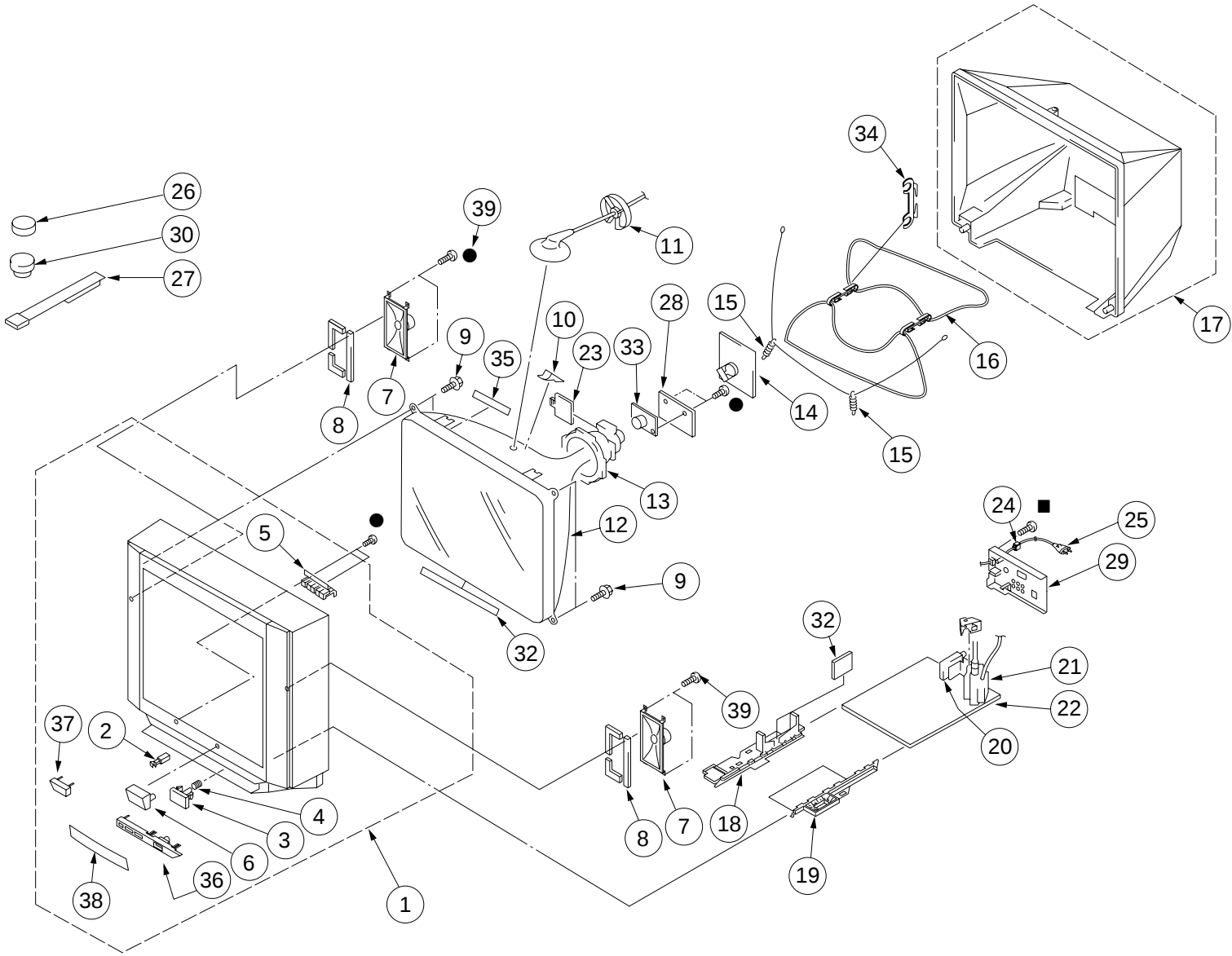
- ▲ : BVTP3 × 12 7-685-648-79
■ : BVTP4 × 16 7-685-663-71



REF. NO.	PART NO.	DESCRIPTION	REMARK
(KV-XF21M80)			
1	X-4036-849-2	BEZNET ASSY	2-6, 39
2	4-047-464-01	CATCHER, PUSH	
3	4-067-183-01	BUTTON, POWER	
4	4-036-405-11	SPRING, COMPRESSION	
5	4-067-181-01	BUTTON, MULTI	
6	* 4-067-180-01	GUIDE, LIGHT	
7	1-529-125-11	SPEAKER (13X7CM)	
8	* 4-069-797-31	CUSHION, SPEAKER(S)	
9	4-302-404-03	SCREW (WASHER HEAD) (+P 4X16)	
10	4-365-808-01	SCREW (5), TAPPING	
11	4-046-600-11	SPACER, DY	
12	* 3-704-372-41	HOLDER, HV CABLE	
13	$\triangle$ 8-738-809-05	PICTURE TUBE (A51LPT70X) (KV-XF21M80)	
14	8-451-505-11	DEFLECTION YOKE (Y21RSA-S)	
15	* A-1331-948-A	C5 BOARD, MOUNTED	
16	4-369-318-61	SPRING, TENSION	
17	$\triangle$ 1-416-946-11	COIL, DEMAGNETIC	
18	$\triangle$ X-4036-465-2	COVER ASSY, REAR	
19	* 4-070-139-01	PWB(L), GUIDE	
20	* 4-070-138-01	PWB(R), GUIDE	
21	8-598-449-10	TUNER, FSS BTF-LG433	
22	$\triangle$ 1-453-293-11	TRANSFORMER ASSY, FLYBACK (NX-1748//M3A4)	
23	* A-1298-983-A	A BOARD, COMPLETE	
24	4-057-714-01	PIECE ASSY, TLH CORRECTION	
25	$\triangle$ 4-022-115-21	HOLDER, AC CORD	
26	$\triangle$ 1-574-062-52	CORD, POWER (WITH CONNECTOR) 2.5A/250V	
27	1-452-032-00	MAGNET,DISC	
28	4-051-736-41	PIECE A(90), CONV, CORRECT	
29	* A-1342-488-A	VM1 BOARD, MOUNTED	
30	* 4-070-140-11	BRACKET, TERMINAL	
31	1-452-094-00	CIRCULAR DISC MAGNET B	
32	* A-1241-372-A	F BOARD, MOUNTED	
33	8-453-011-31	NA299-S2	
34	4-064-883-11	HOLDER, DGC	
35	4-070-142-01	BAFFLE, SPEAKER	
36	1-452-728-41	COIL, NA ROTATION (RT-154)	
37	4-069-652-51	CUSHION (HS BAND)	
38	4-069-653-51	CUSHION, DGC	
39	4-067-185-01	DOOR, CONTROL	

6-2. CHASSIS (KV-HF21M50)

▲ : BVTP3 × 12 7-685-648-79
■ : BVTP4 × 16 7-685-663-71



REF. NO.	PART NO.	DESCRIPTION	REMARK
(KV-HF21M50)			
1	X-4036-989-1	BEZNET ASSY	2-6, 36,37
2	4-047-464-01	CATCHER, PUSH	
3	4-067-190-01	BUTTON, POWER	
4	4-036-405-11	SPRING, COMPRESSION	
5	4-067-196-01	BUTTON, MULTI	
6	4-067-197-01	GUIDE, LIGHT	
7	1-503-902-11	SPEAKER (15X6.5 CM)	
8	* 4-379-189-11	CUSHION, SPEAKER	
9	4-365-808-01	SCREW (5), TAPPING	
10	4-046-600-11	SPACER, DY	
11	* 3-704-372-11	HOLDER, HV CABLE	
12	▲ 8-738-812-05	PICTURE TUBE (A51LPT70X)	
13	8-451-505-11	DEFLECTION YOKE (Y21RSA-S)	
14	* A-1331-884-A	C3 BOARD, MOUNTED	
15	4-369-318-61	SPRING, TENSION	
16	▲ 1-416-946-11	COIL, DEMAGNETIC	
17	▲ X-4036-465-2	COVER ASSY, REAR	
18	* 4-070-189-01	PWB(L), GUIDE	
19	* 4-070-187-01	PWB(R), GUIDE	
20	8-598-449-10	TUNER, FSS BTF-LG433	
21	▲ 1-453-293-11	TRANSFORMER ASSY, FLYBACK (NX-1748//M3A4)	
22	* A-1299-015-A	A BOARD, COMPLETE	
23	4-057-714-01	PIECE ASSY, TLH CORRECTION	
24	4-022-115-12	HOLDER, AC CORD	
25	▲ 1-574-062-52	CORD, POWER (WITH CONNECTOR) 2.5A/250V	
26	1-452-032-00	MAGNET,DISC	
27	4-051-736-41	PIECE A(90), CONV, CORRECT	
28	* A-1342-453-A	VM1 BOARD, MOUNTED	
29	* 4-067-167-11	BRACKET, TERMINAL	
30	1-452-094-00	CIRCULAR DISC MAGNET B	
31	4-069-651-02	BLOTTING SHEET	
32	* A-1241-355-A	F BOARD, MOUNTED	
33	8-453-011-31	NA299-S2	
34	4-064-883-11	HOLDER, DGC	
35	4-069-652-02	CUSHION (HS BAND)	
36	4-067-191-01	PANEL (R)	
37	4-067-193-01	PANEL (L)	
38	4-067-192-91	DOOR, CONTROL	
39	4-054-981-01	SCREW, STEP TAPPING	

SECTION 7

ELECTRICAL PARTS LIST

A

NOTE:

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

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

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All resistors are in ohms
- F : nonflammable
- CAPACITORS
- MF : μ F, PF : μ F
- COILS
- MMH : mH, UH : μ H
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
	* A-1299-015-A	A BOARD, COMPLETE (KV-HF21M50) *****		C042	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	* A-1298-983-A	A BOARD, COMPLETE (KV-XF21M80) *****		C043	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	X-4036-448-3	HEAT SINK ASSY (KV-XF21M80 ONLY)		C044	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	X-4036-449-3	HEAT SINK ASSY (KV-XF21M80 ONLY)		C047	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	X-4036-450-3	HEAT SINK ASSY (KV-XF21M80 ONLY)		C048	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	* 4-040-983-41	TERMINAL BOARD (D) (KV-XF21M80 ONLY)		C050	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	* 4-055-304-01	HOLDER, LED		C051	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	4-066-910-61	HEAT SINK (KV-XF21M80 ONLY)		C053	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	4-066-911-61	HEAT SINK (KV-XF21M80 ONLY)		C054	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	4-066-912-61	HEAT SINK (KV-XF21M80 ONLY)		C055	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
	* 4-067-182-02	HOLDER, FBT (KV-HF21M50)		C103	1-164-004-51	CERAMIC CHIP 0.1MF 10% 25V	
	* 4-070-141-01	HOLDER, FBT (KV-XF21M80)		C104	1-126-933-11	ELECT 100MF 20% 16V	
	4-382-854-11	SCREW (M3X10), P, SW (+)		C107	1-163-005-51	CERAMIC CHIP 470PF 10% 50V	
	4-382-854-21	SCREW (M3X14), P, SW (+)		C108	1-126-933-11	ELECT 100MF 20% 16V	
	7-685-648-79	SCREW +BVTP 3X12 TYPE2 N-S		C109	1-163-005-51	CERAMIC CHIP 470PF 10% 50V	
	<CAPACITOR>			C110	1-163-005-51	CERAMIC CHIP 470PF 10% 50V	
C003	1-163-251-11	CERAMIC CHIP 100PF 5% 50V (KV-HF21M50 ONLY)		C111	1-163-005-51	CERAMIC CHIP 470PF 10% 50V	
C004	1-163-001-51	CERAMIC CHIP 220PF 10% 50V		C112	1-126-933-11	ELECT 100MF 20% 16V	
C005	1-163-001-51	CERAMIC CHIP 220PF 10% 50V		C113	1-126-967-11	ELECT 47MF 20% 50V	
C006	1-164-004-51	CERAMIC CHIP 0.1MF 10% 25V		C114	1-126-967-11	ELECT 47MF 20% 50V	
C007	1-126-933-11	ELECT 100MF 20% 16V		C202	1-163-020-00	CERAMIC CHIP 0.0082MF 10% 50V (KV-HF21M50)	
C008	1-163-251-11	CERAMIC CHIP 100PF 5% 50V		C202	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V (KV-XF21M80)	
C010	1-163-251-11	CERAMIC CHIP 100PF 5% 50V		C203	1-163-020-00	CERAMIC CHIP 0.0082MF 10% 50V (KV-HF21M50)	
C012	1-163-251-11	CERAMIC CHIP 100PF 5% 50V		C203	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V (KV-XF21M80)	
C013	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V		C204	1-136-159-00	FILM 0.033MF 5% 50V (KV-HF21M50)	
C014	1-126-967-11	ELECT 47MF 20% 50V		C204	1-136-164-00	FILM 0.082MF 5% 50V (KV-XF21M80)	
C015	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V		C205	1-164-182-11	CERAMIC CHIP 0.0033MF 10% 50V (KV-HF21M50)	
C016	1-163-113-00	CERAMIC CHIP 68PF 10% 50V		C205	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V (KV-XF21M80)	
C017	1-163-113-00	CERAMIC CHIP 68PF 10% 50V		C206	1-164-182-11	CERAMIC CHIP 0.0033MF 10% 50V (KV-HF21M50)	
C019	1-104-665-11	ELECT 100MF 20% 25V		C206	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V (KV-XF21M80)	
C022	1-163-227-51	CERAMIC CHIP 10PF 0.5PF 50V		C207	1-136-159-00	FILM 0.033MF 5% 50V (KV-HF21M50)	
C023	1-163-227-51	CERAMIC CHIP 10PF 0.5PF 50V		C207	1-136-164-00	FILM 0.082MF 5% 50V (KV-XF21M80)	
C024	1-163-227-51	CERAMIC CHIP 10PF 0.5PF 50V		C208	1-125-797-91	ELECT 10MF 20% 50V	
C026	1-164-004-51	CERAMIC CHIP 0.1MF 10% 25V		C209	1-125-797-91	ELECT 10MF 20% 50V	
C027	1-164-004-51	CERAMIC CHIP 0.1MF 10% 25V		C210	1-126-933-11	ELECT 100MF 20% 16V	
C028	1-163-037-11	CERAMIC CHIP 0.022MF 10% 50V		C211	1-126-941-11	ELECT 470MF 20% 25V	
C030	1-126-965-11	ELECT 22MF 20% 50V		C212	1-126-933-11	ELECT 100MF 20% 16V	
C031	1-164-004-51	CERAMIC CHIP 0.1MF 10% 25V					
C032	1-107-823-51	CERAMIC CHIP 000000000 10% 16V					
C034	1-163-031-11	CERAMIC CHIP 0.01MF 50V					
C041	1-163-251-11	CERAMIC CHIP 100PF 5% 50V					

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REF. NO.	PART NO.	DESCRIPTION	REMARK		
C213	1-126-933-11	ELECT	100MF	20%	16V
C214	1-126-942-61	ELECT	1000MF	20%	25V
C215	1-126-942-61	ELECT	1000MF	20%	25V
C216	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C217	1-125-797-91	ELECT	10MF	20%	50V
C218	1-136-167-00	FILM	0.15MF	5%	50V
C219	1-136-167-00	FILM	0.15MF	5%	50V
C220	1-126-942-61	ELECT	1000MF	20%	25V
C221	1-125-797-91	ELECT	10MF	20%	50V
C223	1-126-965-11	ELECT	22MF	20%	50V
C224	1-163-133-00	CERAMIC CHIP	470PF	10%	50V
C225	1-109-982-51	CERAMIC CHIP	1MF	10%	10V
C226	1-109-982-51	CERAMIC CHIP	1MF	10%	10V
C227	1-163-037-11	CERAMIC CHIP	0.022MF	10%	50V
C228	1-163-024-00	CERAMIC CHIP	0.018MF	10%	50V
C229	1-163-018-00	CERAMIC CHIP	0.0056MF	10%	50V
C230	1-163-024-00	CERAMIC CHIP	0.018MF	10%	50V
C231	1-163-018-00	CERAMIC CHIP	0.0056MF	10%	50V
C232	1-163-037-11	CERAMIC CHIP	0.022MF	10%	50V
C233	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C234	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C235	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C236	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C238	1-164-505-51	CERAMIC CHIP	2.2MF	10%	16V
C240	1-164-505-51	CERAMIC CHIP	2.2MF	10%	16V
C241	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C242	1-164-505-51	CERAMIC CHIP	2.2MF	10%	16V
C243	1-216-295-61	SHORT CHIP	0		
C244	1-164-700-51	CERAMIC CHIP	0.68MF		16V
C245	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C246	1-163-018-00	CERAMIC CHIP	0.0056MF	10%	50V
C247	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C248	1-163-010-11	CERAMIC CHIP	0.0012MF	10%	50V
C249	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C250	1-216-295-61	SHORT CHIP	0		
C251	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C252	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C253	1-163-037-11	CERAMIC CHIP	0.022MF	10%	50V
C254	1-126-965-11	ELECT	22MF	20%	50V
C255	1-163-037-11	CERAMIC CHIP	0.022MF	10%	50V
C256	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C259	1-126-933-11	ELECT	100MF	20%	16V
C264	1-164-505-51	CERAMIC CHIP	2.2MF	10%	16V
C265	1-164-505-51	CERAMIC CHIP	2.2MF	10%	16V
C301	1-126-935-11	ELECT	470MF	20%	16V
C302	1-163-005-51	CERAMIC CHIP	470PF	10%	50V
C303	1-125-797-91	ELECT	10MF	20%	50V
C304	1-126-967-11	ELECT	47MF	20%	50V
C305	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C306	1-163-233-51	CERAMIC CHIP	18PF	5%	50V
C307	1-163-233-51	CERAMIC CHIP	18PF	5%	50V
C308	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C309	1-126-957-11	ELECT	0.22MF	20%	50V
C310	1-125-805-91	ELECT	4.7MF	20%	50V
C311	1-125-797-91	ELECT	10MF	20%	50V
C312	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C313	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C315	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V

REF. NO.	PART NO.	DESCRIPTION	REMARK		
C316	1-126-967-11	ELECT	47MF	20%	50V
C317	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C318	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C319	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C320	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C322	1-163-005-51	CERAMIC CHIP	470PF	10%	50V
C323	1-126-965-11	ELECT	22MF	20%	50V
		(KV-XF21M80 ONLY)			
C324	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C325	1-125-799-91	ELECT	1MF	20%	63V
C327	1-126-965-11	ELECT	22MF	20%	50V
C328	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C329	1-126-965-11	ELECT	22MF	20%	50V
		(KV-XF21M80 ONLY)			
C330	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C331	1-220-948-91	METAL	100	5%	1/2W
C332	1-125-805-91	ELECT	4.7MF	20%	50V
C335	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C336	1-164-004-51	CERAMIC CHIP	0.1MF	10%	25V
C337	1-125-800-91	ELECT	2.2MF	20%	63V
C338	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C341	1-115-340-51	CERAMIC CHIP	0.22MF	10%	25V
C342	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C401	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C402	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C403	1-163-005-51	CERAMIC CHIP	470PF	10%	50V
C404	1-163-005-51	CERAMIC CHIP	470PF	10%	50V
C405	1-126-935-11	ELECT	470MF	20%	16V
C406	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C407	1-164-346-51	CERAMIC CHIP	1MF	10%	16V
C408	1-163-133-00	CERAMIC CHIP	470PF	10%	50V
C409	1-125-805-91	ELECT	4.7MF	20%	50V
C415	1-163-133-00	CERAMIC CHIP	470PF	10%	50V
C502	1-163-145-00	CERAMIC CHIP	0.0015MF	5%	50V
C506	1-107-638-11	ELECT	33MF	20%	160V
C507	1-161-830-00	CERAMIC	0.0047MF		500V
C510	1-102-112-00	CERAMIC	330PF	10%	50V
C513	1-163-263-51	CERAMIC CHIP	330PF	10%	50V
C514	1-106-383-00	MYLAR	0.047MF	10%	200V
C517	1-164-182-11	CERAMIC CHIP	3300PF	10%	50V
C518	1-126-933-11	ELECT	100MF	20%	16V
C519	1-102-212-00	CERAMIC	820PF	10%	500V
C521	1-104-666-11	ELECT	220MF	20%	25V
C522	1-126-933-11	ELECT	100MF	20%	16V
C523	1-102-002-00	CERAMIC	680PF	10%	500V
C524	1-126-967-11	ELECT	47MF	20%	50V
C526	1-130-495-00	MYLAR	0.1MF	5%	50V
C527	1-102-820-00	CERAMIC	330PF	5%	50V
C528	1-162-134-11	CERAMIC	470PF	10%	2KV
C530	1-137-372-11	FILM	0.022MF	5%	50V
C531	1-109-953-11	ELECT	2.2MF	20%	50V
C532	1-128-528-11	ELECT	470MF	20%	25V
C533	1-128-528-11	ELECT	470MF	20%	25V
C536	1-136-165-00	FILM	0.1MF	5%	50V
C537	1-107-911-11	ELECT	220MF	20%	50V
C538	1-136-076-00	FILM	0.0085MF	3%	2KV
C539	1-129-746-91	FILM	0.039MF	5%	400V

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

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REF. NO.	PART NO.	DESCRIPTION	REMARK	REF. NO.	PART NO.	DESCRIPTION	REMARK
C540	1-136-171-00	FILM	0.33MF 5%	50V	C642	1-126-943-11	ELECT 2200MF 20% 25V
C546	1-165-319-11	CERAMIC CHIP	0.1MF	50V	C643	1-126-933-11	ELECT 100MF 20% 16V
C549	1-163-017-00	CERAMIC CHIP	0.0047MF 10%	50V	C644	1-104-331-11	CERAMIC 0.0022MF 10% 1KV
C550	1-106-220-00	MYLAR	0.1MF	100V	C645	1-137-605-11	FILM 0.01MF 10% 250V
C551	1-125-799-91	ELECT	1MF	63V	C646	1-107-679-91	ELECT 10MF 20% 450V
C552	1-162-116-00	CERAMIC	680PF	10% 2KV	C647	1-163-275-11	CERAMIC CHIP 0.001MF 5% 50V
C553	1-162-116-00	CERAMIC	680PF	10% 2KV	C649	1-126-940-11	ELECT 330MF 20% 25V
C554	1-137-417-11	MYLAR	0.0047MF	10% 200V	C650	1-163-275-11	CERAMIC CHIP 0.001MF 5% 50V
C556	1-128-528-11	ELECT	470MF	20% 25V	C651	1-163-133-00	CERAMIC CHIP 470PF 10% 50V
C557	1-126-941-11	ELECT	470MF	20% 25V	C652	1-126-965-11	ELECT 22MF 20% 50V
C558	1-123-024-21	ELECT	33MF	160V	C653	1-126-967-11	ELECT 47MF 20% 50V
C560	1-102-228-00	CERAMIC	470PF	10% 500V	C657	1-101-821-00	CERAMIC 0.0022MF 500V
C561	1-136-557-11	FILM	0.0033MF	5% 630V	C658	1-164-004-51	CERAMIC CHIP 0.1MF 10% 25V
C562	1-102-228-00	CERAMIC	470PF	10% 500V	C901	1-136-153-00	FILM 0.01MF 5% 50V
C564	1-163-038-00	CERAMIC CHIP	0.1MF	25V	C902	1-136-153-00	FILM 0.01MF 5% 50V
C565	1-107-655-11	ELECT	47MF	20% 250V	C905	1-125-805-91	ELECT 4.7MF 20% 50V
C566	1-102-244-00	CERAMIC	220PF	10% 500V	C906	1-164-346-51	CERAMIC CHIP 1MF 10% 16V
C567	1-115-521-11	FILM	0.82MF	5% 250V	C907	1-163-133-00	CERAMIC CHIP 470PF 10% 50V
C568	1-102-228-00	CERAMIC	470PF	10% 500V	C908	1-163-133-00	CERAMIC CHIP 470PF 10% 50V
C570	1-115-520-11	FILM	0.68MF	5% 250V	C909	1-164-346-51	CERAMIC CHIP 1MF 10% 16V
C573	1-106-379-12	MYLAR	0.033MF	10% 200V	C910	1-126-967-11	ELECT 47MF 20% 50V
C574	1-107-636-11	ELECT	10MF	20% 160V	C911	1-126-967-11	ELECT 47MF 20% 50V
C577	1-106-395-00	MYLAR	0.15MF	10% 200V	C912	1-164-004-51	CERAMIC CHIP 0.1MF 10% 25V
C582	1-164-004-51	CERAMIC CHIP	0.1MF	10% 25V	C913	1-126-933-11	ELECT 100MF 20% 16V
C600 $\triangle$	1-104-705-51	FILM	0.1MF	20% 250V	C914	1-163-133-00	CERAMIC CHIP 470PF 10% 50V
C602	1-104-704-51	FILM	0.1MF	20% 250V	<CONNECTOR>		
C604	1-163-009-11	CERAMIC CHIP	0.001MF	10% 50V	CN104	1-695-915-11	TAB (CONTACT)
C605 $\triangle$	1-127-942-51	CERAMIC	330PF	10% 250V	CN202 *	1-785-608-11	PIN, CONNECTOR 4P
C606 $\triangle$	1-127-942-51	CERAMIC	330PF	10% 250V	CN203 *	1-564-506-11	PLUG, CONNECTOR 3P
C607	1-161-830-00	CERAMIC	0.0047MF	99% 500V	CN204 *	1-564-506-11	PLUG, CONNECTOR 3P
C608	1-161-830-00	CERAMIC	0.0047MF	99% 500V	CN305 *	1-564-509-11	PLUG, CONNECTOR 6P
C609	1-126-968-11	ELECT	100MF	20% 50V	CN306 *	1-564-510-11	PLUG, CONNECTOR 7P
C610	1-125-797-91	ELECT	10MF	20% 50V	CN505	1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P
C611	1-161-830-00	CERAMIC	0.0047MF	99% 500V	CN506	4-352-844-01	PIN, LEAD, COATING
C612	1-161-830-00	CERAMIC	0.0047MF	99% 500V	CN507 *	1-564-507-11	PLUG, CONNECTOR 4P (KV-XF21M80 ONLY)
C613	1-117-752-11	ELECT(BLOCK)	330MF	20% 450V	CN601 *	1-580-843-11	PIN, CONNECTOR (POWER)
C614	1-125-797-91	ELECT	10MF	20% 50V	CN602 *	1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P
C616	1-130-202-00	FILM	0.022MF	10% 400V	CN604 *	1-573-963-11	PIN, CONNECTOR (PC BOARD) 3P
C617	1-107-792-11	CERAMIC	100PF	5% 1KV	CN609 *	1-508-784-21	PIN, CONNECTOR (5MM PITCH) 1P
C618	1-125-893-11	FILM	680PF	3% 1.5KV	CN901 *	1-564-507-11	PLUG, CONNECTOR 4P
C619 $\triangle$	1-119-886-51	CERAMIC	470PF	10% 250V	<COMPOSITION CIRCUIT BLOCK>		
C620	1-163-133-00	CERAMIC CHIP	470PF	10% 50V	CP301	1-467-554-21	FILTER BLOCK, COMB (KV-XF21M80 ONLY)
C621	1-102-114-00	CERAMIC	470PF	10% 50V	<DIODE>		
C622	1-102-074-00	CERAMIC	0.001MF	10% 50V	D001	8-719-988-61	DIODE 1SS355TE-17
C623	1-104-665-11	ELECT	100MF	20% 25V	D005	8-719-988-61	DIODE 1SS355TE-17
C624	1-104-331-11	CERAMIC	0.0022MF	10% 1KV	D006	8-719-988-61	DIODE 1SS355TE-17
C627	1-102-002-00	CERAMIC	680PF	10% 500V	D203	8-719-914-42	DIODE DA204K
C628	1-126-942-61	ELECT	1000MF	20% 25V	D300	1-216-295-61	SHORT CHIP 0
C629	1-125-797-91	ELECT	10MF	20% 50V	D301	8-719-988-61	DIODE 1SS355TE-17
C630	1-124-347-00	ELECT	100MF	20% 160V	D306	8-719-988-61	DIODE 1SS355TE-17
C633	1-104-999-11	MYLAR	0.1MF	10% 200V	D307	8-719-988-61	DIODE 1SS355TE-17
C634	1-126-934-11	ELECT	220MF	20% 16V			
C635	1-104-665-11	ELECT	100MF	20% 10V			
C636	1-104-760-51	CERAMIC CHIP	0.047MF	50V			
C639	1-164-004-51	CERAMIC CHIP	0.1MF	10% 25V			
C640	1-164-004-51	CERAMIC CHIP	0.1MF	10% 25V			
C641	1-102-002-00	CERAMIC	680PF	10% 500V			



REF. NO.	PART NO.	DESCRIPTION	REMARK
D308	8-719-988-61	DIODE 1SS355TE-17	
D309	8-719-159-10	DIODE RD5.1SB-T2	
D311	8-719-988-61	DIODE 1SS355TE-17	
D312	8-719-988-61	DIODE 1SS355TE-17	
D313	8-719-988-61	DIODE 1SS355TE-17	
D314	8-719-988-61	DIODE 1SS355TE-17	
D315	8-719-988-61	DIODE 1SS355TE-17	
D316	8-719-069-57	DIODE UDZS-TE17-6.8B	
D320	8-719-069-60	DIODE UDZS-TE17-9.1B (KV-HF21M50 ONLY)	
D321	8-719-069-60	DIODE UDZS-TE17-9.1B (KV-HF21M50 ONLY)	
D401	8-719-158-35	DIODE RD9.1SB	
D402	8-719-158-35	DIODE RD9.1SB	
D403	8-719-158-35	DIODE RD9.1SB	
D404	8-719-158-35	DIODE RD9.1SB	
D405	8-719-158-35	DIODE RD9.1SB	
D406	8-719-158-35	DIODE RD9.1SB	
D504	8-719-302-43	DIODE EL1Z	
D505	8-719-988-61	DIODE 1SS355TE-17	
D506	8-719-911-19	DIODE 1SS119-25	
D507	8-719-988-61	DIODE 1SS355TE-17	
D508	8-719-988-61	DIODE 1SS355TE-17	
D509	1-216-073-61	RES,CHIP 10G	5% 1/10W
D510	8-719-988-61	DIODE 1SS355TE-17	
D511	8-719-988-61	DIODE 1SS355TE-17	
D512	8-719-988-61	DIODE 1SS355TE-17	
D513	8-719-908-03	DIODE GP08D	
D517	8-719-945-80	DIODE ERC06-15S	
D518	8-719-900-26	DIODE ERD29-08J	
D520	1-216-295-61	SHORT CHIP 0	
D521	8-719-302-43	DIODE EL1Z	
D522	8-719-302-43	DIODE EL1Z	
D523	8-719-302-43	DIODE EL1Z	
D527	8-719-908-03	DIODE GP08D	
D528	8-719-908-03	DIODE GP08D	
D531	8-719-988-61	DIODE 1SS355TE-17	
D532	8-719-988-61	DIODE 1SS355TE-17	
D602	8-719-911-19	DIODE 1SS119-25	
D603	8-719-150-92	DIODE RD33EB3T	
D604	8-719-028-72	DIODE RGP02-17EL-6433	
D605	8-719-510-53	DIODE D4SB60L	
D606	8-719-108-18	THYRISTOR 5P6M	
D607	8-719-073-01	DIODE MA111-(K8).S0	
D608	8-719-110-53	DIODE RD20ESB2	
D609	8-719-311-31	DIODE RU-1P	
D610	8-719-043-76	DIODE AK04V0	
D611	8-719-046-74	DIODE AU-01Z-V1	
D613	8-719-046-74	DIODE AU-01Z-V1	
D614	8-719-046-74	DIODE AU-01Z-V1	
D618	8-719-067-18	DIODE RN4Z	
D620	8-719-110-72	DIODE RD30ESB2	
D622	8-719-071-39	DIODE FMU-G26S	
D623	8-719-978-65	DIODE DTZ-TT11-15B	
D624	8-719-073-01	DIODE MA111-(K8).S0	
D625	8-719-158-39	DIODE RD10SB	
D627	8-719-073-84	DIODE 31DQ06-FC5	
D628	8-719-911-19	DIODE 1SS119-25	

REF. NO.	PART NO.	DESCRIPTION	REMARK
D631	8-719-068-00	DIODE ERC04-06SE	
D632	8-719-068-00	DIODE ERC04-06SE	
D633	8-719-948-45	DIODE ERA22-08	
D634	8-719-073-01	DIODE MA111-(K8).S0	
D635	8-719-073-01	DIODE MA111-(K8).S0	
D636	8-719-510-02	DIODE D1NS4	
D637	8-719-109-96	DIODE RD6.8ESB1	
D638	8-719-510-48	DIODE D1N20R	
D901	8-719-069-60	DIODE UDZS-TE17-9.1B (KV-HF21M50)	
D901	8-719-158-35	DIODE RD9.1SB (KV-XF21M80)	
D902	8-719-069-60	DIODE UDZS-TE17-9.1B (KV-HF21M50)	
D902	8-719-158-35	DIODE RD9.1SB (KV-XF21M80)	
D903	8-719-069-60	DIODE UDZS-TE17-9.1B (KV-HF21M50)	
D903	8-719-158-35	DIODE RD9.1SB (KV-XF21M80)	
D904	8-719-069-60	DIODE UDZS-TE17-9.1B (KV-HF21M50)	
D904	8-719-158-35	DIODE RD9.1SB (KV-XF21M80)	
D905	8-719-069-60	DIODE UDZS-TE17-9.1B (KV-HF21M50)	
D905	8-719-158-35	DIODE RD9.1SB (KV-XF21M80)	
D906	8-719-045-19	DIODE SPB-26MVWF	
<CONNECTOR>			
DY1	* 1-580-798-11	CONNECTOR PIN (DY) 6P	
<FERRITE BEAD>			
FB103	1-410-397-21	FERRITE	1.1UH
FB501	1-410-397-21	FERRITE	1.1UH
FB502	1-410-397-21	FERRITE	1.1UH
FB600	1-410-397-21	FERRITE	1.1UH
FB601	1-410-397-21	FERRITE	1.1UH
FB602	1-410-397-21	FERRITE	1.1UH
FB603	1-410-397-21	FERRITE	1.1UH
FB604	1-410-397-21	FERRITE	1.1UH
FB607	1-410-397-21	FERRITE	1.1UH
FB608	1-412-911-31	FERRITE	0UH
FB611	1-410-397-21	FERRITE	1.1UH
FB613	1-410-397-21	FERRITE	1.1UH
FB615	1-410-397-21	FERRITE	1.1UH
<IC>			
IC001	8-752-906-21	IC CXP86449-623S (KV-HF21M50)	
IC001	8-752-906-20	IC CXP86449-622S (KV-XF21M80)	
IC002	8-759-371-21	IC MM1319AFBE	
IC003	8-759-370-34	IC ST24C08FB6	
IC201	8-759-336-30	IC TA8223K	
IC203	8-759-553-40	IC TDA7429S	
IC301	8-752-088-39	IC CXA2130S	
IC502	8-759-700-07	IC NJM2903M	
IC503	8-759-980-58	IC TDA8172	
IC601	8-749-013-75	IC STR-F6654	
IC602	8-749-920-61	IC SE-135N	
IC603	8-759-701-59	IC NJM78M09FA	
IC604	8-759-231-53	IC TA7805S	
IC901	8-742-041-11	HYB IC SBX1981-51 (KV-HF21M50)	
IC901	8-742-041-12	HYB IC SBX1981-11 (KV-XF21M80)	

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

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REF. NO.	PART NO.	DESCRIPTION	REMARK	REF. NO.	PART NO.	DESCRIPTION	REMARK
		<JACK>					
J401	1-779-850-11	JACK BLOCK, PIN 6P		L508	1-412-525-31	INDUCTOR 10UH	
J901	1-770-786-11	JACK		L509	1-459-390-00	INDUCTOR 390UH	
J902	1-770-329-11	JACK, PIN 3P		L510	1-416-972-11	COIL, HORIZONTAL LINEARITY	
		<CHIP CONDUCTOR>		L512	1-412-549-31	INDUCTOR 1MMH	
JR002	1-216-295-61	SHORT CHIP 0		L513	1-412-549-31	INDUCTOR 1MMH	
JR003	1-216-295-61	SHORT CHIP 0		L515	1-459-104-00	COIL, WITH CORE	
JR004	1-216-295-61	SHORT CHIP 0		L518	1-408-611-31	INDUCTOR 47UH	
JR005	1-216-295-61	SHORT CHIP 0		L601	1-412-527-11	INDUCTOR 15UH	
JR006	1-216-295-61	SHORT CHIP 0		L901	1-408-603-31	INDUCTOR 10UH	
JR007	1-216-295-61	SHORT CHIP 0		L902	1-408-603-31	INDUCTOR 10UH	
JR008	1-216-295-61	SHORT CHIP 0		L905	1-414-856-11	INDUCTOR 10UH	
JR009	1-216-295-61	SHORT CHIP 0				<PHOTO COUPLER>	
JR010	1-216-295-61	SHORT CHIP 0		PH600 $\triangle$	8-749-924-35	PHOTO COUPLER ON3171-R	
JR011	1-216-295-61	SHORT CHIP 0				<IC LINK>	
JR012	1-216-295-61	SHORT CHIP 0		PS200	1-532-675-21	LINK, IC 1.5A/150V	
JR013	1-216-295-61	SHORT CHIP 0				<TRANSISTOR>	
JR014	1-216-295-61	SHORT CHIP 0		Q002	8-729-230-49	TRANSISTOR 2SC2712-YG	
JR015	1-216-295-61	SHORT CHIP 0		Q003	8-729-424-08	TRANSISTOR UN2111 (KV-HF21M50)	
JR016	1-216-295-61	SHORT CHIP 0		Q003	8-729-027-23	TRANSISTOR DTA114EKA-T146 (KV-XF21M80)	
JR018	1-216-295-61	SHORT CHIP 0		Q004	8-729-421-22	TRANSISTOR UN2211 (KV-HF21M50)	
JR019	1-216-295-61	SHORT CHIP 0		Q004	8-729-900-53	TRANSISTOR DTC114EK (KV-XF21M80)	
JR102	1-216-295-61	SHORT CHIP 0		Q101	8-729-230-49	TRANSISTOR 2SC2712-YG	
JR109	1-216-295-61	SHORT CHIP 0		Q201	8-729-424-67	TRANSISTOR UN2216	
JR202	1-216-295-61	SHORT CHIP 0		Q202	8-729-424-67	TRANSISTOR UN2216	
JR301	1-216-295-61	SHORT CHIP 0		Q203	8-729-421-19	TRANSISTOR UN2213 (KV-HF21M50)	
JR303	1-216-295-61	SHORT CHIP 0		Q203	1-801-806-11	TRANSISTOR DTC144EKA-T146 (KV-XF21M80)	
JR401	1-216-295-61	SHORT CHIP 0		Q204	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
JR403	1-216-295-61	SHORT CHIP 0		Q204	8-729-216-22	TRANSISTOR 2SA1162-G	
JR404	1-216-295-61	SHORT CHIP 0		Q205	8-729-421-19	TRANSISTOR UN2213 (KV-HF21M50)	
JR405	1-216-295-61	SHORT CHIP 0		Q205	1-801-806-11	TRANSISTOR DTC144EKA-T146 (KV-XF21M80)	
JR500	1-216-295-61	SHORT CHIP 0		Q206	8-729-421-19	TRANSISTOR UN2213 (KV-HF21M50)	
JR501	1-216-295-61	SHORT CHIP 0		Q206	1-801-806-11	TRANSISTOR DTC144EKA-T146 (KV-XF21M80)	
JR600	1-216-295-61	SHORT CHIP 0		Q207	8-729-421-19	TRANSISTOR UN2213 (KV-HF21M50)	
		<COIL>		Q207	1-801-806-11	TRANSISTOR DTC144EKA-T146 (KV-XF21M80)	
L002	1-414-856-11	INDUCTOR 10UH		Q301	8-729-216-22	TRANSISTOR 2SA1162-G	
L003	1-414-180-11	INDUCTOR 3.3UH		Q302	8-729-230-49	TRANSISTOR 2SC2712-YG	
L005	1-414-233-22	INDUCTOR CHIP 0UH		Q303	8-729-216-22	TRANSISTOR 2SA1162-G	
L101	1-414-856-11	INDUCTOR 10UH		Q305	8-729-216-22	TRANSISTOR 2SA1162-G	
L102	1-414-856-11	INDUCTOR 10UH		Q306	8-729-216-22	TRANSISTOR 2SA1162-G	
L103	1-414-856-11	INDUCTOR 10UH		Q307	8-729-230-49	TRANSISTOR 2SC2712-YG	
L104	1-414-856-11	INDUCTOR 10UH		Q308	8-729-216-22	TRANSISTOR 2SA1162-G	
L105	1-414-856-11	INDUCTOR 10UH		Q312	8-729-216-22	TRANSISTOR 2SA1162-G	
L204	1-414-856-11	INDUCTOR 10UH		Q313	8-729-230-49	TRANSISTOR 2SC2712-YG	
L301	1-414-189-31	INDUCTOR 100UH		Q315	8-729-421-19	TRANSISTOR UN2213 (KV-HF21M50)	
L302	1-414-185-41	INDUCTOR 22UH		Q315	1-801-806-11	TRANSISTOR DTC144EK-T146 (KV-XF21M80)	
L501	1-412-525-31	INDUCTOR 10UH		Q401	8-729-424-67	TRANSISTOR UN2216	
L502	1-422-613-11	COIL, AIR CORE		Q402	8-729-424-67	TRANSISTOR UN2216	
L503	1-412-525-31	INDUCTOR 10UH		Q403	8-729-216-22	TRANSISTOR 2SA1162-G	
L504	1-412-525-31	INDUCTOR 10UH		Q404	8-729-216-22	TRANSISTOR 2SA1162-G	
L505	1-412-525-31	INDUCTOR 10UH		Q503	8-729-230-49	TRANSISTOR 2SC2712-YG	
L506	1-412-525-31	INDUCTOR 10UH		Q505	8-729-931-45	TRANSISTOR IRF614	
L507	1-459-111-00	INDUCTOR 10MMH					

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REF. NO.	PART NO.	DESCRIPTION	REMARK	REF. NO.	PART NO.	DESCRIPTION	REMARK
Q506	8-729-140-96	TRANSISTOR 2SD774-34		R046	1-216-049-61	RES,CHIP 1K	5% 1/10W
Q507	8-729-216-22	TRANSISTOR 2SA1162-G		R047	1-414-233-22	INDUCTOR CHIP 0UH	
Q509	8-729-230-49	TRANSISTOR 2SC2712-YG		R048	1-216-073-61	RES,CHIP 10G	5% 1/10W
Q511	8-729-048-07	TRANSISTOR 2SD2578-CA (KV-HF21M50)		R050	1-216-073-61	RES,CHIP 10G	5% 1/10W
Q511	8-729-016-32	TRANSISTOR 2SC4927-01 (KV-XF21M80)		R053	1-216-049-61	RES,CHIP 1K	5% 1/10W
Q601	8-729-023-22	TRANSISTOR 2SD2114K		R055	1-216-073-61	RES,CHIP 10G	5% 1/10W
Q602	8-729-230-49	TRANSISTOR 2SC2712-YG		R056	1-216-073-61	RES,CHIP 10G	5% 1/10W
Q603	8-729-424-08	TRANSISTOR UN2111 (KV-HF21M50)		R061	1-216-033-61	RES,CHIP 220	5% 1/10W
Q603	8-729-027-23	TRANSISTOR DTA114EKA-T146 (KV-XF21M80)		R062	1-216-041-61	RES,CHIP 470	5% 1/10W
Q604	8-729-200-17	TRANSISTOR 2SA1091-O		R063	1-216-037-61	RES,CHIP 330	5% 1/10W
Q605	8-729-044-30	TRANSISTOR 2SK2845-LB102		R064	1-216-037-61	RES,CHIP 330	5% 1/10W
Q606	8-729-230-49	TRANSISTOR 2SC2712-YG		R065	1-216-037-61	RES,CHIP 330	5% 1/10W
Q607	8-729-922-37	TRANSISTOR 2SD2144S-UVW		R066	1-216-049-61	RES,CHIP 1K	5% 1/10W
Q608	8-729-230-49	TRANSISTOR 2SC2712-YG		R105	1-216-295-61	SHORT CHIP 0	
Q901	8-729-421-19	TRANSISTOR UN2213 (KV-HF21M50)		R109	1-216-041-61	RES,CHIP 470	5% 1/10W
Q901	1-801-806-11	TRANSISTOR DTC144EKA-T146 (KV-XF21M80)		R111	1-216-025-61	RES,CHIP 100	5% 1/10W
Q902	8-729-421-19	TRANSISTOR UN2213 (KV-HF21M50)		R112	1-216-025-61	RES,CHIP 100	5% 1/10W
Q902	1-801-806-11	TRANSISTOR DTC144EKA-T146 (KV-XF21M80)		R113	1-216-047-00	METAL CHIP 820	5% 1/10W
		<RESISTOR>		R202	1-216-053-61	RES,CHIP 1.5K	5% 1/10W
R001	1-414-233-22	INDUCTOR CHIP 0UH		R203	1-216-063-91	RES,CHIP 3.9K	5% 1/10W
R002	1-216-025-61	RES,CHIP 100	5% 1/10W			(KV-HF21M50)	
R003	1-216-295-91	SHORT 0 (KV-HF21M50)		R203	1-216-057-61	RES,CHIP 2.2K	5% 1/10W
R003	1-216-073-61	RES,CHIP 10G	5% 1/10W			(KV-XF21M80)	
		(KV-XF21M80)		R204	1-216-061-00	RES,CHIP 3.3K	5% 1/10W
R004	1-216-025-61	RES,CHIP 100	5% 1/10W			(KV-HF21M50)	
				R204	1-216-069-61	RES,CHIP 6.8K	5% 1/10W
R005	1-216-025-61	RES,CHIP 100	5% 1/10W			(KV-XF21M80)	
R007	1-216-295-61	SHORT CHIP 0		R205	1-216-061-00	RES,CHIP 3.3K	5% 1/10W
R008	1-216-065-61	RES,CHIP 4.7K	5% 1/10W			(KV-HF21M50)	
R010	1-216-065-61	RES,CHIP 4.7K	5% 1/10W	R205	1-216-069-61	RES,CHIP 6.8K	5% 1/10W
R011	1-216-065-61	RES,CHIP 4.7K	5% 1/10W			(KV-XF21M80)	
R012	1-216-065-61	RES,CHIP 4.7K	5% 1/10W	R206	1-216-063-91	RES,CHIP 3.9K	5% 1/10W
R013	1-216-065-61	RES,CHIP 4.7K	5% 1/10W			(KV-HF21M50)	
R014	1-216-025-61	RES,CHIP 100	5% 1/10W	R206	1-216-057-61	RES,CHIP 2.2K	5% 1/10W
R015	1-216-025-61	RES,CHIP 100	5% 1/10W			(KV-XF21M80)	
R016	1-216-025-61	RES,CHIP 100	5% 1/10W	R207	1-216-053-61	RES,CHIP 1.5K	5% 1/10W
R017	1-216-049-61	RES,CHIP 1K	5% 1/10W	R208	1-216-061-00	RES,CHIP 3.3K	5% 1/10W
R018	1-216-033-61	RES,CHIP 220	5% 1/10W			(KV-HF21M50)	
R019	1-216-073-61	RES,CHIP 10G	5% 1/10W	R208	1-216-069-61	RES,CHIP 6.8K	5% 1/10W
R021	1-216-073-61	RES,CHIP 10G	5% 1/10W			(KV-XF21M80)	
R022	1-216-033-61	RES,CHIP 220	5% 1/10W	R209	1-216-061-00	RES,CHIP 3.3K	5% 1/10W
R024	1-216-057-61	RES,CHIP 2.2K	5% 1/10W			(KV-HF21M50)	
R025	1-216-057-61	RES,CHIP 2.2K	5% 1/10W	R209	1-216-069-61	RES,CHIP 6.8K	5% 1/10W
R026	1-216-057-61	RES,CHIP 2.2K	5% 1/10W			(KV-XF21M80)	
R027	1-216-073-61	RES,CHIP 10G	5% 1/10W	R210	1-216-027-00	RES,CHIP 120	5% 1/10W
R029	1-216-049-61	RES,CHIP 1K	5% 1/10W			(KV-HF21M50)	
R031	1-216-049-61	RES,CHIP 1K	5% 1/10W	R210	1-216-029-61	RES,CHIP 150	5% 1/10W
R035	1-216-025-61	RES,CHIP 100	5% 1/10W			(KV-XF21M80)	
R036	1-216-025-61	RES,CHIP 100	5% 1/10W	R212	1-216-027-00	RES,CHIP 120	5% 1/10W
R037	1-216-025-61	RES,CHIP 100	5% 1/10W			(KV-HF21M50)	
R040	1-216-025-61	RES,CHIP 100	5% 1/10W	R212	1-216-029-61	RES,CHIP 150	5% 1/10W
						(KV-XF21M80)	
R041	1-216-025-61	RES,CHIP 100	5% 1/10W	R213	1-216-073-61	RES,CHIP 10G	5% 1/10W
R042	1-216-295-61	SHORT CHIP 0		R214	1-216-073-61	RES,CHIP 10G	5% 1/10W
R043	1-216-049-61	RES,CHIP 1K	5% 1/10W	R215	1-216-059-61	RES,CHIP 2.7K	5% 1/10W
R044	1-216-025-61	RES,CHIP 100	5% 1/10W	R216	1-216-059-61	RES,CHIP 2.7K	5% 1/10W
R045	1-414-233-22	INDUCTOR CHIP 0UH		R217	1-216-067-00	METAL CHIP 5.6K	5% 1/10W
				R218	1-216-067-00	METAL CHIP 5.6K	5% 1/10W
				R219	1-216-025-61	RES,CHIP 100	5% 1/10W

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REF. NO.	PART NO.	DESCRIPTION			REMARK	REF. NO.	PART NO.	DESCRIPTION			REMARK
R220	1-216-025-61	RES,CHIP	100	5%	1/10W	R357	1-216-079-00	METAL CHIP	18K	5%	1/10W
R221	1-216-295-61	SHORT CHIP	0			R358	1-216-049-61	RES,CHIP	1K	5%	1/10W
						R359	1-216-033-61	RES,CHIP	220	5%	1/10W
R222	1-216-295-61	SHORT CHIP	0								
R225	1-216-033-61	RES,CHIP	220	5%	1/10W	R360	1-216-033-61	RES,CHIP	220	5%	1/10W
R226	1-216-033-61	RES,CHIP	220	5%	1/10W	R361	1-216-073-61	RES,CHIP	10G	5%	1/10W
R227	1-216-033-61	RES,CHIP	220	5%	1/10W	R362	1-216-075-61	RES,CHIP	12K	5%	1/10W
R228	1-249-389-11	CARBON	4.7	5%	1/4W	R363	1-216-079-00	METAL CHIP	18K	5%	1/10W
						R364	1-216-295-61	SHORT CHIP	0		
R229	1-216-073-61	RES,CHIP	10G	5%	1/10W						
R230	1-216-061-00	RES,CHIP (KV-HF21M50)	3.3K	5%	1/10W	R365	1-216-033-61	RES,CHIP	220	5%	1/10W
						R366	1-216-073-61	RES,CHIP	10G	5%	1/10W
R230	1-216-069-61	RES,CHIP (KV-XF21M80)	6.8K	5%	1/10W	R367	1-216-073-61	RES,CHIP	10G	5%	1/10W
						R370	1-216-033-61	RES,CHIP	220	5%	1/10W
R231	1-216-295-61	SHORT CHIP	0			R376	1-216-081-61	RES,CHIP	22K	5%	1/10W
R234	1-249-389-11	CARBON	4.7	5%	1/4W						
R235	1-216-069-61	RES,CHIP	6.8K	5%	1/10W	R377	1-216-121-61	RES,CHIP	1M	5%	1/10W
R236	1-216-069-61	RES,CHIP	6.8K	5%	1/10W	R378	1-216-031-61	RES,CHIP	180	5%	1/10W
R237	1-216-308-61	METAL CHIP	4.7	5%	1/10W	R401	1-216-049-61	RES,CHIP	1K	5%	1/10W
R301	1-216-073-61	RES,CHIP	10G	5%	1/10W	R402	1-216-073-61	RES,CHIP	10G	5%	1/10W
R302	1-216-295-61	SHORT CHIP	0			R403	1-216-073-61	RES,CHIP	10G	5%	1/10W
R303	1-216-049-61	RES,CHIP	1K	5%	1/10W	R404	1-216-073-61	RES,CHIP	10G	5%	1/10W
R304	1-216-073-61	RES,CHIP	10G	5%	1/10W	R405	1-216-049-61	RES,CHIP	1K	5%	1/10W
R305	1-216-051-61	RES,CHIP	1.2K	5%	1/10W	R406	1-216-073-61	RES,CHIP	10G	5%	1/10W
R306	1-216-073-61	RES,CHIP	10G	5%	1/10W	R407	1-216-049-91	RES,CHIP (KV-HF21M50)	1K	5%	1/10W
R307	1-216-025-61	RES,CHIP	100	5%	1/10W						
						R407	1-216-049-61	RES,CHIP (KV-XF21M80)	1K	5%	1/10W
R308	1-216-025-61	RES,CHIP	100	5%	1/10W	R408	1-216-049-61	RES,CHIP	1K	5%	1/10W
R309	1-216-025-61	RES,CHIP	100	5%	1/10W	R409	1-216-041-61	RES,CHIP	470	5%	1/10W
R310	1-216-025-61	RES,CHIP	100	5%	1/10W	R410	1-216-113-61	RES,CHIP	470K	5%	1/10W
R311	1-216-017-61	RES,CHIP	47	5%	1/10W	R411	1-216-113-61	RES,CHIP	470K	5%	1/10W
R312	1-216-041-61	RES,CHIP	470	5%	1/10W	R412	1-216-041-61	RES,CHIP	470	5%	1/10W
R313	1-216-053-61	RES,CHIP	1.5K	5%	1/10W	R413	1-216-021-61	RES,CHIP	68	5%	1/10W
R314	1-216-045-00	METAL CHIP	680	5%	1/10W	R414	1-216-113-61	RES,CHIP	470K	5%	1/10W
R316	1-216-053-61	RES,CHIP	1.5K	5%	1/10W	R415	1-216-113-61	RES,CHIP	470K	5%	1/10W
R317	1-216-077-61	REGISTER	0			R416	1-216-077-61	REGISTER	0		
R318	1-216-051-61	RES,CHIP	1.2K	5%	1/10W	R417	1-216-077-61	REGISTER	0		
R319	1-216-025-61	RES,CHIP	100	5%	1/10W	R418	1-216-113-61	RES,CHIP	470K	5%	1/10W
R320	1-216-065-61	RES,CHIP	4.7K	5%	1/10W	R419	1-216-022-00	METAL CHIP	75	5%	1/10W
R321	1-216-073-61	RES,CHIP	10G	5%	1/10W	R426	1-216-033-61	RES,CHIP	220	5%	1/10W
R322	1-216-033-61	RES,CHIP	220	5%	1/10W	R505	1-216-101-61	RES,CHIP	150K	5%	1/10W
R326	1-216-295-61	SHORT CHIP	0			R506	1-216-085-00	METAL CHIP	33K	5%	1/10W
R331	1-216-295-61	SHORT CHIP	0								
R332	1-216-033-61	RES,CHIP	220	5%	1/10W	R507	1-249-389-11	CARBON	4.7	5%	1/4W F
R333	1-216-073-61	RES,CHIP	10G	5%	1/10W	R508	1-215-910-00	METAL OXIDE	68	5%	3W F
R334	1-216-129-61	METAL CHIP	2.2M	5%	1/10W	R509	1-215-911-11	METAL OXIDE	100	5%	3W F
R335	1-216-045-00	METAL CHIP	680	5%	1/10W	R510	1-215-885-00	METAL OXIDE	68	5%	2W F
						R511	1-215-911-11	METAL OXIDE	100	5%	3W F
R338	1-216-033-61	RES,CHIP	220	5%	1/10W						
R340	1-216-025-61	RES,CHIP	100	5%	1/10W	R516	1-216-081-61	RES,CHIP	22K	5%	1/10W
R345	1-216-081-61	RES,CHIP	22K	5%	1/10W	R518	1-220-948-91	METAL	100	5%	1/2W
R346	1-216-051-61	RES,CHIP (KV-XF21M80 ONLY)	1.2K	5%	1/10W	R520	1-215-445-00	METAL	10K	1%	1/4W
						R522	1-216-675-91	METAL CHIP	10K	0.50%	1/10W
R347	1-216-051-61	RES,CHIP (KV-XF21M80 ONLY)	1.2K	5%	1/10W	R523	1-220-952-91	METAL MELF	330	5%	1/2W
R348	1-216-675-91	METAL CHIP	10K	0.50%	1/10W	R525	1-218-776-11	METAL CHIP	1M	0.50%	1/10W
R349	1-216-073-61	RES,CHIP	10G	5%	1/10W	R526	1-208-798-11	RES,CHIP	4.7K	0.50%	1/10W
R350	1-216-061-61	RES,CHIP	3.3G	5%	1/10W	R527	1-216-001-61	RES,CHIP	10	5%	1/10W
R351	1-216-053-61	RES,CHIP	1.5K	5%	1/10W	R528	1-216-683-11	METAL CHIP	22K	0.50%	1/10W
R354	1-216-057-61	RES,CHIP	2.2K	5%	1/10W	R529	1-216-635-11	METAL CHIP	220	0.50%	1/10W
R355	1-216-057-61	RES,CHIP	2.2K	5%	1/10W	R531	1-220-963-91	METAL MELF	3.3K	5%	1/2W
R356	1-216-057-61	RES,CHIP	2.2K	5%	1/10W	R533	1-220-958-91	REGISTER	0		
						R534	1-216-361-00	METAL OXIDE	0.22	5%	2W F

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

REF. NO.	PART NO.	DESCRIPTION	REMARK	REF. NO.	PART NO.	DESCRIPTION	REMARK
R535	1-216-067-00	METAL CHIP	5.6K	5%	1/10W		
R536	1-216-067-00	METAL CHIP	5.6K	5%	1/10W		
R537	1-216-683-11	METAL CHIP	22K	0.50%	1/10W		
R540	1-216-065-61	RES,CHIP	4.7K	5%	1/10W		
R541	1-216-065-61	RES,CHIP	4.7K	5%	1/10W		
R542	1-216-295-61	SHORT CHIP	0				
R543	1-249-426-11	CARBON	5.6K	5%	1/4W	F	
R544	1-215-918-00	METAL OXIDE	1.5K	5%	3W	F	
R545	1-216-077-61	REGISTER	0				
R546	1-216-077-61	REGISTER	0				
R547	1-216-085-00	METAL CHIP	33K	5%	1/10W		
R549	1-215-451-00	METAL	18K	1%	1/4W		
R550	1-216-097-61	RES,CHIP	100K	5%	1/10W		
R551	1-220-961-91	METAL CHIP	2.2K	5%	1/2W		
R552	1-216-057-61	RES,CHIP	2.2K	5%	1/10W		
R553	1-215-457-00	METAL	33K	1%	1/4W		
R554	1-215-457-00	METAL	33K	1%	1/4W		
R556	1-215-437-00	METAL	4.7K	1%	1/4W		
R557	1-216-345-11	METAL OXIDE	0.47	5%	1W	F	
R558	1-220-961-91	METAL CHIP	2.2K	5%	1/2W		
R559	1-220-969-91	METAL CHIP	10K	5%	1/2W		
R560	1-216-073-61	RES,CHIP	10G	5%	1/10W		
R562	1-249-401-11	CARBON	47	5%	1/4W		
R565	1-216-073-61	RES,CHIP	10G	5%	1/10W		
R567	1-216-105-61	METAL CHIP	220K	5%	1/10W		
R568	1-249-383-11	CARBON	1.5	5%	1/4W	F	
R570	1-216-069-61	RES,CHIP	6.8K	5%	1/10W		
R571	1-215-437-00	METAL	4.7K	1%	1/4W		
R573	1-216-089-61	REGISTER	0				
R577	1-215-913-11	METAL OXIDE	220	5%	3W	F	
R578	1-216-369-00	METAL OXIDE	1	5%	2W	F	
R579	1-216-097-61	RES,CHIP	100K	5%	1/10W		
R580	1-216-699-91	METAL CHIP	100K	0.50%	1/10W		
R581	1-208-798-11	RES,CHIP	4.7K	0.50%	1/10W		
R585	1-249-391-11	CARBON	6.8	5%	1/4W	F	
R588	1-215-888-00	METAL OXIDE	220	5%	2W	F	
R589	1-215-888-00	METAL OXIDE	220	5%	2W	F	
R590	1-215-465-00	METAL	68K	1%	1/4W		
R591	1-260-288-11	CARBON	0.47	5%	1/2W	F	
R593	1-260-288-11	CARBON	0.47	5%	1/2W	F	
R594	1-260-288-11	CARBON	0.47	5%	1/2W	F	
R596	1-215-920-11	METAL OXIDE	3.3K	5%	3W	F	
R597	1-247-750-11	CARBON	680	5%	1/2W	F	
R599	1-249-389-11	CARBON	4.7	5%	1/4W		
R600	1-220-976-91	METAL MELF	56K	5%	1/2W		
R601	1-249-418-11	CARBON	1.2K	5%	1/4W	F	
R602	1-249-389-11	CARBON	4.7	5%	1/4W	F	
R603	1-215-485-00	METAL	470K	1%	1/4W		
R604	1-216-097-61	RES,CHIP	100K	5%	1/10W		
R607	1-220-965-91	METAL CHIP	4.7K	5%	1/2W		
R608	1-240-205-91	CARBON	22M	5%	1/2W		
R609	1-216-057-61	RES,CHIP	2.2K	5%	1/10W		
R610	1-216-073-61	RES,CHIP	10G	5%	1/10W		
R611	1-216-089-61	REGISTER	0				
R612	1-216-045-00	METAL CHIP	680	5%	1/10W		
R614	1-216-041-61	RES,CHIP	470	5%	1/10W		
R615	1-216-350-11	METAL OXIDE	1.2	5%	1W	F	
R616	1-260-302-51	CARBON	6.8	5%	1/2W	F	
R617	1-247-791-91	CARBON	22	5%	1/4W		
R619	1-260-128-11	CARBON	270K	5%	1/2W		
R620	1-215-915-11	METAL OXIDE	470	5%	3W	F	
R622	1-215-908-00	METAL OXIDE (KV-HF21M50)	33	5%	3W	F	
R622	1-216-400-11	METAL OXIDE (KV-XF21M80)	8.2	5%	3W	F	
R623	1-216-095-61	RES,CHIP	82K	5%	1/10W		
R624	1-216-089-61	REGISTER	0				
R626	1-216-049-61	RES,CHIP	1K	5%	1/10W		
R627	1-240-251-11	CMT,MELF	6.8	5%	10W		
R629	1-247-747-11	CARBON	470	5%	1/2W	F	
R630	1-249-429-11	CARBON	10K	5%	1/4W	F	
R631	1-216-089-61	REGISTER	0				
R632	1-202-933-61	FUSIBLE	0.1	10%	1/2W	F	
R634	$\triangle$ 1-218-265-91	METAL	8.2M	5%	1W		
R635	1-216-492-11	METAL OXIDE	82K	5%	3W	F	
R636	1-215-924-00	METAL OXIDE	15K	5%	3W	F	
R637	1-216-492-11	METAL OXIDE	82K	5%	3W	F	
R639	1-216-363-00	METAL OXIDE	0.33	5%	2W	F	
R640	1-220-956-91	METAL MELF	680	5%	1/2W		
R641	1-216-362-11	METAL OXIDE	0.27	5%	2W	F	
R642	1-220-959-91	METAL MELF	1.5K	5%	1/2W		
R643	1-220-963-91	METAL MELF	3.3K	5%	1/2W		
R644	1-220-959-91	METAL MELF	1.5K	5%	1/2W		
R646	1-215-924-00	METAL OXIDE	15K	5%	3W	F	
R647	1-249-401-11	CARBON	47	5%	1/4W		
R648	1-216-057-61	RES,CHIP	2.2K	5%	1/10W		
R649	1-220-958-91	REGISTER	0				
R650	1-215-882-00	METAL OXIDE	22	5%	2W	F	
R652	1-215-900-11	METAL OXIDE	22K	5%	2W	F	
R653	1-215-873-00	METAL OXIDE	4.7K	5%	1W	F	
R657	1-260-127-11	CARBON	220K	5%	1/2W		
R659	1-216-049-61	RES,CHIP	1K	5%	1/10W		
R660	1-216-073-61	RES,CHIP	10G	5%	1/10W		
R661	1-215-873-00	METAL OXIDE	4.7K	5%	1W	F	
R680	1-216-308-61	METAL CHIP	4.7	5%	1/10W		
R901	1-220-952-91	METAL MELF	330	5%	1/2W		
R902	1-249-411-11	CARBON (KV-HF21M50)	330	5%	1/4W		
R902	1-220-952-91	METAL MELF (KV-XF21M80)	330	5%	1/2W		
R903	1-216-022-00	METAL CHIP	75	5%	1/10W		
R904	1-216-033-61	RES,CHIP	220	5%	1/10W		
R905	1-216-113-61	RES,CHIP	470K	5%	1/10W		
R906	1-216-077-61	REGISTER	0				
R907	1-216-113-61	RES,CHIP	470K	5%	1/10W		
R908	1-216-077-61	REGISTER	0				
R909	1-216-065-61	RES,CHIP	4.7K	5%	1/10W		
R910	1-216-065-61	RES,CHIP	4.7K	5%	1/10W		
R911	1-216-067-00	METAL CHIP	5.6K	5%	1/10W		
R912	1-216-041-61	RES,CHIP	470	5%	1/10W		
R913	1-216-049-61	RES,CHIP	1K	5%	1/10W		
R914	1-216-055-61	RES,CHIP	1.8K	5%	1/10W		
R915	1-216-061-61	RES,CHIP	3.3G	5%	1/10W		
R916	1-216-017-61	RES,CHIP	47	5%	1/10W		

A	C₃ (KV-HF21M50)
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The components identified by shading
and mark Δ are critical for safety.
Replace only with part number specified.

C3 (KV-HF21M50)

C5 (KV-XF21M80)

REF. NO.	PART NO.	DESCRIPTION				REMARK	
<RESISTOR>							
R703	1-249-496-11	CARBON	100K	5%	1/2W		
R705	1-216-380-11	METAL OXIDE	8.2	5%	2W	F	
R706	1-215-417-00	METAL	680	1%	1/4W		
R707	1-215-413-00	METAL	470	1%	1/4W		
R708	1-216-379-11	METAL OXIDE	6.8	5%	2W	F	
R710	1-215-922-11	METAL OXIDE	6.8K	5%	3W	F	
R711	1-247-752-11	CARBON	1K	5%	1/2W		
R712	1-215-922-11	METAL OXIDE	6.8K	5%	3W	F	
R713	1-247-752-11	CARBON	1K	5%	1/2W		
R714	1-215-922-11	METAL OXIDE	6.8K	5%	3W	F	
R715	1-247-752-11	CARBON	1K	5%	1/2W		
R719	1-215-480-00	METAL	300K	1%	1/4W		
R720	1-249-923-11	CARBON	1K	5%	1/4W	F	
R721	1-215-489-00	METAL	680K	1%	1/4W		
R722	1-249-923-11	CARBON	1K	5%	1/4W	F	
R723	1-215-479-00	METAL	270K	1%	1/4W		
R724	1-249-923-11	CARBON	1K	5%	1/4W	F	
R725	1-249-421-11	CARBON	2.2K	5%	1/4W		
R726	1-249-421-11	CARBON	2.2K	5%	1/4W		
R727	1-249-421-11	CARBON	2.2K	5%	1/4W		
R728	1-249-407-11	CARBON	150	5%	1/4W		
R729	1-249-407-11	CARBON	150	5%	1/4W		
R730	1-249-407-11	CARBON	150	5%	1/4W		
R731	1-249-407-11	CARBON	150	5%	1/4W		
R732	1-249-407-11	CARBON	150	5%	1/4W		
R733	1-249-406-11	CARBON	120	5%	1/4W		
R734	1-247-739-11	CARBON	100	5%	1/2W		
R738	1-247-807-31	CARBON	100	5%	1/4W		
R739	1-247-807-31	CARBON	100	5%	1/4W		
R740	1-247-807-31	CARBON	100	5%	1/4W		
R755	1-249-418-11	CARBON	1.2K	5%	1/4W		
R756	1-249-418-11	CARBON	1.2K	5%	1/4W		
R757	1-249-418-11	CARBON	1.2K	5%	1/4W		
<VARIABLE RESISTOR>							
RV702	1-241-656-21	RES, ADJ, METAL FILM 110M					

* A-1331-948-A	C5 BOARD, MOUNTED (KV-XF21M80 ONLY)						

7-682-948-01	SCREW +PSW 3X8						
<CAPACITOR>							
C701	1-162-114-00	CERAMIC	0.0047MF		2KV		
C702	1-102-074-00	CERAMIC	0.001MF	10%	50V		
C703	1-107-651-11	ELECT	4.7MF	20%	250V		
C704	1-130-202-00	FILM	0.022MF	5%	400V		
C706	1-104-664-11	ELECT	47MF	20%	16V		

REF. NO.	PART NO.	DESCRIPTION			REMARK
C708	1-102-114-00	CERAMIC	470PF	10%	50V
C709	1-102-114-00	CERAMIC	470PF	10%	50V
C710	1-102-114-00	CERAMIC	470PF	10%	50V
C712	1-102-116-00	CERAMIC	680PF	10%	50V
C713	1-102-116-00	CERAMIC	680PF	10%	50V
C714	1-102-116-00	CERAMIC	680PF	10%	50V
C716	1-126-933-11	ELECT	100MF	20%	16V
C717	1-101-880-00	CERAMIC	47PF	5%	50V
C736	1-102-114-00	CERAMIC	470PF	10%	50V
C737	1-102-114-00	CERAMIC	470PF	10%	50V
C746	1-102-114-00	CERAMIC	470PF	10%	50V
C1803	1-125-797-91	ELECT	10MF	20%	50V
C1804	1-125-797-91	ELECT	10MF	20%	50V
C1809	1-126-942-61	ELECT	1000MF	20%	25V
<CONNECTOR>					
CN701	1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P			
CN702	1-695-915-11	TAB (CONTACT)			
CN703 *	1-564-509-11	PLUG, CONNECTOR 6P			
CN704	1-695-915-11	TAB (CONTACT)			
CN1801 *	1-564-507-11	PLUG, CONNECTOR 4P			
CN1802 *	1-564-506-11	PLUG, CONNECTOR 3P			
<DIODE>					
D701	8-719-911-19	DIODE 1SS119-25			
D702	8-719-911-19	DIODE 1SS119-25			
D703	8-719-911-19	DIODE 1SS119-25			
D707	8-719-911-19	DIODE 1SS119-25			
D708	8-719-911-19	DIODE 1SS119-25			
D709	8-719-911-19	DIODE 1SS119-25			
D710	8-719-911-19	DIODE 1SS119-25			
D711	8-719-911-19	DIODE 1SS119-25			
D712	8-719-911-19	DIODE 1SS119-25			
D713	8-719-911-19	DIODE 1SS119-25			
D714	8-719-911-19	DIODE 1SS119-25			
D715	8-719-911-19	DIODE 1SS119-25			
D716	8-719-911-19	DIODE 1SS119-25			
D717	8-719-121-26	DIODE RD9.1ESL2			
D1803	8-719-911-19	DIODE 1SS119-25			
D1804	8-719-911-19	DIODE 1SS119-25			
D1808	8-719-908-03	DIODE GP08D			
<IC>					
IC1800	8-759-822-38	IC LA6510			
<JACK>					
J701	 1-540-071-22	SOCKET, CRT			
<COIL>					
L701	1-410-667-31	INDUCTOR	22UH		
L710	1-408-609-41	INDUCTOR	33UH		
L711	1-408-609-41	INDUCTOR	33UH		

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

REF. NO.	PART NO.	DESCRIPTION	REMARK			
	* A-1342-453-A	VM1 BOARD, MOUNTED (KV-HF21M50)				

	* A-1342-488-A	VM1 BOARD, MOUNTED (KV-XF21M80)				

	4-382-854-11	SCREW (M3X10), P, SW (+)				
		<CAPACITOR>				
C5902	1-107-883-11	ELECT	330MF	20%	16V	
C5903	1-161-830-00	CERAMIC	0.0047MF		500V	
C5905	1-126-925-11	ELECT	470MF	20%	10V	
C5906	1-130-491-00	MYLAR	0.047MF	5%	50V	
C5907	1-107-638-11	ELECT	33MF	20%	160V	
C5908	1-106-383-00	MYLAR	0.047MF	10%	200V	
C5909	1-126-968-11	ELECT	100MF	20%	50V	
C5910	1-130-471-00	MYLAR	0.001MF	5%	50V	
C5911	1-107-949-11	ELECT	2.2MF	20%	160V	
C5912	1-104-999-11	MYLAR	0.1MF	10%	200V	
C5913	1-130-471-00	MYLAR	0.001MF	5%	50V	
C5914	1-126-933-11	ELECT	100MF	20%	16V	
C5916	1-130-491-00	MYLAR	0.047MF	5%	50V	
C5917	1-126-925-11	ELECT	470MF	20%	10V	
C5918	1-115-341-51	CERAMIC	120PF	10%	500V	
C5920	1-125-797-91	ELECT	10MF	20%	50V	
C5921	1-101-888-00	CERAMIC	68PF	5%	50V	
		<CONNECTOR>				
CN5901*	1-564-510-11	PLUG, CONNECTOR 7P				
CN5904*	1-770-723-11	CONNECTOR, BOARD TO BOARD 8P				
		<DIODE>				
D5901	8-719-911-19	DIODE 1SS119-25				
D5902	8-719-110-88	DIODE RD39ESB2				
D5903	8-719-911-19	DIODE 1SS119-25				
D5904	8-719-110-88	DIODE RD39ESB2				
D5905	8-719-911-19	DIODE 1SS119-25				
D5906	1-249-406-11	CARBON	120	5%	1/4W	
D5907	1-249-406-11	CARBON	120	5%	1/4W	
		<COIL>				
L5901	1-414-187-11	INDUCTOR	47UH			
L5902	1-414-856-11	INDUCTOR	10UH			
		<TRANSISTOR>				
Q5901	8-729-230-45	TRANSISTOR 2SC2458-YGR				
Q5902	8-729-017-05	TRANSISTOR 2SA1837				
Q5903	8-729-230-45	TRANSISTOR 2SC2458-YGR				
Q5904	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q5905	8-729-230-45	TRANSISTOR 2SC2458-YGR				
Q5906	8-729-017-06	TRANSISTOR 2SC4793				
Q5908	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q5909	8-729-119-78	TRANSISTOR 2SC2785-HFE				

REF. NO.	PART NO.	DESCRIPTION	REMARK			
<RESISTOR>						
R5901	1-220-951-91	METAL	220	5%	1/2W	
R5902	1-249-414-11	CARBON	560	5%	1/4W	F
R5903	1-247-735-11	CARBON	47	5%	1/2W	F
R5904	1-220-952-91	METAL MELF	330	5%	1/2W	
R5905	1-220-958-91	REGISTER	0			
R5906	1-220-958-91	REGISTER	0			
R5907	1-220-958-91	REGISTER	0			
R5908	1-249-383-11	CARBON	1.5	5%	1/4W	F
R5909	1-220-951-91	METAL	220	5%	1/2W	
R5910	1-220-946-81	METAL MELF	68	5%	1/2W	
R5911	1-249-439-11	CARBON	68K	5%	1/4W	
R5912	1-220-975-91	METAL MELF	47K	5%	1/2W	
R5914	1-220-946-81	METAL MELF	68	5%	1/2W	
R5915	1-220-969-91	METAL CHIP	10K	5%	1/2W	
R5916	1-220-959-91	METAL MELF	1.5K	5%	1/2W	
R5917	1-220-957-91	METAL MELF	820	5%	1/2W	
R5918	1-220-969-91	METAL CHIP	10K	5%	1/2W	
R5919	1-249-417-11	CARBON	1K	5%	1/4W	F
R5920	1-249-439-11	CARBON	68K	5%	1/4W	
R5921	1-215-912-11	METAL OXIDE	150	5%	3W	F
R5922	1-220-955-91	METAL MELF	560	5%	1/2W	
R5923	1-249-383-11	CARBON	1.5	5%	1/4W	F
R5925	1-249-401-11	CARBON	47	5%	1/4W	F
R5929	1-215-880-00	METAL OXIDE	10	5%	2W	F
R5930	1-220-954-91	METAL MELF	470	5%	1/2W	
R5931	1-220-954-91	METAL MELF	470	5%	1/2W	
R5932	1-220-954-91	METAL MELF	470	5%	1/2W	
R5933	1-220-954-91	METAL MELF	470	5%	1/2W	
R5934	1-220-970-91	METAL MELF	12K	5%	1/2W	
R5935	1-220-969-91	METAL CHIP	10K	5%	1/2W	

MISCELLANEOUS						

△	1-416-946-11	COIL, DEMAGNETIC				
	1-417-151-21	MATCHING TRANSFORMER, ANTENNA (KV-HF21M50 ONLY)				
	1-452-032-00	MAGNET,DISC				
	1-452-094-00	CIRCULAR DISC MAGNET B				
	1-452-728-41	COIL, NA ROTATION (RT-154) (KV-HF21M50 ONLY)				
	1-501-372-81	ANTENNA, TELESCOPIC (KV-HF21M50 ONLY)				
	1-503-902-11	SPEAKER (15X6.5CM) (KV-HF21M50)				
	1-529-125-11	SPEAKER (13X7CM) (KV-XF21M80)				
△	1-574-062-52	CORD, POWER (WITH CONNECTOR) 2.5A/250V				
	8-451-505-11	DEFLECTION YOKE (Y21RSA-S)				
	8-453-011-31	NA299-S2				
△	8-738-812-05	PICTURE TUBE (A51LPT70X) (KV-HF21M50)				
△	8-738-809-05	PICTURE TUBE (A51LPT70X) (KV-XF21M80)				

REF. NO.	PART NO.	DESCRIPTION	REMARK	REF. NO.	PART NO.	DESCRIPTION	REMARK
ACCESSORIES AND PACKING MATERIALS (KV-HF21M50)							

	1-417-151-21	MATCHING TRANSFORMER, ANTENNA					
	1-501-372-81	ANTENNA, TELESCOPIC					
	3-701-910-00	SCREW, SPECIAL (DIA. 3.8X20)					
	3-867-625-12	MANUAL, INSTRUCTION					
*	4-039-372-01	BAG, PROTECTION					
*	4-067-165-01	CUSHION,(LOWER)(ASS'Y)					
*	4-067-166-01	CUSHION (UPPER)(ASS'Y)					
*	4-067-175-01	INDIVIDUAL CARTON					
	4-392-003-11	BAND, HOLD					
	4-392-004-11	CLIP					

ACCESSORIES AND PACKING MATERIALS (KV-XF21M80)							

	3-701-910-00	SCREW, SPECIAL (DIA. 3.8X20)					
	3-866-882-11	MANUAL, INSTRUCTION					
*	4-053-003-01	BAG, PROTECTION					
*	4-070-796-01	CUSHION (UPPER)(ASSY)					
*	4-070-797-01	CUSHION (LOWER)(ASSY)					
*	4-071-142-01	INDIVIDUAL CARTON					
	4-392-003-31	BAND, HOLD					
	4-392-004-21	CLIP					

REMOTE COMMANDER							

	1-418-163-11	REMOTE COMMANDER (RM-952)					
	9-939-697-01	BATTERY COVER, REMOTE COMMANDER					

