Self Diagnosis Supported model

SERVICE MANUAL

BA-6 CHASSIS

MODEL NAME	REMOTE COMMANDER	DESTINATION	CHASSIS NO.
KV-20FS120	RM-Y194	US	SCC- S61K-A
KV-20FS120	RM-Y194	CND	SCC- S59H-A
KV-21FM120	RM-W151	LATIN NORTH	SCC- S60X-A
KV-21FS120	RM-Y194	LATIN NORTH	SCC- S60Y-A
KV-21FS120	RM-Y194	LATIN SOUTH	SCC- S73A-A
KV-21FA310	RM-Y180	LATIN NORTH	SCC- S60T-A
KV-21FA310	RM-Y180	LATIN SOUTH	SCC- S60U-A
KV-24FS120	RM-Y194	US	SCC- S61L-A
KV-24FS120	RM-Y194	CND	SCC- S59J-A
KV-25FS120	RM-Y194	LATIN NORTH	SCC- S73B-A
KV-25FS120	RM-Y194	LATIN SOUTH	SCC- S73C-A



KV-24FS120



KV-21FA310

TRINITRON® COLOR TELEVISION

SONY®

9-965-959-02

TABLE OF CONTENTS

SECTION TITLE **PAGE**

Specifications 4
Warnings and Cautions 6
Safety Check-Out 7
Self-Diagnostic Function 8

SECTION 1: DISASSEMBLY 10
1-1. Rear Cover Removal (All Except KV-21FA310) 10
1-2. Rear Cover Removal (KV-21FA310 Only) 10
1-3. Chassis Assembly Removal 11
1-4. Service Position 11
1-5. Picture Tube Removal 12
Anode Cap Removal Procedure 12

SECTION 2: SET-UP ADJUSTMENTS 13
2-1. Beam Landing 13
2-2. Convergence 14
2-3. Focus 15
2-4. Screen (G2) 16
2-5. Method of Setting the Service Adjustment Mode 16
2-6. White Balance Adjustments 16

SECTION 3: SAFETY RELATED ADJUSTMENTS 17
3-1. ⋈ R565 Confirmation Method (HV Hold-Down Confirmation) and Readjustments 17
3-2. B+ Voltage Confirmation and Adjustment 17

SECTION 4: CIRCUIT ADJUSTMENTS 19
4-1. Setting the Service Adjustment Mode 19
4-2. Memory Write Confirmation Method 19
4-3. Remote Adjustment Buttons and Indicators 19
4-4. Service Data Lists 20
4-5. ID Map Table 34
4-6. A Board Adjustments 34

SECTION 5: DIAGRAMS 37
5-1. Circuit Boards Location 37
5-2. Printed Wiring Board and Schematic Diagram Information 37
5-3. Block Diagram and Schematics 38
A Board Schematic Diagram 39
HB Board Schematic Diagram (All Except KV-21FA310) 41
HR Board Schematic Diagram (KV-21FA310 Only) 44
CV Board Schematic Diagram 45
K Board Schematic Diagram (KV-21FA310 Only) 49
5-4. Semiconductors 51

SECTION 6: EXPLODED VIEWS 52
6-1. Picture Tube (KV-20FS120/21FS120 Only) 52
6-2. Chassis (KV-20FS120/21FS120 Only) 53
6-3. Picture Tube (KV-21FM120 Only) 54
6-4. Chassis (KV-21FM120 Only) 55
6-5. Picture Tube (KV-21FA310 Only) 56
6-6. Chassis (KV-21FA310 Only) 57
6-7. Picture Tube (KV-24FS120/25FS120 Only) 58
6-8. Chassis (KV-24FS120/25FS120 Only) 59

SECTION 7: ELECTRICAL PARTS LIST 60

SPECIFICATIONS

	KV-20FS120	KV-21FM120	KV-21FS120 (N)	KV-21FS120 (S)
Power Requirements	120V, 60Hz	120V, 60Hz	120V, 60Hz	220V, 50/60Hz
Number of Inputs/Outputs				
Video [1]	2	2	2	2
S Video [2]	0	0	0	0
Y,P_B, P_R [3]	1	0	1	1
Audio [4]	4	2	4	4
Audio Out [5]	0	0	0	0
Speaker Output (W)	10W x 2	5W x 2	10W x 2	10W x 2
Headphones	1	1	1	1
Power Consumption (W)				
In Use (Max)	140W	125W	140W	135W
In Standby (Max) [6]	1W	1W	1W	1W
Dimensions (W x H x D)				
mm	631 x 468 x 490.5 mm	631 x 468 x 490.5 mm	631 x 468 x 490.5 mm	631 x 468 x 490.5 mm
in	24 7/8 x 18 3/8 x 19 1/4 in	24 7/8 x 18 3/8 x 19 1/4 in	24 7/8 x 18 3/8 x 19 1/4 in	24 7/8 x 18 3/8 x 19 1/4 in
Mass				
kg	25.2 kg	25.2 kg	25.2 kg	25.2 kg
lbs	55 lbs 9 oz	55 lbs 9 oz	55 lbs 9 oz	55 lbs 9 oz

	KV-21FA310 (N)	KV-21FA310 (S)	KV-24FS120 KV-25FS10 (N)	KV-25FS120 (S)
Power Requirements	120V, 60Hz	220V, 50/60Hz	120V, 60Hz	220V, 50/60Hz
Number of Inputs/Outputs				
Video [1]	2	2	2	2
S Video [2]	1	1	1	1
Y,P_B, P_R [3]	1	1	1	1
Audio [4]	4	4	4	4
Audio Out [5]	1	1	1	1
Speaker Output (W)	5W x 3	5W x 3	10W x 2	10W x 2
Subwoofer	15W	15W	NA	NA
Headphones	1	1	1	1
Power Consumption (W)				
In Use (Max)	155W	150W	165W	160W
In Standby (Max) [6]	1W	1W	1W	1W
Dimensions (W x H x D)				
mm	609 x 540 x 503 mm	609 x 540 x 503 mm	718 x 526.5 x 480 mm	718 x 526.5 x 480 mm
in	24 x 21 1/4 x 19 3/4 in	24 x 21 1/4 x 19 3/4 in	28 1/4 x 20 3/4 x 18 7/8 in	28 1/4 x 20 3/4 x 18 7/8 in
Mass				
kg	28.6 kg	28.6 kg	32.8 kg	32.8 kg
lbs	63 lbs	63 lbs	72 lbs 5 oz	72 lbs 5 oz

1) 1 Vp-p 75 ohms unbalanced, sync negative
2) Y: 1 Vp-p 75 ohms unbalanced, sync negative
   C: 0.286 Vp-p (Burst signal), 75 ohms
3) Y: 1.0 Vp-p, 75 ohms unbalanced, sync negative;
   P_B: 0.7 Vp-p, 75 ohms
   P_R: 0.7 Vp-p, 75 ohms
4) 500 mVrms (100% modulation), Impedance: 47 kilohms
5) More than 408 mVrms at the maximum volume setting (variable)
   More than 408 mVrms (fix); Impedance (output): 2 kilohms
6) This specification is maximum wattage.

Television system
American TV standard, NTSC

Channel coverage
VHF: 2-13/ UHF: 14-69/ CATV: 1-125

Picture tube
FD Trinitron® tube

Visible screen size
20-inch picture measured diagonally
(KV-20FS120/21FM120/21FS120/21FA310 Only)
24-inch picture measured diagonally
(KV-24FS120/25FS120 Only)

Actual screen size
21-inch measured diagonally
(KV-20FS120/21FM120/21FS120/21FA310 Only)
25-inch measured diagonally
(KV-24FS120/25FS120 Only)

Antenna
75 ohm external terminal for VHF/UHF

Supplied Accessories
Remote Commander RM-Y194
(KV-20FS120/21FS120/24FS120/25FS120 Only)
Remote Commander RM-W151
(KV-21FM120 Only)
Remote Commander RM-Y180
(KV-21FA310 Only)
Two Size AA (R6) Batteries
Antenna, Telescopic
(KV-21FM120/21FS120/21FA310/25FS120 Only)

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WARNINGS AND CAUTIONS

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.

WARNING!!

An isolation transformer should be used during any service to avoid possible shock hazard, because of live chassis. The chassis of this receiver is directly connected to the ac power line.

⚠ SAFETY-RELATED COMPONENT WARNING!!

Components identified by shading and ⚠ mark on the schematic diagrams, exploded views, and in the parts list are critical for safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in supplements published by Sony. Circuit adjustments that are critical for safe operation are identified in this manual. Follow these procedures whenever critical components are replaced or improper operation is suspected.

ATTENTION!!

Apres avoir deconnecte le cap de l'anode, court-circuiter l'anode du tube cathodique et celui de l'anode du cap au chassis metallique de l'appareil, ou la couche de carbone peinte sur le tube cathodique ou au blindage du tube cathodique.

Afin d'eviter tout risque d'electrocution provenant d'un châssis sous tension, un transformateur d'isolement doit etre utilisé lors de tout dépannage. Le châssis de ce récepteur est directement raccordé à l'alimentation du secteur.

⚠ ATTENTION AUX COMPOSANTS RELATIFS A LA SECURITE!!

Les composants identifies par une trame et par une marque ⚠ sur les schemas de principe, les vues explosees et les listes de pieces sont d'une importance critique pour la securite du fonctionnement. Ne les remplacer que par des composants Sony dont le numero de piece est indique dans le present manuel ou dans des supplements publies par Sony. Les reglages de circuit dont l'importance est critique pour la securite du fonctionnement sont identifies dans le present manuel. Suivre ces procedures lors de chaque remplacement de composants critiques, ou lorsqu'un mauvais fonctionnement suspecte.

SAFETY CHECK-OUT

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

1. Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.

2. Check the interboard wiring to ensure that no wires are “pinched” or touching high-wattage resistors.

3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.

4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.

5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.

6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.

7. Check the B+ and HV to see if they are specified values. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.

8. Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

Leakage Test

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

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instructions.

2. A battery-operated AC milliampmeter. The Data Precision 245 digital multimeter is suitable for this job.

3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low voltage scale. The Simpson’s 250 and Sanwa SH-63TRD are examples of passive VOMs that are suitable. Nearly all battery-operated digital multimeters that have a 2 VAC range are suitable (see Figure A).

How to Find a Good Earth Ground

A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms.

If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble- light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure B).

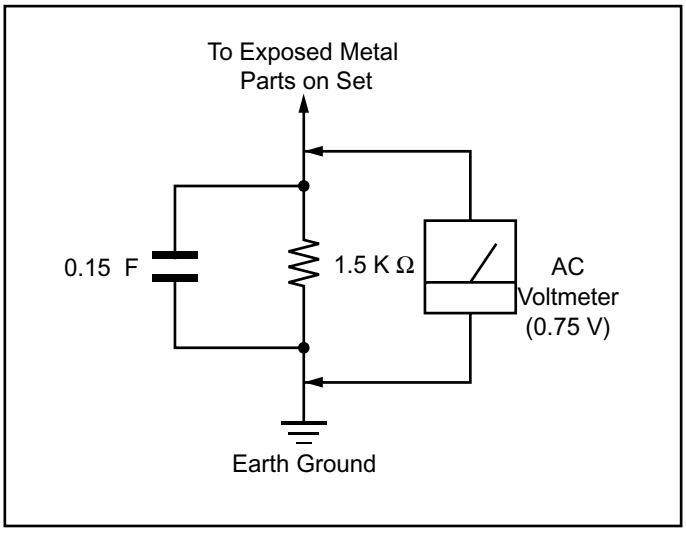


Figure A. Using an AC voltmeter to check AC leakage.

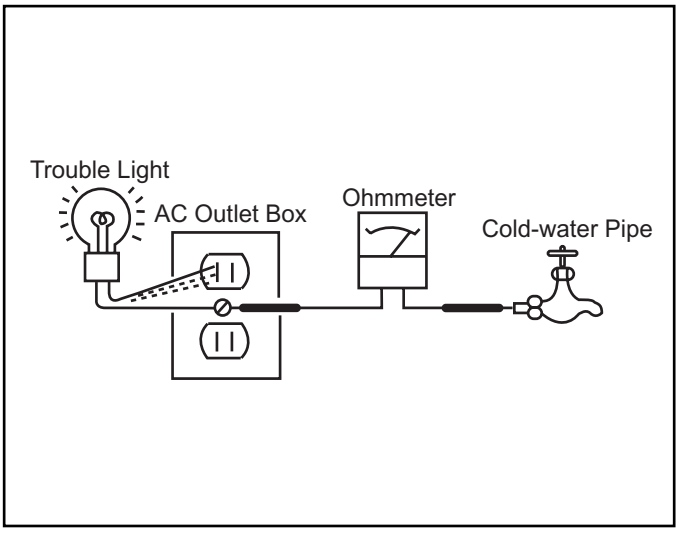


Figure B. Checking for earth ground.

SELF-DIAGNOSTIC FUNCTION

Self Diagnosis Supported model

The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER LED will automatically begin to flash. The number of times the LED flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER LED 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.

Diagnostic Test Indicators

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

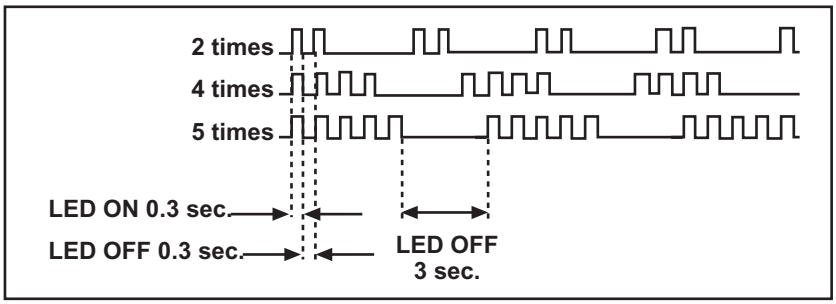
Results for all of the following diagnostic items are displayed on screen. No error has occurred if the screen displays a "0".

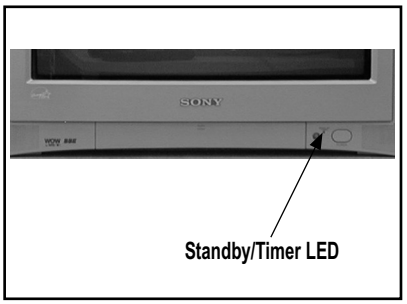
Diagnostic Item Description	No. of times STANDBY/ TIMER lamp flashes	Self-Diagnositc Display/ Diagnostic Result	Probable Cause Location	Detected Symptoms
Power does not turn on	Does not light	————	• Power cord is not plugged in. • Fuse is burned out (F601). (A Board)	• Power does not come on. • No power is supplied to the TV. • AC Power supply is faulty.
+B overcurrent (OCP)*	2 times	2:0 or 2:1	• H.OUT (Q506) is shorted. (A Board) (20"/21" models only) H.OUT (Q505) is shorted. (A Board) (24"/25" models only) •RGB Amp (IC1751) is shorted. (CV Board)	• Power does not come on. • Load on power line is shorted.
I-Prot	4 times	4:0 or 4:1	• +13V is not supplied. (A Board) • IC545 is faulty. (A Board)	• Has entered standby state after horizontal raster. • Vertical deflection pulse is stopped. • Power line is shorted or power supply is stopped.
IK (AKB)	5 times	5:0 or 5:1	• Video OUT (IC545) is faulty. (A Board) • IC001 is faulty. (A Board) • Screen (G2) is improperly adjusted.**	• No raster is generated. • CRT Cathode current detection reference pulse output is small.

*If a +B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously. The symptom that is diagnosed first by the mircrocontroller is displayed on the screen.

**Refer to Screen (G2) Adjustments in Section 2-4. of this manual.

Display of Standby/Timer LED Flash Count





Diagnostic Item	Flash Count*
+B Overcurrent	2 times
I-Prot	4 times
IK (AKB)	5 times

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

Stopping the Standby/Timer LED 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.

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 on the screen for confirmation.

To Bring Up Screen Test

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

Display ➡ Channel 5 ➡ Sound Volume - ➡ Power ON

⇧ Note that this differs from entering the Service Mode (Sound Volume +).

Self-Diagnostic Screen Display

SELF DIAGNOSTIC		
2:	+B OCP	0
3:	+B OVP	N/A
4:	VSTOP	0
5:	AKB	1
101:	WDT	N/A

Numeral “0” means that no fault was detected.

Numeral “1” means a fault was detected one time only.

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

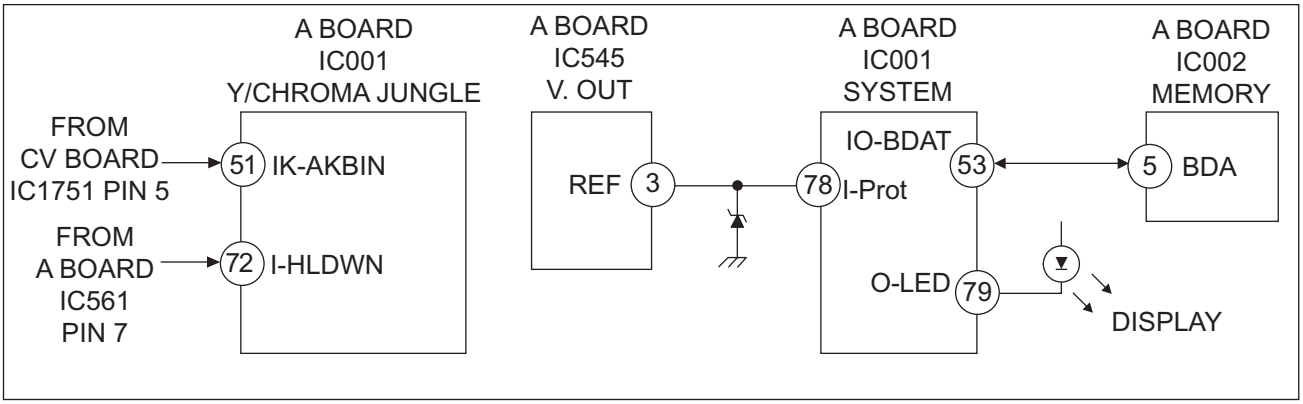
To clear the result display to “0”, press buttons on the Remote Commander sequentially when the diagnostic screen is displayed, as shown below:

Channel 8 ➡ ENTER

Quitting the Self-Diagnostic Screen

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

Self-Diagnostic Circuit



+B overcurrent (OCP)

Occurs when an overcurrent on the +B (135V) line is detected by pin 72 of IC001 (A Board). If the voltage of pin 72 of IC001 (A Board) is less than 1V when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.

I-Prot

Occurs when an absence of the vertical deflection pulse is detected by pin 78 of IC001 (A Board). Power supply will shut down when waveform interval exceeds 2 seconds.

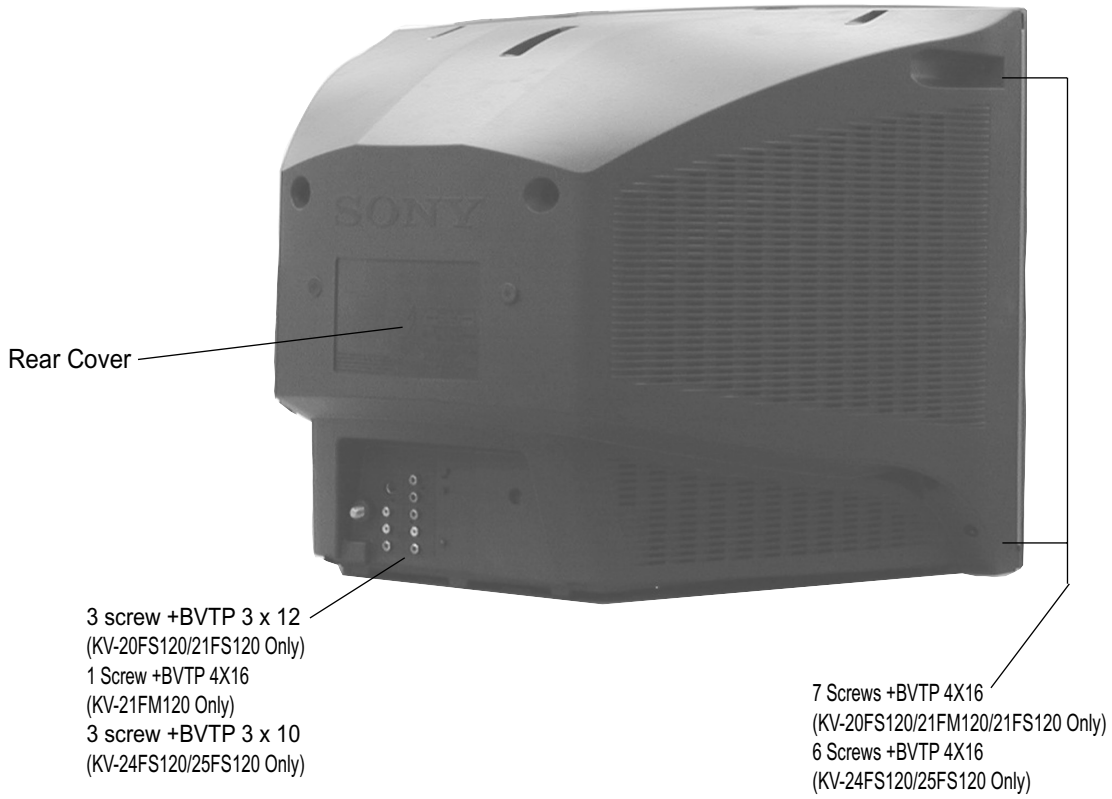
IK (AKB)

If the RGB levels* do not balance within 2 seconds after the power is turned on, this error will be detected by IC001 (A Board). TV will stay on, but there will be no picture.

*(Refers to the RGB levels of the AKB detection Ref pulse that detects 1K).

SECTION 1: DISASSEMBLY

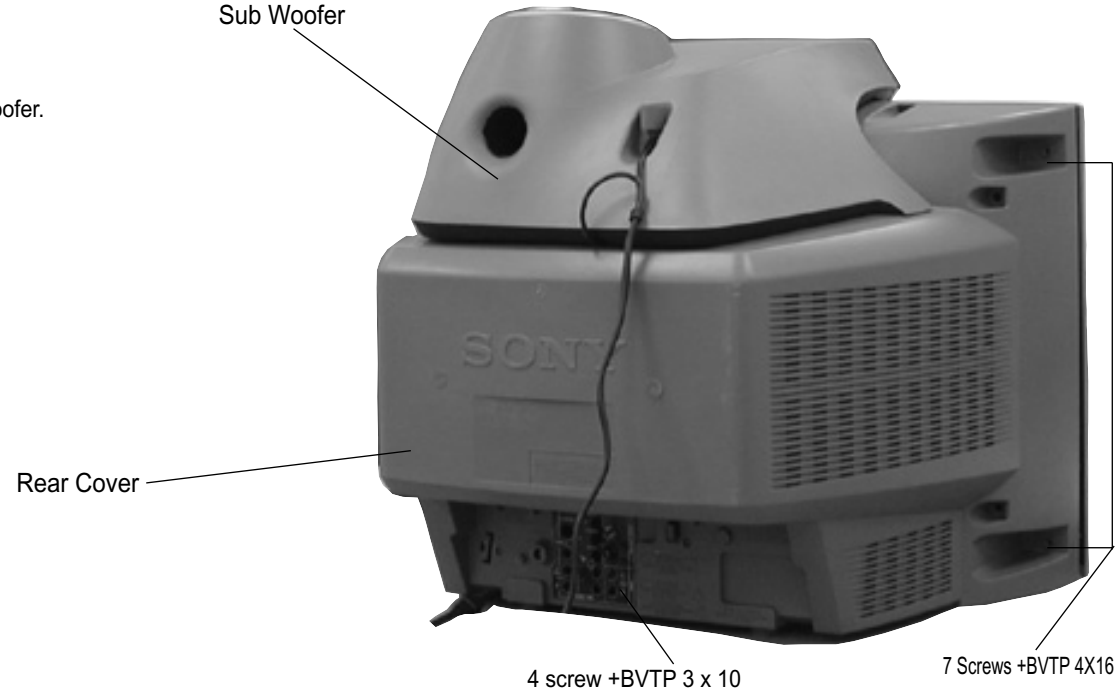
1-1. REAR COVER REMOVAL (ALL EXCEPT KV-21FA310)



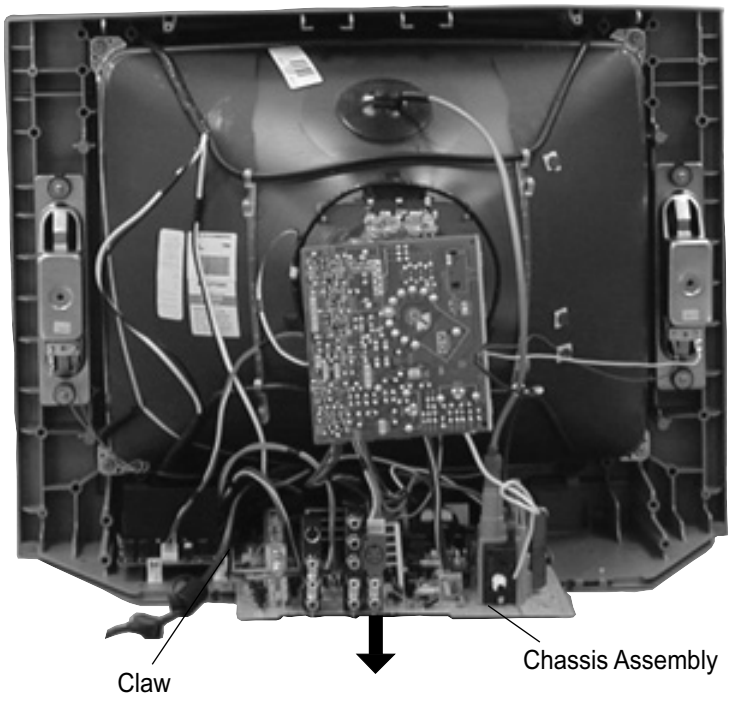
1-2. REAR COVER REMOVAL (KV-21FA310 ONLY)

① Lift to remove Sub-woofer.

② Remove screws.



1-3. CHASSIS ASSEMBLY REMOVAL

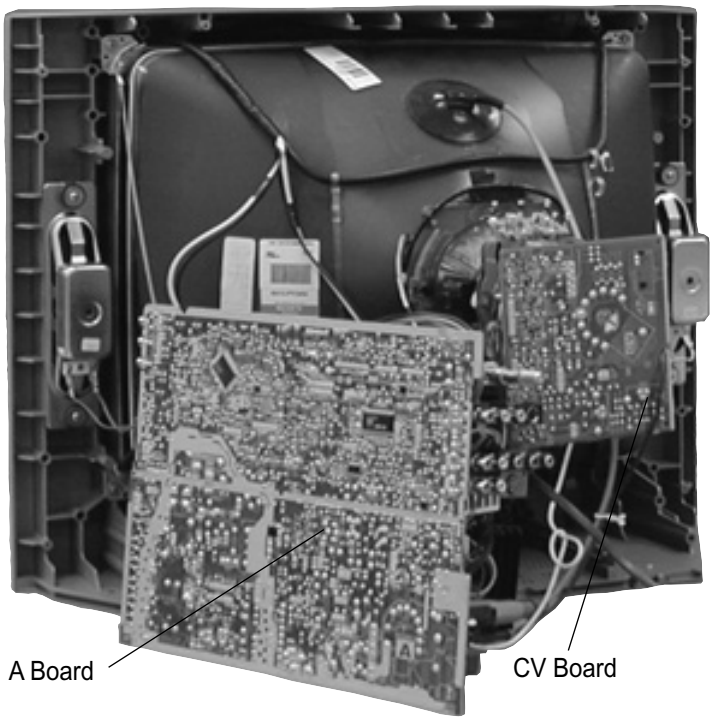


1-4. SERVICE POSITION

① Push down on clips to release K Board, then unplug the 2 pin woofer connector and move out of the way.

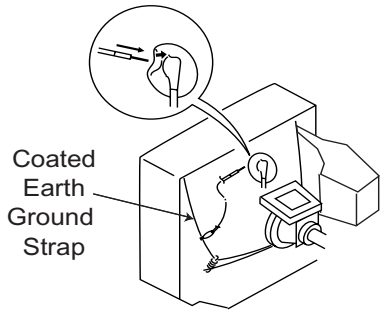
② Press on catch tab to release A Board.

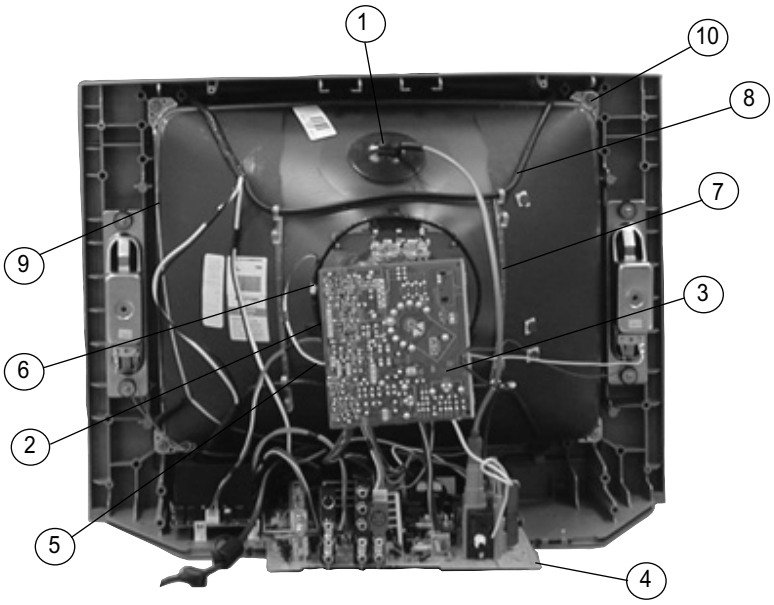
③ Disconnect remaining cables to allow A Board to be removed.



1-5. PICTURE TUBE REMOVAL

WARNING: BEFORE REMOVING THE ANODE CAP
High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT before attempting to remove the anode cap. Short between anode and CRT coated earth ground strap.



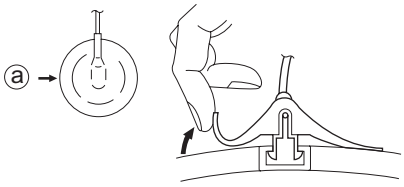


1. Discharge the anode of the CRT and remove the anode cap.
2. Unplug all interconnecting leads from the deflection yoke, neck assembly, degaussing coils and CRT grounding strap.
3. Remove the CV Board from the CRT.
4. Remove the chassis assembly.
5. Loosen the neck assembly fixing screw and remove.
6. Loosen the deflection yoke fixing screw and remove.
7. Place the set with the CRT face down on a cushion and remove the degaussing coil holders.
8. Remove the degaussing coils.
9. Remove the CRT grounding strap and spring tension devices.
10. Unscrew the four CRT fixing screws [located on each CRT corner] and remove the CRT [Take care not to handle the CRT by the neck].

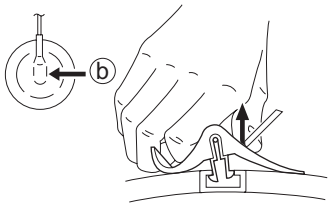
ANODE CAP REMOVAL PROCEDURE

WARNING: High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT **before** attempting to remove the anode cap. Short between anode and coated earth ground strap of CRT.
NOTE: After removing the anode cap, short circuit the anode of the picture tube and the anode cap to either the metal chassis, CRT shield, or carbon painted on the CRT.

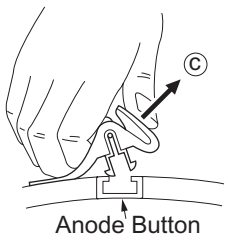
REMOVAL PROCEDURES



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



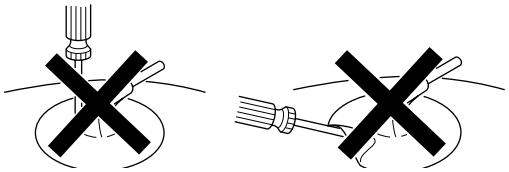
Use your thumb to pull the rubber cap firmly in the direction indicated by arrow ⓑ .



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

HOW TO HANDLE AN ANODE CAP

1. Do not use sharp objects which may cause damage to the surface of the anode cap.
2. To avoid damaging the anode cap, do not squeeze the rubber covering too hard. A material fitting called a shatter-hook terminal is built into the rubber.
3. Do not force turn the foot of the rubber cover. This may cause the shatter-hook terminal to protrude and damage the rubber.



SECTION 2: 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.

Set the controls as follows unless otherwise noted:
VIDEO MODE: Pro
PICTURE CONTROL: Normal
BRIGHTNESS CONTROL: Normal

Perform the adjustments in order as follows:

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

Note Test Equipment Required:

1. Color Bar Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital Multimeter

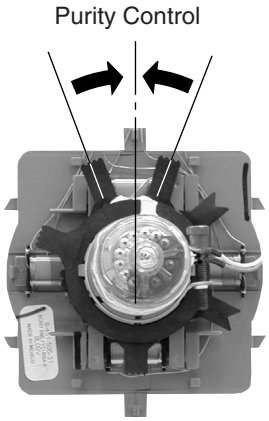
2-1. BEAM LANDING

Before beginning adjustment procedure:

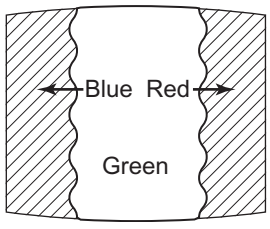
1. Degauss the entire screen.
2. Feed in the white pattern signal.

Adjustment Procedure

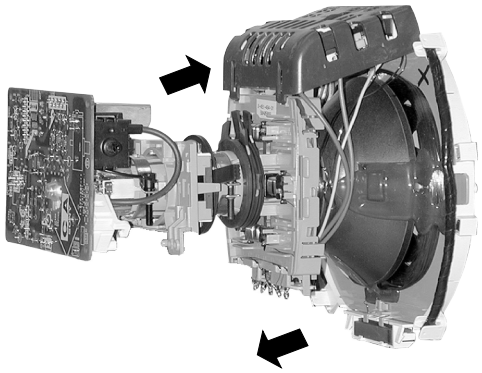
1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown below:

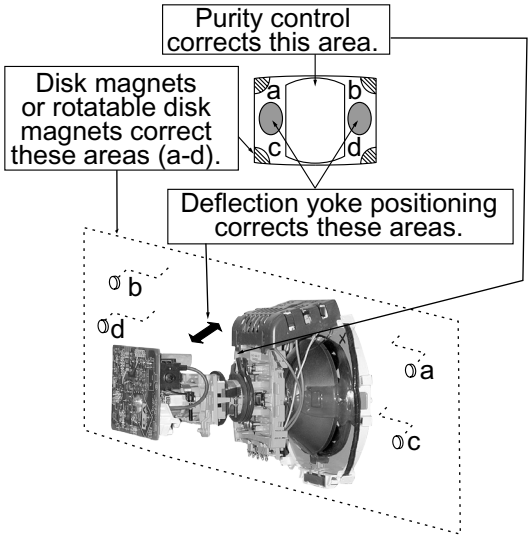


3. Turn the raster signal of the pattern generator to green.
4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are even on both sides.



5. Move the deflection yoke forward, and adjust so that the entire screen becomes green.
6. Switch over the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. If landing at the corner is not right, adjust by using the disk magnets.





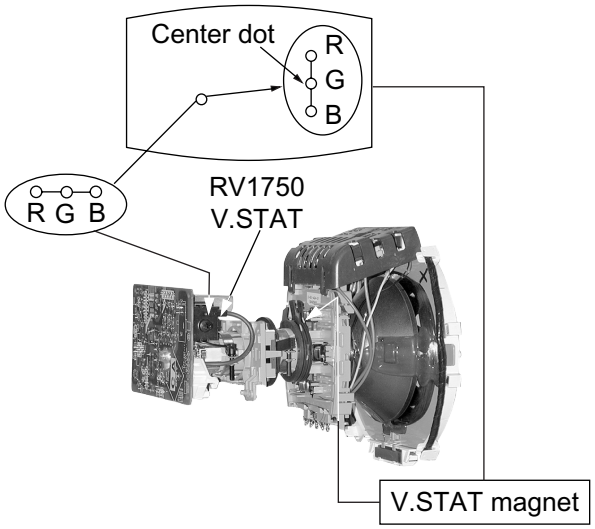
2-2. CONVERGENCE

Before starting convergence adjustments:

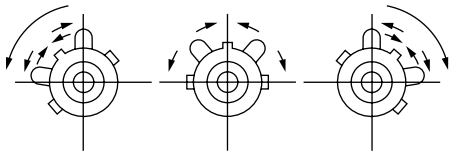
1 Perform FOCUS, VLIN and VSIZE adjustments.
2. Set BRIGHTNESS control to minimum.
3. Feed in dot pattern.

Vertical Static Convergence

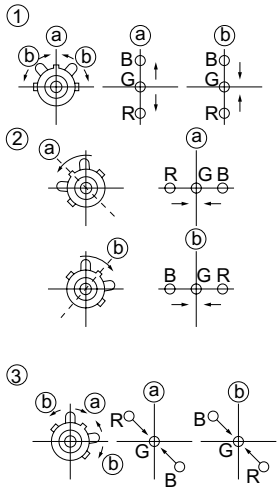
1. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen (Vertical movement adjust S V.STAT RV1750 to converge).



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



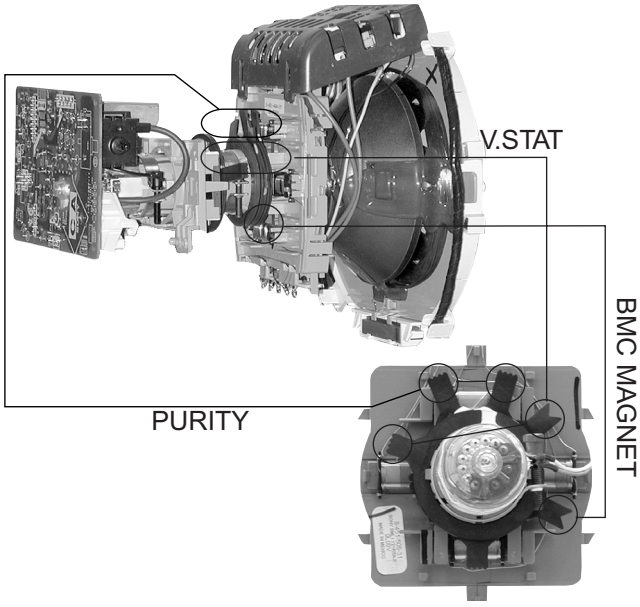
When the V. STAT magnet is moved in the direction of arrow a and b, red, green, and blue dots move as shown below:

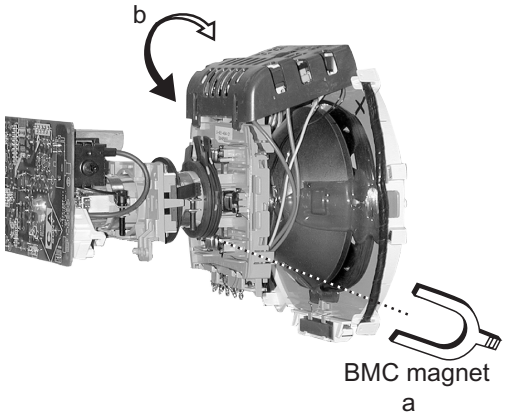


Horizontal Static Convergence

If the blue dot does not converge with the red and green dots, peform the following:

1. Move BMC magnet (a) to correct insufficient H.Static convergence.
2. Rotate BMC magnet (b) to correct insufficient V.Static convergence.
3. After adjusting the BMC magnet, repeat Beam Landing Adjustment.

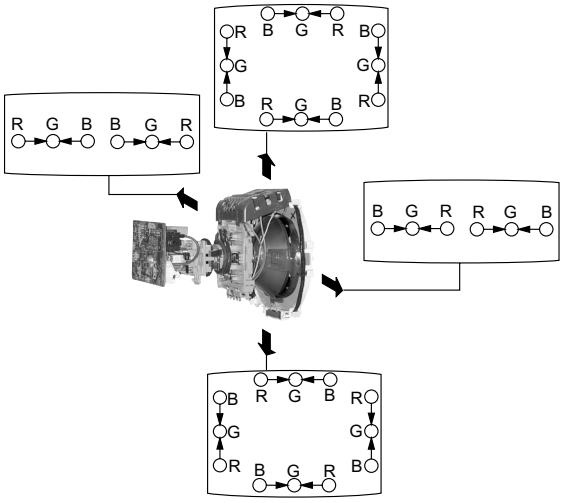




Dynamic Convergence Adjustment

Before performing this adjustment, perform Horizontal and Vertical Static Convergence Adjustment.

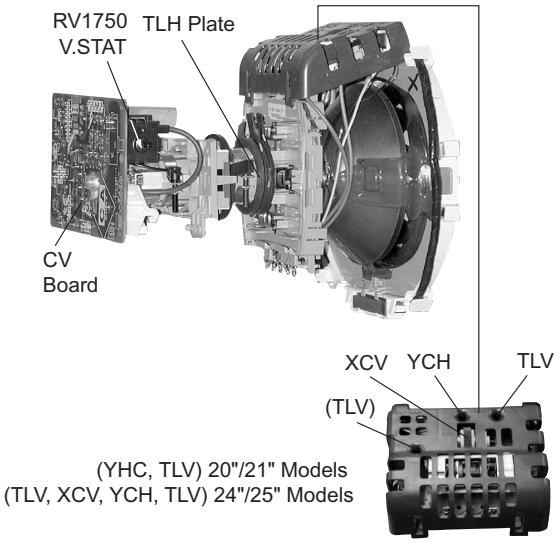
1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below:

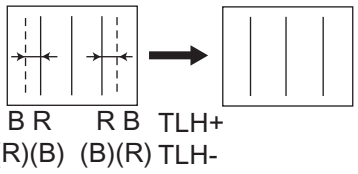


4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

TLH Plate Adjustment

1. Input crosshatch pattern.
2. Adjust PICTURE QUALITY to standard, PICTURE and BRIGHTNESS to 50%, and OTHER to standard.
3 Adjust the Horizontal Convergence of red and blue dots by tilting the TLH plate on the deflection yoke.

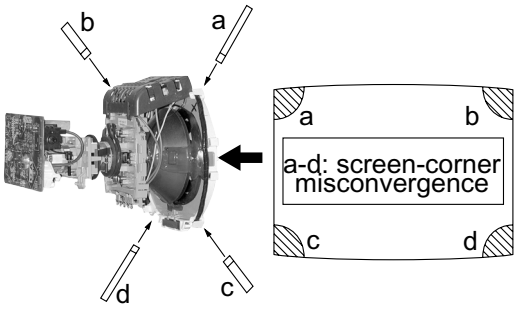




4. Adjust XCV core to balance X axis.
5. Adjust YCH VR to balance Y axis.
6. Adjust vertical red and blue convergence with V.TILT (TLV VR.)
   Note: Perform adjustment 3-6 while tracking items 1 and 2.

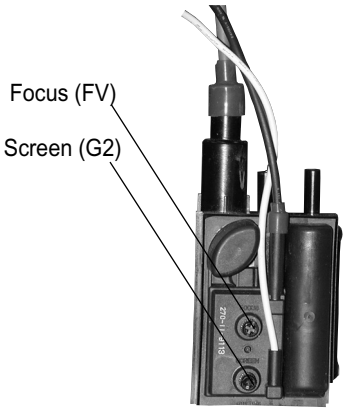
Screen-Corner Convergence

1. Affix a permalloy assembly corresponding to the misconverged areas:



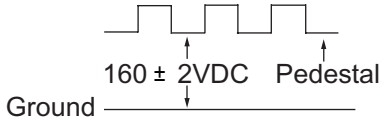
2-3. FOCUS

1. Adjust FOCUS control for best pictures.



2-4. SCREEN (G2)

1. Input a dot pattern.
2. Set the PICTURE and BRIGHTNESS controls at minimum and COLOR control at normal.
3. Adjust SBRT, GCUT, BCUT in service mode with an oscilloscope as shown below so that voltages on the red, green, and blue cathodes are 160 ± 2VDC.



4. Observe the screen and adjust SCREEN (G2) VR in FBT to obtain the faintly visible background of dot signal.

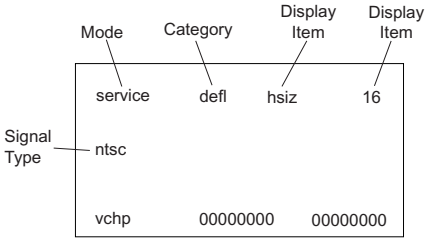
2-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

Service Mode Procedure

1. Standby mode (power off).
2. Press [Display] ➡ Channel [5] ➡ Sound Volume [+] ➡ Power on the Remote Commander (press each button within a second).

Service Adjustment Mode On

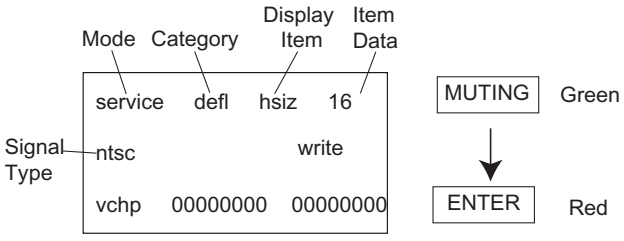
1. The CRT displays the time being adjusted.



2. Press [1] or [4] on the Remote Commander to select the time.
3. Press [3] or [6] on the Remote Commander to change the data.
4. Press [MUTING] then [ENTER] to save into the memory.

Service Adjustment Mode Memory

Turn the set off then on to exit Service Adjustment Mode.



2-6. WHITE BALANCE ADJUSTMENTS

1. Input an entire white signal with burst.
2. Set to Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Adjust with SBRT if necessary.
5. Select GCUT and BCUT with [1] and [4] .
6. Adjust with [3] and [6] for the best white balance.
7. Set the PICTURE and BRIGHTNESS to maximum.
8. Select GDRV and BDRV with [1] and [4].
9. Adjust with [3] and [6] for the best white balance.
10. Press [MUTING] then [ENTER] to save into the memory.

SECTION 3: SAFETY RELATED ADJUSTMENTS

3-1. ⋈ R565 CONFIRMATION METHOD (HV HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components which are marked with ◪ on the schematic diagram:

Part Replaced (◪)	Adjustment (⋈)
DY, T585, CRT, IC001, IC561, IC600, C506, C507, C508, T511, L510, C588, L588, C566, C561, C563, D567, D568, D566, PH602, R567, R568, R565, R566, R562, R563, R561, R528…….A Board	HV HOLD-DOWN R565 ☚

Preparation Before Confirmation

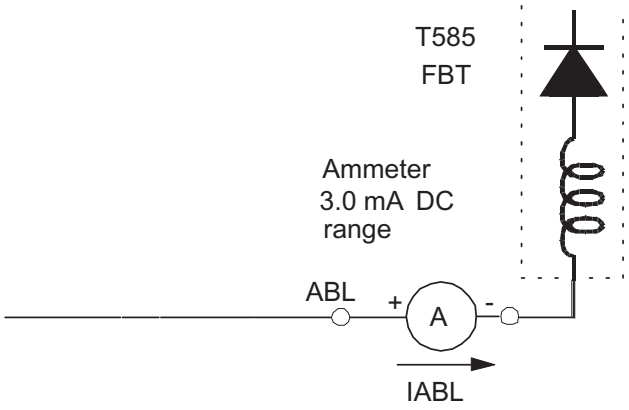
1. Using a Variac, apply AC input voltage: 120 ± 2 VAC.
2. Turn the POWER switch ON.
3. Input a white signal and set the PICTURE and BRIGHTNESS controls to maximum.
4. Confirm that the voltage between C566 (+) or TP30 and ground is more than 97 VDC for 20”/21” models, or 105 VDC for 24”/25” models.

Hold-Down Operation Confirmation

1. Connect the current meter between Pin 11 of the FBT (T585) and the PWB land where Pin 11 would normally attach (See Figure 1 on the next page).
2. Input a dot signal and set PICTURE and BRIGHTNESS to minimum: IABL = 100 ± 100µA.
3. Confirm the voltage of A Board TP-23 is 135.6 ± 1VDC.
4. Connect the digital voltmeter and the DC power supply via Diode 1SS119 to C566 (+) and ground (See Figure 1 on next page).
5. Increase the DC power voltage gradually until the picture blanks out.
6. Turn DC power source off immediately.
7. Read the digital voltmeter indication (standard < 117.0 VDC) for 20”/21” models (standard < 138.0 VDC) for 24”/25” models.
8. Input a white signal and set PICTURE and BRIGHTNESS to maximum: IABL = 1350 ± 100µA for 20”/21” models or IABL = 1650 ± 100µA for 24”/25” models
9. Repeat steps 4 through 7.

Hold-Down Readjustment

If the setting indicated in Step 2 of Hold-Down Operation Confirmation cannot be met, readjustment should be performed by altering the resistance value of R565 component marked with ⋈.



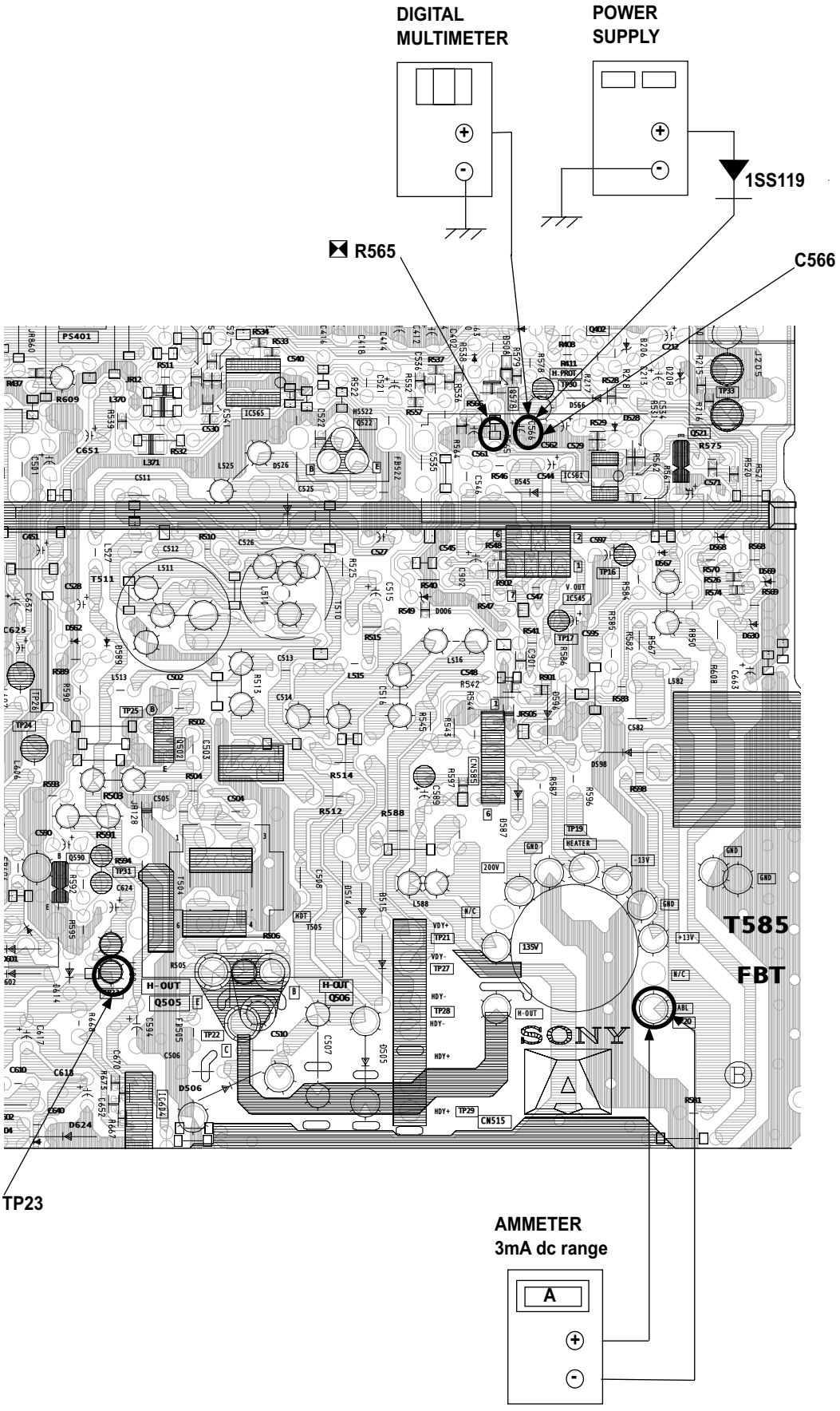
3-2. B+ VOLTAGE CONFIRMATION AND ADJUSTMENT

Note: The following adjustments should always be performed when replacing the following components, which are marked with ◪ on the schematic diagram on the A Board:

A BOARD:	◪ IC600, PH602

1. Using a Variac, apply AC input voltage: 130 + 2.0 / - 0.0 VAC.
2. Input a DOT pattern at Q.C.
3. Set the PICTURE and the BRIGHTNESS controls to minimum.
4. Confirm the voltage of A Board between TP-23 & Ground is =135.6 ± 1VDC.
5. If step 4 is not satisfied, replace the components listed above, then repeat steps 1 through 3.

FIGURE 1


DIGITAL
MULTIMETER
POWER
SUPPLY
1SS119
R565
C566
T585
FBT
TP23
AMMETER
3mA dc range
A

SECTION 4: CIRCUIT ADJUSTMENTS

Electrical AdjustmenTs by Remote Commander

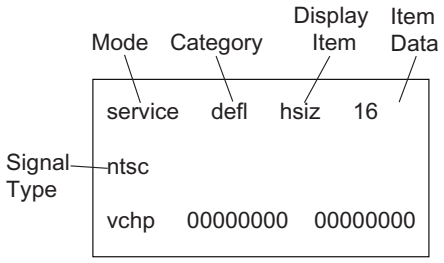
Use the Remote Commander (RM-Y194, RM-W151, RM-Y180) to perform the circuit adjustments in this section.
Test Equipment Required: 1. Pattern generator 2. Frequency counter 3. Digital multimeter 4. Audio oscillator

4-1. SETTING THE SERVICE ADJUSTMENT MODE

1. Standby mode (Power off).
2. Press the following buttons on the remote commander within a second of each other:
   Display ➡ Channel 5 ➡ Sound Volumne + ➡ Power

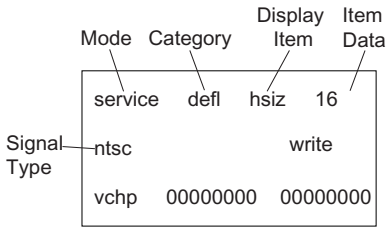
Service Adjustment Mode On

1. The CRT displays the item being adjusted.

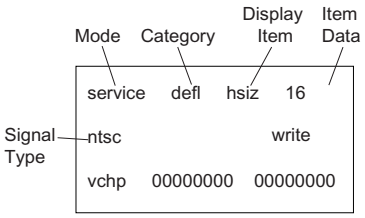


2. Press 1 or 4 on the Remote Commander to select the item.
3. Press 3 or 6 on the Remote Commander to change the data.
4. Press MUTING then ENTER to write into memory.

Service Adjustment Mode Memory



1. Press 8 then ENTER on the Remote Commander to initialize.



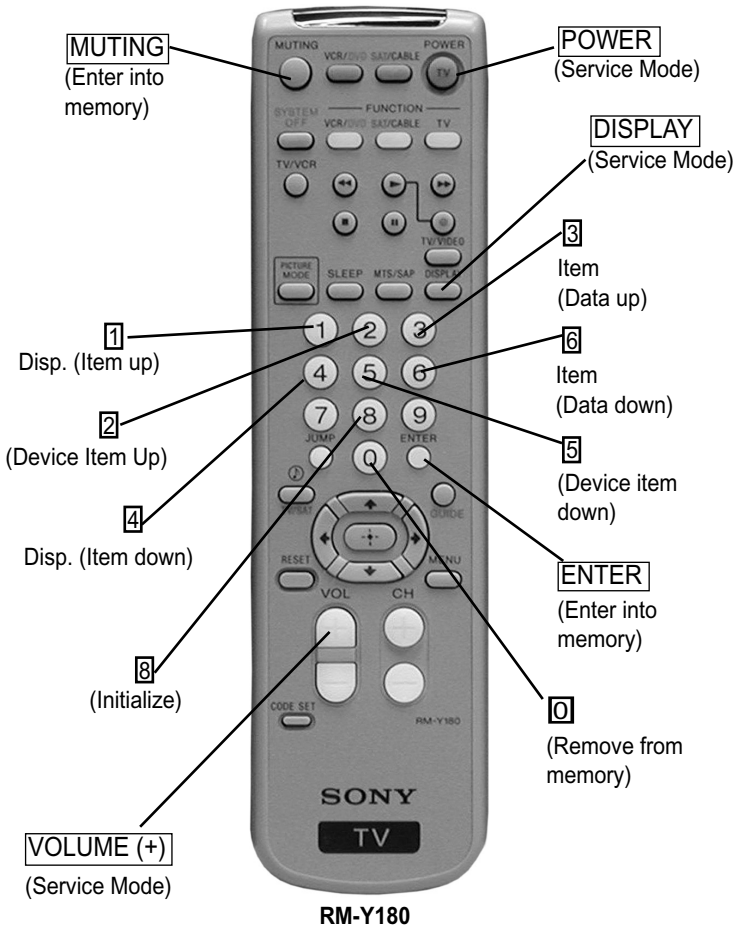
Carry out Step 1 when adjusting IDs 0-6 and when replacing and adjusting IC002

3. Press MUTING then ENTER to write into memory.
2. Turn set off then on to exit Service Adjustment Mode.

4-2. MEMORY WRITE CONFIRMATION METHOD

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

4-3. REMOTE ADJUSTMENT BUTTONS AND INDICATORS



RM-Y180

4-4. SERVICE DATA LISTS

Service Group	Fix/ Var	No.	Name	Description	NTSC Init Data
VERSION	Fix	0	VER	Microprocessor version information	=
DEF	VAR	1	HSIZ	H-SIZE (EW DC : YUV OFFSET)	29
	VAR	2	HPOS	H POSITION: YUV OFFSET	37
	VAR	3	VSIZ	V RAMP SIZE: YUV OFFSET	35
	VAR	4	VPOS	V POSITION (RAMP DC) NOT USEFUL: YUV OFFSET	33
	VAR	5	VLIN	V LINEARITY	31
	VAR	6	SCOR	S CORRECTION	26
	VAR	7	VBOW	BOW	37
	VAR	8	VANG	ANGLE	31
	VAR	9	TRAP	EW TRAPESIUM	25
	VAR	10	PAMP	PARABOLA (EW PIN)	9
	VAR	11	UPIN	UPPER CORNER (UPPER PIN)	32
	VAR	12	LPIN	LOWER CORNER (LOWER PIN)	32
	VAR	13	TROT	TROT	109
	VAR	14	HBLK	FBPBLK (H BLK MODE SELECT)	0
	VAR	15	RBLK	HBLK R POS (HBLK REAR TIMING: YUV OFFSET)	15
	VAR	16	LBLK	HBLK F POS (HBLK FRONT TIMING: YUV OFFSET)	48
	FIX	17	VBLK	VBLK POS (V BLK WIDTH)	0
	FIX	18	HMSK	Macro OFF (TOP VEND [WHEN MACROVISION] PREVENT OFF)	0
	FIX	19	HDW	IIC_HOUT_DUTY (H PULSE WIDTH [25u/19u]	1
	FIX	20	AFC	H AFC Gain (AFC GAIN)	0
	FIX	21	AFC1	H Charge pump (AFC1 TIME CONSTANT)	3
	FIX	22	AFCW	AFC1 PULLIN (AFC1 PULL IN WIDE)	0
	FIX	23	CDMD	V CD MODE (V DET WINDOW SW TIMING)	1
	FIX	24	HSS	SYNC SLICE LVL(H) (SYNC SLICE LEVEL [H sepa])	0
	FIX	25	VSS	SYNC SLICE LVL(L) (SYNC SLICE LEVEL [V sepa])	3
	FIX	26	SLDN	AUTO SLICE DOWN (AUTO SLICE LEVEL DOWN)	0
	FIX	27	SLUP	AUTO SLICE UP (AUTO SLICE LEVEL UP)	0
	FIX	28	JPSW	VJPSW (JUMP SW)	0
	FIX	29	HOSC	H VCO FOR OFFSET ADJUST OFFSET	5
	FIX	30	EHT	EHT	4
	FIX	31	EHTG	EHT GAIN (EHT MODE)	1

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
16 : 9	VAR	1	VSIZ	V RAMP SIZE	55
	VAR	2	VPOS	V POSITION (RAMP DC)	37
	VAR	3	VLIN	V LINEARITY	30
	VAR	4	SCOR	S CORRECTION	20
	VAR	5	TRAP	EW TRAPESIUM	30
	VAR	6	PAMP	PARABOLA (EW PIN)	0
	VAR	7	UPIN	UPPER CORNER (UPPER PIN)	34
	VAR	8	LPIN	LOWER CORNER (LOWER PIN)	32
	VAR	9	ABLG	ABL GAIN	15
	VAR	10	SCON	SUB CONTRAST LEVEL	10
	VAR	11	VPW	JUMP PULSE WIDTH	1

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
VP1	VAR	1	RDRV	R DRIVE	45	45	45	N/A
	VAR	2	GDRV	G DRIVE: GDOF OFFSET (only Color Temp. "Warm")	28	28	30	N/A
	VAR	3	BDRV	B DRIVE: BDOF OFFSET (only Color Temp. "Warm")	33	33	29	N/A
	VAR	4	RCUT	HARDWARE AKB (R) CMP DATA	120	120	120	N/A
	VAR	5	GCUT	HARDWARE AKB (G) CMP DATA	98	98	72	N/A
	VAR	6	BCUT	HARDWARE AKB (B) CMP DATA	102	102	91	N/A
	VAR	7	SCON	SUB CONTRAST LEVEL	16	16	16	N/A
	VAR	8	SHUE	SUB TINT (HUE)	7	7	7	N/A
	VAR	9	SCOL	SUB COLOR LEVEL	17	17	27	N/A
	VAR	10	SBRT	SUB BRIGHTNESS	11	11	14	N/A
	FIX	11	RON	R OUTPUT ON (0:R OUTPUT OFF 1:R OUTPUT ON)	1			
	FIX	12	GON	G OUTPUT ON (0:R OUTPUT OFF 1:R OUTPUT ON)	1			
	FIX	13	BON	B OUTPUT ON (0:R OUTPUT OFF 1:R OUTPUT ON)	1			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
VP1	FIX	14	BLLV	BLUE STRETCH (00:NO<->11:DEEP) only Color Temp "Cool"	1			
	FIX	15	MTRX	MATRIX RATIO SELECT	0			
	FIX	16	AXIS	R-Y PHASE SELECT	52			
	VAR	17	SSHO	SUB SHARPNESS GAIN (OVER) RF/VIDEO	10	26	25	N/A
	VAR	18	SSHP	SUB SHARPNESS GAIN (PRE) RF/VIDEO	15	31	30	N/A
	VAR	19	SHPF	SHARPNESS FOR (00:2 CLK <-> 11:5 CLK)	1	0	0	N/A
	FIX	20	SHCL	SHARPNESS CORING LEVEL	0			
	FIX	21	SHMX	SHARPNESS LIMITER LEVEL	15			
	FIX	22	ACLV	ACL GAIN	0			
	FIX	23	AKBD	AKB SELF DIAGNOSTIC COUNTER (@1 SEC)	2			
	FIX	24	AKBS	AKB SWITCH (0:AKB OFF 1:H/W AKB ON)	1			
	FIX	25	REFP	AKB REFPLS TIMING	0			
	FIX	26	YNRC	YNR LIMITER LEVEL	15			
	FIX	27	BKON	BLACK STRETCH ON	1			
	FIX	28	BKAT	BLACK STRETCH DETECTOR TIME CONSTANT1	15			
	FIX	29	BKRC	BLACK STRETCH DETECTOR TIME CONSTANT2	4			
	FIX	30	BKDP	BLACK STRETCH DEPTH	soft cont'l			
	FIX	31	BKSP	BLKSTPNT BLACK STRETCH POINT	2			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
VP2	FIX	1	VMOF	VM GAIN(Off) (VM LEVEL AT "OFF" SETTING)	2			
	FIX	2	VMLO	VM GAIN(Low) (VM LEVEL AT "LOW" SETTING)	4			
	FIX	3	VMHI	VM GAIN(High) (VM LEVEL AT "HIGH"SETTING)	8			
	FIX	4	VMDL	VM DELAY (VM DELAY)	6			
	FIX	5	VMPL	VM POL (VM POLARITY)	0			
	FIX	6	VMWD	VM WIDTH (VM WIDTH)	0			
	FIX	7	VMCL	VM CORING LEVEL (VM CORING LEVEL)	0			
	FIX	8	VMMX	VM MAX (VM LIMITER LEVEL)	15			
	FIX	9	CKLV	KILLER LEVEL (VM COLOR KILLER VTH)	1	1	0	N/A
	FIX	10	CKON	FORCE KILLER (FORCE KILLER)	0			
	FIX	11	ALFA	ALFA (ADAPTIVE DET SENSITIVITY)	2			
	FIX	12	YCMD	MANEXP (YC SEPA FORCE SELECT [00:ADAPTIVE 01:H 10:V 11:HV])	0			
	FIX	13	VACL	V APERTURE CORING LV (V APERTURE CORING LEVEL)	0			
	FIX	14	VAGA	V APERTURE GAIN (V APERTURE GAIN LEVEL)	soft cont'l			
	FIX	15	VAMX	V APERTURE MAX GAIN (V APERTURE LIMITER LEVEL)	5			
	FIX	16	GAMM	GAMMA (GAMMA [00:NO <-> 11:DEEP])	soft cont'l			
	FIX	17	YDLY	Y DELAY (Y DELAY TIME)	1	1	3	N/A
	FIX	18	CDLY	C DELAY (C DELAY TIME)	0			
	FIX	19	YOFF	Y Mute (Y OUTPUT MUTE)	0			
	FIX	20	CBPF	SAW FILTER(7.2MHzBPF) (C BPF FOR HI)	0			
	FIX	21	BGPP	BGP POS (BGP [FOR C DECODER] TIMING)	9	9	28	N/A
	VAR	22	GDOF	G DRIVE OFFSET only Color Temp. "Warm"	9			
	VAR	23	BDOF	B DRIVE OFFSET only Color Temp. "Warm"	14			
	VAR	24	GCOF	G CUT CMP DATA OFFSET only Color Temp. "Warm"	11			
	VAR	25	BCOF	B CUT CMP DATA OFFSET only Color Temp. "Warm"	28			
	VAR	26	DCTV	DCTRAN VTH<6:0> (DCTRANSFER VTH)	30			
	FIX	27	DCTG	DCTRAN GAIN<4:0> (DCTRANFER GAIN)	soft cont'l			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
NR	VAR	1	SCOL	SUB COLOR LEVEL	17
	VAR	2	SHCL	SHARPNESS CORING LEVEL	15
	VAR	3	SHMX	SHARPNESS LIMITER LEVEL	7
	FIX	4	YNRC	YNR LIMITER LEVEL	7
	FIX	5	VMHI	VM LEVEL AT " HIGH " SETTING	10
	FIX	6	VMCL	VM CORING LEVEL	0
	FIX	7	VMMX	VM LIMITER LEVEL	7
	FIX	8	VAMX	V APERTURE LIMITER LEVEL	0
	FIX	9	GAMM	GAMMA (00: NO < - > 11:DEEP)	0
	FIX	10	YNRS	YNR ON	1
	FIX	11	WSTH	WEAK SIGNAL VTH	7
	FIX	12	WSVA	WEAK SIGNAL VIDEO ATT	0
	FIX	13	WSCA	WEAK SIGNAL CHROMA ATT	5
	FIX	14	NRCH	THRNZV1(NOISE DET TIME CONSTANT)	0
	FIX	15	NRCL	THRNZV2 (NOISE DET TIME CONSTANT)	16
	FIX	16	NRVL	THRNZH1 (NOISE DET VTH)	2
	FIX	17	NRVH	THRNZH2 (NOISE DET VTH)	0
	FIX	18	IPNC	DETNZ STATUS COUNTER	2
	FIX	19	IPNV	DETECTION PERIOD	10

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC BA6 DATA (DEC)			
					PALLET = VIVID	PALLET = STD	PALLET = MOVIE	PALLET = PRO
PALLET	FIX	1	VPIC	PICTURE	63	50	37	31
	FIX	2	VBRI	BRIGHTNESS	27	30	31	31
	FIX	3	VCOL	COLOR	37	32	31	31
	FIX	4	VHUE	HUE	31	31	31	31
	FIX	5	VSHA	SHARPNESS	31	32	31	21
	FIX	6	VVM	VM	2	1	0	0
	FIX	7	VTRI	COLOR TEMP	0	1	2	1
	FIX	8	VAPA	APERTURE G	5	5	3	0
	FIX	9	VGMA	GAMMA	3	1	0	0
	FIX	10	VDCT	DCT LV	23	15	2	2
	FIX	11	VBKP	BLACK STRETCH DEPTH (VIDEO)	3	3	4	7
	FIX	12	TBKD	BLACK STRETCH DEPTH (TUNER)	3	3	4	7

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
Y	FIX	1	YNRS	YNR SW (YNR ON)	0
	FIX	2	YTHR	Y THR 2D (Y SIGNAL THROUGH 2DYCS)	0
	FIX	3	Y2D	Y2D Fix (Y SIGNAL GENERATE from 2DYCS)	0
	FIX	4	2DFX	C BPF Fix (C SIGNAL GENERATE from H/V BPF only	1
	FIX	5	CLPS	CLAMP CONTROL SW (0: CLAMP OFF. 1: CLAMP AUTO. 2: CLAMP ON]	1
	FIX	6	VLPF	VIDEO LPF (Y_LPF [ANALOG] for adjust)	3
	FIX	7	CLPF	CHROMA LPF (C_LPF [ANALOG] for adjust)	3
	FIX	8	BPFB	YCS HBPF BACK (YCS HBPF SELECT [BACK])	1
	FIX	9	BPFF	YCS HBPF FRONT (YCS HBPF SELECT [FRONT])	1
	FIX	10	BKTS	BS T2 IFON (BLACK STRETCH RECOVER TIME OUT	0
	FIX	11	VMG_2	$VMGAIN_2$ (MODULATOR FEEDBACK GAIN CONTROL	2
	FIX	12	CLPT	CLAMP KEEP TIMER (CLAMP AUTO ON KEEP TIMER COUNT [@ 100 MS])	15

Service Group	Fix/ Var	No.	Name	Item name & (Description)	A8 Init Data	Video	YUV	16:09
C	FIX	1	A1FL	AMP OFF1 L (ANALOG ACC hysteresis)	90			
	FIX	2	A1ON	AMP ON (ANALOG ACC AMP ON LEVEL)	4			
	FIX	3	ACCS	ACC SW (ACC ON/OFF)	0	0	1	N/A
	FIX	4	AASL	AVE SEL (C DECODER TIME CONSTANT [32, 16, 8, 1H])	2			
	FIX	5	BASL	B2AVE SEL (ACC TIME CONSTANT)	0			
	FIX	6	XFFR	FREE RUN (VCXO FORCE FREERUN)	0	0	1	N/A
	FIX	7	A2ON	AMP2 ON Thresh (ABL VTH)	4			
	FIX	8	A3ON	AMP3 ON Thresh (ACL VTH)	4			
	FIX	9	A2FL	AMP2 OFF Thresh L (AMP2 OFF LEVEL LOWER)	64			
	FIX	10	A3FL	AMP3 OFF Thresh L (AMP3 OFF LEVEL LOWER)	64			
	FIX	11	AXTH	AXIS HYS (AXS HYS)	30			
	FIX	12	ACTH	ROM HYS (ROM HYS)	10			
	FIX	13	AVAV	AVE SEL AV (AVE SEL AV)	3			
	FIX	14	B2TH	B2COMP (B2COMP)	0			
	FIX	15	ACCP	ACC COMP (ACC COMP)	0			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
RGB	FIX	1	AMUT	RGB POWER ON MUTE (RGB POWER ON MUTE)	0			
	FIX	2	PMUT	RGB Mute before OSD (RGB MUTE [EXCEPT OSD]	1			
	FIX	3	CORL	CUTOFF R L (R CUTOFF LOWER)	212			
	FIX	4	CORH	CUTOFF R H (R CUTOFF UPPER)	0			
	FIX	5	COGL	CUTOFF G L (G CUTOFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL"	197			
	FIX	6	COGH	CUTOFF G H (G CUTOFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL"	0			
	FIX	7	COBL	CUTOFF B L (B CUT OFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL"	176			
	FIX	8	COBH	CUTOFF B H (B CUT OFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL"	0			
	FIX	9	ABLS	ABL SEL (ABL SELECT)	0			
	FIX	10	ALSP	ACL SPEED (ACL SPEED)	0			
	FIX	11	ALRS	ACL SPE (ACL RECOVER SPEED)	2			
	FIX	12	ALAS	ACL ASPE (ACL ATACK SPEED)	9			
	FIX	13	ABLG	ABL GAIN (ABL GAIN)	5			
	FIX	14	ALS2	ACLASPE2 (ACL ATACK SPEED [2])	2			
	FIX	15	AKBM	AKB MODE (AKB MODE)	0			
	FIX	16	AKBP	AKB P[5:0] (AKB PULSE HEIGHT)	16			
	FIX	17	OSDL	OSD LIMIT (OSD LIMMIT SELECT)	0			
	FIX	18	UVIN	Y/U/V UVINV (U/V INVERT)	0			
	FIX	19	UVG	U/V GAIN (U/V OFFSET CANCELER ON)	0			
	FIX	20	UOFS	U IN OFFSET (U IN OFF SET)	7			
	FIX	21	VOFS	V IN OFFSET (V IN OFFSET)	15			
	FIX	22	AALG	ANA ACL GAIN (ANALOG ACL GAIN CONTROL)	0			
	FIX	23	AALS	ANA ACL ON (ANALOG ACL ON/OFF CONTROL)	1			
	FIX	24	UVDE	UV_DITHER_EN (UVIN DITHER ENABLE)	0	0	1	N/A
	FIX	25	UVDT	UV_DITHER_TEST (UVIN DITHER TEST)	0	0	6	N/A

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
DEFD	FIX	1	HFFR	AFC FREE RUN (AFC1 FORCE FREE RUN)	0			
	FIX	2	HFUP	HFREE UP (H FREE RUN FREQUENCY UP [700 Hz]	0			
	FIX	3	JSWW	VJP WIDTH (JUMP PULSE WIDTH)	0			
	FIX	4	EWCL	V/EW DAC CLK CONTROL (EW/VRAMP DA CLOCK SELECT)	0	0	0	N/A
	FIX	5	XF0A	FREE RUN OFFSET (VCXO FREE RUN ADJUST)	0			
	FIX	6	BGST	BG START (BGP [FOR PLL] TIMING)	16	16	1	N/A
	FIX	7	XPHA	VCXO CTL (VXCO PHASE ADJUST)	10			
	FIX	8	HRMP	Ramp Slew Rate (AFC2 TIME CONSTANT)	3			
	FIX	9	RPLU	Ref Charge pump (REF PLL TIME CONSTANT)	3			
	FIX	10	RPLB	Ref VCO (REF PLL TIME CONSTANT)	1			
	FIX	11	XF0B	VCXO FREE RUN (VXCO Fo ADJUST)	0			
	FIX	12	RPLS	REF FB SW (REF VCO FB LOOP SELECT)	0			
	FIX	13	SSM	Sync Sepa Mask (SyncSepaMasking CONTROL)	0			
	FIX	14	VSAG	V-sag (V-SAG prevent ON)	0			
	FIX	15	AFC2	AFC2 Gain (AFC2 GAIN CONTROL)	3			
	FIX	16	VRFL	V RAMP FIL OFF (V RAMP FILTER SWITCHING OFF)	1			
	FIX	17	SSLP	LPY SYNC (LFP pre SYNC SEPA ON/OFF	1			
	FIX	18	XPLU	B PLL Change pump (ACP TIME CONSTANT)	1			
	FIX	19	8FSC	8FSC SEL (8fsCLK Skew OFF)	1	1	0	N/A
	FIX	20	4FS2	4FSC SEL2 (4fsCLK Skew OFF)	1	1	0	N/A
	FIX	21	CDM2	V_CD_MODE2 (V_LOGIC SW)	1			
	FIX	22	BGPC	Add. FTN BGP C (BGP C)	0			
	FIX	23	MHDL	Add. FTN BGP SEL (BBP SEL)	1			
	FIX	24	BFRE	V FREE (FORCE V FREE RUN)	0			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
DEFD	FIX	25	HRPP	AFC2 RAMP POS (FRAMP RRAMP H OUT CONTROL RANGE	8			
	FIX	26	DSCK	CLOCK SEL (DS DAC CLK SW 2)	1	1	1	0
	FIX	27	VBHK	VBLK HALFKIL (V BLK HALF KILL)	0			
	FIX	28	VPW	V PLS WIDTH (V Pulse Wide)	1			
	FIX	29	DTH	D THRESHOLD LEVEL (DITHER THRESHOLD LEVEL CONTROL AT IIC AUTOD= ON	0			
	FIX	30	SLON	LPF SYNC ON (LPF SYNC ON)	1			
	FIX	31	VSSW	SYNC SLICE LVL(V)_W (SYNC SLICE LEVEL [V] Wide Window	0			
	FIX	32	AF2S	AFC2_SEL (ADC2 TIMING SW)	0			
	FIX	33	VSL2	V_SYNC_LPF_2 (DIGITAL V_SINC_LPF [Fall])	0			
	FIX	34	VSL1	V_SYNC_LPF_1 (DIGITAL V_SINC_LPF [Rise])	1			
	FIX	35	VYUV	YUV VSIZE OFFSET (YUV V-SIZE OFFSET)	8			
	FIX	36	VYVP	YUV VPOS OFFSET (YUV V-POSITION OFFSET)	8			
	FIX	37	VYHS	YUV HSIZE OFFSET (YUV H-SIZE OFFSET)	8			
	FIX	38	VYHP	YUV HPOS OFFSET (YUV H-POSITION OFFSET)	7			
	FIX	39	VSHE	V-SHRINK MODE (V-SHRINK MODE for AV)	0			
	FIX	40	VYRB	YUV RBLK (YUV RBLK OFFSET)	7			
	FIX	41	VYLB	YUV LBLK (YUV LBLK OFFSET)	7			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data	Video	YUV	16:09
OTHER	FIX	1	PCLP	pedestal CLAMP ON/OFF (SYNC TIP/PEDESTAL CLAMP SELECT)	0			
	FIX	2	VRT	VRT Voltage (ADC REFERENCE [00:1.15Vpp 01:1.25 Vpp 10:1.35 Vpp 11:1.45 Vpp])	1			
	FIX	3	14HI	INV 14H CLK (4fsc [Skew] CLK POLARITY)	0	0	0	N/A
	FIX	4	14HD	14H CLK DLY (4fscCLK [Skew] CLK DELAY ADJUST)	0	0	0	N/A
	FIX	5	DSI	INV DS CLK (8fscCLK POLARITY)	0	0	0	N/A
	FIX	6	DSD	DS CLK DLY (8fscCLK DELAY ADJUST)	0	0	0	N/A
	FIX	7	ADCD	AD CLK DLY (ADC CLK DELAY ADJUSTO)	0	0	1	N/A
	FIX	8	4FSC	4FSC SW (AD/LOGIC CLK SWAP)	0			
	FIX	9	WSTH	WEAK_SIG_VTH (WEAK_SIGNAL VTH)	0			
	FIX	10	WSVA	WEAK SIG VIDEO ATT (WEAK SIGNAL VIDEO ATT)	0	0	0	N/A
	FIX	11	WSCA	WEAK SIG CHROMA ATT (WEAK SIGNAL CHROMA ATT)	0	0	0	N/A
	FIX	12	VREF	VREF_SEL (AD REFERENCE SELECT [VZ])	0			

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
OSD	FIX	1	HT	HT (HALF TONE LEVEL)	0
	FIX	2	OSLR	OSD LVL R (R OSD LEVEL)	25
	FIX	3	OSLG	OSD LVL G (G OSD LEVEL)	25
	FIX	4	OSDC	OSD COMP (OSD COMP)	0
	FIX	5	OSLB	OSD LVL B (B OSD LEVEL)	25

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
H/W AKB	FIX	1	HRIL	H/W AKB R INI DATA L (H/W AKB RED OUTPUT LOWER)	soft cont'l
	FIX	2	HRIH	H/W AKB R INI DATA H (H/W AKB RED OUTPUT UPPER)	soft cont'l
	FIX	3	HGIL	H/W AKB G INI DATA L (H/W AKB GREEN OUTPUT LOWER)	soft cont'l
	FIX	4	HGIH	H/W AKB G INI DATA H (H/W AKB GREEN OUTPUT UPPER)	soft cont'l
	FIX	5	HBIL	H/W AKB B INI DATA L (H/W AKB BLUE OUTPUT LOWER)	soft cont'l
	FIX	6	HBIH	H/W AKB B INI DATA H (H/W AKB BLUE OUTPUT UPPER)	soft cont'l
	FIX	7	HLM1	AKB_LIM1<7:0> (H/W AKB LIM1)	6
	FIX	8	HLM2	AKB_LIM2<7:0> (H/W AKB LIM2)	12
	FIX	9	HLM3	AKA_LIM3<7:0> (H/W AKB LIM3)	21
	FIX	10	HAD1	AKB_ADD1<7:0> (H/W AKB SPEED1)	2
	FIX	11	HAD2	AKB_ADD2<7:0> (H/W AKB SPEED2)	6
	FIX	12	HAKE	AKB_EN (H/W AKB MANUAL [MCU] / HARD	1
	FIX	13	HASP	AKB_SPEED (H/W AKB SPEED)	3
	FIX	14	HERL	AKB_SWERR<7:0> (H/W AKB ERROR DET THRESH)	40
	FIX	15	HLMC	AKB_ERRC<7:0> (H/W AKB ERROR DET TIME)	20
	FIX	16	HPWL	AKBSWPON<7:0> (H/W AKB POWER ON TRESH)	4
	FIX	17	HPWC	AKB_PWERRC (H/W AKB POWER ON TIME)	90
	FIX	18	HFMT	H/W AKB2 HOLD TIMER (H/W AKB2 HOLD TIMER (@ 100 MSEC) [0: No hold]	20
	FIX	19	SPMT	AKB POW ON MUTE EXIT (AKB POWER ON MUTE EXIT TIMMER)	120

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC 21FA310	20FS120	21FM120	24FS120
AUDIO PROCESSOR	VAR	1	SBAL	SBAL (SUB BALANCE)	4	4	4	4
	VAR	2	SBAS	SBAS (SUB BASS)	0	6	4	7
	VAR	3	STRE	STRE (SUB TREBLE)	0	7	7	7
	VAR	4	SRL	SRL (SURROUND LEVEL)	0	0	0	0
	VAR	5	BBOL	BBOL (SURROUND OFF-BBE LOW)	4	0	0	0
	VAR	6	BBOH	BBOH (SURROUND OFF-BBE HIGH)	7	0	0	0
	VAR	7	BBSL	BBSL (SIMULATE BBE LOW)	2	0	0	0
	VAR	8	BBSH	BBSH (SIMULATE BBE HIGH)	7	0	0	0
	VAR	9	BBGL	BBGL (WOW GAME BBE LOW)	4	0	0	0
	VAR	10	BBGH	BBGH (WOW GAME BBE HIGH)	9	0	0	0
	VAR	11	BBTL	BBTL (SRS BBE LOW)	0	0	0	0
	VAR	12	BBTH	BBTH (SRS BBE HIGH)	0	0	0	0
	VAR	13	BBDL	BBDL (Audio Processor Prologic BBE Low for DOLBY)	3	0	0	0
	VAR	14	BBDH	BBDH (Audio Processor Prologic BBE High for DOLBY)	5	0	0	0
	VAR	15	VFIX	VFIX (AUDIO OUTPUT FIX DATA)	0	0	0	0
	VAR	16	AGCL	AGCL (AGC LEVEL)	2	2	2	2
	VAR	17	VCOF	RF OFFSET DATA	9	9	9	9

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC 21FA310	20FS120	21FM120	24FS120
AP2	VAR	1	BBEL	SUB AUDIO PROCESSOR PROLOGIC BBE LOW	2	0	0	0
	VAR	2	BBEH	SUB AUDIO PROCESSOR PROLOGIC BBE HIGH	5	0	0	0
	VAR	3	BBOL	SURROUND OFF-BBE LOW	2	0	0	0
	VAR	4	BBSL	SIMULATE BBE LOW	2	0	0	0
	VAR	5	BBGL	WOW GAME BBE LOW	3	0	0	0
	VAR	6	AGCL	SUB AUDIO PROCESSOR AGC LEVEL	2	0	0	0
	VAR	7	DDOF	DOLBY OFFSET DATA	15	0	0	0

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
MICROPROCESSOR	FIX	1	DISP	DISP (OSD HORIZONTAL OFFSET)	55
	FIX	2	CCHP	CCHP (FOR TILT DATA CALCULATION)	80
	FIX	3	HRLW	HRLW (LOW LIMIT OF H-PULSE COUNTING WINDOW [RF]	16
	FIX	4	HRHG	HRLG (HIGH LIMIT OF H-PULSE COUNTING WINDOW [RF]	64
	FIX	5	HSDT	HSDTCT (H-PULSE DETECTION [S-VIDEO]	8
	FIX	6	STPI	STPI (GRADUAL CONTRAST INCREASE STARTING LEVEL)	40
	FIX	7	RAPI	RAPI (GRADUAL CONTRAST INCREASE Vsync COUNTER)	10

Service Group	Fix/ Var	No.	Name	Item name & (Description)	NTSC Init Data
Feature	VAR		ID0	Language related	81
	VAR		ID1	Video related	23
	VAR		ID2	Audio related	113
	VAR		ID3	Miscellaneous	130
	VAR		ID4	Miscellaneous	32
	VAR		ID5	Miscellaneous	16
	VAR		ID6	Miscellaneous	48
	VAR		ID7	Miscellaneous	69

4-5. ID MAP TABLE

Model	Destination	ID-O	ID-1	ID-2	ID-3	ID-4	ID-5	ID-6	ID-7
KV-20FS120	US	89	7	9	34	0	16	0	5
KV-20FS120	CND	89	7	9	50	0	16	0	5
KV-21FM120	L NORTH	81	3	0	130	32	16	48	69
KV-21FS120	L NORTH	81	7	9	130	32	16	48	69
KV-21FS120	L SOUTH	81	7	9	130	32	16	48	69
KV-21FA310	L NORTH	81	23	113	130	32	16	48	69
KV-21FA310	L SOUTH	81	23	113	130	32	16	48	69
KV-24FS120	US	89	23	9	34	0	16	0	5
KV-24FS120	CND	89	23	9	50	0	16	0	5
KV-25FS120	L NORTH	81	23	9	130	32	16	48	69
KV-25FS120	L SOUTH	81	23	9	130	32	16	48	69

4-6. A BOARD ADJUSTMENTS

H. Frequency (Free Run) Check

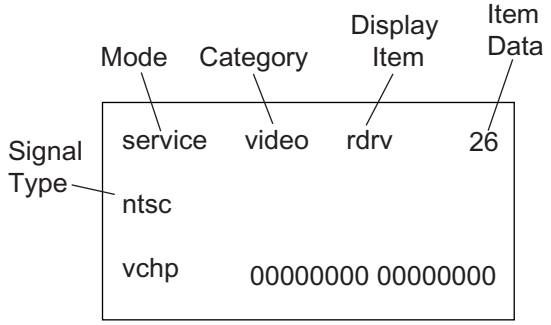
1. Input a TV mode (RF) with no signal.
2. Connect a frequency counter to base of Q502 (TP-25 H. DRIVE) on the A Board.
3. Check H. Frequency for 15735 ± 200 Hz.

V. Frequency (Free Run) Check

1. Select video 1 with no signal input.
2. Set the conditions for a standard setting.
3. Connect the frequency counter to TP-27 (V OUT) or CN515 pin ⑥ (V DY+) and ground on the A Board .
4. Check that V. Frequency shows 60 ± 4 Hz.

Drive (SCON)

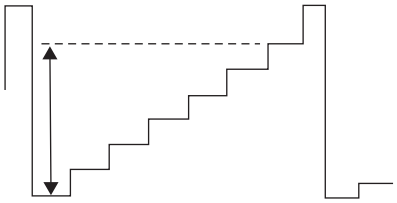
1. Input a color-bar signal and set the level to 75%.
2. Set in Pro mode + PICTURE MAX.
3. Activate the Service Adjustment Mode.



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

4. Connect an oscilloscope probe to CV Board, J1751Pin 12 (KR) (Red Out) .
5. Select SCON with 1 and 4 .
6. Adjust the value of SCON with 3 and 6 for 86 ± 3Vpp for 20/21 inch, and 96 ± 3Vpp for 24/25 inch.

76 – 3Vpp for 20/21 inch
82 – 3Vpp for 24/25 inch

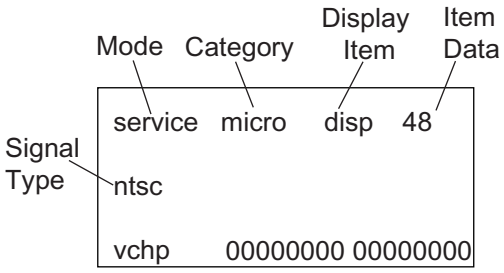


R ON:	ON	(1)
G ON:	ON	(1)
B ON:	ON	(1)

7. Press MUTING then ENTER to save into the memory.

Display Position Adjustment (DISP)

1. Input a color-bar signal.
2. Set to Service Adjustment Mode.
3. Select DISP with 1 and 4 .
4. Adjust values of DISP with 3 and 6 to adjust characters to the center.
5. Press MUTING then ENTER to save into the memory.
6. Check to see if the text is displayed on the screen.

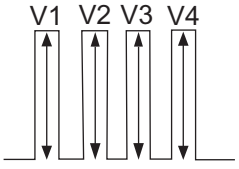


Sub Bright Adjustment (SBRT)

1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Select the SBRT item with 1 and 4 .
5. Adjust the values of SBRT with 3 and 6 to obtain a faintly visible crosshatch.
6. Press MUTING then ENTER to save into the memory.

Sub Hue, Sub Color Adjustment (SHUE, SCOL)

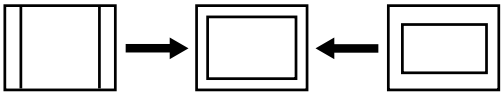
1. Input color-bar signal at 75%.
2. Activate the Service Adjustment Mode.
3. Set (PIC) to Max and (COL) to 50%.
4. Connect an oscilloscope probe to CV Board, CN301Pin ④ Blue Out.
5. Select the SHUE and SCOL item with 1 and 4 .
6. While showing the SHUE item, adjust the waveform with 3 and 6 until the second and third bars show the same level (V2 = V3 < 0.15Vp-p). Set Sub Hue -2 Step.
7. While showing the SCOL item, adjust the waveform with 3 and 6 until the first and fourth bars show the same level (V1 = V4 < 0.15Vp-p). Set Sub Col +3 Step.



8. Press MUTING then ENTER to save into the memory.

V. Size Adjustment (VSIZ)

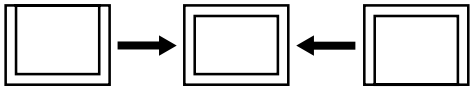
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VSIZ item with 1 and 4 .
4. Adjust value of VPOS with 1 and 4 for the best vertical center.
5. Press MUTING then ENTER to save into the memory.



V. Center Adjustment (VPOS)

Perform this adjustment after performing H. Frequency (Free Run) Check.

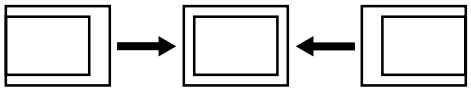
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VPOS item with 1 and 4 .
4. Adjust value of VPOS with 3 and 6 for the best vertical center.
5. Press MUTING then ENTER to save into the memory.



H. Center Adjustment (HPOS)

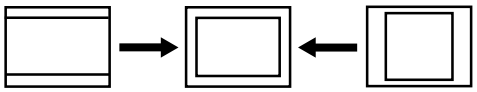
Perform this adjustment after performing H. Frequency (Free Run) Check.

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the HPOS item with 1 and 4 .
4. Adjust the value of HPOS with 3 and 6 for the best horizontal center.
5. Press MUTING then ENTER to save into the memory.



H. Size Adjustment (HSIZ)

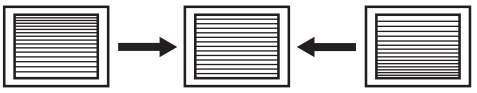
1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Select HSIZ with 1 and 4 .
4. Adjust with 3 and 6 for the best horizontal size.
5. Press MUTING then ENTER to save into the memory.



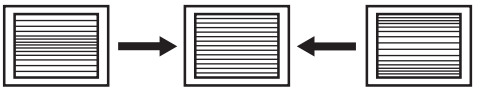
V. Linearity (VLIN), V. Correction (SCOR), PIN Amp (PAMP), and Horizontal Trapezoid (HTRP) Adjustments

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VLIN, SCOR, PAMP, and HTRP with with 1 and 4.
4. Adjust with 3 and 6 for the best horizontal size.
5. Press MUTING then ENTER to save into the memory.

V LINEARITY (VLIN)



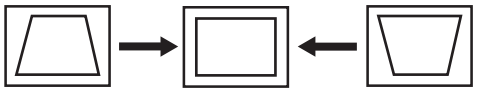
V CORRECTION (SCOR)



PIN AMP (PAMP)



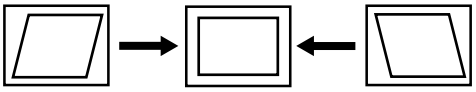
HORIZONTAL TRAPEZOID (HTRP)



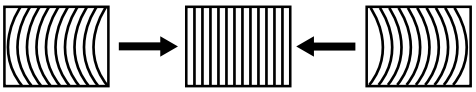
V. Angle (VANG), V. Bow (VBOW), Upper PIN (UPIN) and Low PIN (LPIN) Adjustments

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VANG, VBOW, UPIN, and LPIN with 1 and 4.
4. Adjust with 3 and 6 for the best picture.
5. Press MUTING then ENTER to save into the memory.

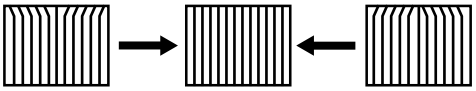
V ANGLE (VANG)



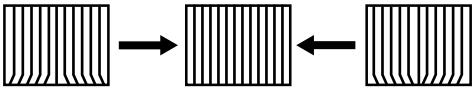
V BOW (VBOW)



UPPER PIN (UPIN)



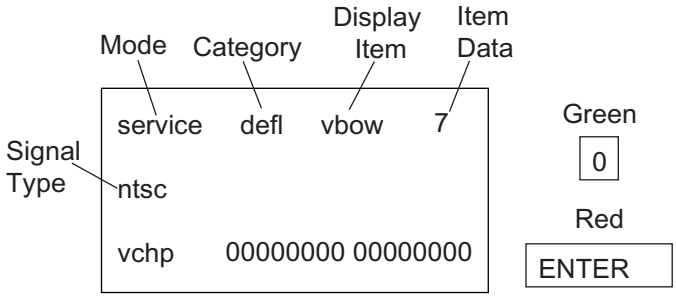
LOW PIN (LPIN)



Service Adjustment Mode Memory

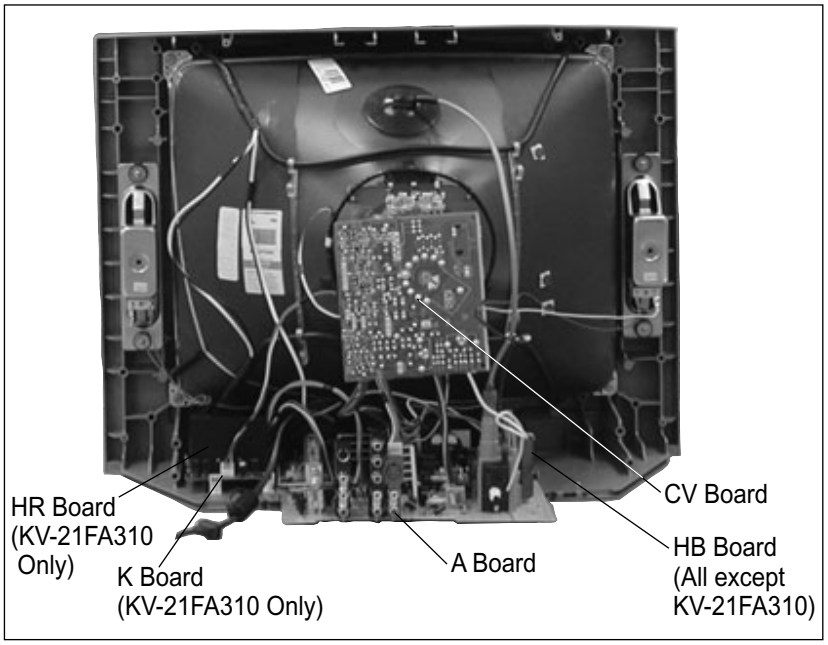
1. After completing all adjustments, press 0 then ENTER .

Read From Memory



SECTION 5: DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION



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

The symbol ▬▬ indicates a fast operating fuse and is displayed on the component side of the board. Replace only with fuse of the same rating as marked.

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

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

The components identified by ⋈ in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be necessary, replace only with the value originally used.

5-2. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM INFORMATION

All capacitors are in µF unless otherwise noted. pF : µµF 50WV or less are not indicated except for electrolytics and tantalums.

All electrolytics are in 50V unless otherwise specified.

All resistors are in ohms. k=1000, M=1000k

Indication of resistance, which does not have one for rating electrical power, is as follows: Pitch : 5mm Rating electrical power :

$^1/_4$ W in resistance, $^1/_{10}$ W and $^1/_8$ W in chip resistance.

: nonflammable resistor.

: fusible resistor.

△ : internal component.

▭ : panel designation and adjustment for repair.

⊥ : earth ground

⏚ : earth-chassis

All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

Readings are taken with a color-bar signal input.

Readings are taken with a 10M digital multimeter.

Voltages are DC with respect to ground unless otherwise noted.

Voltage variations may be noted due to normal production tolerances.

All voltages are in V.

S : Measurement impossibillity.

: B-line. (Actual measured value may be different).

: signal path. (RF)

Circled numbers are waveform references.

When replacing components identified by ◪, make the necessary adjustments as indicated. If the results do not meet the specified value, change the component identified by ⋈ and repeat the adjustment until the specified value is achieved.
(Refer to Section 3: Safety Related Adjustments on Page 17.)

When replacing the parts listed in the table below, it is important to perform the related adjustments.

Part Replaced (◪)	Adjustment (⋈)
DY, T585, CRT, IC001, IC561, IC600, C506, C507, C508, T511, L510, C588, L588, C566, C561, C563, D567, D568, D566, PH602, R567, R568, R565, R566, R562, R563, R561, R528…….....A Board	HV HOLD-DOWN R565

REFERENCE INFORMATION

RESISTOR

: RN	METAL FILM
: RC	SOLID
: FPRD	NONFLAMMABLE CARBON
: FUSE	NONFLAMMABLE FUSIBLE
: RW	NONFLAMMABLE WIREWOUND
: RS	NONFLAMMABLE METAL OXIDE
: RB	NONFLAMMABLE CEMENT
: ※	ADJUSTMENT RESISTOR

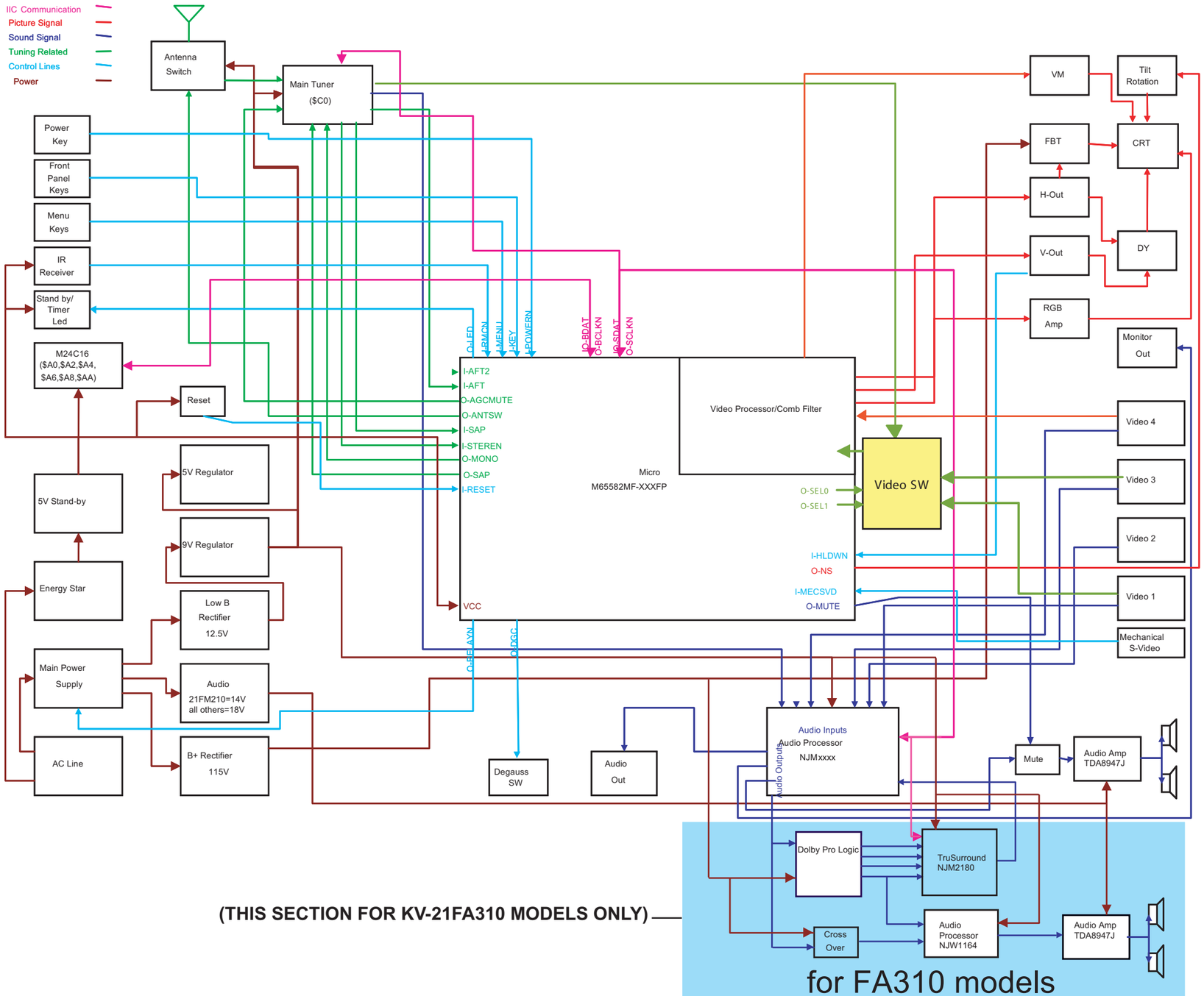
COIL

: LF-8L	MICRO INDUCTOR

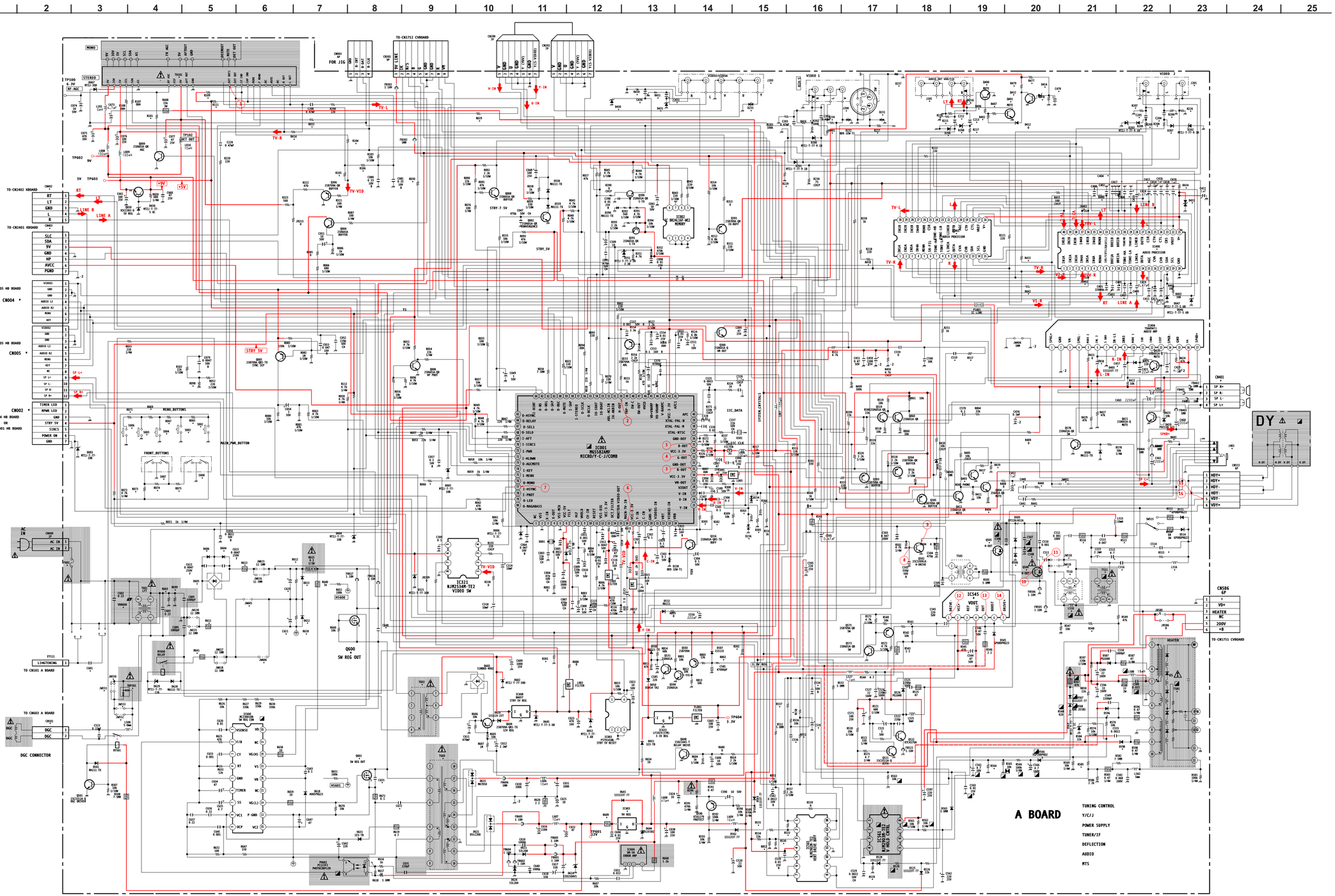
CAPACITOR

: TA	TANTALUM
: PS	STYROL
: PP	POLYPROPYLENE
: PT	MYLAR
: MPS	METALIZED POLYESTER
: MPP	METALIZED POLYPROPYLENE
: ALB	BIPOLAR
: ALT	HIGH TEMPERATURE
: ALR	HIGH RIPPLE

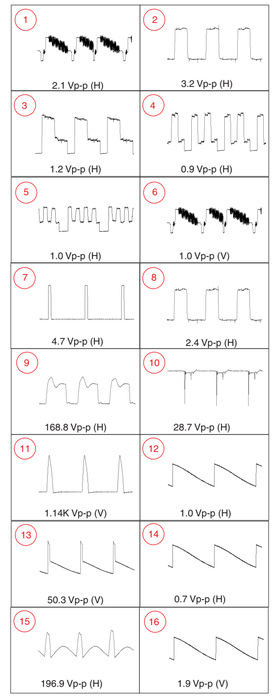
5-3. BLOCK DIAGRAM AND SCHEMATICS



A BOARD SCHEMATIC DIAGRAM

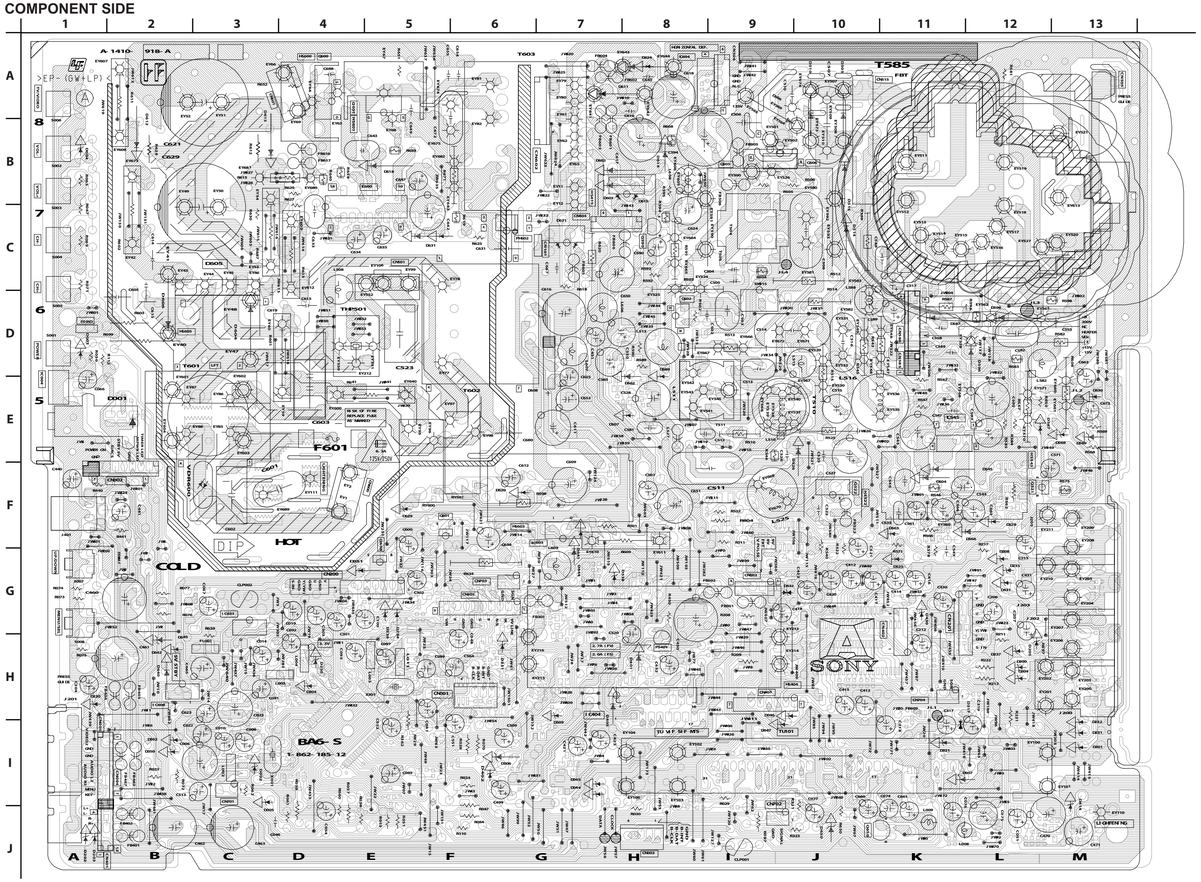


A BOARD WAVEFORMS



A [TUNING CONTROL, Y-C JUNGLE, POWER SUPPLY, TUNER/IF, DEFLECTION, AUDIO, MTS]

COMPONENT SIDE



A BOARD IC VOLTAGE LIST

IC001					IC321					IC545		IC600		IC608	
PIN	VOLT	31	2.9	63	1.4	PIN	VOLT	24	3.9	17	4.5	PIN	VOLT	PIN	VOLT	PIN	VOLT
1	N/C	33	2.8	65	4.9	1	4.5	26	0.6	19	3.9	1	0.7	1	2.5	I	11.0
2	GND	34	3.3	66	0.0	2	0.3	27	4.5	20	0.6	2	13.5	2	1.8	O	5.0
3	2.2	35	2.9	67	0.1	3	4.5	28	4.5	21	4.5	3	-12.2	3	2.2	G	GND
4	2.2	36	GND	68	0.1	4	0.4	29	4.5	22	N/C	4	-13.3	4	2.5	IC633	
5	GND	37	1.8	69	2.4	5	4.5	30	4.5	23	4.5	5	0.2	5	GND	PIN	VOLT
6	5.0	38	0.0	70	5.0	6	9.0	31	4.5	24	4.5	6	13.8	6	0.0	I	9.0
7	0.0	39	0.1	71	5.0	7	4.4	32	4.5	25	4.5	7	0.7	7	4.0	G	GND
8	2.0	40	2.0	72	0.1	8	GND	33	4.5	26	N/C	IC561		8	17.2	O	3.3
9	0.3	41	1.6	73	0.0	IC400		34	N/C	27	4.5	PIN	VOLT	9	GND		
10	2.1	42	3.3	74	5.0	PIN	VOLT	35	N/C	28	4.5	1	0.1	10	10.4		
11	5.0	43	N/C	75	5.0	1	4.5	36	N/C	29	4.5	2	3.4	11	0.0		
12	GND	44	1.6	76	5.0	2	4.5	37	4.5	30	4.5	3	2.3	12	4.6		
13	3.3	45	1.6	77	0.1	3	4.5	38	4.5	IC404		4	GND	13	N/C		
14	3.1	46	2.3	78	0.0	4	4.5	39	4.5	PIN	VOLT	5	9.2	14	163.6		
15	1.0	47	1.0	79	4.9	5	N/C	40	4.5	1	8.3	6	10.2	15	153.5		
16	1.5	48	N/C	80	4.9	6	N/C	IC401		2	GND	7	0.1	16	157.6		
17	3.3	49	0.5	IC002		7	N/C	PIN	VOLT	3	19.6	8	13.5	17	N/C		
18	0.5	50	1.2	PIN	VOLT	8	4.5	1	4.5	4	8.3	IC565		18	340.0		
19	1.1	51	2.0	1	GND	9	4.5	2	4.5	5	19.6	PIN	VOLT	IC603			
20	GND	52	1.5	2	GND	10	4.5	3	4.5	6	3.2	1	3.4	PIN	VOLT		
21	0.5	53	4.8	3	GND	11	4.5	4	4.5	7	0.0	2	3.4	I	12.0		
22	1.7	54	4.8	4	GND	12	4.5	5	n/c	8	0.0	3	2.1	G	GND		
23	0.5	55	4.8	5	4.8	13	4.5	6	4.5	9	3.2	4	9.0	O	9.0		
24	0.5	56	4.8	6	4.8	14	4.5	7	4.5	10	9.1	5	1.0	IC604			
25	0.5	57	N/C	7	GND	15	0.6	8	4.5	11	9.7	6	1.0	PIN	VOLT		
26	0.0	58	5.2	8	5.0	16	3.5	9	n/c	12	3.2	7	1.0	1	133.7		
27	0.0	59	0.0	IC003		17	3.5	10	4.5	13	3.3	8	1.6	2	N/C		
28	2.1	60	0.0	PIN	VOLT	18	4.8	11	3.5	14	8.3	9	1.6	3	2.5		
29	2.7	61	0.0	1	N/C	19	4.8	12	3.5	15	GND	10	1.6	4	11.3		
30	3.3	62	0.0	2	GND	20	GND	13	4.8	16	19.6	11	GND	5	GND		
				3	GND	21	**9**	14	4.8	17	8.3	12	1.6				
				4	5.0	22	4.5	15	GND			13	1.6				
				5	5.0	23	3.8	16	9.0			14	1.6				

All voltages are in V.

A BOARD TRANSISTOR VOLTAGE LIST

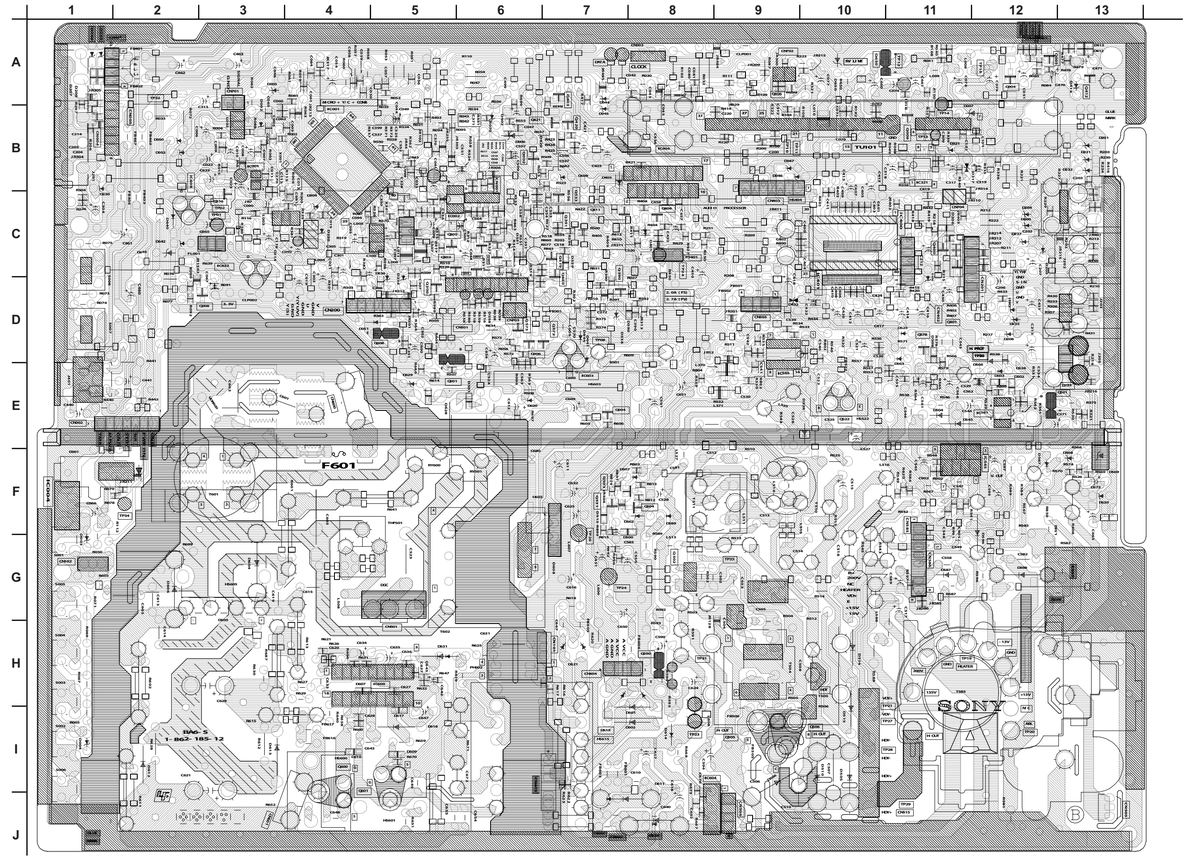
	B	C	E		B	C	E
Q002	0.0	2.0	GND	**Q501**	0.0	14.3	GND
Q004	3.8	9.0	4.4	**Q502**	0.0	74.1	GND
Q005	5.1	0.8	5.0	**Q503**	2.9	0.0	9.0
Q006	0.0	0.0	GND	**Q504**	0.0	0.0	GND
Q008	0.0	2.6	GND	**Q505**	0.0	131.8	0.0
Q009	0.0	5.2	GND	**Q506**	0.0	131.8	0.0
Q300	1.8	9.0	2.4	**Q519**	0.0	3.8	GND
Q301	3.6	2.1	3.6	**Q521**	0.0	3.8	GND
Q303	3.6	GND	2.8	**Q522**	0.1	-2.1	0.0
Q304	3.6	GND	2.9	**Q531**	0.0	0.0	GND
Q305	3.6	GND	3.0	**Q533**	1.5	GND	1.5
Q306	5.5	GND	4.9	**Q572**	0.0	2.6	GND
Q316	0.0	3.3	0.0	**Q573**	2.6	0.0	2.6
Q390	0.8	1.5	1.9	**Q578**	0.0	0.5	GND
Q391	0.6	3.3	1.5	**Q590**	133.7	0.0	134.2
Q400	0.0	0.1	GND	**Q604**	30.6	11.6	30.2
Q401	0.0	0.1	GND	**Q608**	0.0	6.7	GND
Q403	0.0	0.7	0.0	**Q650**	5.8	9.0	5.0
Q404	0.0	0.0	GND	**Q860**	3.9	5.7	3.3
Q411	0.0	5.8	GND				
Q412	0.1	0.1	GND				

All voltages are in V.

	D	G	S
Q600	313.0	160.0	156.0
Q601	155.0	4.9	0.0

A [TUNING CONTROL, Y-C JUNGLE, POWER SUPPLY, TUNER/IF, DEFLECTION, AUDIO, MTS]

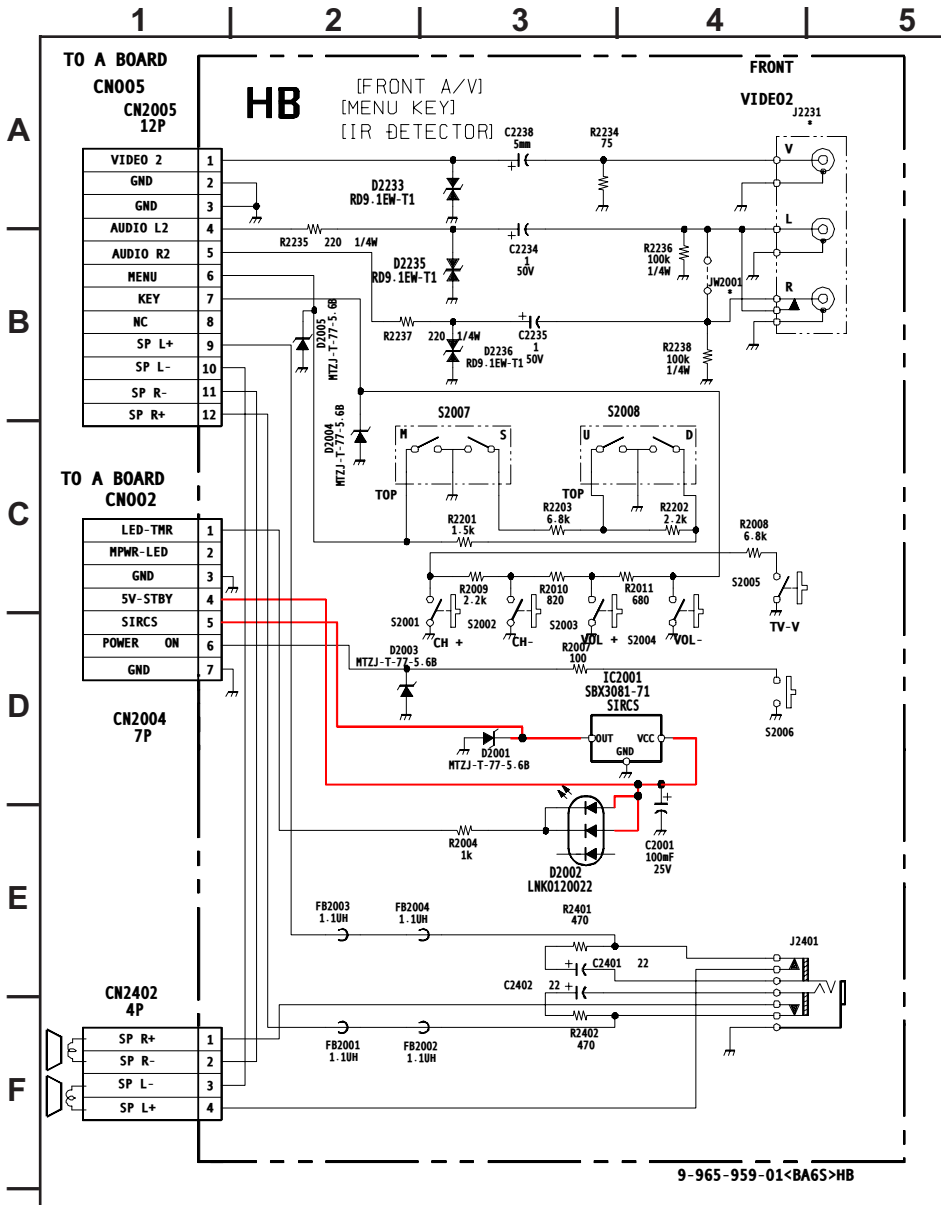
CONDUCTOR SIDE



A BOARD LOCATOR LIST CONDUCTOR SIDE

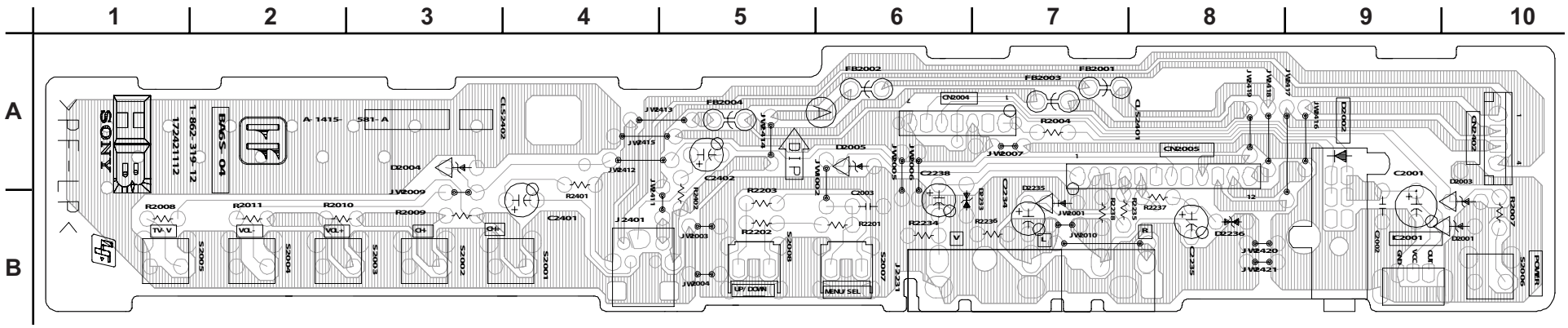
DIODE		DIODE		DIODE		IC		TRANSISTORS	
D002	B3	D317	B11	D563	D11	IC001	B4	Q391	C7
D003	G1	D321	B11	D566	E12	IC002	C5	Q400	C11
D004	I1	D351	C6	D567	F12	IC003	B3	Q401	D11
D005	A3	D390	D8	D568	F13	IC321	B11	Q403	A7
D006	B6	D401	C8	D569	F13	IC400	C10	Q404	C8
D007	B11	D405	B7	D587	G11	IC401	C10	Q411	C7
D045	B7	D412	A13	D589	F8	IC404	B8	Q412	A13
D046	B9	D414	A13	D596	G12	IC545	F11	Q420	B7
D047	B9	D420	B6	D598	G12	IC561	E12	Q421	B6
D050	B2	D430	D11	D603	F7	IC565	E9	Q501	E6
D051	D4	D431	D12	D604	G3	IC600	H5	Q502	G8
D052	B2	D432	D9	D605	G3	IC603	D7	Q503	F7
D200	C12	D500	G7	D606	G3	IC604	I9	Q504	F8
D201	B13	D501	E6	D611	J8	IC608	B2	Q505	I9
D202	A1	D505	I10	D612	I2	IC633	C3	Q506	I10
D203	A1	D506	I9	D613	I4	TRANSISTORS		Q519	C7
D204	B12	D507	F8	D614	I8	Q002	B6	Q521	E12
D205	C12	D508	D11	D615	I7	Q004	A12	Q522	E10
D206	C11	D510	I10	D618	I5	Q005	A12	Q531	F7
D207	A11	D513	F7	D620	E6	Q006	D7	Q533	C7
D208	D12	D514	H10	D621	H7	Q008	D3	Q572	D7
D209	A1	D515	H10	D624	J8	Q009	B11	Q573	D6
D230	C1	D525	D11	D628	E5	Q300	D5	Q578	D11
D231	B13	D526	E10	D629	E5	Q301	C6	Q590	H8
D232	B13	D528	E12	D631	H6	Q303	C5	Q600	I4
D234	D5	D545	E11	D641	D7	Q304	D6	Q601	I5
D235	D12	D558	D6	D642	C2	Q305	C6	Q604	E8
D236	D5	D559	C7	D644	D7	Q306	B9	Q608	D5
D237	C12	D562	F8	D645	C2	Q316	C3	Q650	A10
				D650	B10	Q390	D7	Q860	C7

HB BOARD SCHEMATIC DIAGRAM (ALL EXCEPT KV-21FA310)



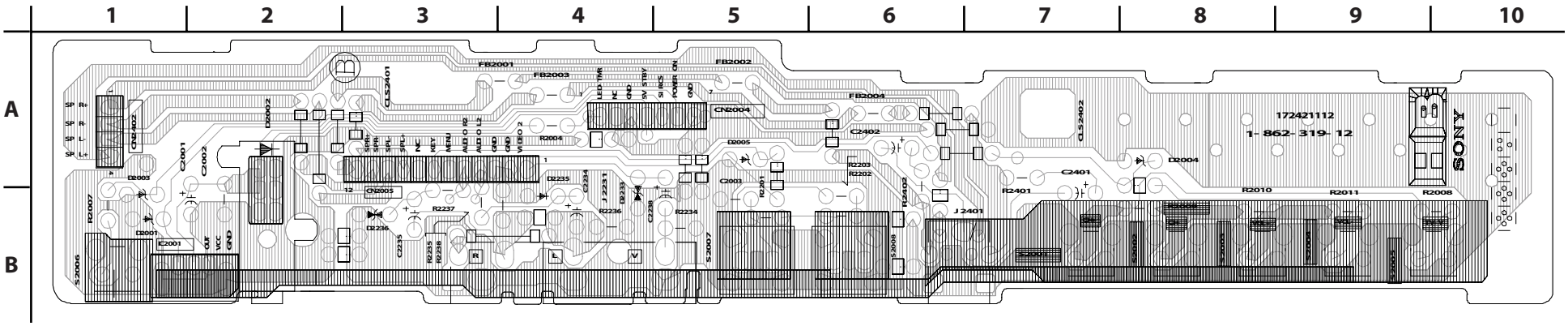
HB [FRONT A/V, MENU KEY, IR DETECTOR]

COMPONENT SIDE (ALL EXCEPT KV-21FA310)

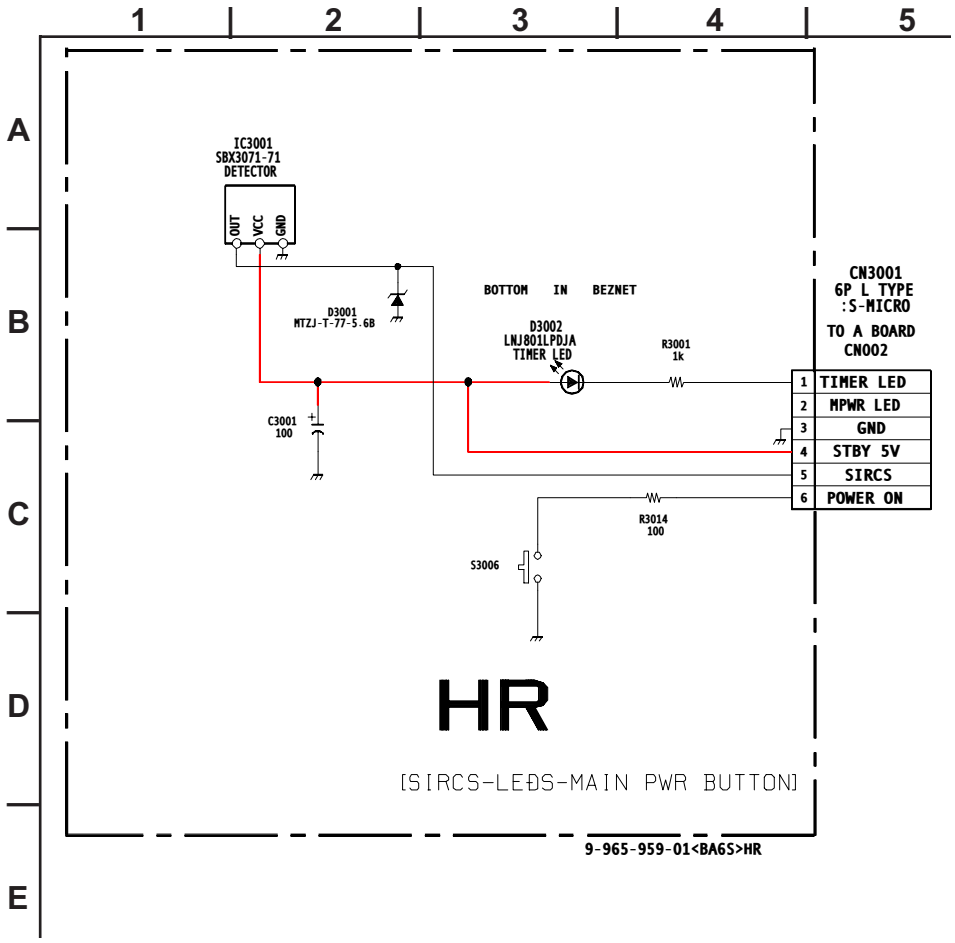


HB [FRONT A/V, MENU KEY, IR DETECTOR]

CONDUCTOR SIDE (ALL EXCEPT KV-21FA310)

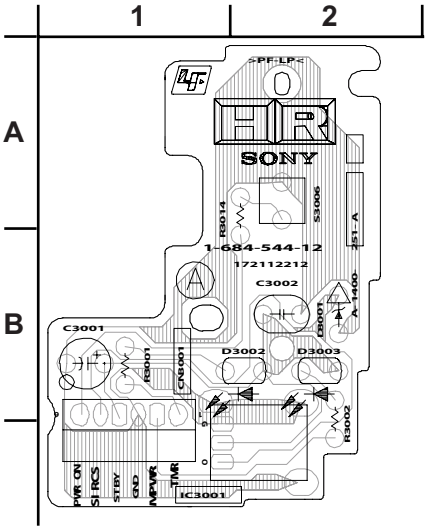


HR BOARD SCHEMATIC DIAGRAM (KV-21FA310 ONLY)



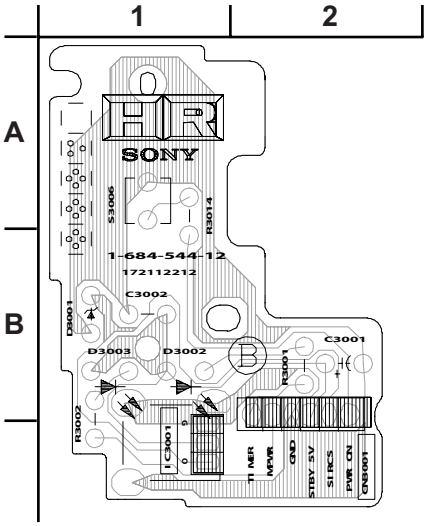
HR [SIRCS, LEDS, MAIN PWR BUTTON]

COMPONENT SIDE (KV-21FA310 ONLY)

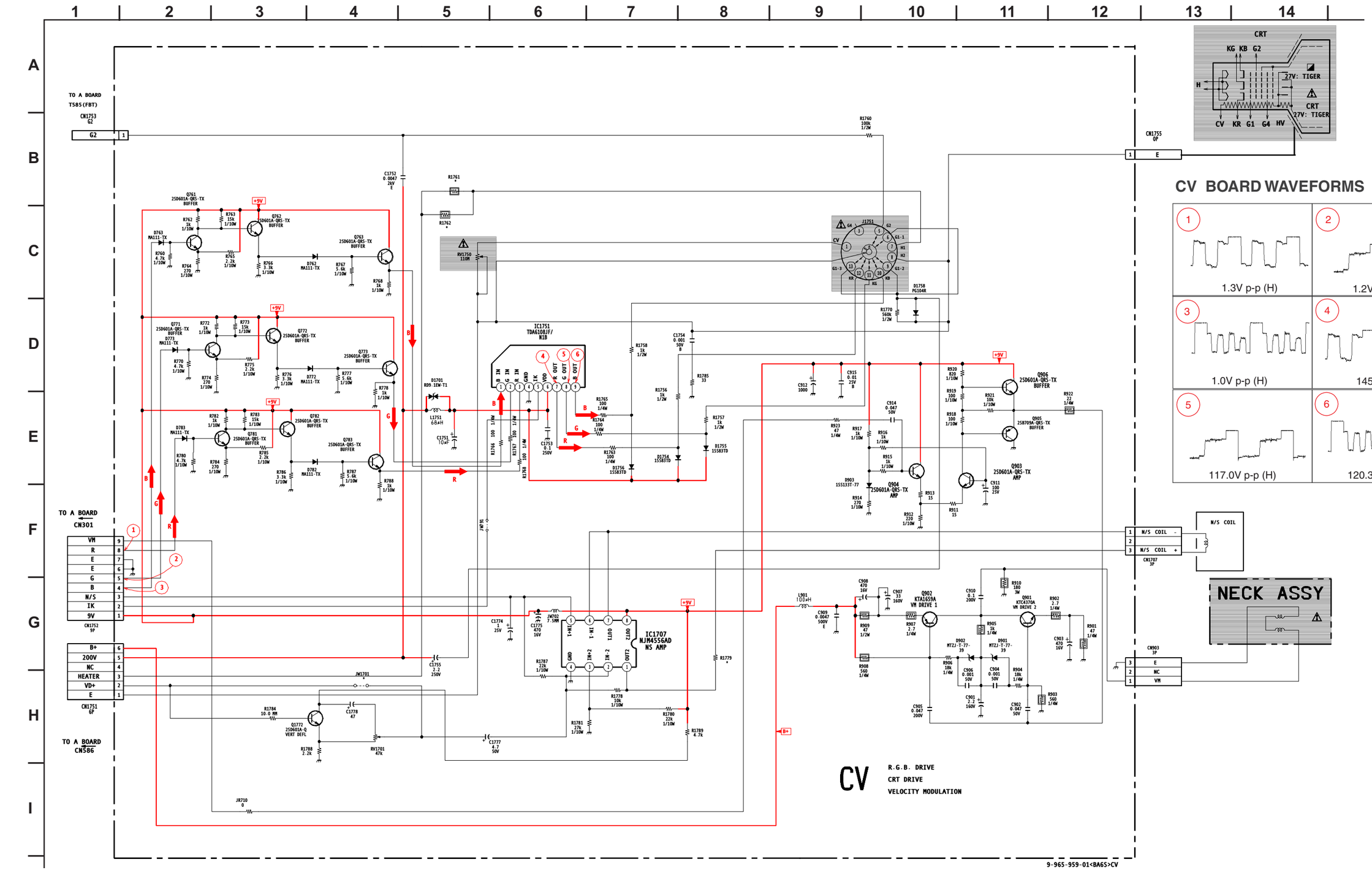


HR [SIRCS, LEDS, MAIN PWR BUTTON]

CONDUCTOR SIDE (KV-21FA310 ONLY)



CV BOARD SCHEMATIC DIAGRAM



CV BOARD WAVEFORMS

CV BOARD IC VOLTAGE LIST

IC701		IC1751	
PIN	**VOLT**	**PIN**	**VOLT**
1	1.8	1	2.0
2	2.8	2	2.0
3	4.4	3	2.4
4	GND	4	GND
5	4.8	5	3.7
6	4.8	6	200.0
7	4.8	7	136.0
8	9.0	8	142.0
		9	140.0

All voltages are in V.

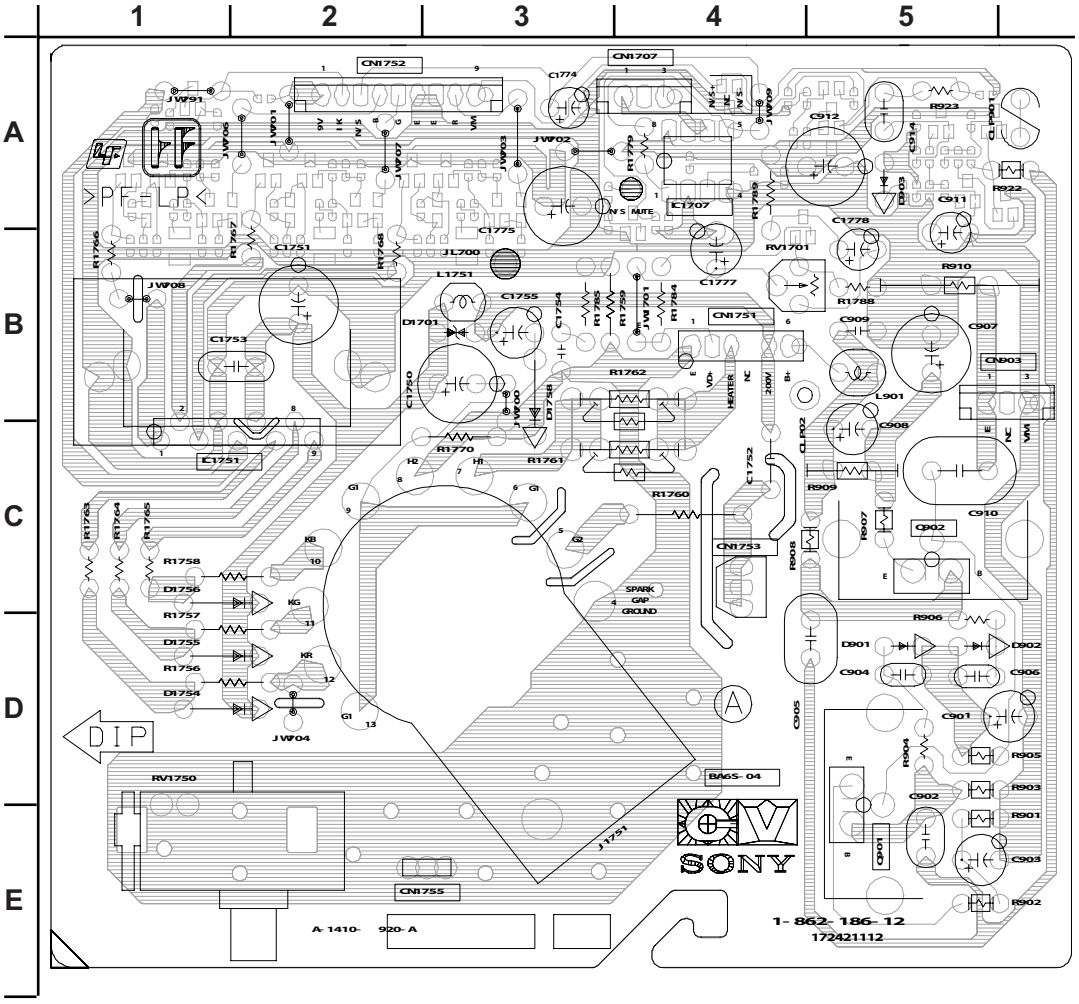
CV BOARD TRANSISTOR LIST

	B	C	E		B	C	E
Q761	2.2	3.8	2.9	**Q783**	2.1	9.0	2.7
Q762	3.1	9.0	3.8	**Q901**	0.9	67.0	0.4
Q763	2.0	9.0	2.6	**Q902**	134.0	67.0	134.0
Q771	2.2	3.8	2.9	**Q903**	1.8	5.4	2.4
Q772	3.2	9.0	3.8	**Q904**	1.8	9.0	2.4
Q773	2.0	9.0	2.6	**Q905**	5.7	GND	5.4
Q781	2.2	3.9	2.9	**Q906**	5.7	9.0	6.1
Q782	3.3	9.0	3.9	**Q1772**	0.0	0.0	0.0

All voltages are in V.

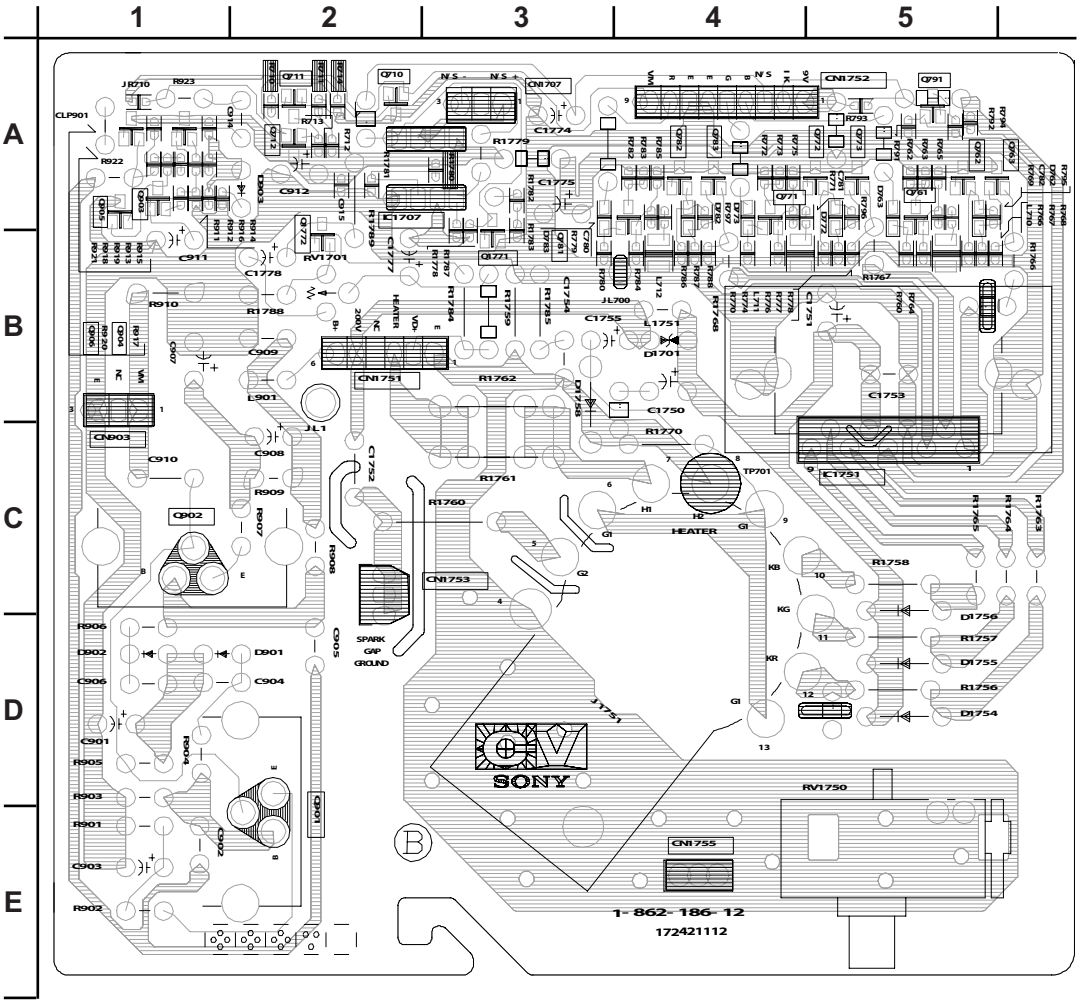
CV [RGB DRIVE, CRT DRIVE, VELOCITY MODULATION]

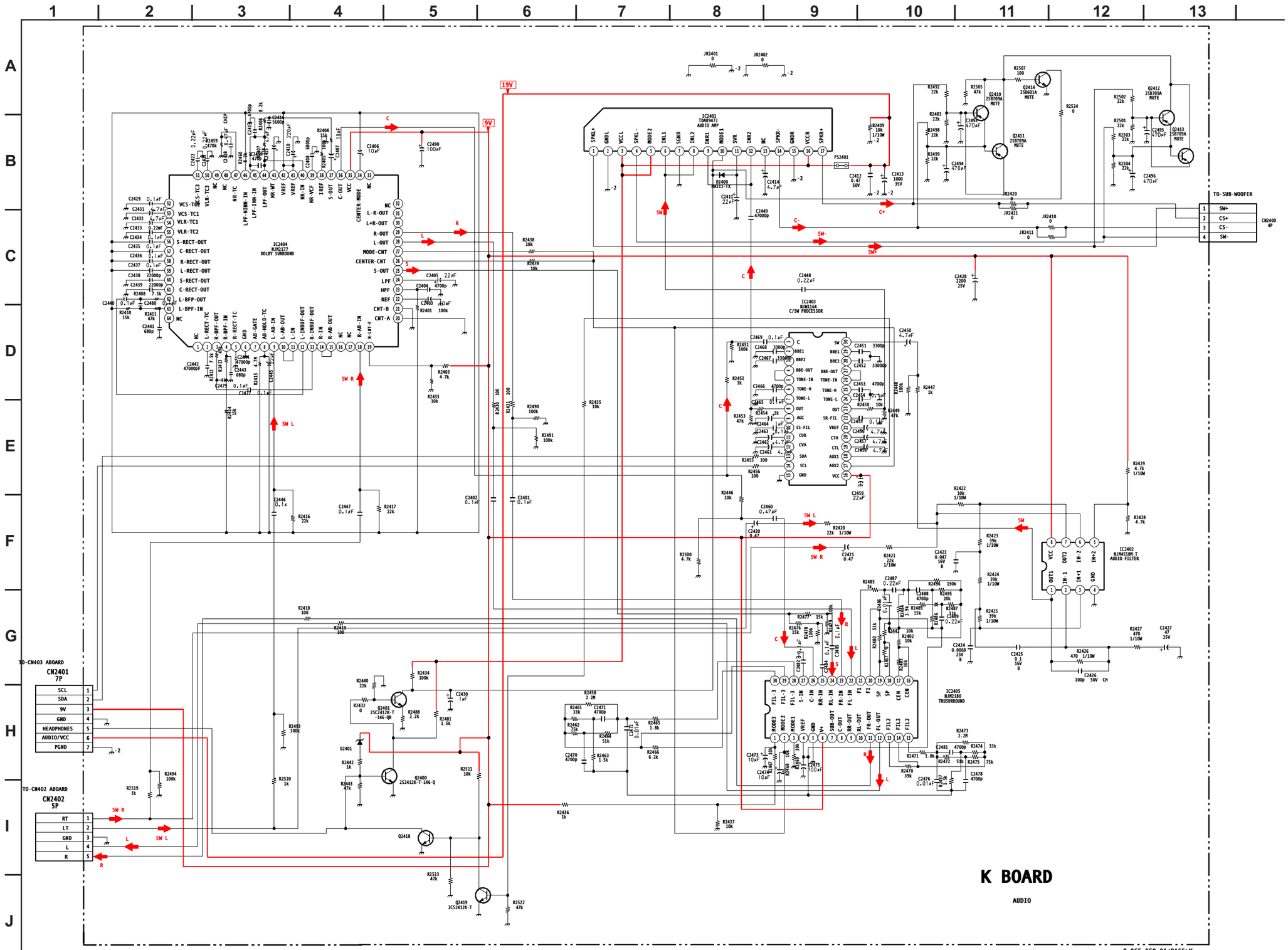
COMPONENT SIDE



CV [RGB DRIVE, CRT DRIVE, VELOCITY MODULATION]

CONDUCTOR SIDE




IC2404
NJM2177
DOLBY SURROUND
IC2401
TDA8947J
AUDIO AMP
IC2403
NJW1164
C/SW PROCESSOR
IC2405
NJM2180
TRUSURROUND
IC2402
NJM4558M-T
AUDIO FILTER
Q2400
2S2412K-T-146-Q
Q2401
2SC2412K-T
-146-QR
Q2410
2SB709A
MUTE
Q2411
2SB709A
MUTE
Q2412
2SB709A
MUTE
Q2413
2SB709A
MUTE
Q2414
2SD601A
MUTE
Q2418
Q2419
2CS2412K-T
PS2401
D2400
RA111-TX
TO-SUB-WOOFER
CN2400
4P
1 SW+
2 CS+
3 CS-
4 SW-
TO-CN403 ABOARD
CN2401
7P
SCL 1
SDA 2
9V 3
GND 4
HEADPHONES 5
AUDIO/VCC 6
PGND 7
TO-CN402 ABOARD
CN2402
5P
RT 1
LT 2
GND 3
L 4
R 5
19V
9V
SW
SW L
SW R
K BOARD
AUDIO
9-965-959-01<BA6S>K

K BOARD IC VOLTAGE LIST

IC2401		IC2403	
PIN	VOLT	PIN	VOLT
1	8.3	1	4.5
2	GND	2	4.5
3	19.6	3	4.5
4	8.3	4	4.5
5	19.6	5	4.5
6	3.2	6	4.5
7	GND	7	4.5
8	0.0	8	4.5
9	3.2	9	1.0
10	9.1	10	4.5
11	9.7	11	3.4
12	3.2	12	3.3
13	3.3	13	4.5
14	8.3	14	4.5
15	GND	15	GND
16	19.6	16	9.0
17	8.3	17	4.9
IC2402		18	0.0
PIN	VOLT	19	3.88
1	4.5	20	3.88
2	4.5	21	4.5
3	4.5	22	4.5
4	GND	23	4.5
5	4.5	24	4.5
6	4.5	25	4.5
7	4.5	26	4.5
8	9.0	27	4.5

IC2404	
PIN	VOLT
1	n/c
2	4.0
3	4.0
4	4.0
5	4.0
6	GND
7	n/c
8	3.8
9	4.0
10	4.0
11	4.0
12	4.0
13	4.0
14	4.0
15	4.0
16	n/c
17	n/c
18	4.0
19	5.8
20	GND
21	GND
22	4.0
23	2.65
24	4.0

28	4.5	25	4.0
29	4.5	26	4.0
30	4.5	27	4.37
31	n/c	28	4.0
32	n/c	29	4.0
33	n/c	30	n/c
34	4.0	31	n/c
35	9.0	32	n/c
36	4.0	33	n/c
37	4.0	34	4.0
38	1.45	35	GND
39	4.0	36	4.0
40	4.0	37	4.0
41	4.0	38	4.0
42	4.0	39	4.0
43	4.0	40	4.0
44	4.0	41	4.0
45	4.0	42	4.0
46	4.0	43	4.0
47	0.0	44	4.0
48	n/c	45	4.0
49	n/c	46	4.0
50	4.0	47	0.0
51	3.0	48	n/c
52	3.0	49	n/c
53	3.0	50	4.0

IC2405	
PIN	VOLT
1	7.7
2	4.6
3	0.0
4	4.5
5	0.0
6	9.0
7	n/c
8	n/c
9	n/c
10	n/c
11	4.5
12	4.5
13	4.5
14	4.5
15	4.5
16	4.5
17	4.5
18	4.5
19	4.5
20	4.5
21	4.5
22	4.5
23	4.5
24	4.5
25	4.5
26	4.5
27	4.5
28	4.5
29	4.5
30	4.5

All voltages are in V.

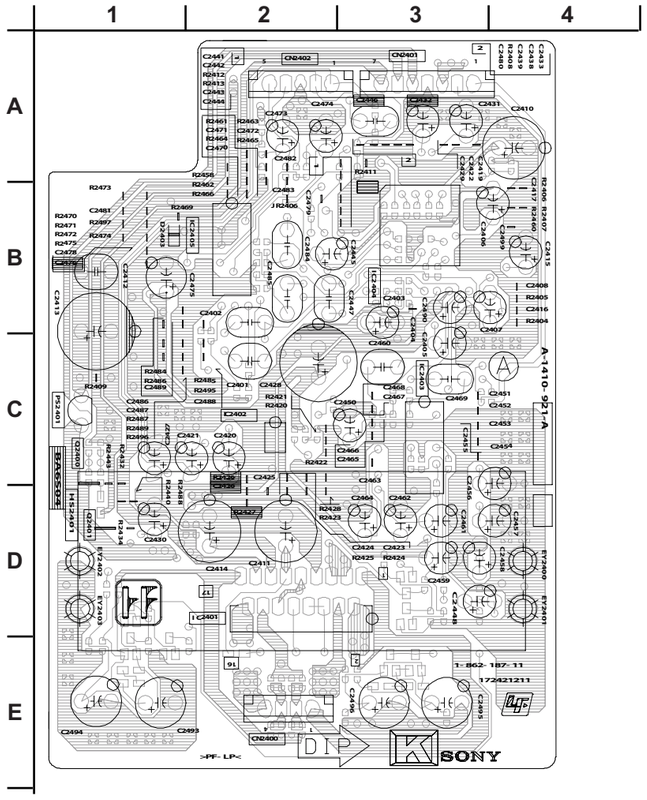
K BOARD TRANSISTOR LIST

	B	C	E
Q2400	0.7	0.0	GND
Q2401	0.0	17.9	0.0
Q2410	4.8	0.0	4.8
Q2411	4.8	0.0	4.8
Q2412	4.8	0.0	4.9
Q2413	4.8	0.0	4.9
Q2414	0.0	0.2	GND
Q2418	0.0	0.7	GND
Q2419	0.0	0.0	GND

All voltages are in V.

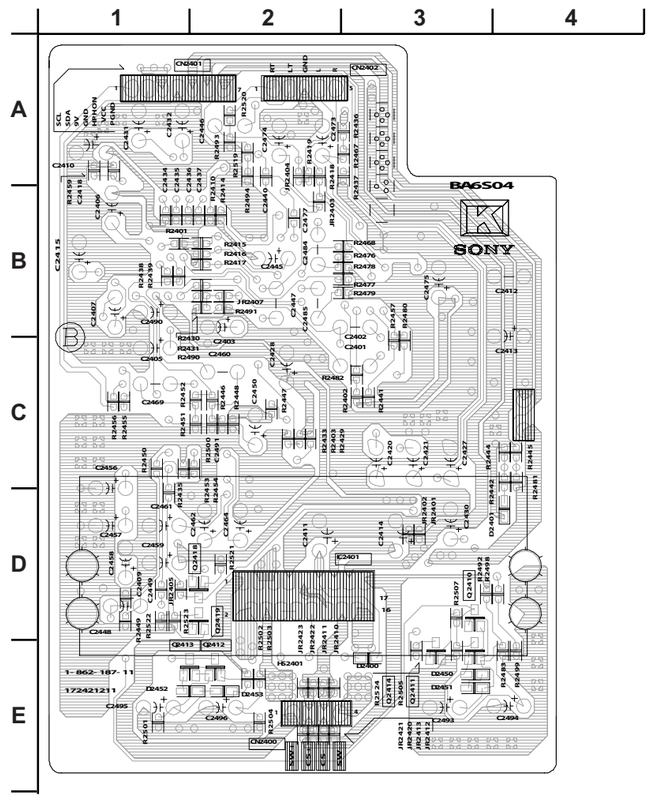
K [AUDIO]

COMPONENT SIDE (KV-21FA310 ONLY)



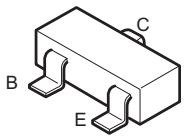
K [AUDIO]

CONDUCTOR SIDE (KV-21FA310 ONLY)

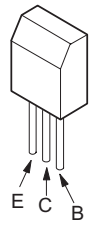


5-4. SEMICONDUCTORS

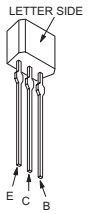
2SB709A-QRS-TX
2SD601A-QRS-TX



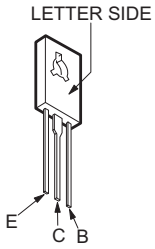
2SB734-T-34
2SC3209LK-TP



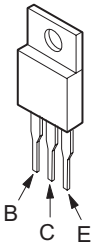
2SA1309A-QRSTA
2SC3311A-QRSTA
2SD2144S-TP-UVW



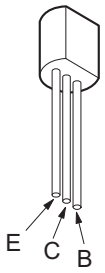
2SC3840K



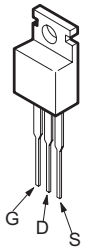
2SA1837



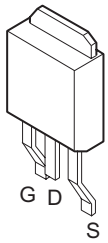
2SA1091O-TPE2



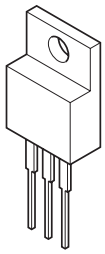
IRF614



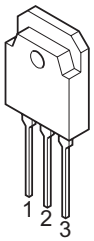
2SK2663



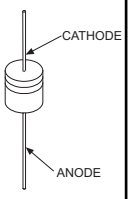
2SC4793



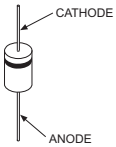
2SD2578-YB



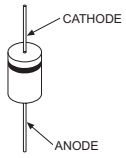
ERA38-06TP1
ERA82-004TP5
1SS133T-77
D1NS0R-TA
MTZJ-T-77-12C
MTZJ-T-77-15B
MTZJ-T-77-33B
MTZJ-T-77-39



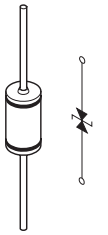
RU-1P
ERC06-15S
EGP20DPKG23
MTZJ-T-77-5.1C
MTZJ-T-77-5.6C
MTZJ-T-77-7.5A
MTZJ-T-77-10B
MTZJ-T-77-30D
RGP10-GPKG3
RGP02-17PKG23
RGP15GPKG23



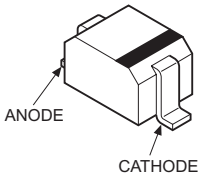
ERB44-06TP1
1SS83TD
GP08DPKG23
RGP10GPKG23
RU4AM-T3



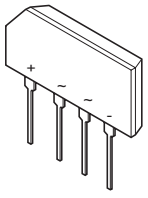
RD9.1EW-T1



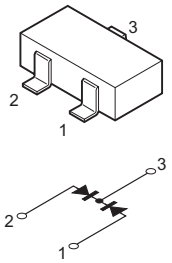
MA111-TX
UDZ-TE-17.5.1B UDZ-TE-17.91B



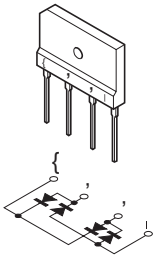
D2SB60A-F04



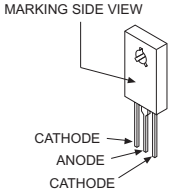
DAP202K-T-146



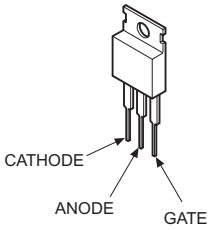
D4SB60L-F



D5LC20U



TF541M



SECTION 6: EXPLODED VIEWS

Components not identified by a part number or description are not stocked because they are seldom required for routine service.

The component parts of an assembly are indicated by the reference numbers in the far right column of the parts list and within the dotted lines of the diagram.

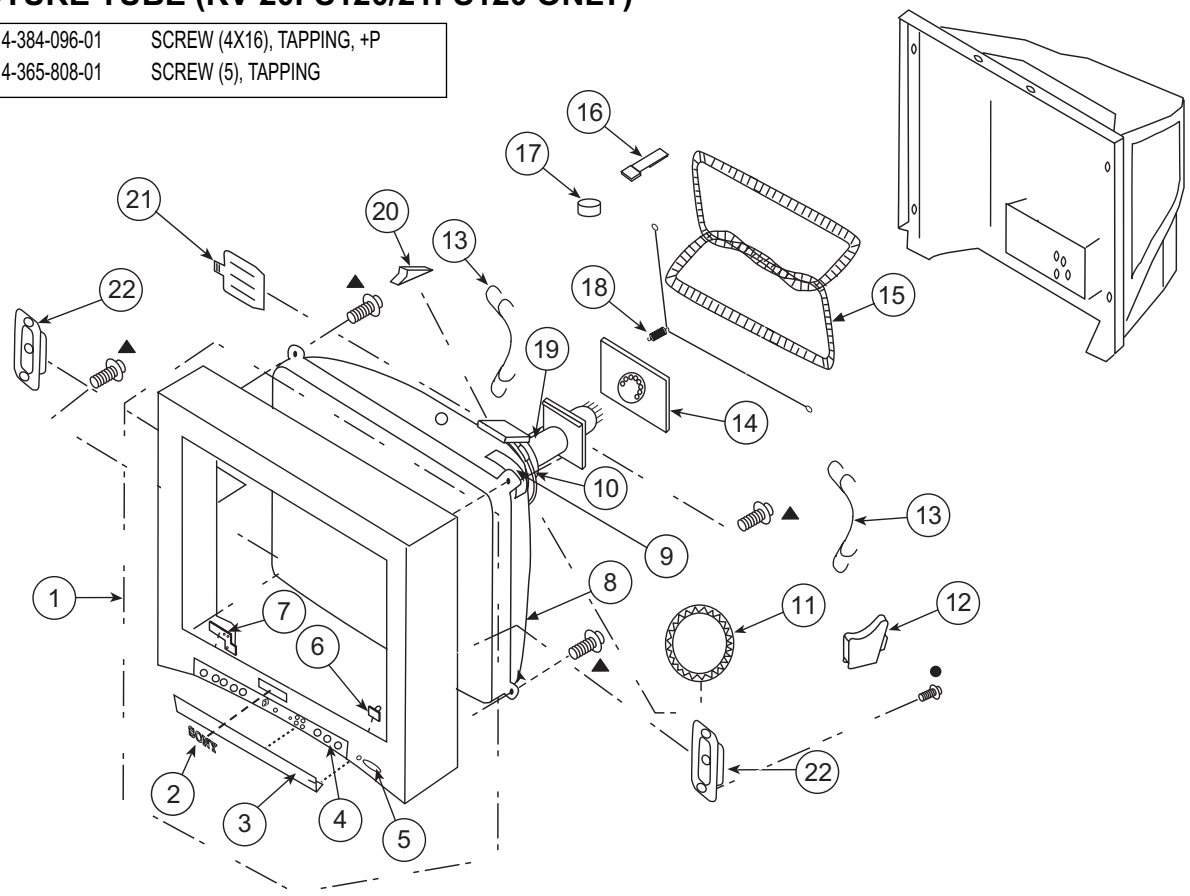
*** Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.**

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

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

6-1. PICTURE TUBE (KV-20FS120/21FS120 ONLY)

● 4-384-096-01 SCREW (4X16), TAPPING, +P
▲ 4-365-808-01 SCREW (5), TAPPING



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
1	X-4042-988-1	BEZNET ASSY (20) (KV-20FS120 ONLY)	[2-7]
1	X-4042-990-1	BEZNET ASSY (21) (KV-21FS120 ONLY)	[2-7]
2	4-046-161-21	EMBLEM, SONY NO.8	
3	4-102-301-11	DOOR	
4	4-102-307-01	LABEL, DOOR	
5	4-102-305-11	BUTTON, POWER	
6	4-102-306-01	GUIDE, LED/IR	
* 7	4-083-303-01	SPRING, METAL	
⚠ 8	8-738-831-05	CRT 21RSN(SDP) (ALL EXCEPT KV-21FS120 L SOUTH)	
⚠ 8	8-738-838-05	CRT 21RSN(SDP)(SOUTH) (KV-21FS120 L SOUTH ONLY)	
* 9	4-074-576-01	CUSHION, DGC	
⚠ 10	8-451-505-71	DY Y21RSA-V	

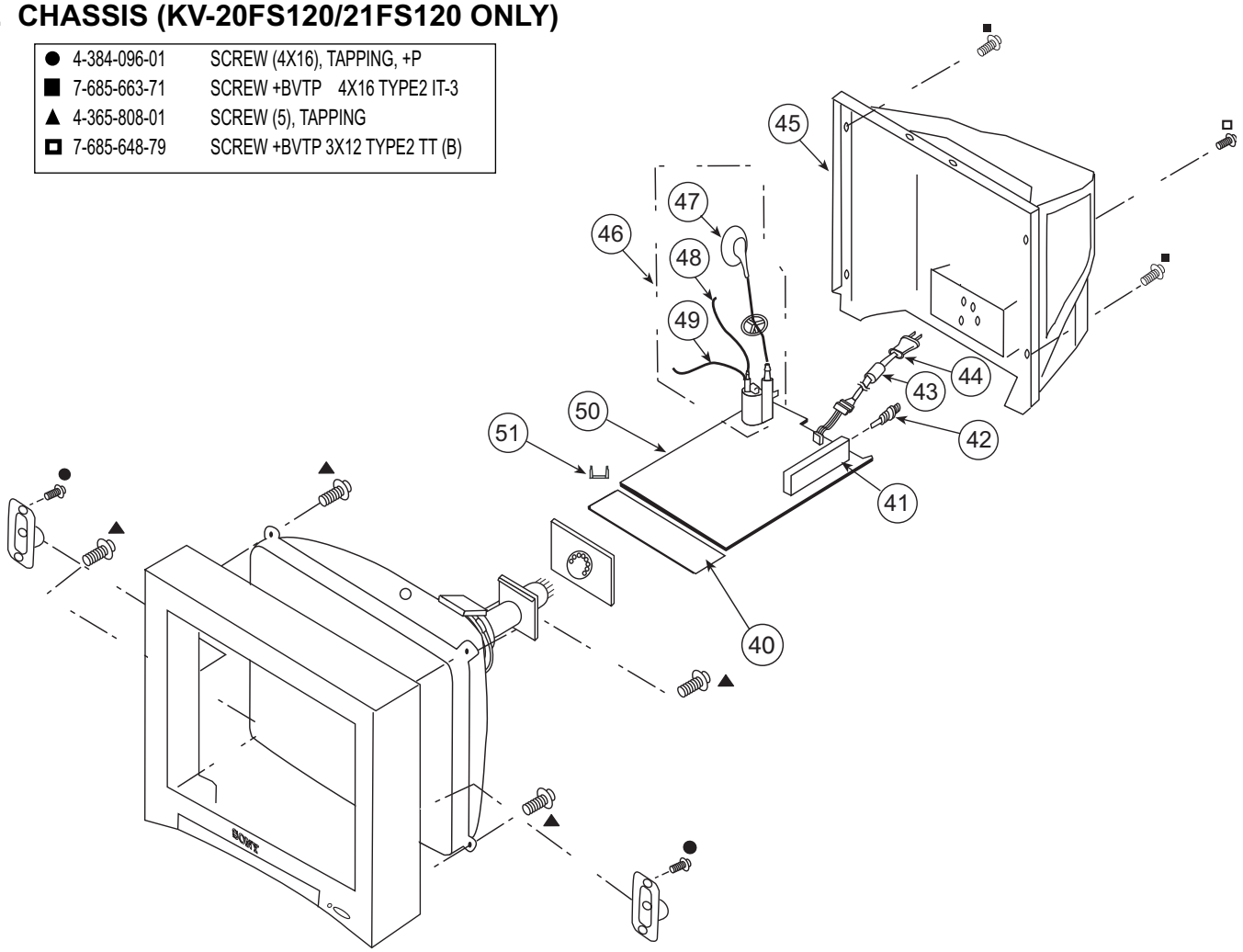
REF. NO.	PART NO.	DESCRIPTION
⚠ 11	1-456-285-11	COIL, NA ROTATION (RT-154)
12	4-102-537-01	SUPPORT, CRT(20)
* 13	4-080-810-21	BAND, DEGAUSS COIL
* 14	A-1410-919-A	CV (VAR) BOARD, MOUNTED
⚠ 15	1-456-153-11	COIL, DEGAUSSING
16	4-083-414-01	PIECE A(110), CONV CORRECT
17	1-452-032-00	MAGNET, DISC
* 18	4-375-394-01	SPRING, TENSION
⚠ 19	1-451-561-21	NECK ASSEMBLY
☛ 20	4-053-005-01	SPACER, DY
21	4-057-714-01	PIECE ASSY, TLH CORRECTION
22	1-825-831-11	LOUDSPEAKER (15X6.5CM)

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

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

6-2. CHASSIS (KV-20FS120/21FS120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
■	7-685-663-71	SCREW +BVTP 4X16 TYPE2 IT-3
▲	4-365-808-01	SCREW (5), TAPPING
◘	7-685-648-79	SCREW +BVTP 3X12 TYPE2 TT (B)



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
* 40	A-1415-580-A	HB (VAR) BOARD, MOUNTED	
⚠ 41	8-598-593-50	TUNER, FSS BTF-WA421	
⚠ 42	1-766-374-11	PLUG, F-PIN	
43	1-500-586-11	FILTER, CLAMP (FERRITE CORE) (KV-21FS120 L SOUTH ONLY)	
⚠ 44	1-824-069-11	CORD, AC POWER (WITH CONNECTOR) (ALL EXCEPT KV-21FS120 L SOUTH)	
⚠ 44	1-757-840-12	CORD, POWER (WITH CONNECTOR) (KV-21FS120 L SOUTH ONLY)	
45	4-102-302-01	COVER, REAR	
⚠ 46	1-453-316-21	FBT ASSY NX-1748//X4A4	[47-49]
⚠ 47	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠ 48	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	
⚠ 49	1-900-803-22	WIRE ASSY, G2 LEAD	

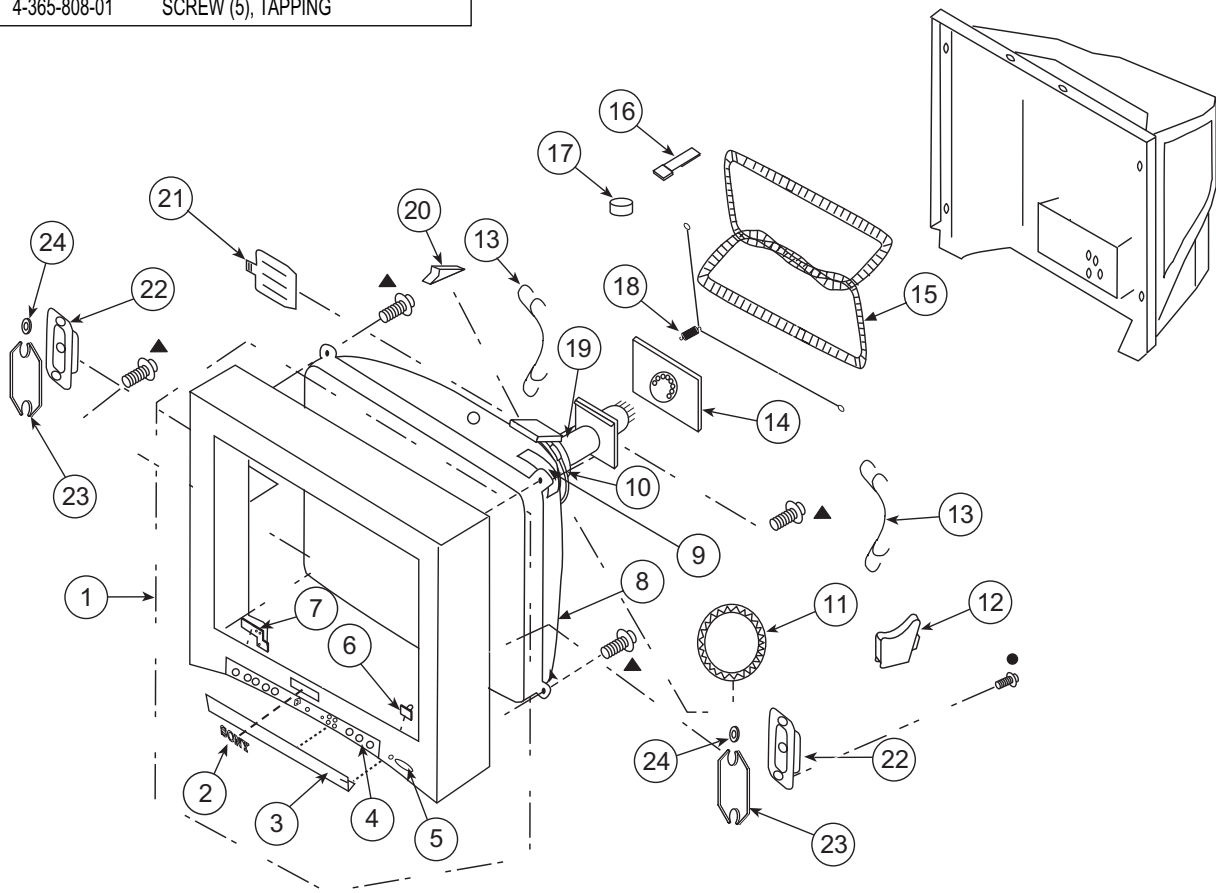
REF. NO.	PART NO.	DESCRIPTION
* 50	A-1302-931-A	A BOARD, COMPLETE (KV-20FS120/21FS120 L NORTH ONLY)
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
* 50	A-1302-980-A	A BOARD, COMPLETE (KV-21FS120 L SOUTH ONLY)
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
* 51	4-076-951-01	HINGE, PWB

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

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

6-3. PICTURE TUBE (KV-21FM120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
▲	4-365-808-01	SCREW (5), TAPPING



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
* 1	X-4042-989-1	BEZNET ASSY (21)	[2-7]
2	4-046-161-21	EMBLEM, SONY NO.8	
3	4-102-301-11	DOOR	
4	4-102-307-11	LABEL, DOOR	
5	4-102-305-11	BUTTON, POWER	
6	4-102-306-01	GUIDE, LED/IR	
* 7	4-083-303-01	SPRING, METAL	
⚠ 8	8-738-831-05	CRT 21RSN(SDP)	
* 9	4-074-576-01	CUSHION, DGC	
⚠ 10	8-451-505-71	DY Y21RSA-V	
⚠ 11	1-456-285-11	COIL, NA ROTATION (RT-154)	
12	4-102-537-01	SUPPORT, CRT(20)	
* 13	4-080-810-21	BAND, DEGAUSS COIL	
* 14	A-1410-919-A	CV (VAR) BOARD, MOUNTED	
⚠ 15	1-456-153-11	COIL, DEGAUSSING	

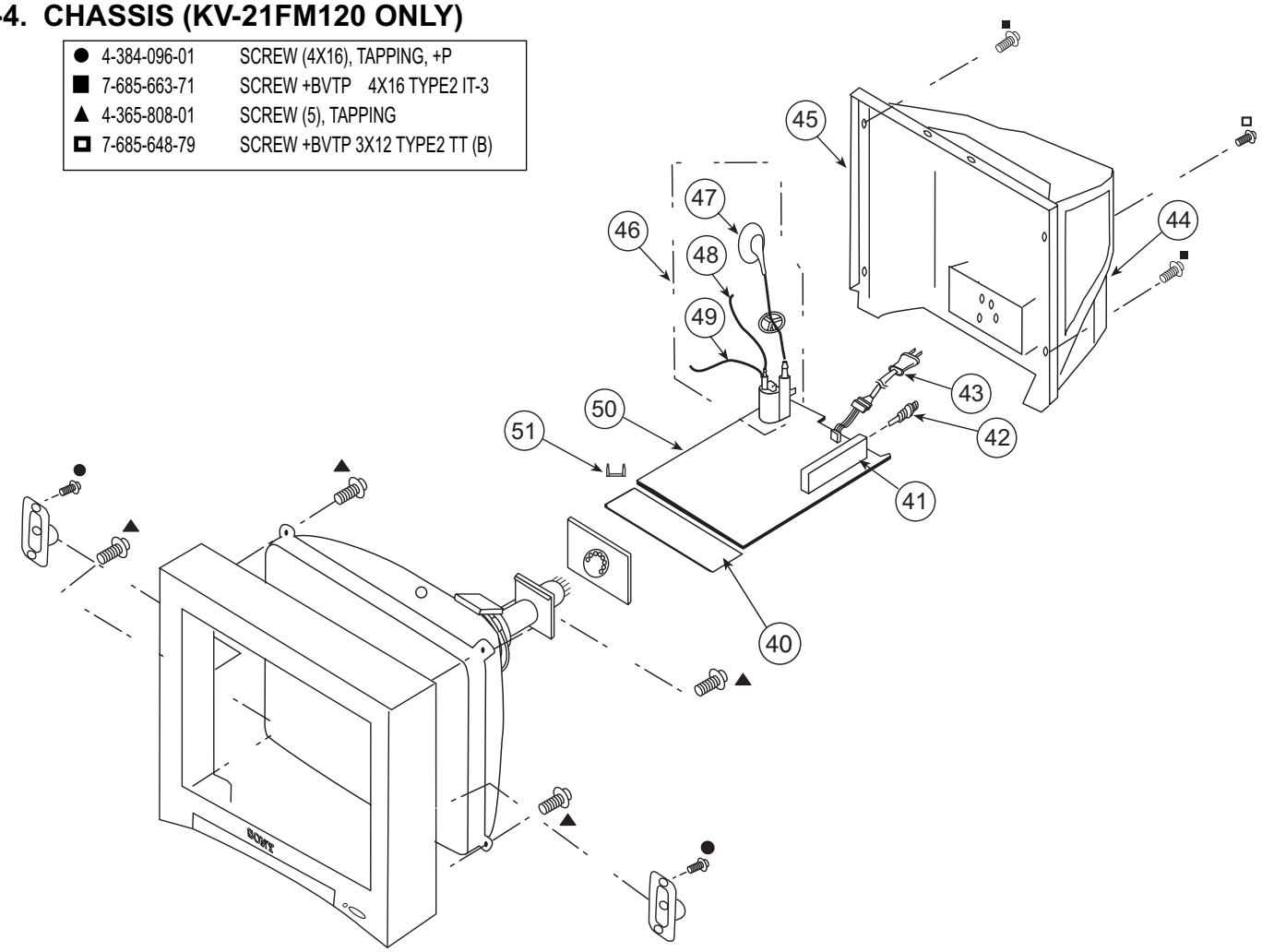
REF. NO.	PART NO.	DESCRIPTION
16	4-083-414-01	PIECE A(110), CONV CORRECT
17	1-452-032-00	MAGNET, DISC
* 18	4-375-394-01	SPRING, TENSION
⚠ 19	1-451-561-21	NECK ASSEMBLY
☛ 20	4-053-005-01	SPACER, DY
21	4-057-714-01	PIECE ASSY, TLH CORRECTION
22	1-825-039-11	SPEAKER (15X6.5CM)
* 23	4-046-981-03	BRACKET, SPEAKER
* 24	4-374-745-91	CUSHION (A)

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

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

6-4. CHASSIS (KV-21FM120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
■	7-685-663-71	SCREW +BVTP 4X16 TYPE2 IT-3
▲	4-365-808-01	SCREW (5), TAPPING
□	7-685-648-79	SCREW +BVTP 3X12 TYPE2 TT (B)



	REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
*	40	A-1415-692-A	HB (VAR) BOARD, MOUNTED	
⚠	41	8-598-594-30	TUNER, FSS BTF-FA421	
⚠	42	1-766-374-11	PLUG, F-PIN	
⚠	43	1-824-069-11	CORD, AC POWER (WITH CONNECTOR)	
*	44	4-102-308-01	LABEL, TERMINAL	
	45	4-102-302-01	COVER, REAR	
⚠	46	1-453-316-21	FBT ASSY NX-1748//X4A4	[47-49]
⚠	47	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠	48	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	

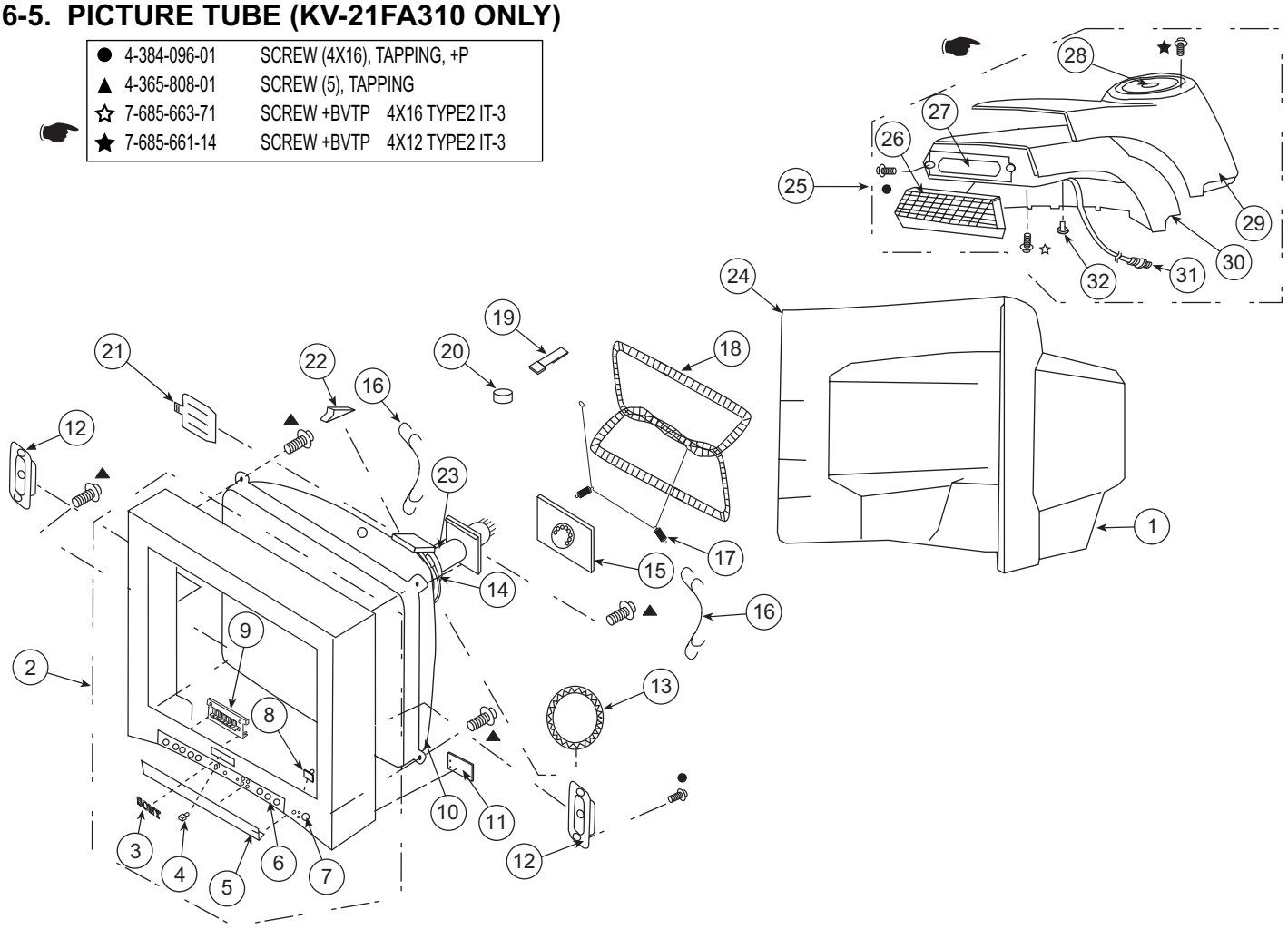
	REF. NO.	PART NO.	DESCRIPTION
⚠	49	1-900-803-22	WIRE ASSY, G2 LEAD
*	50	A-1302-979-A	A BOARD, COMPLETE
			The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
*	51	4-076-951-01	HINGE, PWB

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

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

6-5. PICTURE TUBE (KV-21FA310 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
▲	4-365-808-01	SCREW (5), TAPPING
☆	7-685-663-71	SCREW +BVTP 4X16 TYPE2 IT-3
★	7-685-661-14	SCREW +BVTP 4X12 TYPE2 IT-3



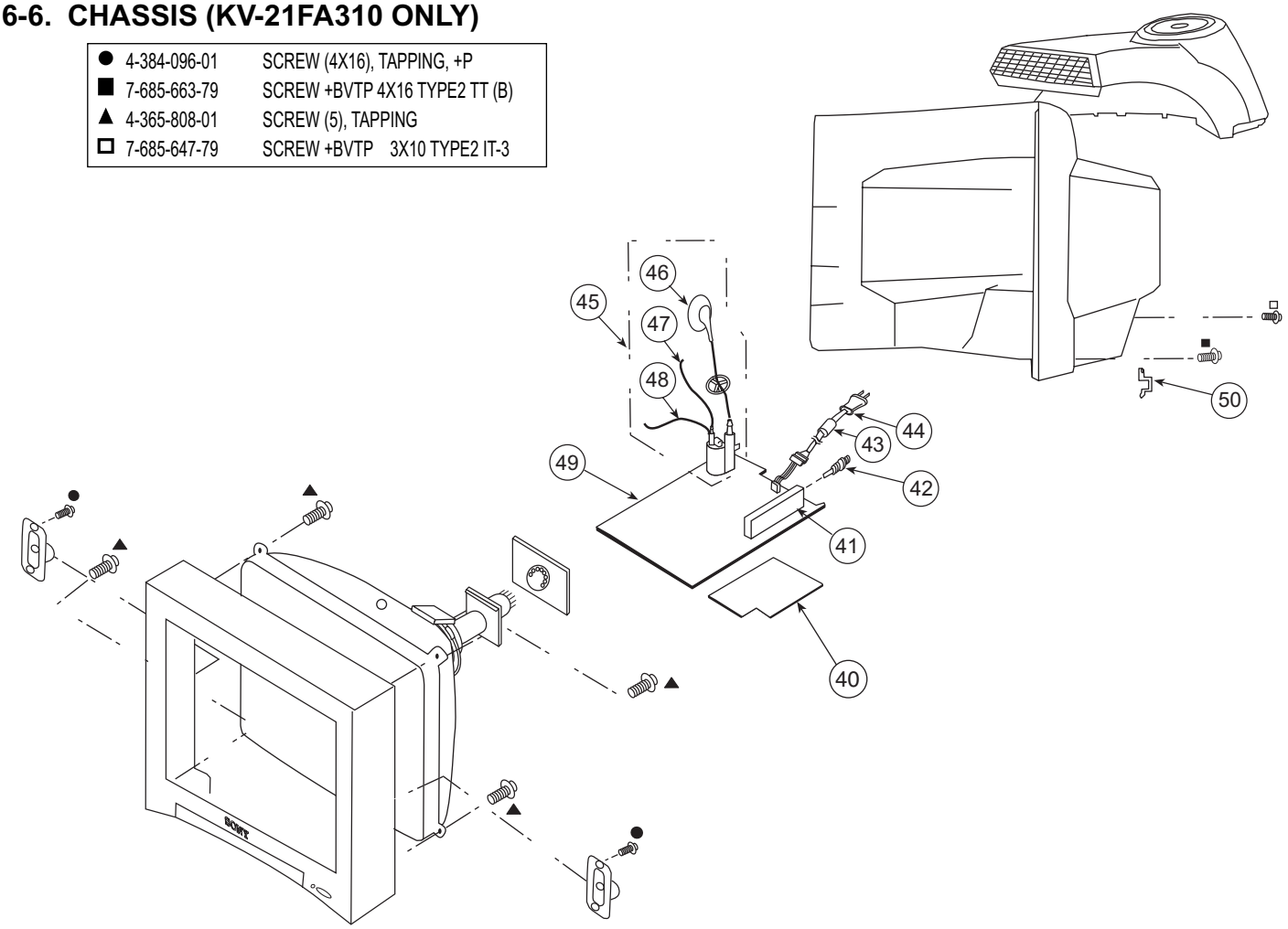
REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
* 1	4-094-381-11	LABEL, 21FA TERMINAL	
2	X-4043-168-1	BEZNET ASSY	[3-9]
3	4-046-161-21	EMBLEM, SONY NO.8	
4	4-042-192-01	CATCHER, PUSH	
5	4-087-155-11	DOOR, CONTROL	
6	4-074-895-71	LABEL, FRONT TERMINAL (20)	
7	4-087-150-41	BUTTON, POWER	
8	4-087-156-01	GUIDE, LIGHT	
9	4-087-151-01	BUTTON, MULTI	
⚠ 10	8-738-831-05	CRT 21RSN(SDP) (KV-21FA310 L NORTH ONLY)	
⚠ 10	8-738-838-05	CRT 21RSN(SDP)(SOUTH) (KV-21FA310 L SOUTH ONLY)	
* 11	A-1415-629-A	HR (VAR) BOARD, MOUNTED	
12	1-825-808-11	LOUDSPEAKER (19.2CMX4.2CM)	
⚠ 13	1-456-285-11	COIL, NA ROTATION (RT-154)	
⚠ 14	8-451-505-71	DY Y21RSA-V	
* 15	A-1410-919-A	CV (VAR) BOARD, MOUNTED	
* 16	4-080-810-21	BAND, DEGAUSS COIL	
* 17	4-375-394-01	SPRING, TENSION	
⚠ 18	1-456-153-11	COIL, DEGAUSSING	
19	4-083-414-01	PIECE A(110), CONV CORRECT	
20	1-452-032-00	MAGNET, DISC	
21	4-057-714-01	PIECE ASSY, TLH CORRECTION	
☛ 22	4-053-005-01	SPACER, DY	
⚠ 23	1-451-561-21	NECK ASSEMBLY	
24	4-087-153-04	COVER, REAR	
* 25	A-1606-602-A	SPEAKER ASSY (21)	[26-32]
* 26	4-101-825-01	GRILLE, CENTER (W21)	
27	1-825-809-11	LOUDSPEAKER (19.2CMX4.2CM)	
28	1-825-807-11	LOUDSPEAKER (13CM)	
* 29	4-101-822-01	COVER, TOP (W21)	
* 30	4-101-823-01	COVER, BOTTOM (W21)	
* 31	1-828-903-11	CONNECTION CABLE	
* 32	4-068-528-41	FOOT	

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

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

6-6. CHASSIS (KV-21FA310 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
■	7-685-663-79	SCREW +BVTP 4X16 TYPE2 TT (B)
▲	4-365-808-01	SCREW (5), TAPPING
□	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3



	REF. NO.	PART NO.	DESCRIPTION [ASSEMBLY INCLUDES]
*	40	A-1410-921-A	K BOARD, MOUNTED
⚠	41	8-598-593-50	TUNER, FSS BTF-WA421
⚠	42	1-766-374-11	PLUG, F-PIN
	43	1-500-586-11	FILTER, CLAMP (FERRITE CORE) (KV-21FA310 L SOUTH ONLY)
⚠	44	1-824-069-11	CORD, AC POWER (WITH CONNECTOR) (KV-21FA310 L NORTH ONLY)
⚠	44	1-757-840-12	CORD, POWER (WITH CONNECTOR) (KV-21FA310 L SOUTH ONLY)
⚠	45	1-453-316-21	FBT ASSY NX-1748//X4A4 [46-48]
⚠	46	1-251-642-52	CAP ASSY, HIGH-VOLTAGE
⚠	47	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD
⚠	48	1-900-803-22	WIRE ASSY, G2 LEAD

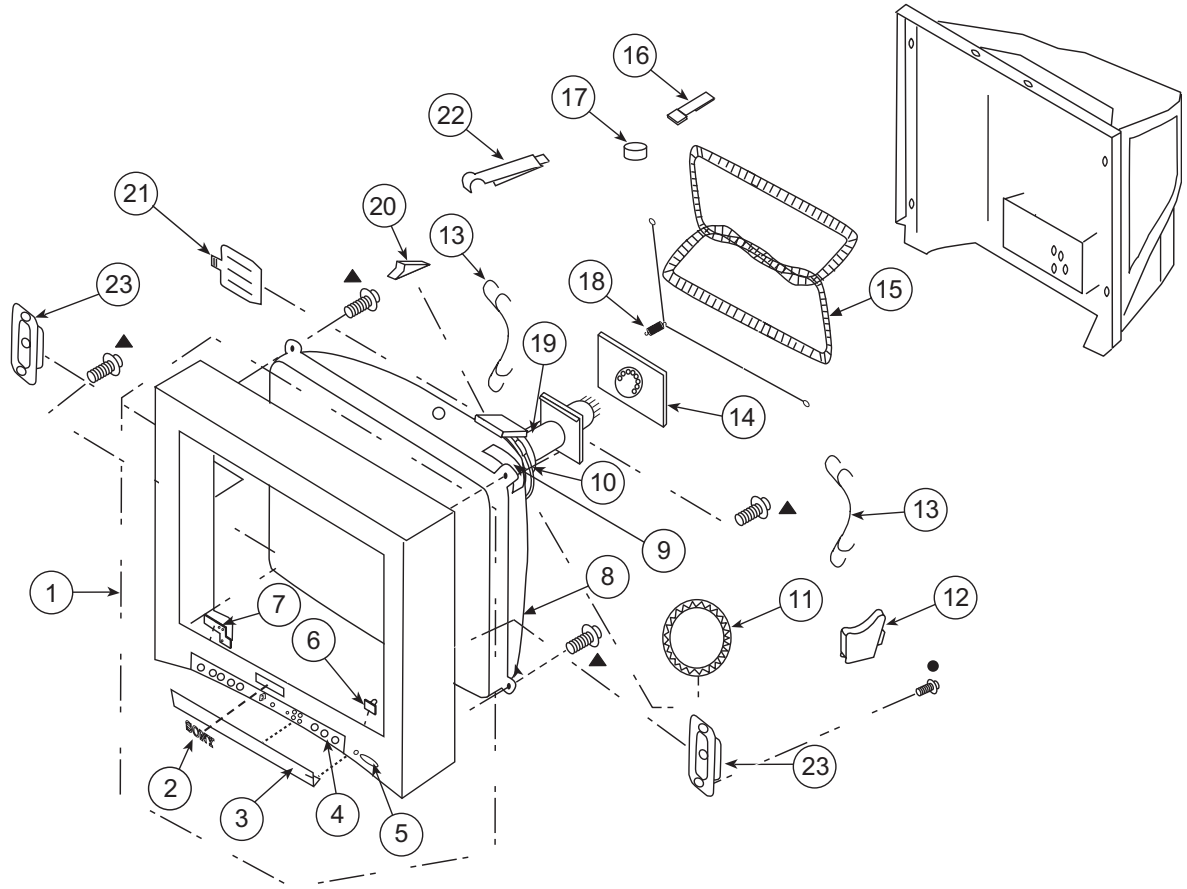
	REF. NO.	PART NO.	DESCRIPTION
*	49	A-1302-879-A	A BOARD, COMPLETE (KV-21FA310 L NORTH ONLY)
			The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 46-48)
*	49	A-1302-953-A	A BOARD, COMPLETE (KV-21FA310 L SOUTH ONLY)
			The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 46-48)
*	50	4-081-980-11	HOLDER, AC CABLE

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

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

6-7. PICTURE TUBE (KV-24FS120/25FS120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
▲	4-046-765-12	SCREW, TAPPING 7+CROWN WASHER



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
1	X-4042-991-1	BEZNET ASSY	[2-7]
2	4-046-160-31	EMBLEM, SONY NO.9	
3	4-102-301-11	DOOR	
4	4-102-307-01	LABEL, DOOR	
5	4-102-305-11	BUTTON, POWER	
6	4-102-306-01	GUIDE, LED/IR	
* 7	4-083-303-01	SPRING, METAL	
⚠ 8	8-733-250-05	CRT 25RSN	
9	4-089-346-01	CUSHION, DGC	
⚠ 10	1-451-475-11	DEFLECTION YOKE (Y25RSA)	
⚠ 11	1-452-896-11	COIL, NA ROTATION (RT-200)	
12	4-102-536-01	SUPPORT, CRT(24)	
* 13	4-080-810-21	BAND, DEGAUSS COIL	
* 14	A-1415-605-A	CV (VAR) BOARD, MOUNTED	

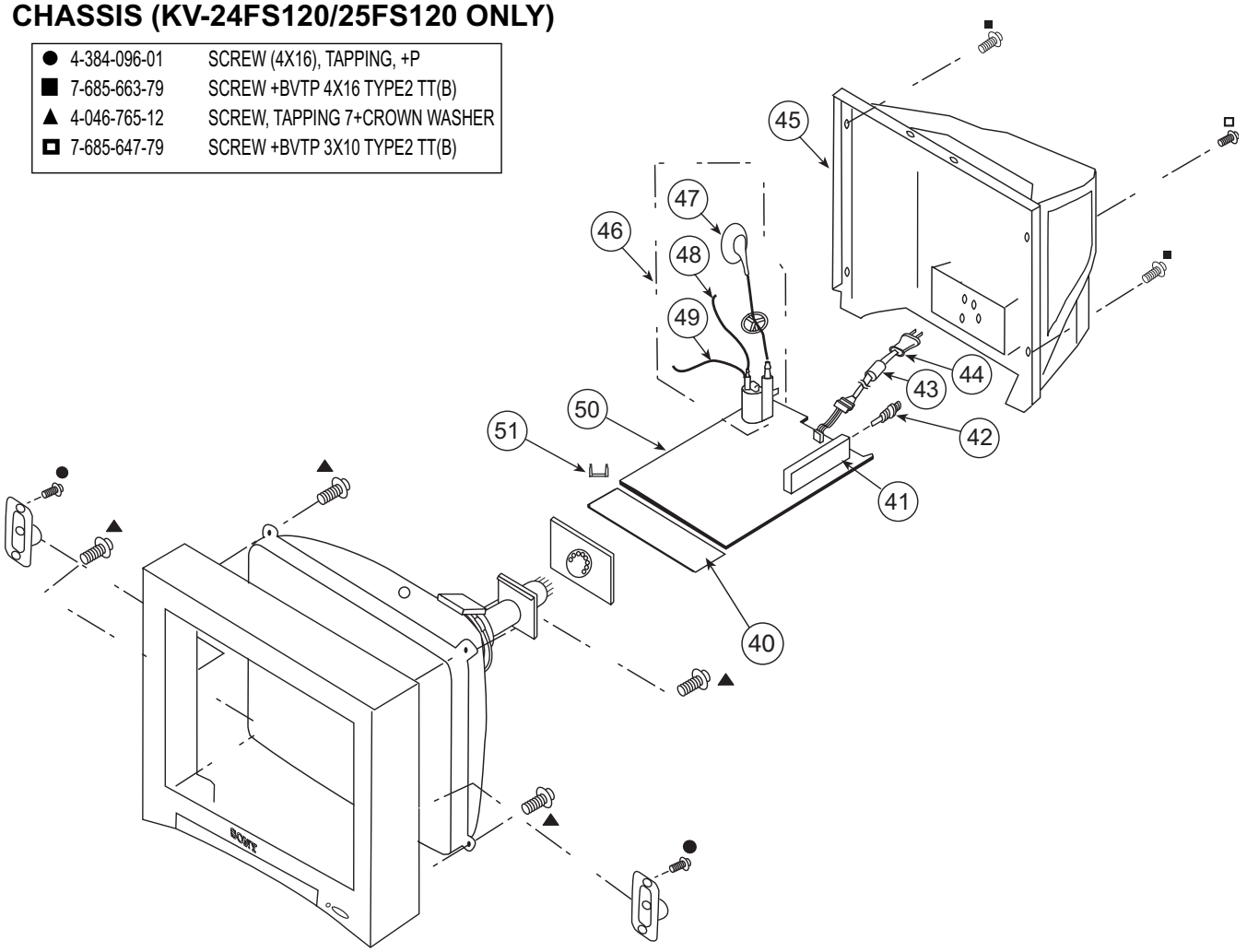
REF. NO.	PART NO.	DESCRIPTION
⚠ 15	1-419-509-21	COIL, DEGAUSSING (ALL EXCEPT KV-25FS120 L. SOUTH)
⚠ 15	1-456-576-11	DEGAUSSING COIL (KV-25FS120 L. SOUTH ONLY)
16	4-083-414-01	PIECE A(110), CONV CORRECT
17	1-452-032-00	MAGNET,DISC
18	4-036-329-01	SPRING (B), TENSION
⚠ 19	1-451-561-21	NECK ASSEMBLY
⚠ 20	4-053-005-01	SPACER, DY
21	4-057-714-01	PIECE ASSY, TLH CORRECTION
22	4-102-312-01	CLIP, DGC
23	1-825-831-11	LOUDSPEAKER (15X6.5CM)

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

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

6-8. CHASSIS (KV-24FS120/25FS120 ONLY)

●	4-384-096-01	SCREW (4X16), TAPPING, +P
■	7-685-663-79	SCREW +BVTP 4X16 TYPE2 TT(B)
▲	4-046-765-12	SCREW, TAPPING 7+CROWN WASHER
◘	7-685-647-79	SCREW +BVTP 3X10 TYPE2 TT(B)



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
* 40	A-1415-580-A	HB (VAR) BOARD, MOUNTED	
⚠ 41	8-598-593-50	TUNER, FSS BTF-WA421	
⚠ 42	1-766-374-11	PLUG, F-PIN	
43	1-500-586-11	FILTER, CLAMP (FERRITE CORE) (KV-25FS120 L. SOUTH ONLY)	
⚠ 44	1-824-069-11	CORD, AC POWER(WITH CONNECTOR) (ALL EXCEPT KV-25FS120 L. SOUTH)	
⚠ 44	1-757-840-12	CORD, POWER (WITH CONNECTOR) (KV-25FS120 L. SOUTH ONLY)	
45	4-102-310-01	COVER, REAR	
⚠ 46	1-453-336-11	FBT ASSY NX-4011//X4A4	[47-49]
⚠ 47	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠ 48	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	
⚠ 49	1-900-803-22	WIRE ASSY, G2 LEAD	

REF. NO.	PART NO.	DESCRIPTION
* 50	A-1302-944-A	A BOARD, COMPLETE (ALL EXCEPT KV-25FS120 L. SOUTH)
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
* 50	A-1303-007-A	A BOARD, COMPLETE (KV-25FS120 L. SOUTH ONLY)
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 47-49)
* 51	4-076-951-01	HINGE, PWB

SECTION 7: ELECTRICAL PARTS LIST

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

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

The components in this manual identified by the following symbol: ⋈ indicate parts that have been carefully factory-selected to satisfy regulations regarding X-ray radiation for each set.

Should replacement be required for one of these components, replace only with the value originally used.

*** Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.**

RESISTORS
- **All resistors are in ohms**
- **F : nonflammable**
- **All variable and adjustable resistors have characteristic curve B, unless otherwise noted.**

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

A

REF. NO.	PART NO.	DESCRIPTION	VALUES
*	**A-1302-879-A**	**A BOARD, COMPLETE (KV-21FA310 LATIN NORTH ONLY)**	
*	**A-1302-931-A**	**A BOARD, COMPLETE (KV-20FS120/21FS120 LATIN NORTH ONLY)**	
*	**A-1302-944-A**	**A BOARD, COMPLETE (KV-24FS120/25FS120 LATIN NORTH ONLY)**	
*	**A-1302-953-A**	**A BOARD, COMPLETE (KV-21FA310 LATIN SOUTH ONLY)**	
*	**A-1302-979-A**	**A BOARD, COMPLETE (KV-21FM120 ONLY)**	
*	**A-1302-980-A**	**A BOARD, COMPLETE (KV-21FS120 LATIN SOUTH ONLY)**	
*	**A-1303-007-A**	**A BOARD, COMPLETE (KV-25FS120 LATIN SOUTH ONLY)**	
⚠	1-533-223-11	FUSE HOLDER	0A 0V
*	4-374-846-11	COVER, CAPACITOR, CAP TYPE	
	4-382-854-11	SCREW (M3X10), P, SW (+)	

The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. Order the following leads when requesting this A Board:

⚠	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠	1-900-803-22	WIRE ASSY, G2 LEAD	
⚠	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	

CAPACITOR

C003	1-162-919-11	CERAMIC CHIP	22pF	5%	50V
C004	1-162-923-11	CERAMIC CHIP	47pF	5%	50V
C005	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C006	1-126-942-61	ELECT	1000µF	20%	25V
C007	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C008	1-126-956-91	ELECT	0.1µF	20%	50V
C009	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C010	1-126-960-11	ELECT	1µF	20%	50V
C011	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C012	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C014	1-126-960-11	ELECT	1µF	20%	50V
C015	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C019	1-126-956-91	ELECT	0.1µF	20%	50V
C021	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C022	1-126-964-11	ELECT	10µF	20%	50V
C023	1-126-935-11	ELECT	470µF	20%	16V
C033	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C041	1-126-964-11	ELECT	10µF	20%	50V
C047	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C048	1-104-665-11	ELECT	100µF	20%	25V
C049	1-126-960-11	ELECT	1µF	20%	50V
C051	1-126-964-11	ELECT	10µF	20%	50V
C052	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C053	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C054	1-126-960-11	ELECT	1µF	20%	50V
C056	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C057	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C064	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C074	1-126-964-11	ELECT	10µF	20%	50V
C075	1-126-935-11	ELECT	470µF	20%	16V
C076	1-104-665-11	ELECT	100µF	20%	25V
C077	1-126-947-11	ELECT	47µF	20%	35V
C079	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C080	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C081	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C090	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C091	1-126-947-11	ELECT	47µF	20%	35V
C092	1-126-947-11	ELECT	47µF	20%	35V
C094	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C095	1-126-947-11	ELECT	47µF	20%	35V
C096	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C097	1-126-947-11	ELECT	47µF	20%	35V
C098	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C099	1-126-947-11	ELECT	47µF	20%	35V
C100	1-126-956-91	ELECT	0.1µF	20%	50V

A

REF. NO.	PART NO.	DESCRIPTION	VALUES		
C115	1-164-739-11	CERAMIC CHIP	560pF	5%	50V
C116	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C200	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C202	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C203	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C204	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
	(KV-21FA310LN/21FA310LS ONLY)				
C204	1-216-864-11	CHIP, CONDUCTOR	0		
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C205	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
	(KV-21FA310LN/21FA310LS ONLY)				
C205	1-216-864-11	CHIP, CONDUCTOR	0		
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C212	1-126-963-11	ELECT	4.7µF	20%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C213	1-126-963-11	ELECT	4.7µF	20%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C220	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C301	1-126-956-91	ELECT	0.1µF	20%	50V
C302	1-126-956-91	ELECT	0.1µF	20%	50V
C303	1-126-956-91	ELECT	0.1µF	20%	50V
C304	1-126-956-91	ELECT	0.1µF	20%	50V
C305	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C306	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C307	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C309	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C313	1-126-956-91	ELECT	0.1µF	20%	50V
C318	1-126-964-11	ELECT	10µF	20%	50V
C319	1-126-964-11	ELECT	10µF	20%	50V
C325	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
C326	1-164-505-11	CERAMIC CHIP	2.2µF	16V	
C328	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C330	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C337	1-162-919-11	CERAMIC CHIP	22pF	5%	50V
C351	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C370	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C390	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C400	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
	(KV-21FA310LN/21FA310LS ONLY)				
C401	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
C402	1-164-174-11	CERAMIC CHIP	0.0082µF	10%	25V
	(KV-21FA310LN/21FA310LS ONLY)				
C403	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C404	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C405	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
	(KV-21FA310LN/21FA310LS ONLY)				
C406	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
	(KV-21FA310LN/21FA310LS ONLY)				
C407	1-162-965-11	CERAMIC CHIP	0.0015µF	10%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C407	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C408	1-162-965-11	CERAMIC CHIP	0.0015µF	10%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C408	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C409	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	(KV-21FA310LN/21FA310LS ONLY)				
C409	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C410	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	(KV-21FA310LN/21FA310LS ONLY)				
C410	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C411	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
	(KV-21FA310LN/21FA310LS ONLY)				
C412	1-126-960-11	ELECT	1µF	20%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C412	1-124-252-00	ELECT	0.33µF	20%	50V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C413	1-126-963-11	ELECT	4.7µF	20%	50V
C414	1-126-961-11	ELECT	2.2µF	20%	50V
C415	1-126-963-11	ELECT	4.7µF	20%	50V
C416	1-126-960-11	ELECT	1µF	20%	50V
C417	1-126-960-11	ELECT	1µF	20%	50V
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
C418	1-126-963-11	ELECT	4.7µF	20%	50V
	(KV-21FA310LN/21FA310LS ONLY)				
C419	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C420	1-126-960-11	ELECT	1µF	20%	50V
C421	1-126-965-91	ELECT	22µF	20%	50V
C422	1-126-960-11	ELECT	1µF	20%	50V
C423	1-126-963-11	ELECT	4.7µF	20%	50V
C424	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C430	1-126-963-11	ELECT	4.7µF	20%	50V
	(ALL EXCEPT KV-21FM120)				

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	C431	1-126-963-11	ELECT	4.7µF	20%	50V
		(ALL EXCEPT KV-21FM120)				
	C436	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	C440	1-126-965-91	ELECT	22µF	20%	50V
		(KV-21FA310LN/21FA310LS ONLY)				
	C441	1-126-965-91	ELECT	22µF	20%	50V
		(KV-21FA310LN/21FA310LS ONLY)				
	C450	1-126-943-11	ELECT	2200µF	20%	25V
	C451	1-126-959-11	ELECT	0.47µF	20%	50V
	C452	1-126-960-11	ELECT	1µF	20%	50V
	C457	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
		(KV-21FA310LN/21FA310LS ONLY)				
	C457	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
		(ALL EXCEPT 21FA310LN/21FA310LS)				
	C458	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
		(KV-21FA310LN/21FA310LS ONLY)				
	C458	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
		(ALL EXCEPT 21FA310LN/21FA310LS)				
	C460	1-126-943-11	ELECT	2200µF	20%	25V
	C461	1-126-943-11	ELECT	2200µF	20%	25V
	C462	1-126-943-11	ELECT	2200µF	20%	25V
	C463	1-126-943-11	ELECT	2200µF	20%	25V
	C470	1-126-935-11	ELECT	470µF	20%	16V
		(KV-21FA310LN/21FA310LS ONLY)				
	C501	1-126-959-11	ELECT	0.47µF	20%	50V
	C502	1-102-112-00	CERAMIC	330pF	10%	50V
	C503	1-106-383-00	MYLAR	0.047µF	10%	200V
	C504	1-102-228-00	CERAMIC	470pF	10%	500V
	C505	1-102-228-00	CERAMIC	470pF	10%	500V
⚠	C506	1-117-214-11	CERAMIC	0.001µF	10%	2KV
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	C506	1-162-116-00	CERAMIC	680pF	10%	2KV
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
⚠	C507	1-117-642-11	FILM	8200pF	3%	1.2KV
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	C507	1-127-717-21	FILM	19000pF	3%	1.2KV
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
⚠	C508	1-129-722-00	FILM	0.047µF	5%	630V
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	C508	1-130-895-00	FILM	0.056µF	5%	400V
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				

REF. NO.	PART NO.	DESCRIPTION	VALUES		
C509	1-126-964-11	ELECT	10µF	20%	50V
C510	1-117-214-11	CERAMIC	0.001µF	10%	2KV
C511	1-115-521-11	FILM	0.82µF	5%	250V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C511	1-117-813-11	FILM	0.75µF	5%	250V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C512	1-104-987-11	MYLAR	0.001µF	5%	200V
C513	1-106-383-00	MYLAR	0.047µF	10%	200V
C514	1-115-519-11	FILM	0.82µF	5%	250V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C514	1-115-521-11	FILM	0.56µF	5%	250V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C515	1-107-651-11	ELECT	4.7µF	20%	250V
C516	1-117-661-11	ELECT	0.15µF	5%	250V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C519	1-216-864-11	SHORT CHIP			
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C519	1-216-828-11	METAL CHIP	3.9K	5%	1/10W
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C520	1-126-965-91	ELECT	22µF	20%	50V
C521	1-126-960-11	ELECT	1µF	20%	50V
C522	1-102-244-00	CERAMIC	220pF	10%	500V
C523	1-165-529-11	MYLAR	0.22µF	10	275V
C525	1-164-646-11	CERAMIC	2200pF	10%	500V
C526	1-102-244-00	CERAMIC	220pF	10%	500V
C527	1-107-645-11	ELECT	22µF	20%	200V
C529	1-164-690-91	CERAMIC CHIP	0.0022µF	5%	50V
C534	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C534	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C535	1-137-372-11	MYLAR	0.022µF	5%	50V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C536	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
C536	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
C537	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C539	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C542	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C544	1-126-967-11	ELECT	47µF	20%	50V
C545	1-126-969-11	ELECT	220µF	20%	50V
C546	1-137-194-81	FILM	0.47µF	5%	50V

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	C549	1-101-821-00	CERAMIC	0.0022µF		500V
	C550	1-104-666-11	ELECT	220µF	20%	25V
	C551	1-126-960-11	ELECT	1µF	20%	50V
	C552	1-126-964-11	ELECT	10µF	20%	50V
	C553	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	C554	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
	C555	1-101-821-00	CERAMIC	0.0022µF		500V
	C558	1-162-318-11	CERAMIC	0.001µF	10%	500V
	C559	1-216-864-11	SHORT CHIP			
	C560	1-216-833-11	METAL CHIP	10K	5%	1/10W
	C561	1-126-963-11	ELECT	4.7µF	20%	50V
	C562	1-104-666-11	ELECT	220µF	20%	25V
	C563	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
	C566	1-107-635-11	ELECT	4.7µF	20%	160V
	C570	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
	C571	1-104-665-11	ELECT	100µF	20%	25V
	C581	1-136-161-00	FILM	0.047µF	5%	50V
	C582	1-106-387-00	MYLAR	0.068µF	10%	200V
	C585	1-104-666-11	ELECT	220µF	20%	25V
⚠	C588	1-137-417-11	MYLAR	0.015µF	10%	100V
	C589	1-128-560-11	ELECT	22µF	20%	100V
	C590	1-126-964-11	ELECT	10µF	20%	50V
	C594	1-123-024-21	ELECT	33µF		160V
	C595	1-104-666-11	ELECT	220µF	20%	25V
	C597	1-104-666-11	ELECT	220µF	20%	25V
	C600	1-126-964-11	ELECT	10µF	20%	50V
	C601	1-117-703-11	CERAMIC	0.0047µF		250V
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
⚠	C602	1-165-529-11	MYLAR	0.22µF	10	275V
⚠	C603	1-165-529-11	MYLAR	0.22µF	10	275V
⚠	C605	1-117-699-11	CERAMIC	0.001µF	99%	250V
	C609	1-126-942-61	ELECT	1000µF	20%	25V
	C610	1-164-645-11	CERAMIC	1000pF	10%	500V
	C611	1-126-971-11	ELECT	470µF	20%	50V
	C612	1-126-961-11	ELECT	2.2µF	20%	50V
	C613	1-161-964-91	CERAMIC	0.0047µF		250V
	C615	1-161-964-91	CERAMIC	0.0047µF		250V
	C616	1-126-943-11	ELECT	2200µF	20%	25V
	C617	1-107-935-11	ELECT	330µF	20%	100V
	C618	1-107-935-11	ELECT	330µF	20%	100V
	C620	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
	C621	1-117-893-11	ELECT	470µF	20%	250V
		(ALL EXCEPT KV-21FM120)				

	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	C621	1-165-921-11	ELECT	390µF	20%	250V
		(KV-21FM120 ONLY)				
	C624	1-107-636-11	ELECT	10µF	20%	160V
	C625	1-126-964-11	ELECT	10µF	20%	50V
	C629	1-117-893-11	ELECT	470µF	20%	250V
		(ALL EXCEPT KV-21FM120)				
	C629	1-165-921-11	ELECT	390µF	20%	250V
		(KV-21FM120 ONLY)				
⚠	C631	1-113-896-11	CERAMIC	220pF	10%	250V
	C632	1-126-967-11	ELECT	47µF	20%	50V
	C633	1-136-479-11	FILM	0.001µF	5%	100V
	C634	1-126-947-11	ELECT	47µF	20%	35V
	C635	1-126-963-11	ELECT	4.7µF	20%	50V
	C636	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	C637	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	C638	1-104-665-11	ELECT	100µF	20%	25V
	C640	1-164-645-11	CERAMIC	1000pF	10%	500V
	C642	1-126-969-11	ELECT	220µF	20%	50V
	C643	1-130-777-00	MYLAR	0.1µF	5%	100V
	C645	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
	C647	1-126-947-11	ELECT	47µF	20%	35V
	C648	1-104-330-91	CERAMIC	470pF	10%	1KV
		(ALL EXCEPT KV-21FM120)				
	C648	1-125-969-91	CERAMIC	680pF	10%	1KV
		(KV-21FM120 ONLY)				
	C650	1-126-942-61	ELECT	1000µF	20%	25V
	C651	1-126-942-61	ELECT	1000µF	20%	25V
	C652	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
	C655	1-104-330-91	CERAMIC	470pF	10%	1KV
		(ALL EXCEPT KV-21FM120)				
	C655	1-125-969-91	CERAMIC	680pF	10%	1KV
		(KV-21FM120 ONLY)				
	C660	1-126-947-11	ELECT	47µF	20%	35V
	C661	1-104-665-11	ELECT	100µF	20%	25V
	C665	1-104-665-11	ELECT	100µF	20%	25V
	C672	1-137-756-22	FILM	22000pF	3%	800V
		(ALL EXCEPT KV-21FM120)				
	C672	1-165-608-11	FILM	15000pF	3%	800V
		(KV-21FM120 ONLY)				
	C673	1-126-963-11	ELECT	4.7µF	20%	50V
⚠	C680	1-117-699-11	CERAMIC	0.001µF	99%	250V
	C690	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V

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	REF. NO.	PART NO.	DESCRIPTION	VALUES
		CONNECTOR		
*	CN002	1-564-509-11	PLUG, CONNECTOR	6P
		(KV-21FA310LN/21FS310LS ONLY)		
*	CN002	1-564-510-11	PLUG, CONNECTOR	7P
		(ALL EXCEPT KV-21FA310LN/21FS310LS)		
*	CN003	1-560-124-00	PLUG, CONNECTOR (2.5MM)	4P
*	CN005	1-564-515-11	PLUG, CONNECTOR	12P
		(ALL EXCEPT KV-21FA310LN/21FS310LS)		
*	CN401	1-564-507-11	PLUG, CONNECTOR	4P
		(KV-21FA310LN/21FS310LS ONLY)		
*	CN501	1-508-786-00	PIN, CONNECTOR (5MM PITCH)	2P
*	CN515	1-580-798-11	CONNECTOR PIN (DY)	6P
		(ALL EXCEPT KV-21FA310LN/21FS310LS)		
*	CN586	1-564-509-11	PLUG, CONNECTOR	6P
⚠*	CN600	1-580-843-11	PIN, CONNECTOR (POWER)	
		DIODE		
	D002	8-719-109-89	DIODE	RD5.6ESB2
	D003	8-719-110-17	DIODE	RD10ESB2
	D004	8-719-110-17	DIODE	RD10ESB2
	D005	8-719-110-17	DIODE	RD10ESB2
	D006	8-719-921-44	DIODE	MTZJ-5.1C
	D007	8-719-982-22	DIODE	MTZJ-30D
	D046	8-719-109-89	DIODE	RD5.6ESB2
	D047	8-719-109-89	DIODE	RD5.6ESB2
	D050	8-719-510-02	DIODE	D1NS4
	D051	6-500-175-01	DIODE	1E3-TB
	D052	8-719-109-89	DIODE	RD5.6ESB2
	D200	8-719-929-15	DIODE	HZS9.1NB2
	D201	8-719-929-15	DIODE	HZS9.1NB2
	D202	8-719-929-15	DIODE	HZS9.1NB2
	D203	8-719-929-15	DIODE	HZS9.1NB2
	D206	8-719-070-62	DIODE	PDZ9.1B-115
		(KV-21FA310LN/21FS310LS ONLY)		
	D207	1-216-864-11	SHORT CHIP	
		(KV-21FA310LN/21FS310LS ONLY)		
	D207	8-719-404-50	DIODE	MA111-TX
		(ALL EXCEPT KV-21FA310LN/21FS310LS)		
	D208	8-719-929-15	DIODE	HZS9.1NB2
		(KV-21FA310LN/21FS310LS ONLY)		
	D209	1-216-864-11	SHORT CHIP	
		(KV-21FA310LN/21FS310LS ONLY)		

REF. NO.	PART NO.	DESCRIPTION	VALUES
D209	8-719-404-50	DIODE	MA111-TX
	(ALL EXCEPT KV-21FA310LN/21FS310LS)		
D230	8-719-108-12	DIODE	RD9.1EW
D231	8-719-108-12	DIODE	RD9.1EW
	(KV-21FA310LN/24FS120/25FS120LN/21FA310LS/25FS120LS ONLY)		
D232	8-719-108-12	DIODE	RD9.1EW
D234	8-719-108-12	DIODE	RD9.1EW
	(ALL EXCEPT KV-21FM120)		
D235	8-719-108-12	DIODE	RD9.1EW
	(ALL EXCEPT KV-21FM120)		
D236	8-719-108-12	DIODE	RD9.1EW
	(ALL EXCEPT KV-21FM120)		
D237	8-719-108-12	DIODE	RD9.1EW
	(KV-21FA310LN/24FS120/25FS120LN/21FA310LS/25FS120LS ONLY)		
D321	8-719-110-17	DIODE	RD10ESB2
D351	8-719-109-66	DIODE	RD3.3ESB2
D390	8-719-404-50	DIODE	MA111-TX
D401	8-719-921-63	DIODE	MTZJ-7.5B
D405	8-719-991-33	DIODE	1SS133T-77
D412	1-216-864-11	SHORT CHIP	
D414	8-719-921-63	DIODE	MTZJ-7.5B
	(KV-21FA310LN/21FA310LS ONLY)		
D420	8-719-072-68	DIODE	PDZ13B-115
D430	8-719-929-15	DIODE	HZS9.1NB2
	(ALL EXCEPT KV-21FM120)		
D431	8-719-929-15	DIODE	HZS9.1NB2
	(ALL EXCEPT KV-21FM120)		
D432	8-719-108-12	DIODE	RD9.1EW
	(ALL EXCEPT KV-21FA310LN/21FA310LS)		
D500	8-719-404-50	DIODE	MA111-TX
D501	8-719-404-50	DIODE	MA111-TX
D505	8-719-081-00	DIODE	BY228/A52A/
D506	8-719-979-85	DIODE	EGP20G
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
D506	6-500-485-01	DIODE	FR305G-E
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
D507	8-719-991-33	DIODE	1SS133T-77
D508	8-719-404-50	DIODE	MA111-TX
D513	8-719-404-50	DIODE	MA111-TX
D514	8-719-908-03	DIODE	GP08D
D515	8-719-908-03	DIODE	GP08D
D525	8-719-991-33	DIODE	1SS133T-77
D526	8-719-074-25	DIODE	PG104R
D528	8-719-991-33	DIODE	1SS133T-77

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REF. NO.	PART NO.	DESCRIPTION	VALUES
D545	8-719-908-03	DIODE	GP08D
D558	8-719-404-50	DIODE	MA111-TX
D559	8-719-404-50	DIODE	MA111-TX
D562	8-719-991-33	DIODE	1SS133T-77
D566	8-719-979-84	DIODE	EGP20DPKG23
D567	8-719-991-33	DIODE	1SS133T-77
D568	8-719-110-08	DIODE	RD8.2ESB2
D569	8-719-921-44	DIODE	MTZJ-5.1C
D587	8-719-074-25	DIODE	PG104R
D589	8-719-991-33	DIODE	1SS133T-77
D596	8-719-063-70	DIODE	D1NL20U
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
D596	6-500-531-01	DIODE	PG154R
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
D598	8-719-063-70	DIODE	D1NL20U
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
D598	6-500-531-01	DIODE	PG154R
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
D603	8-719-064-12	DIODE	S1NB60-4062
D604	6-500-890-01	DIODE	1N5406G-EB
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
D605	8-719-510-53	DIODE	D4SB60L
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)		
D606	6-500-890-01	DIODE	1N5406G-EB
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
D611	8-719-510-73	DIODE	S3L20µF4
D612	8-719-068-00	DIODE	ERC04-06SE
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
D613	8-719-068-00	DIODE	ERC04-06SE
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
D614	8-719-057-52	DIODE	EZ0150AV1
D615	6-500-177-01	DIODE	MA7D50
D618	8-719-979-64	DIODE	µF4005PKG23
D620	8-719-911-19	DIODE	1SS119-25
D621	8-719-510-37	DIODE	D5LC20U
D624	8-719-510-73	DIODE	S3L20µF4
D628	8-719-404-50	DIODE	MA111-TX
D629	8-719-110-31	DIODE	RD12ESB2
D631	6-500-175-01	DIODE	1E3-TB
D641	8-719-991-33	DIODE	1SS133T-77
D642	8-719-982-22	DIODE	MTZJ-30D
D644	8-719-110-31	DIODE	RD12ESB2
D645	8-719-109-89	DIODE	RD5.6ESB2
D650	8-719-109-89	DIODE	RD5.6ESB2

REF. NO.	PART NO.	DESCRIPTION	VALUES
	FUSE		
⚠ F601	1-576-193-11	FUSE	6.3A 125V
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)		
⚠ F601	1-532-506-51	FUSE	6.3A 250V
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)		
	FERRITE BEAD		
FB301	1-410-397-21	FERRITE	1.1µH
FB505	1-410-397-21	FERRITE	1.1µH
FB506	1-410-397-21	FERRITE	1.1µH
FB522	1-410-397-21	FERRITE	1.1µH
FB601	1-410-397-21	FERRITE	1.1µH
FB602	1-410-397-21	FERRITE	1.1µH
FB603	1-410-397-21	FERRITE	1.1µH
FB604	1-410-397-21	FERRITE	1.1µH
FB605	1-410-397-21	FERRITE	1.1µH
FB616	1-469-578-11	FERRITE	1.1µH
FB617	1-469-578-11	FERRITE	1.1µH
	FILTER		
FL001	1-239-803-11	ENCAPSULATED	COMPONENT
	IC		
⚠ IC001	6-804-178-01	IC	M65582AµF-XXXFP
IC002	6-704-004-01	IC	BR24L16F-WE2
IC003	8-759-352-91	IC	PST9143NL
IC321	8-759-353-00	IC	NJM2534M(TE2)
IC400	6-706-033-01	IC	NJW1172JK1-TE2
	(KV-21FA310LN/21FA310LS ONLY)		
IC401	6-706-032-01	IC	NJW1142M(TE2)
	(ALL EXCEPT KV-21FA310LN/21FA310LS ONLY)		
IC404	6-705-054-01	IC	TDA8947J
IC545	6-703-470-01	IC	STV9302A
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
IC545	8-759-696-71	IC	STV9379A
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
⚠ IC561	8-759-700-07	IC	NJM2903M
IC565	8-759-700-44	IC	NJM2902M
IC600	6-705-810-01	IC	MCZ3001DB
IC603	6-705-466-01	IC	BA90BC0T
	(KV-21FA310LN/21FA310LS ONLY)		
IC603	6-705-818-01	IC	MC7809CF
	(ALL EXCEPT KV-21FA310LN/21FA310LS)		

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	REF. NO.	PART NO.	DESCRIPTION	VALUES
⚠	IC604	8-749-012-13	IC	DM-58
	IC608	8-759-450-47	IC	BA05T
	IC633	6-703-080-01	IC	LF33CV
		JACK		
	J200	1-794-115-11	JACK BLOCK	2P
		(KV-21FM120 ONLY)		
	J200	1-794-118-11	JACK BLOCK	3P
		(KV-20FS120/21FS120LN/21FS120LS ONLY)		
	J200	1-794-119-11	TERMINAL BLOCK, S	4P
		(KV-21FA310LN/24FS120/25FS120LN/21FA310LS/25FS120LS ONLY)		
	J201	1-794-048-11	JACK, PIN	3P
		(KV-21FA310LN/21FA310LS ONLY)		
*	J203	1-817-461-11	PIN JACK BLOCK	5P
		(ALL EXCEPT KV-21FM120)		
*	J205	1-818-352-11	PIN JACK W/DIN CONNECTOR	
		(KV-21FA310LN/21FA310LS ONLY)		
	J401	1-750-264-11	JACK	
		(KV-21FA310LN/21FA310LS ONLY)		
		CHIP CONDUCTOR		
	JR2	1-216-864-11	SHORT CHIP	
	JR6	1-216-864-11	SHORT CHIP	
	JR7	1-216-864-11	SHORT CHIP	
	JR12	1-216-864-11	SHORT CHIP	
	JR44	1-216-864-11	SHORT CHIP	
	JR102	1-216-864-11	SHORT CHIP	
	JR128	1-216-864-11	SHORT CHIP	
	JR201	1-216-864-11	SHORT CHIP	
	JR207	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR209	1-216-864-11	SHORT CHIP	
	JR211	1-216-864-11	SHORT CHIP	
	JR212	1-216-864-11	SHORT CHIP	
	JR213	1-216-864-11	SHORT CHIP	
	JR214	1-216-864-11	SHORT CHIP	
	JR215	1-216-864-11	SHORT CHIP	
	JR255	1-216-864-11	SHORT CHIP	
	JR301	1-216-864-11	SHORT CHIP	
	JR302	1-216-864-11	SHORT CHIP	
	JR303	1-216-864-11	SHORT CHIP	
	JR304	1-216-864-11	SHORT CHIP	
	JR305	1-216-864-11	SHORT CHIP	
	JR306	1-216-864-11	SHORT CHIP	
	JR310	1-216-864-11	SHORT CHIP	
	JR311	1-216-864-11	SHORT CHIP	
	JR312	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR315	1-216-864-11	SHORT CHIP	
	JR317	1-216-864-11	SHORT CHIP	
	JR401	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR402	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR403	1-216-864-11	SHORT CHIP	
		(ALL EXCEPT KV-21FM120)		
	JR411	1-216-864-11	SHORT CHIP	
	JR485	1-216-864-11	SHORT CHIP	
	JR486	1-216-864-11	SHORT CHIP	
	JR504	1-216-864-11	SHORT CHIP	
	JR585	1-216-864-11	SHORT CHIP	
	JR586	1-216-864-11	SHORT CHIP	
	JR1502	1-216-864-11	SHORT CHIP	
		JUMPER WIRE		
	JW57	1-249-409-11	CARBON	220 5% 1/4W
		COIL		
	L002	1-239-803-11	ENCAPSULATED	COMPONENT
	L003	1-239-803-11	ENCAPSULATED	COMPONENT
	L004	1-239-803-11	ENCAPSULATED	COMPONENT
	L005	1-239-803-11	ENCAPSULATED	COMPONENT
	L006	1-414-273-11	INDUCTOR	100µH
	L007	1-414-273-11	INDUCTOR	100µH
	L008	1-414-857-11	INDUCTOR	100µH
	L009	1-414-857-11	INDUCTOR	100µH
	L010	1-414-267-21	INDUCTOR	10µH
	L011	1-239-803-11	ENCAPSULATED	COMPONENT
	L101	1-414-229-11	FERRITE	0µH
⚠	L510	1-406-981-21	INDUCTOR	470µH
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
	L513	1-406-677-11	INDUCTOR	10MH
	L515	1-412-552-11	INDUCTOR	2.2MH

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REF. NO.	PART NO.	DESCRIPTION	VALUES
L516	1-406-978-11	INDUCTOR	150µH
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
L525	1-409-955-31	INDUCTOR	8MH
L527	1-410-397-21	FERRITE	1.1µH
L588	1-412-528-11	INDUCTOR	18µH
L606	1-412-525-31	INDUCTOR	10µH
L607	1-412-525-31	INDUCTOR	10µH
L608	1-412-533-21	INDUCTOR	47µH
L609	1-412-525-31	INDUCTOR	10µH
	PHOTO COUPLER		
⚠ PH602	8-749-010-64	PHOTO COUPLER	PC123F2
	IC LINK		
PS401	1-576-337-21	IC LINK	2.7A 50V
	TRANSISTOR		
Q002	8-729-422-27	TRANSISTOR	2SD601A-Q
Q004	8-729-422-27	TRANSISTOR	2SD601A-Q
Q005	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q006	8-729-422-27	TRANSISTOR	2SD601A-Q
Q008	8-729-422-27	TRANSISTOR	2SD601A-Q
Q009	8-729-422-27	TRANSISTOR	2SD601A-Q
Q300	8-729-422-27	TRANSISTOR	2SD601A-Q
Q301	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q303	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q304	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q305	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q306	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q316	8-729-422-27	TRANSISTOR	2SD601A-Q
Q390	8-729-422-27	TRANSISTOR	2SD601A-Q
Q391	8-729-422-27	TRANSISTOR	2SD601A-Q
Q400	8-729-422-27	TRANSISTOR	2SD601A-Q
	(KV-21FA310LN/21FA310LS ONLY)		
Q401	8-729-422-27	TRANSISTOR	2SD601A-Q
	(KV-21FA310LN/21FA310LS ONLY)		
Q403	8-729-422-27	TRANSISTOR	2SD601A-Q
	(KV-21FA310LN/21FA310LS ONLY)		
Q404	8-729-422-27	TRANSISTOR	2SD601A-Q
Q411	8-729-422-27	TRANSISTOR	2SD601A-Q
Q412	8-729-422-27	TRANSISTOR	2SD601A-Q
	(KV-21FA310LN/21FA310LS ONLY)		
Q420	8-729-422-27	TRANSISTOR	2SD601A-Q
Q421	8-729-422-27	TRANSISTOR	2SD601A-Q
Q501	8-729-423-33	TRANSISTOR	2SC3311A-QRSTA
Q502	8-729-140-50	TRANSISTOR	2SC3209LK
Q503	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q504	8-729-422-27	TRANSISTOR	2SD601A-Q
Q505	6-550-041-01	TRANSISTOR	2SD2634-Y
	(KV-24FS120/25FS120LN/25FS120LS ONLY)		
⚠ Q506	6-550-042-01	TRANSISTOR	2SD2627LS-YB11
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)		
Q519	8-729-422-27	TRANSISTOR	2SD601A-Q
Q521	8-729-423-33	TRANSISTOR	2SC3311A-QRSTA
Q522	8-729-053-87	TRANSISTOR	KTC4370A
Q531	8-729-422-27	TRANSISTOR	2SD601A-Q
Q533	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q572	8-729-422-27	TRANSISTOR	2SD601A-Q
Q573	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q578	8-729-422-27	TRANSISTOR	2SD601A-Q
Q590	6-550-362-01	TRANSISTOR	KTA1279
Q600	8-729-053-36	TRANSISTOR	2SK2640-01MR-F122
	(ALL EXCEPT KV-21FM120)		
Q600	8-729-052-29	TRANSISTOR	2SK2876-01MR-F122
	(KV-21FM120 ONLY)		
Q601	8-729-053-36	TRANSISTOR	2SK2640-01MR-F122
	(ALL EXCEPT KV-21FM120)		
Q601	8-729-052-29	TRANSISTOR	2SK2876-01MR-F122
	(KV-21FM120 ONLY)		
Q604	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q608	8-729-922-37	TRANSISTOR	2SD2144S-UVW
Q650	6-550-409-01	TRANSISTOR	KSC2383-O
Q860	8-729-422-27	TRANSISTOR	2SD601A-Q
	RESISTOR		
R002	1-216-864-11	SHORT CHIP	
R003	1-216-821-11	METAL CHIP	1K 5% 1/10W
R004	1-216-817-11	METAL CHIP	470 5% 1/10W
R005	1-400-427-21	FERRITE	0µH
R006	1-216-829-11	METAL CHIP	4.7K 5% 1/10W
R007	1-400-427-21	FERRITE	0µH
R015	1-216-833-11	METAL CHIP	10K 5% 1/10W
R027	1-218-732-11	METAL CHIP	47K 0.50% 1/10W

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R028	1-249-409-11	CARBON	220	5%	1/4W
R029	1-249-409-11	CARBON	220	5%	1/4W
	(ALL EXCEPT KV-21FM120)				
R030	1-249-409-11	CARBON	220	5%	1/4W
	(ALL EXCEPT KV-21FM120)				
R031	1-216-813-11	METAL CHIP	220	5%	1/10W
R032	1-216-813-11	METAL CHIP	220	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R033	1-249-409-11	CARBON	220	5%	1/4W
R035	1-216-809-11	METAL CHIP	100	5%	1/10W
R037	1-216-833-11	METAL CHIP	10K	5%	1/10W
R038	1-216-821-11	METAL CHIP	1K	5%	1/10W
R039	1-216-815-11	METAL CHIP	330	5%	1/10W
R040	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R041	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R042	1-216-813-11	METAL CHIP	220	5%	1/10W
R043	1-216-813-11	METAL CHIP	220	5%	1/10W
R044	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R045	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R047	1-249-409-11	CARBON	220	5%	1/4W
R048	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R049	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R050	1-249-425-11	CARBON	4.7K	5%	1/4W
R051	1-249-417-11	CARBON	1K	5%	1/4W
R052	1-216-813-11	METAL CHIP	220	5%	1/10W
R053	1-249-433-11	CARBON	22K	5%	1/4W
R054	1-249-433-11	CARBON	22K	5%	1/4W
R055	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R056	1-216-833-11	METAL CHIP	10K	5%	1/10W
R057	1-249-417-11	CARBON	1K	5%	1/4W
R058	1-249-429-11	CARBON	10K	5%	1/4W
R059	1-249-417-11	CARBON	1K	5%	1/4W
R060	1-249-409-11	CARBON	220	5%	1/4W
	(ALL EXCEPT KV-21FM120)				
R061	1-249-429-11	CARBON	10K	5%	1/4W
R062	1-249-413-11	CARBON	470	5%	1/4W
R063	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R065	1-249-415-11	CARBON	680	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R067	1-249-416-11	CARBON	820	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R069	1-249-421-11	CARBON	2.2K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R070	1-249-409-11	CARBON	220	5%	1/4W

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R071	1-249-427-11	CARBON	6.8K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R072	1-249-425-11	CARBON	4.7K	5%	1/4W
R073	1-249-419-11	CARBON	1.5K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R074	1-249-421-11	CARBON	2.2K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R075	1-249-427-11	CARBON	6.8K	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R076	1-247-807-31	CARBON	100	5%	1/4W
R080	1-216-833-11	METAL CHIP	10K	5%	1/10W
R081	1-216-841-11	METAL CHIP	47K	5%	1/10W
R082	1-216-857-11	METAL CHIP	1M	5%	1/10W
R083	1-216-847-11	METAL CHIP	150K	5%	1/10W
R084	1-216-819-11	METAL CHIP	680	5%	1/10W
R085	1-216-864-11	SHORT CHIP			
R086	1-216-821-11	METAL CHIP	1K	5%	1/10W
R087	1-247-807-31	CARBON	100	5%	1/4W
R088	1-216-864-11	SHORT CHIP			
R090	1-216-837-11	METAL CHIP	22K	5%	1/10W
R091	1-216-841-11	METAL CHIP	47K	5%	1/10W
R092	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R093	1-216-841-11	METAL CHIP	47K	5%	1/10W
R094	1-414-229-11	FERRITE	0µH		
R095	1-216-813-11	METAL CHIP	220	5%	1/10W
R096	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R098	1-216-839-11	METAL CHIP	33K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R098	1-216-837-11	METAL CHIP	22K	5%	1/10W
	(KV-21FM120 ONLY)				
R101	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R101	1-216-832-11		8.2K	5%	1/10W
	(KV-21FM120 ONLY)				
R102	1-216-837-11	METAL CHIP	22K	5%	1/10W
R103	1-216-833-11	METAL CHIP	10K	5%	1/10W
R104	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R105	1-216-864-11	SHORT CHIP			
	(ALL EXCEPT KV-21FM120)				
R106	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R107	1-414-229-11	FERRITE	0µH		
R108	1-414-229-11	FERRITE	0µH		

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R109	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R110	1-249-409-11	CARBON	220	5%	1/4W
R111	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R112	1-249-425-11	CARBON	4.7K	5%	1/4W
R115	1-216-817-11	METAL CHIP	470	5%	1/10W
R116	1-216-853-11	METAL CHIP	470K	5%	1/10W
R200	1-216-813-11	METAL CHIP	220	5%	1/10W
R202	1-216-845-11	METAL CHIP	100K	5%	1/10W
R203	1-216-845-11	METAL CHIP	100K	5%	1/10W
R206	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R207	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R208	1-249-409-11	CARBON	220	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R209	1-249-409-11	CARBON	220	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R215	1-216-853-11	METAL CHIP	470K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R216	1-216-853-11	METAL CHIP	470K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R217	1-249-409-11	CARBON	220	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R218	1-216-813-11	METAL CHIP	220	5%	1/10W
R220	1-216-813-11	METAL CHIP	220	5%	1/10W
R221	1-249-409-11	CARBON	220	5%	1/4W
R222	1-249-409-11	CARBON	220	5%	1/4W
R226	1-218-285-11	METAL CHIP	75	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R227	1-218-285-11	METAL CHIP	75	5%	1/10W
	(KV-21FA310LN/21FA310LS/24FS120/25FS120LN/25FS120LS ONLY)				
R229	1-218-285-11	METAL CHIP	75	5%	1/10W
	(KV-21FA310LN/21FA310LS/24FS120/25FS120LN/25FS120LS ONLY)				
R230	1-218-285-11	METAL CHIP	75	5%	1/10W
R234	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R250	1-216-821-11	METAL CHIP	1K	5%	1/10W
R251	1-216-821-11	METAL CHIP	1K	5%	1/10W
R301	1-216-864-11	SHORT CHIP			
	(KV-20FS120/21FS12LN/21FM120/21FS120LS ONLY)				
R302	1-216-864-11	SHORT CHIP			
	(KV-20FS120/21FS12LN/21FM120/21FS120LS ONLY)				
R303	1-216-863-11	METAL CHIP	3.3M	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R305	1-218-285-11	METAL CHIP	75	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R305	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R308	1-216-821-11	METAL CHIP	1K	5%	1/10W
R309	1-216-833-11	METAL CHIP	10K	5%	1/10W
R310	1-216-821-11	METAL CHIP	1K	5%	1/10W
R311	1-216-813-11	METAL CHIP	220	5%	1/10W
R312	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W
R313	1-216-864-11	SHORT CHIP			
R314	1-216-833-11	METAL CHIP	10K	5%	1/10W
R315	1-216-813-11	METAL CHIP	220	5%	1/10W
R316	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R317	1-216-813-11	METAL CHIP	220	5%	1/10W
R318	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R319	1-216-813-11	METAL CHIP	220	5%	1/10W
R320	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R321	1-247-807-31	CARBON	100	5%	1/4W
R322	1-218-684-11	METAL CHIP	470	0.50%	1/10W
R323	1-215-415-00	METAL	560	1%	1/4W
R324	1-216-821-11	METAL CHIP	1K	5%	1/10W
R325	1-216-864-11	SHORT CHIP			
R326	1-400-427-21	FERRITE	0µH		
R328	1-400-427-21	FERRITE	0µH		
R335	1-216-813-11	METAL CHIP	220	5%	1/10W
R337	1-216-801-11	METAL CHIP	22	5%	1/10W
R338	1-216-864-11	SHORT CHIP			
R351	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R352	1-216-853-11	METAL CHIP	470K	5%	1/10W
R363	1-218-285-11	METAL CHIP	75	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R363	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R364	1-218-285-11	METAL CHIP	75	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R364	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R370	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R371	1-216-849-11	METAL CHIP	220K	5%	1/10W
R372	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R382	1-216-863-11	METAL CHIP	3.3M	5%	1/10W
	(ALL EXCEPT KV-21FM120)				

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R390	1-216-864-11	SHORT CHIP			
R391	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R392	1-216-818-11	METAL CHIP	560	5%	1/10W
R393	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R394	1-216-833-11	METAL CHIP	10K	5%	1/10W
R400	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R401	1-216-809-11	METAL CHIP	100	5%	1/10W
R402	1-216-864-11	SHORT CHIP			
	(KV-21FA310LN/21FA310LS ONLY)				
R403	1-216-809-11	METAL CHIP	100	5%	1/10W
R404	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R404	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	(KV-21FM120 ONLY)				
R405	1-216-833-11	METAL CHIP	10K	5%	1/10W
R406	1-216-813-11	METAL CHIP	220	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R407	1-216-813-11	METAL CHIP	220	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R408	1-216-864-11	SHORT CHIP			
R409	1-216-864-11	SHORT CHIP			
R410	1-216-833-11	METAL CHIP	10K	5%	1/10W
R411	1-216-833-11	METAL CHIP	10K	5%	1/10W
R414	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R415	1-216-809-11	METAL CHIP	100	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R416	1-216-864-11	SHORT CHIP			
	(KV-21FM120 ONLY)				
R417	1-216-864-11	SHORT CHIP			
	(KV-21FA310LN/21FA310LS ONLY)				
R418	1-216-809-11	METAL CHIP	100	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R421	1-216-864-11	SHORT CHIP			
R422	1-216-833-11	METAL CHIP	10K	5%	1/10W
R423	1-216-813-11	METAL CHIP	220	5%	1/10W
R424	1-216-841-11	METAL CHIP	47K	5%	1/10W
R425	1-216-833-11	METAL CHIP	10K	5%	1/10W
R427	1-216-841-11	METAL CHIP	47K	5%	1/10W
R429	1-216-841-11	METAL CHIP	47K	5%	1/10W
R430	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R431	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R433	1-216-809-11	METAL CHIP	100	5%	1/10W
R434	1-216-864-11	SHORT CHIP			
	(KV-21FA310LN/21FA310LS ONLY)				
R434	1-216-805-11	METAL CHIP	47	5%	1/10W
	(ALL EXCEPT KV-21FA310LN/21FA310LS)				
R439	1-216-845-11	METAL CHIP	100K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R440	1-249-413-11	CARBON	470	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R441	1-249-413-11	CARBON	470	5%	1/4W
	(KV-21FA310LN/21FA310LS ONLY)				
R442	1-216-809-11	METAL CHIP	100	5%	1/10W
	(ALL EXCEPT KV-21FM120)				
R443	1-216-841-11	METAL CHIP	47K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R450	1-249-425-11	CARBON	4.7K	5%	1/4W
R477	1-216-819-11	METAL CHIP	680	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R478	1-216-833-11	METAL CHIP	10K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R479	1-216-821-11	METAL CHIP	1K	5%	1/10W
	(KV-21FA310LN/21FA310LS ONLY)				
R499	1-216-845-11	METAL CHIP	100K	5%	1/10W
R501	1-249-411-11	CARBON	330	5%	1/4W
R502	1-249-425-11	CARBON	4.7K	5%	1/4W
R503	1-215-921-11	METAL OXIDE	4.7K	5%	3W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R503	1-215-919-11	METAL OXIDE	2.2K	5%	3W
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
R504	1-249-425-11	CARBON	4.7K	5%	1/4W
R507	1-216-833-11	METAL CHIP	10K	5%	1/10W
R510	1-260-320-11	CARBON	220	5%	1/2W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R510	1-260-328-11	CARBON	1K		
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
R512	1-215-910-00	METAL OXIDE	68	5%	3W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R513	1-215-913-11	METAL OXIDE	220	5%	3W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R513	1-215-908-00	METAL OXIDE	33	5%	3W
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				

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

A component identified by this ⋈ symbol indicates that it has been carefully factory-selected to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	R514	1-215-910-00	METAL OXIDE	68	5%	3W
	R515	1-215-886-11	METAL OXIDE	100	5%	2W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R515	1-215-885-00	METAL OXIDE	68		
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R517	1-218-883-11	METAL CHIP	33K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R517	1-216-837-11	METAL CHIP	22K	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R518	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R519	1-218-877-11	METAL CHIP	18K	0.50%	1/10W
	R520	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R521	1-216-819-11	METAL CHIP	680	5%	1/10W
	R522	1-249-411-11	CARBON	330	5%	1/4W
	R524	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W
	R525	1-215-861-00	METAL OXIDE	47	5%	1W
	R526	1-218-724-11	METAL CHIP	22K	0.50%	1/10W
	R527	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
⚠	R528	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	R528	1-218-816-11	METAL CHIP	390	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R529	1-218-724-11	METAL CHIP	22K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R529	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R530	1-218-873-11	METAL CHIP	12K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R530	1-218-708-11	METAL CHIP	4.7K	0.50%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R533	1-216-826-11	METAL CHIP	2.7K	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R533	1-216-833-11	METAL CHIP	10K	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R534	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
	R535	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R535	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R536	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R537	1-216-857-11	METAL CHIP	1M	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R537	1-216-849-11	METAL CHIP	220K	5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R538	1-216-851-11	METAL CHIP	330K	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R539	1-216-864-11	SHORT CHIP			
	R540	1-249-429-11	CARBON	10K	5%	1/4W
	R541	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R541	1-218-714-11	METAL CHIP	8.2K	0.5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R542	1-215-445-00	METAL	10K	1%	1/4W
	R543	1-216-351-00	METAL OXIDE	1.5	5%	1W
	R544	1-249-389-11	CARBON	4.7	5%	1/4W
	R545	1-215-890-11	METAL OXIDE	470	5%	2W
	R546	1-249-385-11	CARBON	2.2	5%	1/4W
	R547	1-215-445-00	METAL	10K	1%	1/4W
	R548	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R548	1-218-714-11	METAL CHIP	8.2K	0.5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R549	1-216-841-11	METAL CHIP	47K	5%	1/10W
	R550	1-216-817-11	METAL CHIP	470	5%	1/10W
	R551	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	R552	1-216-845-11	METAL CHIP	100K	5%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R553	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R554	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
	R555	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R556	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
	R557	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
	R559	1-216-837-11	METAL CHIP	22K	5%	1/10W
	R560	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R561	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R562	1-249-429-11	CARBON	10K	5%	1/4W
	R563	1-218-871-11	METAL CHIP	10K	0.50%	1/10W
	R564	1-218-738-11	METAL CHIP	82K	0.5%	1/10W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
⋈	R565	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
	R566	1-215-469-00	METAL	100K	1%	1/4W
⚠	R567	1-215-879-11	METAL OXIDE	47K	5%	1W
	R568	1-215-416-00	METAL	620	1%	1/4W
	R569	1-249-429-11	CARBON	10K	5%	1/4W
	R570	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
	R572	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	R573	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	R574	1-216-833-11	METAL CHIP	10K	5%	1/10W

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

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

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	R575	1-249-389-11	CARBON	4.7	5%	1/4W
	R578	1-249-429-11	CARBON	10K	5%	1/4W
	R580	1-216-837-11	METAL CHIP	22K	5%	1/10W
	R581	1-249-441-11	CARBON	100K	5%	1/4W
	R583	1-249-377-11	CARBON	0.47	5%	1/4W
	R584	1-215-453-00	METAL	22K	1%	1/4W
	R585	1-215-453-00	METAL	22K	1%	1/4W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
	R585	1-215-449-00	METAL	15K	1%	1/4W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R586	1-218-855-11	METAL CHIP	2.2K	0.50%	1/10W
	R587	1-249-401-11	CARBON	47	5%	1/4W
	R588	1-215-882-00	METAL OXIDE	22	5%	2W
	R589	1-247-895-91	CARBON	470K	5%	1/4W
	R590	1-249-429-11	CARBON	10K	5%	1/4W
	R591	1-216-365-00	METAL OXIDE	0.47	5%	2W
	R592	1-249-441-11	CARBON	100K	5%	1/4W
	R593	1-249-429-11	CARBON	10K	5%	1/4W
⚠	R594	1-249-417-11	CARBON	1K	5%	1/4W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
⚠	R594	1-249-418-11	CARBON	1.2K	5%	1/4W
		(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	R595	1-247-895-91	CARBON	470K	5%	1/4W
	R596	1-249-377-11	CARBON	0.47	5%	1/4W
	R597	1-216-849-11	METAL CHIP	220K	5%	1/10W
	R598	1-249-377-11	CARBON	0.47	5%	1/4W
	R599	1-216-837-11	METAL CHIP	22K	5%	1/10W
⚠	R603	1-219-513-11	METAL	4.7M	5%	1/2W
		(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)				
	R604	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R605	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R606	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R607	1-216-857-11	METAL CHIP	1M	5%	1/10W
	R608	1-215-924-00	METAL OXIDE	15K	5%	3W
	R609	1-245-670-11	CEMENT RESISTOR	4.7		
		(KV-21FA310LN/21FA310LS ONLY)				
	R609	1-202-962-11	CEMENT RESISTOR	3.3	5%	10W
		(ALL EXCEPT KV-21FA310LN/21FA310LS)				
	R611	1-202-961-11	CEMENTED	1.8	5%	10W
		(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)				
	R611	1-244-206-11	CEMENTED	2.2	5%	10W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R612	1-260-131-11	CEMENTED	470K	5%	1/2W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				

	REF. NO.	PART NO.	DESCRIPTION	VALUES		
	R613	1-202-961-11	CEMENTED	1.8	5%	10W
		(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)				
	R613	1-244-206-11	CEMENTED	2.2	5%	10W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R614	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
⚠	R615	1-202-933-61	FUSIBLE	0.1	10%	1/2W
	R616	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R617	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R619	1-249-389-11	CARBON	4.7	5%	1/4W
	R620	1-216-353-00	METAL OXIDE	2.2	5%	1W
	R625	1-249-413-11	CARBON	470	5%	1/4W
	R626	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
	R627	1-215-481-00	METAL	330K	1%	1/4W
	R628	1-260-131-11	CEMENTED	470K	5%	1/2W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R629	1-215-481-00	METAL	330K	1%	1/4W
	R630	1-215-481-00	METAL	330K	1%	1/4W
	R631	1-218-718-11	METAL CHIP	12K	0.50%	1/10W
	R632	1-216-809-11	METAL CHIP	100	5%	1/10W
	R634	1-215-905-11	METAL OXIDE	10	5%	3W
	R640	1-249-417-11	CARBON	1K	5%	1/4W
	R641	1-240-262-11	CEMENTED	0.68	5%	10W
		(KV-21FA310LN/20FS120/21FS120LN/24FS120/25FS120LN ONLY)				
	R641	1-244-206-11	CEMENTED	2.2	5%	10W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R641	1-205-998-11	CEMENTED	1	5%	10W
		(KV-21FM120 ONLY)				
	R647	1-216-811-11	METAL CHIP	150	5%	1/10W
	R650	1-249-415-11	CARBON	680	5%	1/4W
	R651	1-249-441-11	CARBON	100K	5%	1/4W
	R652	1-249-441-11	CARBON	100K	5%	1/4W
	R658	1-249-393-11	CARBON	10	5%	1/4W
	R659	1-249-393-11	CARBON	10	5%	1/4W
	R660	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R667	1-216-833-11	METAL CHIP	10K	5%	1/10W
⚠	R668	1-249-418-11	CARBON	1.2K	5%	1/4W
	R670	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R671	1-243-979-71	METAL OXIDE	0.1	5%	2W
⚠	R699	1-218-265-11	METAL CHIP	8.2M	5%	1W
		(KV-21FA310LS/21FS120LS/25FS120LS ONLY)				
	R680	1-216-864-11	SHORT CHIP			
	R801	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
	R802	1-218-877-11	METAL CHIP	18K	0.50%	1/10W
		(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				

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A

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R802	1-218-871-11	METAL CHIP	10K	0.50%	1/10W
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
R803	1-218-719-11	METAL CHIP	13K	0.50%	1/10W
R804	1-249-435-11	CARBON	33K	5%	1/4W
R812	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R813	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R814	1-218-736-11	METAL CHIP	68K	0.50%	1/10W
R815	1-218-732-11	METAL CHIP	47K	0.50%	1/10W
R850	1-215-453-00	METAL	22K	1%	1/4W
R851	1-216-821-11	METAL CHIP	1K	5%	1/10W
R852	1-218-869-11	METAL CHIP	8.2K	0.50%	1/10W
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)				
R860	1-216-833-11	METAL CHIP	10K	5%	1/10W
R861	1-216-833-11	METAL CHIP	10K	5%	1/10W
R862	1-216-813-11	METAL CHIP	220	5%	1/10W
R893	1-216-864-11	SHORT CHIP			

RELAY

RY501	1-755-198-11	RELAY, AC POWER	
⚠ RY600	1-755-395-11	RELAY (AC POWER)	

SWITCH

S002	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S003	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S004	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S005	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S006	1-692-431-21	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S007	1-762-816-11	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
S008	1-762-816-11	SWITCH, TACTILE	
	(KV-21FA310LN/21FA310LS ONLY)		
SW515	1-572-707-11	SWITCH, LEVER	

TRANSFORMER

T505	1-433-836-11	TRANSFORMER, HORIZONTAL DRIVE
T510	1-437-610-11	TRANSFORMER, FERRITE
	(KV-24FS120/25FS120LN/25FS120LS ONLY)	
⚠ T511	1-435-079-21	TRANSFORMER, HORIZONTAL LINEAR
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)	
⚠ T511	1-433-850-11	TRANSFORMER, HORIZONTAL LINEAR
	(KV-24FS120/25FS120LN/25FS120LS ONLY)	
⚠ T585	1-453-316-21	FBT ASSY NX-1748//X4A4
	(ALL EXCEPT KV-24FS120/25FS120LN/25FS120LS)	
⚠ T585	1-453-336-11	FBT ASSY NX-4011//X4A4
	(KV-24FS120/25FS120LN/25FS120LS ONLY)	
⚠ T601	1-435-617-11	TRANSFORMER, LINE FILTER
⚠ T602	1-435-675-11	TRANSFORMER, STANDBY
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)	
⚠ T602	1-435-676-11	TRANSFORMER, STANDBY
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)	
⚠ T603	1-439-898-21	CONVERTER TRANSFORMER
	(ALL EXCEPT KV-21FM120)	
⚠ T603	1-437-609-11	CONVERTER TRANSFORMER
	(KV-21FM120 ONLY)	

THERMISTOR

⚠ THP501	1-809-539-11	THERMISTOR, POSITIVE
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)	
⚠ THP501	1-809-540-11	THERMISTOR, POSITIVE
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)	

TUNER

⚠ TU101	8-598-593-50	TUNER, FSS BTF-WA421
	(ALL EXCEPT KV-21FM120)	
⚠ TU101	8-598-594-30	TUNER, FSS BTF-FA421
	(KV-21FM120 ONLY)	

VARISTOR

⚠ VDR600	1-810-974-21	VARISTOR
	(ALL EXCEPT KV-21FA310LS/21FS120LS/25FS120LS)	
⚠ VDR600	1-803-967-11	VARISTOR
	(KV-21FA310LS/21FS120LS/25FS120LS ONLY)	

CRYSTAL

X001	1-795-006-21	VIBRATOR, CRYSTAL
X301	1-781-377-21	VIBRATOR, CRYSTAL

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CV

CV

REF. NO.	PART NO.	DESCRIPTION	VALUES		
*	**A-1410-919-A**	**CV (VAR) BOARD, MOUNTED**			
	(KV-20FS120/21FA310LN/21FA310LS/21FM120/21FS120LN/21FS120LS ONLY)				
*	**A-1415-605-A**	**CV (VAR) BOARD, MOUNTED**			
	(KV-24FS120/25FS120LN/25FS120LS ONLY)				
	4-382-854-11	SCREW (M3X10), P, SW (+)			
		CAPACITOR			
	C901	1-107-667-11	ELECT	2.2µF	20% 400V
	C902	1-130-491-00	MYLAR	0.047µF	5% 50V
	C903	1-126-935-11	ELECT	470µF	20% 16V
	C904	1-130-471-00	MYLAR	0.001µF	5% 50V
	C905	1-106-383-00	MYLAR	0.047µF	10% 200V
	C906	1-130-471-00	MYLAR	0.001µF	5% 50V
	C907	1-107-638-11	ELECT	33µF	20% 160V
	C908	1-126-935-11	ELECT	470µF	20% 16V
	C909	1-161-830-00	CERAMIC	0.0047µF	500V
	C910	1-104-999-11	MYLAR	0.1µF	5% 200V
	C911	1-104-665-11	ELECT	100µF	20% 25V
	C912	1-126-942-61	ELECT	1000µF	20% 25V
	C914	1-130-491-00	MYLAR	0.047µF	5% 50V
	C915	1-162-970-11	CERAMIC CHIP	0.01µF	10% 25V
	C1751	1-107-652-11	ELECT	10µF	20% 250V
	C1752	1-162-114-00	CERAMIC	0.0047µF	2KV
	C1753	1-137-528-11	MYLAR	0.1µF	10% 250V
	C1754	1-102-074-00	CERAMIC	0.001µF	10% 50V
	C1755	1-107-649-11	ELECT	2.2µF	20% 250V
	C1774	1-126-960-11	ELECT	1µF	20% 50V
	C1775	1-126-935-11	ELECT	470µF	20% 16V
	C1777	1-126-963-11	ELECT	4.7µF	20% 50V
	C1778	1-126-947-11	ELECT	47µF	20% 35V
		CONNECTOR			
*	CN903	1-564-506-11	PLUG, CONNECTOR	3P	
	CN1707	1-564-506-11	PLUG, CONNECTOR	3P	
*	CN1752	1-564-512-11	PLUG, CONNECTOR	9P	
	CN1753	1-785-879-11	CONNECTOR, ONE TOUCH		
	CN1755	1-695-915-11	TAB (CONTACT)		

REF. NO.	PART NO.	DESCRIPTION	VALUES
		DIODE	
D762	8-719-404-50	DIODE	MA111-TX
D763	8-719-404-50	DIODE	MA111-TX
D772	8-719-404-50	DIODE	MA111-TX
D773	8-719-404-50	DIODE	MA111-TX
D782	8-719-404-50	DIODE	MA111-TX
D783	8-719-404-50	DIODE	MA111-TX
D901	8-719-110-86	DIODE	RD39ESB
D902	8-719-110-86	DIODE	RD39ESB
D903	8-719-991-33	DIODE	1SS133T-77
D1701	8-719-108-12	DIODE	RD9.1EW
D1754	8-719-901-83	DIODE	1SS83
D1755	8-719-901-83	DIODE	1SS83
D1756	8-719-901-83	DIODE	1SS83
D1758	8-719-074-25	DIODE	PG104R
		IC	
IC1707	8-759-356-16	IC	NJM4556AD
IC1751	8-759-562-43	IC	TDA6108JF/N1B
		JACK	
⚠ J1751	1-451-544-11	SOCKET, CRT	
		CHIP CONDUCTOR	
JR710	1-216-864-11	SHORT CHIP	
		COIL	
L901	1-408-615-31	INDUCTOR	100µH
L1751	1-408-613-31	INDUCTOR	68µH
		TRANSISTOR	
Q761	8-729-422-27	TRANSISTOR	2SD601A-Q
Q762	8-729-422-27	TRANSISTOR	2SD601A-Q
Q763	8-729-422-27	TRANSISTOR	2SD601A-Q
Q771	8-729-422-27	TRANSISTOR	2SD601A-Q
Q772	8-729-422-27	TRANSISTOR	2SD601A-Q
Q773	8-729-422-27	TRANSISTOR	2SD601A-Q
Q781	8-729-422-27	TRANSISTOR	2SD601A-Q
Q782	8-729-422-27	TRANSISTOR	2SD601A-Q

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CV

REF. NO.	PART NO.	DESCRIPTION	VALUES		
Q783	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q901	8-729-053-87	TRANSISTOR	KTC4370A		
Q902	6-550-247-01	TRANSISTOR	KTA1659A		
Q903	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q904	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q905	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
Q906	8-729-422-27	TRANSISTOR	2SD601A-Q		
Q1772	8-729-422-27	TRANSISTOR	2SD601A-Q		
	RESISTOR				
R760	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R762	1-218-692-11	METAL CHIP	1K	0.50%	1/10W
R763	1-216-835-11	METAL CHIP	15K	5%	1/10W
R764	1-218-678-11	METAL CHIP	270	0.50%	1/10W
R765	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W
R766	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R767	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R768	1-216-821-11	METAL CHIP	1K	5%	1/10W
R770	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R772	1-218-692-11	METAL CHIP	1K	0.50%	1/10W
R773	1-216-835-11	METAL CHIP	15K	5%	1/10W
R774	1-218-678-11	METAL CHIP	270	0.50%	1/10W
R775	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W
R776	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R777	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R778	1-216-821-11	METAL CHIP	1K	5%	1/10W
R780	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R782	1-218-692-11	METAL CHIP	1K	0.50%	1/10W
R783	1-216-835-11	METAL CHIP	15K	5%	1/10W
R784	1-218-678-11	METAL CHIP	270	0.50%	1/10W
R785	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W
R786	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R787	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R788	1-216-821-11	METAL CHIP	1K	5%	1/10W
R901	1-249-401-11	CARBON	47	5%	1/4W
R902	1-249-386-11	CARBON	2.7	5%	1/4W
R903	1-249-414-11	CARBON	560	5%	1/4W
R904	1-249-432-11	CARBON	18K	5%	1/4W
R905	1-249-417-11	CARBON	1K	5%	1/4W
R906	1-249-432-11	CARBON	18K	5%	1/4W
R907	1-249-386-11	CARBON	2.7	5%	1/4W
R908	1-249-414-11	CARBON	560	5%	1/4W
R909	1-260-312-11	CARBON	47	5%	1/2W
R910	1-216-476-11	METAL OXIDE	180	5%	3W

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R911	1-216-799-11	METAL CHIP	15	5%	1/10W
R912	1-216-813-11	METAL CHIP	220	5%	1/10W
R913	1-216-799-11	METAL CHIP	15	5%	1/10W
R914	1-216-814-11	METAL CHIP	270	5%	1/10W
R915	1-216-821-11	METAL CHIP	1K	5%	1/10W
R916	1-216-821-11	METAL CHIP	1K	5%	1/10W
R917	1-216-821-11	METAL CHIP	1K	5%	1/10W
R918	1-216-809-11	METAL CHIP	100	5%	1/10W
R919	1-216-809-11	METAL CHIP	100	5%	1/10W
R920	1-216-820-11	METAL CHIP	820	5%	1/10W
R921	1-216-833-11	METAL CHIP	10K	5%	1/10W
R922	1-249-397-11	CARBON	22	5%	1/4W
R923	1-249-401-11	CARBON	47	5%	1/4W
R1756	1-260-328-11	CARBON	1K	5%	1/2W
R1757	1-260-328-11	CARBON	1K	5%	1/2W
R1758	1-260-328-11	CARBON	1K	5%	1/2W
R1760	1-260-123-11	CARBON	100K	5%	1/2W
R1761	1-216-373-11	METAL OXIDE	2.2	5%	2W
R1761	1-216-395-00	METAL OXIDE	3.3	5%	3W
(KV-20FS120/21FA310LN/21FA310LS/21FM120/21FS120LN/21FS120LS ONLY)					
R1761	1-216-373-11	METAL OXIDE	2.2		2W
(KV-24FS120/25FS120LN/25FS120LS ONLY)					
R1762	1-216-375-00	METAL OXIDE	3.3	5%	2W
(KV-24FS120/25FS120LN/25FS120LS ONLY)					
R1763	1-247-807-31	CARBON	100	5%	1/4W
R1764	1-247-807-31	CARBON	100	5%	1/4W
R1765	1-247-807-31	CARBON	100	5%	1/4W
R1766	1-247-807-31	CARBON	100	5%	1/4W
R1767	1-247-807-31	CARBON	100	5%	1/4W
R1768	1-247-807-31	CARBON	100	5%	1/4W
R1770	1-260-132-11	CARBON	560K	5%	1/2W
R1778	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1779	1-247-791-91	CARBON	22	5%	1/4W
(KV-24FS120/25FS120LN/25FS120LS ONLY)					
R1780	1-216-837-11	METAL CHIP	22K	5%	1/10W
R1781	1-216-838-11	METAL CHIP	27K	5%	1/10W
R1785	1-249-399-11	CARBON	33	5%	1/4W
R1787	1-216-837-11	METAL CHIP	22K	5%	1/10W
R1788	1-249-421-11	CARBON	2.2K	5%	1/4W
R1789	1-249-425-11	CARBON	4.7K	5%	1/4W
	VARIABLE RESISTOR				
RV1701	1-238-019-11	RES, ADJ, METAL FILM	47K		
⚠ RV1750	1-241-656-11	RES, ADJ, METAL FILM	110M		

K

K

REF. NO.	PART NO.	DESCRIPTION	VALUES		
*	**A-1410-921-A**	**K BOARD, MOUNTED**			
	(KV-21FA310 only)				
	4-382-854-11	SCREW (M3X10), P, SW (+)			
	CAPACITOR				
C2401	1-130-495-00	MYLAR	0.1µF	5%	50V
C2402	1-130-495-00	MYLAR	0.1µF	5%	50V
C2403	1-126-964-11	ELECT	10µF	20%	50V
C2404	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2405	1-126-965-91	ELECT	22µF	20%	50V
C2406	1-126-964-11	ELECT	10µF	20%	50V
C2407	1-126-964-11	ELECT	10µF	20%	50V
C2408	1-162-969-11	CERAMIC CHIP	0.0068µF	10%	25V
C2410	1-126-969-11	ELECT	220µF	20%	50V
C2411	1-126-965-91	ELECT	22µF	20%	50V
C2412	1-137-194-81	FILM	0.47µF	5%	50V
C2413	1-100-120-51	ELECT	1000µF	20%	35V
C2414	1-126-963-11	ELECT	4.7µF	20%	50V
C2415	1-126-967-11	ELECT	47µF	20%	50V
C2416	1-164-172-11	CERAMIC CHIP	0.0056µF	10%	25V
C2417	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2418	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C2419	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2420	1-126-959-11	ELECT	0.47µF	20%	50V
C2421	1-126-959-11	ELECT	0.47µF	20%	50V
C2422	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2423	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C2424	1-162-969-11	CERAMIC CHIP	0.0068µF	10%	25V
C2425	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2426	1-162-927-11	CERAMIC CHIP	100pF	5%	50V
C2427	1-126-947-11	ELECT	47µF	20%	35V
C2428	1-126-943-11	ELECT	2200µF	20%	25V
C2429	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2430	1-126-960-11	ELECT	1µF	20%	50V
C2431	1-126-963-11	ELECT	4.7µF	20%	50V
C2432	1-126-963-11	ELECT	4.7µF	20%	50V
C2433	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2434	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2435	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2436	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V

REF. NO.	PART NO.	DESCRIPTION	VALUES		
C2437	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2438	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
C2439	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
C2440	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2441	1-115-412-11	CERAMIC CHIP	680pF	5%	25V
C2442	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C2443	1-115-412-11	CERAMIC CHIP	680pF	5%	25V
C2444	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C2445	1-126-965-91	ELECT	22µF	20%	50V
C2446	1-130-495-00	MYLAR	0.1µF	5%	50V
C2447	1-130-495-00	MYLAR	0.1µF	5%	50V
C2448	1-137-190-91	FILM	0.22µF	5%	50V
C2449	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C2450	1-126-963-11	ELECT	4.7µF	20%	50V
C2451	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
C2452	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
C2453	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2454	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2455	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2456	1-126-963-11	ELECT	4.7µF	20%	50V
C2457	1-126-963-11	ELECT	4.7µF	20%	50V
C2458	1-126-963-11	ELECT	4.7µF	20%	50V
C2459	1-126-965-91	ELECT	22µF	20%	50V
C2460	1-137-194-81	FILM	0.47µF	5%	50V
C2461	1-126-963-11	ELECT	4.7µF	20%	50V
C2462	1-126-963-11	ELECT	4.7µF	20%	50V
C2463	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2464	1-126-960-11	ELECT	1µF	20%	50V
C2465	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2466	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2467	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
C2468	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
C2469	1-130-495-00	MYLAR	0.1µF	5%	50V
C2470	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2471	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2472	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C2473	1-126-964-11	ELECT	10µF	20%	50V
C2474	1-126-964-11	ELECT	10µF	20%	50V
C2475	1-126-968-11	ELECT	100µF	20%	50V
C2476	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C2477	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2478	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2479	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2480	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
C2481	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2482	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C2484	1-130-495-00	MYLAR	0.1µF	5%	50V
C2485	1-130-495-00	MYLAR	0.1µF	5%	50V
C2486	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C2487	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2488	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C2489	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C2490	1-104-665-11	ELECT	100µF	20%	25V
C2493	1-126-935-11	ELECT	470µF	20%	16V
C2494	1-126-935-11	ELECT	470µF	20%	16V
C2495	1-126-935-11	ELECT	470µF	20%	16V
C2496	1-126-935-11	ELECT	470µF	20%	16V
C2499	1-164-315-11	CERAMIC CHIP	470pF	5%	50V

CONNECTOR

* CN2401	1-564-510-11	PLUG, CONNECTOR	7P	
* CN2402	1-564-508-11	PLUG, CONNECTOR	5P	

DIODE

D2400	8-719-404-50	DIODE	MA111-TX
D2401	8-719-070-60	DIODE	PDZ7.5B-115

IC

IC2401	6-705-054-01	IC	TDA8947J
IC2402	8-759-100-96	IC	UPC4558G2
IC2403	6-706-034-01	IC	NJW1164M-TE2
IC2404	8-759-165-01	IC	NJM2177AFG1
IC2405	8-759-686-15	IC	NJM2180M (TE2)

CHIP CONDUCTOR

JR2401	1-216-864-11	SHORT CHIP
JR2402	1-216-864-11	SHORT CHIP
JR2410	1-216-864-11	SHORT CHIP
JR2411	1-216-864-11	SHORT CHIP
JR2420	1-216-864-11	SHORT CHIP
JR2421	1-216-864-11	SHORT CHIP

IC LINK

PS2401	1-576-337-21	IC LINK	2.7A	50V

REF. NO.	PART NO.	DESCRIPTION	VALUES

TRANSISTOR

Q2400	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q2401	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q2410	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q2411	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q2412	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q2413	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
Q2414	8-729-422-27	TRANSISTOR	2SD601A-Q
Q2418	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q2419	8-729-120-28	TRANSISTOR	2SC1623-L5L6

RESISTOR

R2401	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2402	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2403	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R2404	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2405	1-218-895-11	METAL CHIP	100K	0.50%	1/10W
R2406	1-218-714-11	METAL CHIP	8.2K	0.50%	1/10W
R2407	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2408	1-218-868-11	METAL CHIP	7.5K	0.50%	1/10W
R2409	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2410	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2411	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2412	1-218-868-11	METAL CHIP	7.5K	0.50%	1/10W
R2413	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2414	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2415	1-220-397-11	METAL CHIP	4.7M	5%	1/10W
R2416	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2417	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2418	1-216-809-11	METAL CHIP	100	5%	1/10W
R2419	1-216-809-11	METAL CHIP	100	5%	1/10W
R2420	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2421	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2422	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2423	1-216-840-11	METAL CHIP	39K	5%	1/10W
R2424	1-216-840-11	METAL CHIP	39K	5%	1/10W
R2425	1-216-840-11	METAL CHIP	39K	5%	1/10W
R2426	1-216-817-11	METAL CHIP	470	5%	1/10W
R2427	1-216-817-11	METAL CHIP	470	5%	1/10W
R2428	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R2429	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R2430	1-216-809-11	METAL CHIP	100	5%	1/10W

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R2431	1-216-809-11	METAL CHIP	100	5%	1/10W
R2432	1-216-864-11	SHORT CHIP			
R2433	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2434	1-218-895-11	METAL CHIP	100K	0.50%	1/10W
R2435	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2436	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2437	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2438	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2439	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2440	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2441	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2442	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2443	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2446	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2447	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2448	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2449	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2450	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2451	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2452	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2453	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2454	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2455	1-216-809-11	METAL CHIP	100	5%	1/10W
R2456	1-216-809-11	METAL CHIP	100	5%	1/10W
R2457	1-216-864-11	SHORT CHIP			
R2458	1-216-861-11	METAL CHIP	2.2M	5%	1/10W
R2459	1-216-853-11	METAL CHIP	470K	5%	1/10W
R2460	1-218-714-11	METAL CHIP	8.2K	0.50%	1/10W
R2461	1-216-839-11	METAL CHIP	33K	5%	1/10W
R2462	1-218-296-11	METAL CHIP	75K	5%	1/10W
R2463	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R2464	1-218-331-11	METAL CHIP	51K	5%	1/10W
R2465	1-216-824-11	METAL CHIP	1.8K	5%	1/10W
R2466	1-218-866-11	METAL CHIP	6.2K	0.50%	1/10W
R2467	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2468	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2469	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2470	1-216-840-11	METAL CHIP	39K	5%	1/10W
R2471	1-216-824-11	METAL CHIP	1.8K	5%	1/10W
R2472	1-218-331-11	METAL CHIP	51K	5%	1/10W
R2473	1-216-861-11	METAL CHIP	2.2M	5%	1/10W
R2474	1-216-839-11	METAL CHIP	33K	5%	1/10W
R2475	1-218-296-11	METAL CHIP	75K	5%	1/10W
R2476	1-216-835-11	METAL CHIP	15K	5%	1/10W

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R2477	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2478	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2479	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2480	1-218-331-11	METAL CHIP	51K	5%	1/10W
R2481	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R2482	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2483	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2484	1-216-828-11	METAL CHIP	3.9K	5%	1/10W
R2485	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2486	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2487	1-218-717-11	METAL CHIP	11K	0.50%	1/10W
R2488	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R2489	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2490	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2491	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2492	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2493	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2494	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2495	1-218-292-11	METAL CHIP	20K	5%	1/10W
R2496	1-216-847-11	METAL CHIP	150K	5%	1/10W
R2497	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R2498	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2499	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2500	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R2501	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2502	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2503	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2504	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2505	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2507	1-216-809-11	METAL CHIP	100	5%	1/10W
R2519	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2520	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2521	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2522	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2523	1-216-841-11	METAL CHIP	47K	5%	1/10W
R2524	1-216-864-11	SHORT CHIP			

HR HB

REF. NO.	PART NO.	DESCRIPTION	VALUES		
HR					
*	**A-1415-629-A**	**HR (VAR) BOARD, MOUNTED** (KV-21FA310 only)			
		CAPACITOR			
	C3001	1-104-665-11	ELECT	100µF	20% 25V
		CONNECTOR			
*	CN3001	1-564-521-11	PLUG, CONNECTOR	6P	
		DIODE			
	D3001	8-719-109-89	DIODE	RD5.6ESB2	
	D3002	8-719-057-09	DIODE	LNJ801LPDJA	
		IC			
	IC3001	8-742-211-20	HYB IC	SBX3071-71	
		RESISTOR			
	R3001	1-249-417-11	CARBON	1K	5% 1/4W
	R3014	1-247-807-31	CARBON	100	5% 1/4W
		SWITCH			
	S3006	1-786-338-12	SWITCH, TACTILE		
HB					
*	**A-1415-580-A**	**HB (VAR) BOARD, MOUNTED** (ALL EXCEPT KV-21FA310LN/21FA310LS/21FM120)			
*	**A-1415-692-A**	**HB (VAR) BOARD, MOUNTED** (KV-21FM120 ONLY)			
		CAPACITOR			
	C2001	1-104-665-11	ELECT	100µF	20% 25V
	C2234	1-126-960-11	ELECT	1µF	20% 50V
	C2235	1-126-960-11	ELECT	1µF	20% 50V
	C2401	1-126-965-91	ELECT	22µF	20% 50V
	C2402	1-126-965-91	ELECT	22µF	20% 50V

REF. NO.	PART NO.	DESCRIPTION	VALUES		
		CONNECTOR			
*	CN2402	1-564-507-11	PLUG, CONNECTOR	4P	
		DIODE			
	D2001	8-719-109-89	DIODE	RD5.6ESB2	
	D2002	8-719-070-80	DIODE	LNK0120022G	
	D2003	8-719-109-89	DIODE	RD5.6ESB2	
	D2004	8-719-109-89	DIODE	RD5.6ESB2	
	D2005	8-719-109-89	DIODE	RD5.6ESB2	
	D2233	8-719-108-12	DIODE	RD9.1EW	
	D2235	8-719-108-12	DIODE	RD9.1EW	
	D2236	8-719-108-12	DIODE	RD9.1EW	
		FERRITE BEAD			
	FB2001	1-410-397-21	FERRITE	1.1µH	
	FB2002	1-410-397-21	FERRITE	1.1µH	
	FB2003	1-410-397-21	FERRITE	1.1µH	
	FB2004	1-410-397-21	FERRITE	1.1µH	
		IC			
	IC2001	8-742-212-20	HYB IC	SBX3081-71	
		JACK			
	J2231	1-794-048-11	JACK, PIN	3P (ALL EXCEPT KV-21FA310LN/21FA310LS/21FM120)	
	J2231	1-580-441-41	JACK, PIN	2P (KV-21FM120 ONLY)	
	J2401	1-568-267-21	JACK		
		RESISTOR			
	R2004	1-249-417-11	CARBON	1K	5% 1/4W
	R2007	1-247-807-31	CARBON	100	5% 1/4W
	R2008	1-249-427-11	CARBON	6.8K	5% 1/4W
	R2009	1-249-421-11	CARBON	2.2K	5% 1/4W
	R2010	1-249-416-11	CARBON	820	5% 1/4W
	R2011	1-249-415-11	CARBON	680	5% 1/4W
	R2201	1-249-419-11	CARBON	1.5K	5% 1/4W
	R2202	1-249-421-11	CARBON	2.2K	5% 1/4W
	R2203	1-249-427-11	CARBON	6.8K	5% 1/4W
	R2234	1-247-804-11	CARBON	75	5% 1/4W

HB

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R2235	1-249-409-11	CARBON	220	5%	1/4W
R2236	1-249-441-11	CARBON	100K	5%	1/4W
R2237	1-249-409-11	CARBON	220	5%	1/4W
R2238	1-249-441-11	CARBON	100K	5%	1/4W
R2401	1-249-413-11	CARBON	470	5%	1/4W
R2402	1-249-413-11	CARBON	470	5%	1/4W

SWITCH

S2001	1-692-431-21	SWITCH, TACTILE
S2002	1-692-431-21	SWITCH, TACTILE
S2003	1-692-431-21	SWITCH, TACTILE
S2004	1-692-431-21	SWITCH, TACTILE
S2005	1-692-431-21	SWITCH, TACTILE
S2006	1-692-431-21	SWITCH, TACTILE
S2007	1-762-816-11	SWITCH, TACTILE
S2008	1-762-816-11	SWITCH, TACTILE

ACCESSORIES AND PACKING

1-501-730-41 ANTENNA, TELESCOPIC
(ALL EXCEPT KV-20FS120/24FS120)

* 4-041-255-01 BAG, PROTE CTION
(KV-25FS120LN/25FS120LS ONLY)

* 4-041-255-23 BAG, PROTECTION
(KV-21FA310LN/21FA310LS/24FS120 ONLY)

* 4-073-838-01 BAG, PROTECTION
(KV-20FS120/21FM120/21FS120LN/21FS120LS ONLY)

* 4-102-064-01 CARTON, INDIVIDUAL
(KV-20FS120 ONLY)

* 4-102-067-01 CARTON, INDIVIDUAL
(KV-21FA310LN/21FA310LS ONLY)

4-102-070-01 CARTON, INDIVIDUAL
(KV-25FS120LN/25FS120LS ONLY)

* 4-102-538-01 CARTON, INDIVIDUAL
(KV-21FS120LN/21FS120LS ONLY)

* 4-102-539-01 CARTON, INDIVIDUAL
(KV-21FM120 ONLY)

* 4-103-302-01 CARTON, INDIVIDUAL
(KV-24FS120 ONLY)

REF. NO.	PART NO.	DESCRIPTION	VALUES

* 4-102-066-01 CUSHION, LOWER
(KV-20FS120/21FM120/21FS120LN/21FS120LS ONLY)

* 4-102-069-01 CUSHION, LOWER
(KV-21FA310LN/21FS310LS ONLY)

* 4-102-072-01 CUSHION, LOWER
(KV-24FS120/25FS120LN/25FS120LS ONLY)

* 4-102-065-01 CUSHION, UPPER
(KV-20FS120/21FM120/21FS120LN/21FS120LS ONLY)

* 4-102-068-01 CUSHION, UPPER
(KV-21FA310LN/21FA310LS ONLY)

* 4-102-071-01 CUSHION, UPPER
(KV-24FS120/25FS120LN/25FS120LS ONLY)

4-101-451-41 MANUAL, INSTRUCTION
(KV-21FA310LN/21FA310LS ONLY)

4-101-452-21 MANUAL, INSTRUCTION
(KV-20FS120 ONLY)

4-101-452-31 MANUAL, INSTRUCTION
(KV-20FS120 CANADA ONLY)

4-101-452-41 MANUAL, INSTRUCTION
(KV-21FM120/21FS120LN/21FS120LS/25FS120LN/25FS120LS ONLY)

4-101-454-21 MANUAL, INSTRUCTION
(KV-24FS120 ONLY)

4-101-455-31 MANUAL, INSTRUCTION
(KV-24FS120 CANADA ONLY)

1-417-182-11 MATCHING TRANSFORMER, ANTENNA
(ALL EXCEPT KV-20FS120/24FS120)

REMOTE COMMANDER

1-477-846-11 REMOTE COMMANDER (RM-W151)

(☛) 4-084-290-01 BATTERY COVER (for RM-W151)
(KV-21FM120 ONLY)

1-476-680-12 REMOTE COMMANDER (RM-Y180)

4-978-977-11 BATTERY COVER (for RM-Y180)
(KV-21FA310LS/21FA310LN ONLY)

1-468-835-11 REMOTE COMMANDER (RM-Y194)

(☛) 9-939-697-01 BATTERY COVER (for RM-Y194)
(ALL EXCEPT KV-21FM120/21FA310LS/21FA310LN)

SERVICE MANUAL

BA-6 CHASSIS

In an effort to reduce the size of this pdf file the tiled schematics are not attached to this Service Manual. To receive a complete set of the tiled schematics for this manual please submit a request to Nita Wardlaw at nita.wardlaw@am.sony.com.