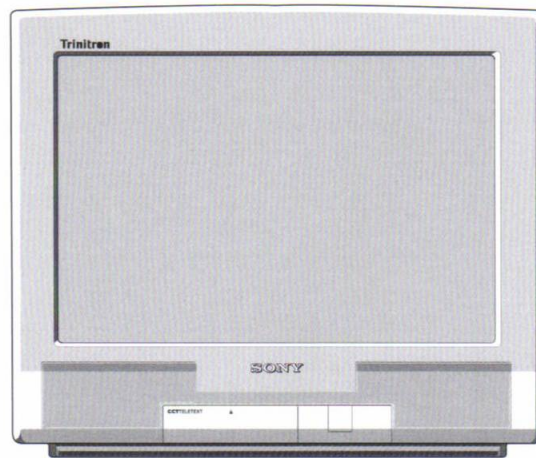


SERVICE MANUAL

BE-5 CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-21R1A	RM-836	Italian	SCC-K31A-A				
KV-21R1D	RM-836	AEP	SCC-K32A-A				
KV-21R1E	RM-836	Spanish	SCC-K30A-A				



TRINITRON® COLOR TV
SONY®

ITEM MODEL	Television System	Channel Coverage	Colour System
Italian	B/G/H	VHF: E2-E12 UHF: E21-E69 Hyper: S1-S41	PAL NTSC3.58/4.43 (video input only)
AEP	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: S1-S20 Hyper: S1-S41 D/K VHF: R1-R20 UHF: R21-R69	PAL, SECAM NTSC3.58/4.43 (video input only)
Spanish	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: E21-E69 Hyper : S1-S41 D/K VHF: R1-R20 UHF: R21-R69	PAL, SECAM NTSC3.58/4.43 (video input only)

MODEL	21R1A	21R1D	21R1E
Power Consumption	75W	75W	75 W

SPECIFICATIONS

Picture Tube Hi-Black Trinitron
 Approx. 55 cm (21 inches)
 (Approx. 51 cm picture measured
 diagonally) 100° deflection

Rear/Front Terminals

[REAR]

21-pin Euro connector (CENELEC standard)
 - Including audio/video input, RGB input

[FRONT]

- ➔ 2 Video input - phono jack
- ➔ Audio inputs - phono jacks
- ➔ Headphone jack - stereo minijack


[RM-836]

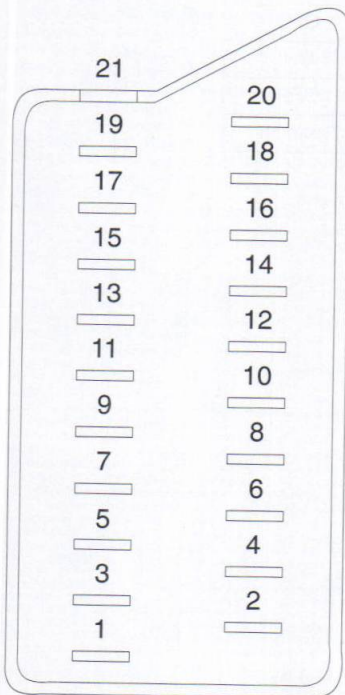
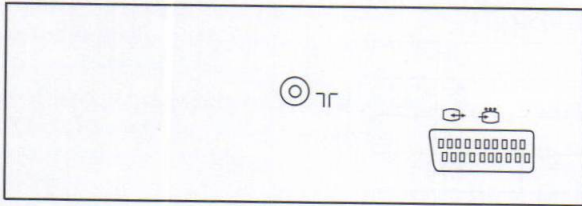
Remote control system Infrared control
 Power requirements 3V dc (2 batteries) R6 (size AA)
 Dimensions Approx. 210x45x24 mm (w/h/d)
 Weight Approx. 90g
 (Not including battery)

Sound output 14Wx2 (music power)
 7Wx2 (RMS)
 Dimensions 517x472x489 mm approx.
 Weight Approx. 21.0 kg
 Supplied accessories RM-836 Remote Commander (1)
 IEC designated batteries (2)
 Other features TELETEXT , Fasttext
 TOP text (KV-21R1A and 21R1D only)
 NICAM (KV-21R1E only)

Design and specifications are subject to change without notice.

Model name	KV-21R1A	KV-21R1D	KV-21R1E
Item			
PIP	OFF	OFF	OFF
MPIP	OFF	OFF	OFF
Rotation Coil	ON	ON	ON
VM Set	ON	ON	ON
Scart 1	ON	ON	ON
Scart 2	OFF	OFF	OFF
Front in (3)	ON	ON	ON
AKB in 16:9 mode	ON	ON	ON
TXT	ON	ON	ON
FLOF	ON	ON	ON
TOP	ON	ON	ON
Norm B/G/H	ON	ON	ON
Norm I	OFF	OFF	OFF
Norm D/K	OFF	ON	ON
Norm L	OFF	OFF	OFF
Language Preset	Italian	German	Spanish

21 pin connector ( 1)



Pin No.	1	2	4	Signal	Signal Level
1	○	○	○	Audio output B (Right)	Standard level : 0.5V rms Output impedance : Less than 1k ohms*
2	○	○	○	Audio input B (Right)	Standard level : 0.5V rms Output impedance : More than 10k ohms*
3	○	○	○	Audio output A (Left)	Standard level : 0.5V rms Output impedance : Less than 1k ohm*
4	○	○	○	Ground (Audio)	
5	○	○	○	Ground (Blue)	
6	○	○	○	Audio input A (Left)	Standard level : 0.5V rms Output impedance : Less than 10k ohm*
7	○	●	●	Blue input	0.7 ± 3dB, 75 ohms, positive
8	○	○	○	Function select (AV control)	High state (9.5 - 12V) : Part mode Low state (0 - 2V) : TV mode Input impedance : More than 10k ohms Input capacitance : Less than 2nF
9	○	○	○	Ground (Green)	
10	○	○	○	Open	
11	○	●	●	Green	
12	○	○	○	Open	
13	○	○	○	Ground (Red)	
14	○	○	○	Ground (Blanking)	
15	○	—	—	Red input	0.7 ± 3dB, 75 ohms, positive
	—	○	○	(S signal) chroma input	0.7 ± 3dB, 75 ohms, positive
16	○	●	●	Blanking input (Ys signal)	High state (1 - 3V) Low state (0 - 0.4V) Input impedance : 75 ohms
17	○	○	○	Ground (Video output)	
18	○	○	○	Ground (Video input)	
19	○	○	○	Video output	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
20	○	—	—	Video input	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
	—	○	○	Video input Y (S signal)	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
21	○	○	○	Common ground (plug, shield)	

○ Connected ● Not Connected (Open) * at 20Hz - 20kHz

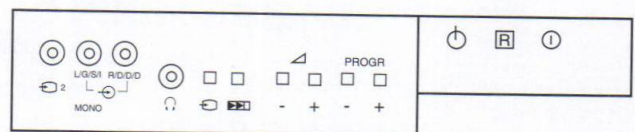


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CAUTION


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.

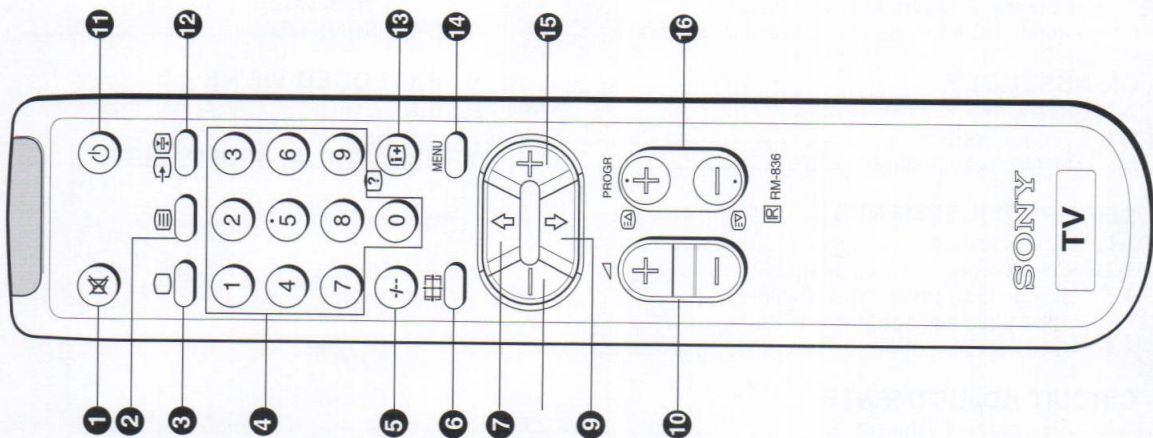
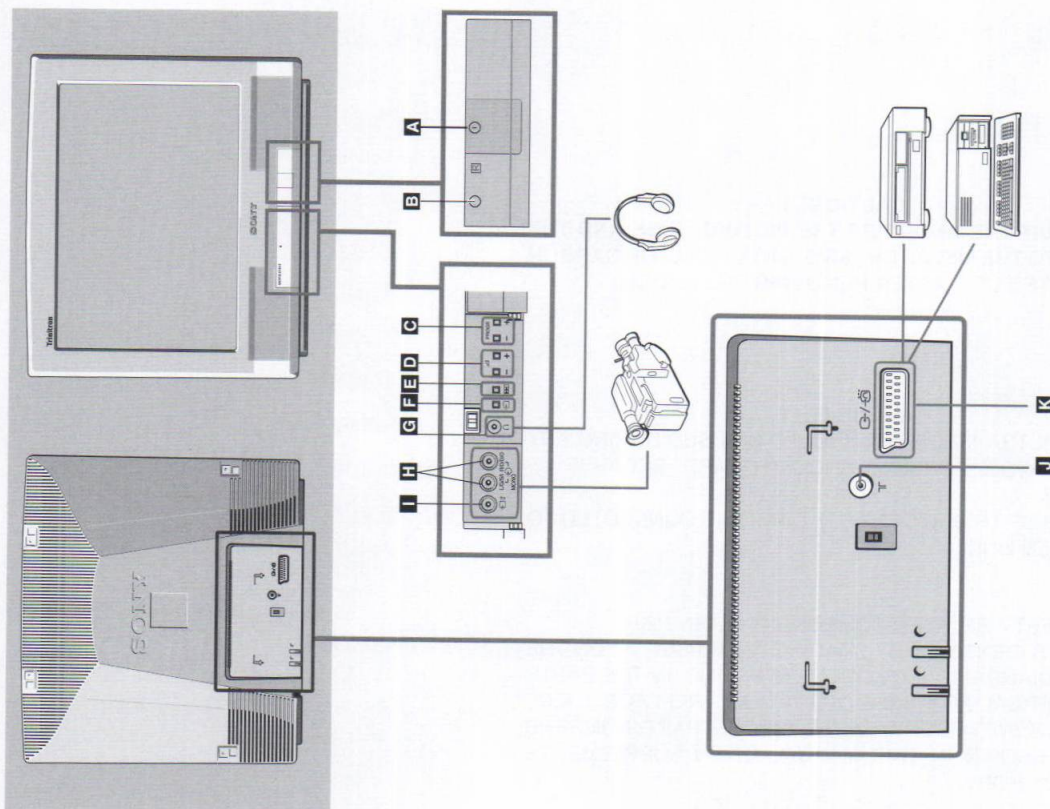
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

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.

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

SECTION 1 GENERAL



Getting Started

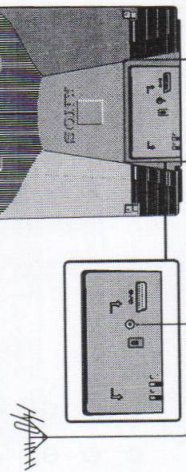
Please open the flaps at the front and at the back of the Instruction Manual for illustrations of the TV set and the Remote Commander. Letters in boxes refer to the buttons on the TV set, numbers in circles to the buttons on the Remote Commander.

Note: The illustrations in this instruction manual are based on the KV-25R1D model. You may find differences between these illustrations and your actual model.

Step 1

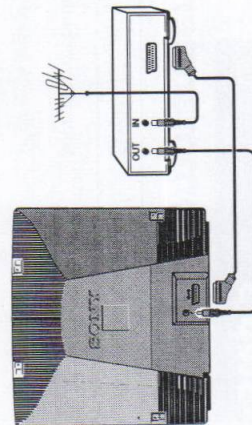
Connecting the Aerial

(If you connect a VCR, skip to step 2).
Connect an external aerial to the socket) J.



Step 2

Connecting a VCR



We recommend that you tune in the VCR signal to programme number "0".
For details see "Presetting Channels Manually" on page 33.

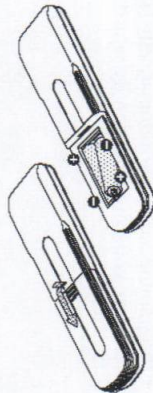
Step 3

Connecting the Mains Plug

Connect the mains plug of the TV set to the electrical outlet (220-240 V AC, 50 Hz).

Step 4

Inserting the Batteries into the Remote Commander



Always remember to dispose of used batteries in an environmental friendly way.

Step 5

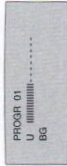
Remote Commander Overview

Refer to Symbol	Effect	Refer to Page
1	Sound on/off button	30
2	Teletext on button	37
3	TV button / TV power on Teletext off button	30 37
4 1...9,0	Number buttons	30
5 - / - -	Double digit entering button	30
6	Screen Format	30
7, 8, 4, 15	MENU: Cursor buttons to operate Menu functions TELETEXT: Fastext / TOP Text buttons	31 37
9	Volume control	30
10	Standby button	30
11	Input mode button Teletext: Freezing the subpage	38 37
12	On screen display button Teletext: reveal button	30 37
13 MENU	Menu on/off button	31
16 PROGR +/- 	Programme buttons Teletext: Page up/down buttons	30 37

Step 6

Presetting Channels Automatically

TV searches for all available channels. If manual tuning is preferred see Menu option - Presetting Channels Manually.



- 1 Depress power switch **A** on TV set.
- 2 Press and hold **E** on TV set for 2 seconds. Auto tuning starts and screen shows.

- When Auto tuning stops, the programme position 1 is displayed.
- Programme names are automatically taken from Teletext if available. With that function, you can easily identify which channel you are watching.

TV Operation

TV Operation

This section explains functions used whilst watching TV. Most operations are carried out using the Remote Commander (numbers in circles). All basic functions are also available on the TV set (letters in boxes).

To

Press

- **A** on TV
- **10**
TV is now in standby mode, **10** indicator **B** on TV lights.
- **3**, **PROGR +/ - 16 C** or any number button **4**
- **A** on TV
To save energy we recommend switching off completely when TV is not in use.

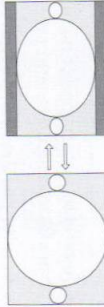
- **PROGR +/ - 16 C** or number buttons **4**
*For double digit numbers press -/ - **5** then the number e.g. For 23, press -/ - **5** then 2 and 3.*

- **12**
Press again to make programme number disappear.

- **+/ - 9 D**
- **1**
Press again to restore sound.


- **11 F**
Press again to return to TV programme.

- **6**
Press again to return to 4:3 mode.





MENU Operation

Use the following buttons on Remote Commander to control Menu screen.






- 1 Press **MENU 13** to switch the Menu Screen on / off.

- 2 Use the coloured buttons as follows:
Green **7** Scroll up

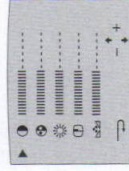
- Red - **8** decrease / select
- Blue **15** Scroll down
- Yellow + **14** increase / confirm (OK)

Adjusting the Picture and Sound





- 1 Press **MENU 13**.

- 2 Press green **7** or blue **15** to select **Picture** or **Sound** and press yellow **14** (OK) to confirm.

- 3 Press green **7** or blue **15** to select the item you wish to change.

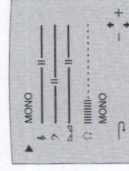
PICTURE CONTROL

Symbol	Item	-	Effect	+
	Picture	Less	More	
	Colour	Less	More	
	Brightness	Darker	Brighter	
	Sharpness	Softer	Sharper	
	Hue control (only for NTSC video signals)	Reddish	Greenish	



SOUND CONTROL

Symbol	Item	-	Effect	+
	MONO/STEREO	A: channel 1 Stereo/Mono	B: channel 2	
	Treble	Less	More	
	Bass	Less	More	
	Balance	More left	More Right	
	Headphones: Volume	Less	More	
	MONO/STEREO	A: channel 1 Stereo/Mono	B: channel 2	



Presetting Channels Manually

Up to 60 programme positions are available for presetting channels.

- 1 Press MENU **13**.
- 2 Press green **7** or blue **15** to select \rightarrow and press yellow (OK) **14**.
- 3 Select programme number using PROG + / - **16** **C** or the number buttons **4**.



- 4 Press green **7** or blue **15** to select tuning bar (|||||...) and press red **8** or yellow **14** to start channel search. When a channel is found the tuning bar stops moving and you see the picture.
- 5 If you want to store, press green **7** or blue **15** to select \diamond and press yellow (OK) **14**. If you don't want to store, press red **8** or yellow **14** to continue search.
- 6 Repeat steps 3 to 5 for all other channels.
- 7 Press MENU **13** to return to normal TV screen.

- 4 Press red **8** or yellow **14** to change levels.

- 5 Press MENU **13** to return to normal TV screen.

- To reset to factory preset picture levels, press green **7** or blue **15** to select \rightarrow and press yellow (OK) **14**.
- To return to the Main menu, select \rightarrow and press yellow.
- **When receiving a STEREO or Bilingual programme:**
 1. Stereo/Monoaural: on the screen appears [D] or [D].
 2. Bilingual: on the screen appears [D] or [D].

Using the Sleep Timer

The TV may be set to switch to the standby mode automatically after a length of time chosen by you. You may set the time in 30 minutes steps up to 4 hours.



- 1 Press MENU **13**.
- 2 Press green **7** or blue **15** to select \diamond
- 3 Press red **8** or yellow **14** to set time delay.
0.00 (OFF) 0.30 1.00 1.30 4.00
- 4 Press MENU **13** to return to normal TV screen.
When watching TV, press **12** to display time remaining.

Skipping Programme Positions

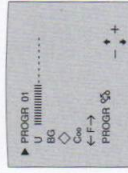
You can skip unused programme positions when selecting channels with the PROGR +/- buttons. You can still select them, however, using the number buttons 4.

1 Press MENU 13.

2 Press green 7 or blue 15 to select ⇨ and press yellow 14.



3 Select programme number you want to skip using PROGR +/- 16 17 or number buttons 4.



4 Press green 7 or blue 15 to select Coo and press yellow (OK) 14.

5 Press green 7 or blue 15 to select ◊ and press yellow (OK) 14 to store.

6 Repeat steps 3 to 5 for other unused programme positions.

7 Press MENU 13 to return to normal TV screen.

Fine-Tuning Channels

You can fine tune a stored channel.

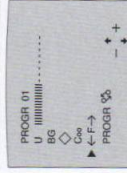
1 Select the channel you wish to fine tune.

2 Press MENU 13.

3 Press green 7 or blue 15 button to select ⇨ and press yellow (OK) 14.



4 Press green 7 or blue 15 to select ⇨F → and use red 8 or yellow 14 to adjust tuning.


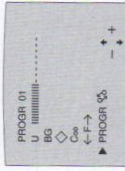
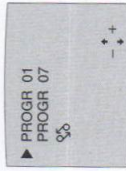


5 Press green 7 or blue 15 to select ◊ and press yellow (OK) 14 to store.

6 Press MENU 13 to return to normal TV screen.

Exchanging Programme Positions

After tuning you may wish to rearrange the programme positions.

- 1 Press MENU **13**.
- 2 Press green **7** or blue **15** button to select \rightarrow and press yellow (OK) **14**.
 
- 3 Press green **7** or blue **15** to select **PROGR 01** and press yellow (OK) **14**.
 
- 4 Press red **8** or yellow **14** to select the first programme position.
 
- 5 Press the blue **15** button.
- 6 Press red **8** or yellow **14** to select the second programme position.
- 7 Press blue **15** to select \leftarrow and press yellow (OK) **14** to exchange.
- 8 Repeat steps 4 to 7 for other programme positions.
- 9 Press MENU **13** to return to normal TV screen.

Teletext Operation

Viewing Teletext

Teletext is an information service broadcast by TV stations.

- 1 Select the channel which carries the teletext service you wish to receive.
- 2 Press **2** to switch on teletext.
- 3 Input three digits for the page number using the programme number buttons **4** or **5** / **16** (next or previous page).
- 4 Press **3** to switch off teletext.

Teletext errors may occur if the broadcasting signals are weak.

Using Other Teletext Functions

Superimposing teletext on the TV

Press **2** once in teletext mode or twice in TV mode to superimpose teletext on the TV screen.
Press **2** again to cancel superimposing.



Freezing a teletext subpage

Press **1** (HOLD) to freeze the subpage. Freezing the page prevents the information that is displayed from being updated.
Press **1** to cancel HOLD and allow update to continue.

Revealing concealed information (eg: answers to a quiz).

Press **2** to reveal information.
Press again to conceal the information.

Using colour buttons to access pages (Fastext)

When the colour coded menu appears at the bottom of a page, press the colour button (green, red, yellow or blue) **7** **8** **14** **15** to access the corresponding page.

Connecting Optional Equipment

There is a wide range of optional equipment you can connect to your TV. Refer to the illustrations on the back flap page of this manual.

Symbol Acceptable input signals

- / → 2 **F** **I** • Normal audio / video through the phono jacks.
- / → **K** • Normal audio / video and RGB through Euro AV connector.

Selecting the Input

Press → **F** repeatedly to select the desired video source.
Press **I** to return to normal TV operation.

Connecting Headphones

Plug in the headphones to the **□** socket on the front of the TV set.

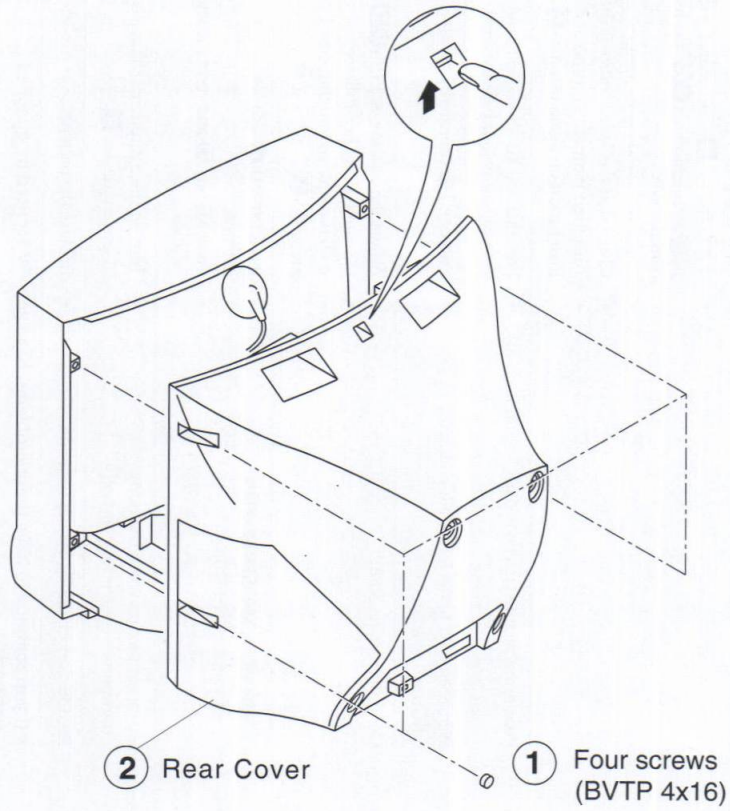
Troubleshooting

Here are some simple solutions to the problems which affect the picture and sound.

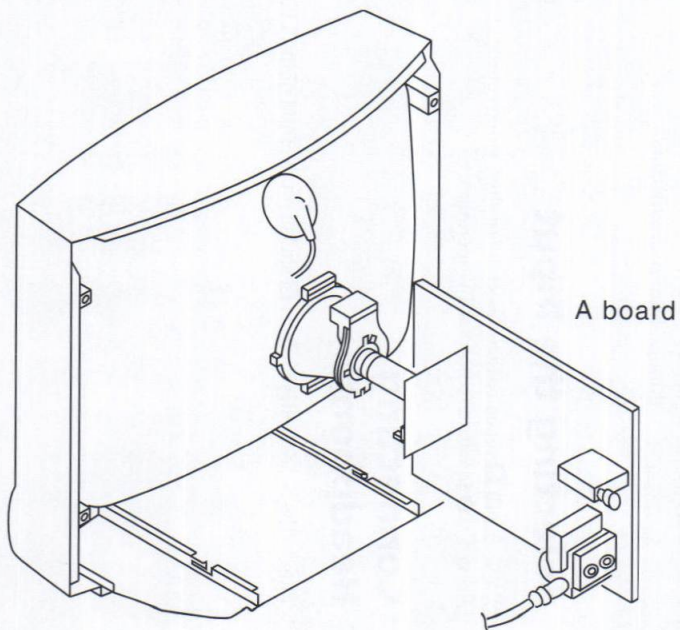
Problem	Solution
No picture, screen is dark, no sound	<ul style="list-style-type: none"> • Plug the TV in. • Press A on the TV. • If B indicator is on press 3 or the programme number 4 on the remote commander. • Check the aerial connection. • Check that the video source is on. • Turn the TV off for 3 or 4 seconds and then turn it on again using A.
Poor or no picture (screen is dark, sound is good)	<ul style="list-style-type: none"> • Press MENU B and adjust brightness picture and colour balance level.
Picture moved to the left when watching a RGB video source.	<ul style="list-style-type: none"> • Press → I repeatedly to select → I.
Good picture, no sound	<ul style="list-style-type: none"> • Adjust the volume + / - D. • Disconnect any headphones. • If ⚡ is displayed on the screen, press 1.
No colour on colour programmes	<ul style="list-style-type: none"> • Press MENU B and adjust colour balance. • Press MENU B and reset to factory settings.
Distorted picture when changing programmes or selecting teletext	<ul style="list-style-type: none"> • Turn off the equipment connected to the 21-pin connector K.
Remote commander does not function	<ul style="list-style-type: none"> • Replace the batteries.
	<ul style="list-style-type: none"> • If you continue to have these problems, have your TV serviced by qualified personnel. • NEVER open the casing yourself.

SECTION 2 DISASSEMBLY

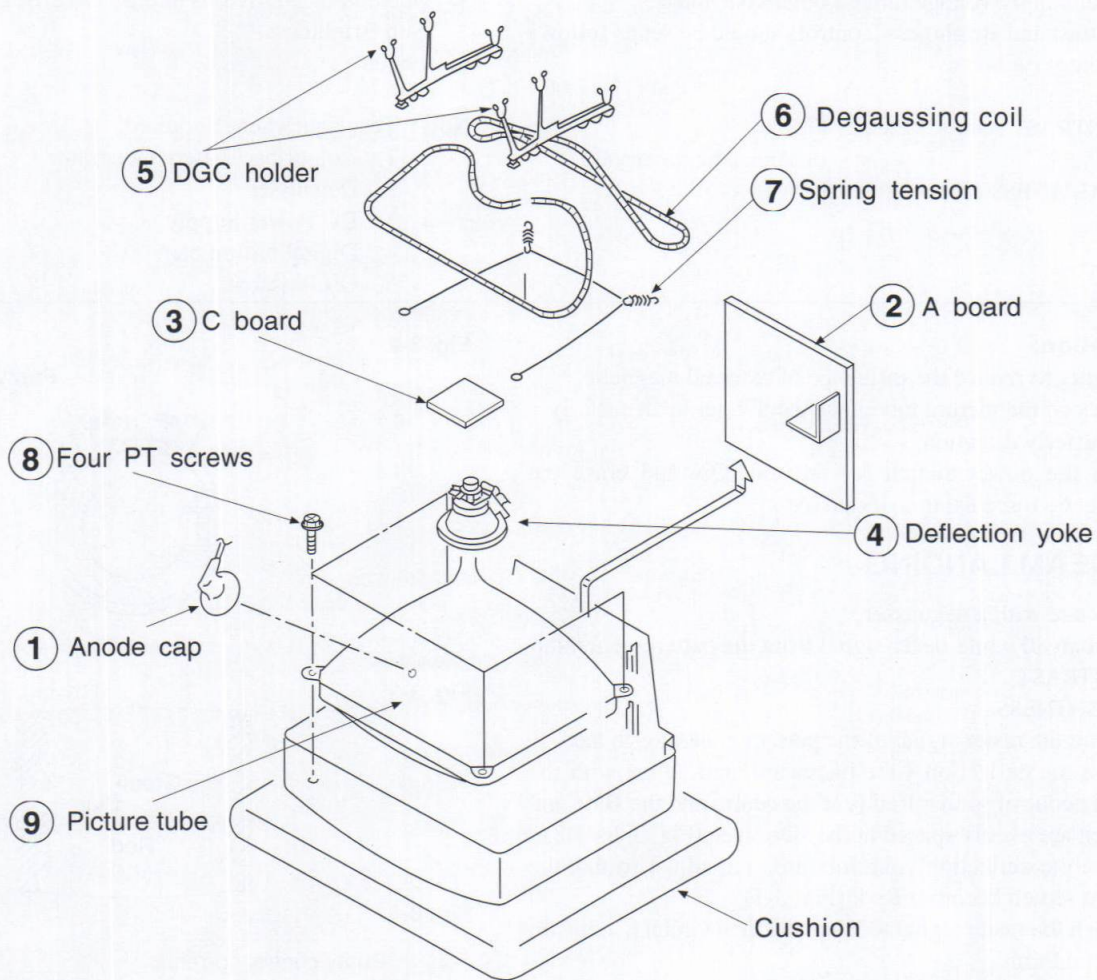
2-1. REAR COVER REMOVAL



2-2. SERVICE POSITION



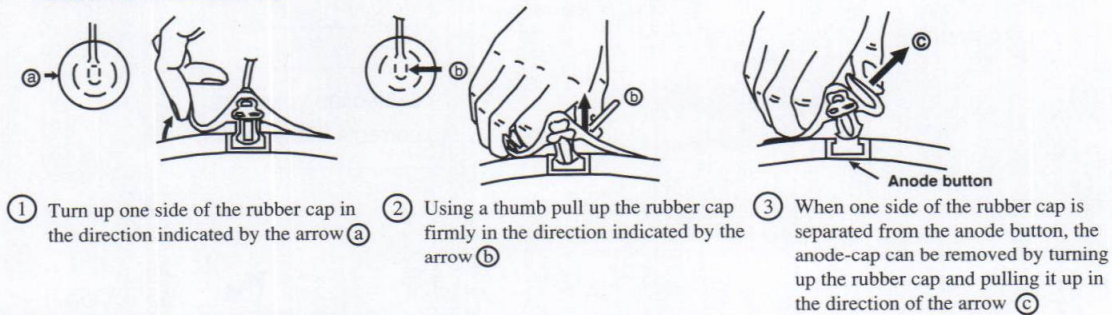
2-3. PICTURE TUBE REMOVAL



• REMOVAL OF ANODE-CAP

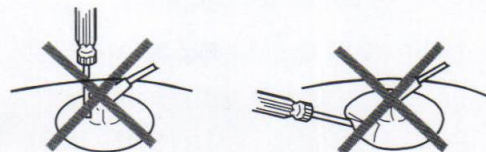
Note: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

* REMOVING PROCEDURES.



• HOW TO HANDLE AN ANODE-CAP

- 1 Don't damage the surface of anode-cap with sharp shaped material !
- 2 Don't press the rubber hardly not to hurt inside of anode-caps !
A metal fitting called as shatter-hook terminal is built into the rubber.
- 3 Don't turn the foot of rubber over hardly !
The shatter-hook terminal will stick out or damage the rubber.



SECTION 3 SET-UP ADJUSTMENTS

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

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

CONTRAST control 80%
(or Normal by commander)
BRIGHTNESS control 50%

Perform the adjustments in the following order:

1. Beam Landing
2. Convergence
3. Screen (G2), Drive, White Balance, Sub Colour and Sub Brightness.
4. Focus

Note: Test Equipment Required.

1. Colour bar/Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital multimeter
5. Oscilloscope

Preparation:

- In order to reduce the influence of external magnetic forces on the picture tube, face the TV set in an easterly or westerly direction.
- Turn the power switch for the unit ON and erase the magnetic force using a degausser.

3-1. BEAM LANDING

Demagnetize with a degausser.

1. Input an all white raster signal from the pattern generator.
CONTRAST } normal
BRIGHTNESS }
2. Switch the raster signal of the pattern generator to Red.
3. Move the deflection yoke backward, and adjust with the purity control so that Red is at the centre and the Blue and Green are evenly spaced at the sides. see (Fig. 3-1 - 3-3)
4. Move the deflection yoke forward, and adjust so that the entire screen becomes Red. (Fig. 3-1)
5. Switch the raster signal to Blue and then Green to confirm the condition.
6. When the position of the deflection yoke has been determined, tighten it with the deflection yoke mounting screw.
7. When the landing at the corners is not correct, adjust by using disk magnets. (Fig. 3-4)

Fig. 3-2

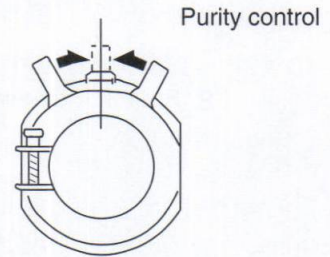


Fig. 3-3

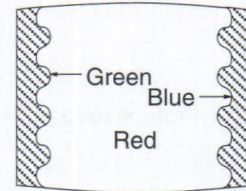


Fig. 3-4

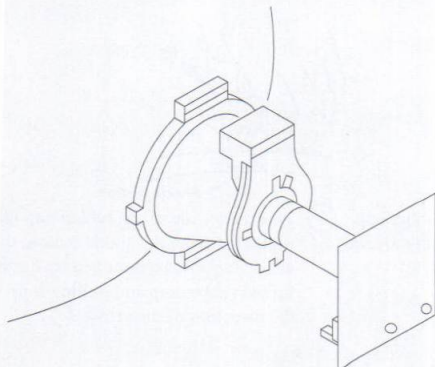
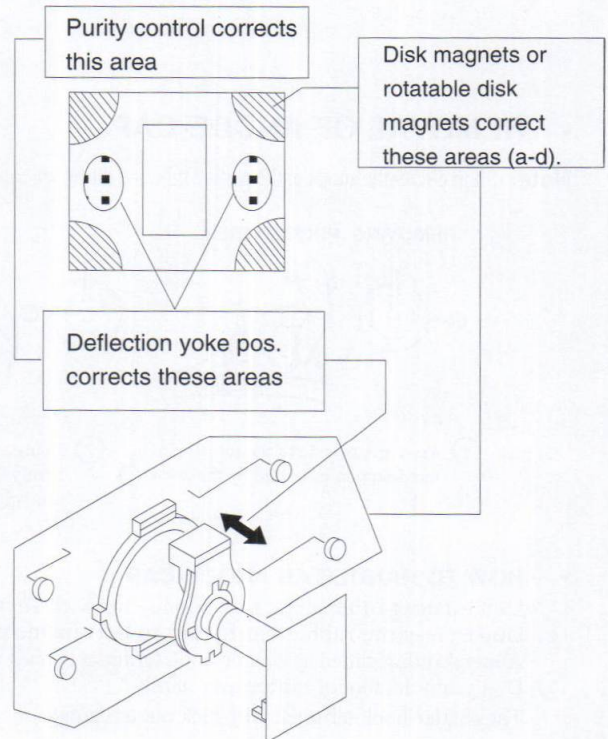


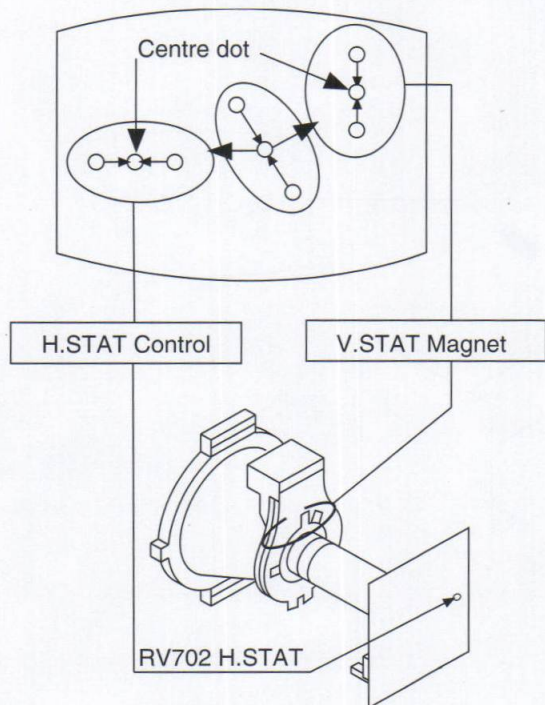
Fig. 3-1

3-2. CONVERGENCE

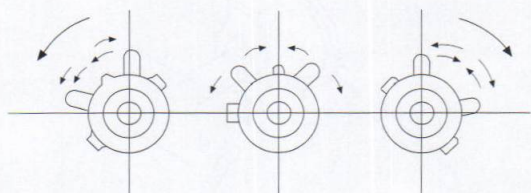
Preparation:

- Before starting, perform FOCUS, H.SIZE, and V.SIZE adjustments.
- Set the BRIGHTNESS control to minimum.
- Input a dot pattern from the pattern generator.

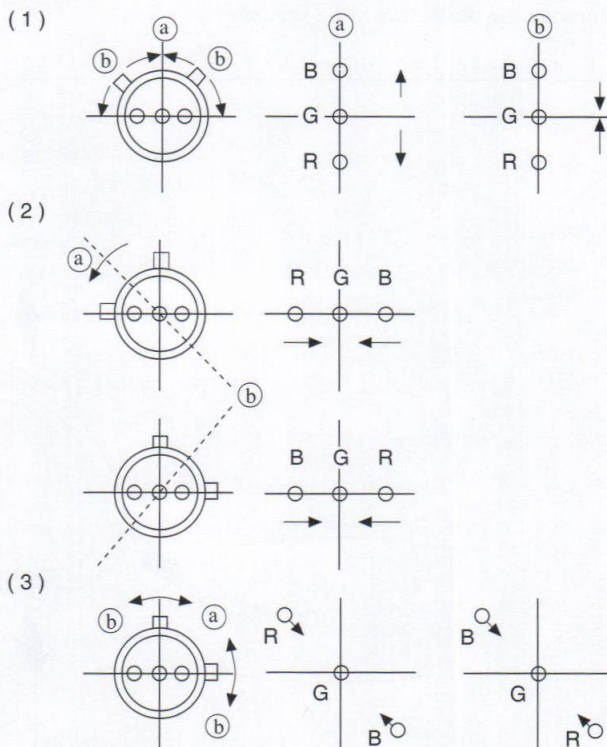
(1) Horizontal and Vertical Static Convergence



1. Adjust the H.STAT control to converge the Red, Green and Blue dots at the centre of the screen. (Horizontal movement)
 2. Adjust the V.STAT magnet to converge the Red, Green and Blue dots at the centre of the screen. (Vertical movement)
- If the horizontal dots cannot coincide with variable range of the H.STAT convergence, adjust together with the V.STAT convergence while tracking.
(Adjust the convergence by tilting the V.STAT convergence or by opening or closing the V.STAT convergence.)



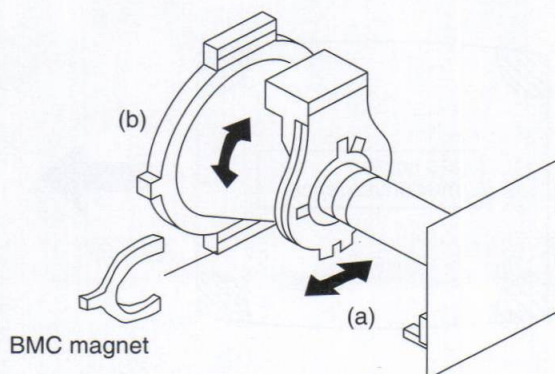
3. When the V.STAT magnet is moved in the direction of the (a) and (b) arrows, the Red, Green and Blue dots move as shown below.



If the Red and Blue dots do not converge with the Green dots, perform the following steps.

1. Move the BMC magnet (a) to correct for insufficient H.static convergence.
2. Rotate the BMC magnet (b) to correct for insufficient V.static convergence.

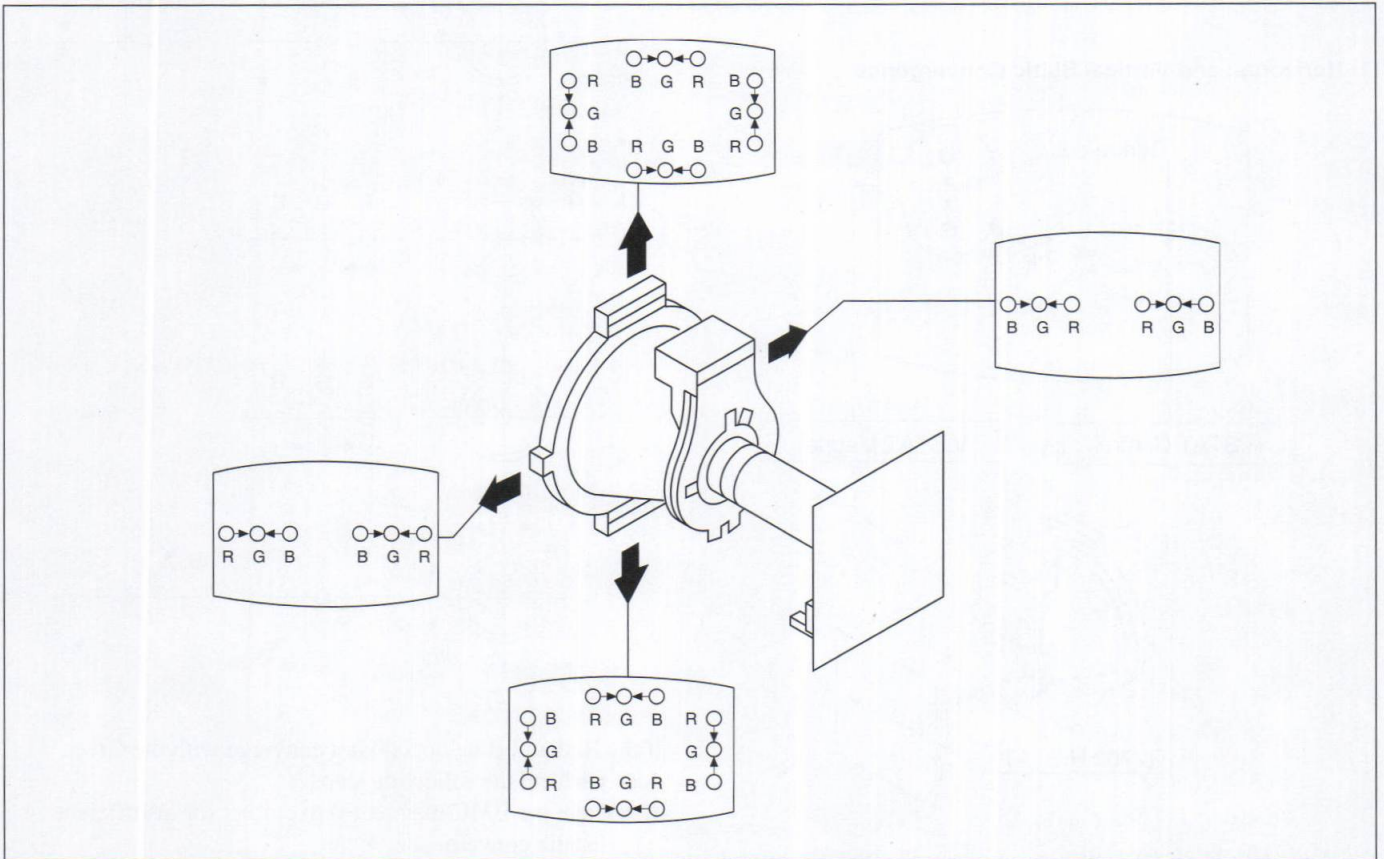
In either case, repeat the Beam Landing Adjustment.



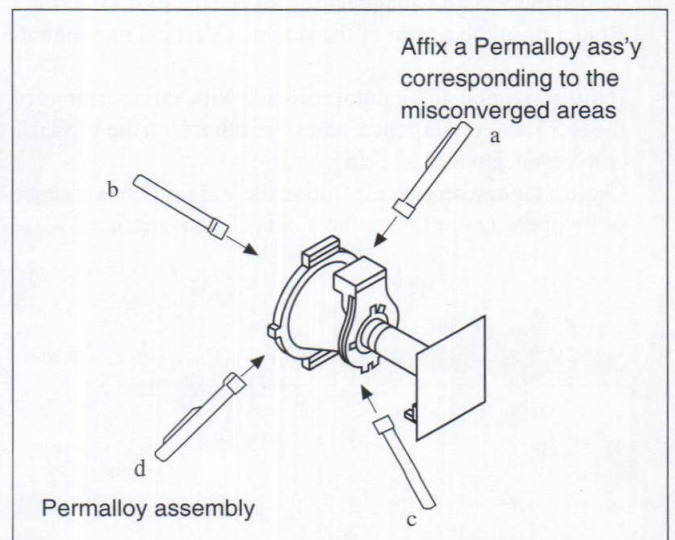
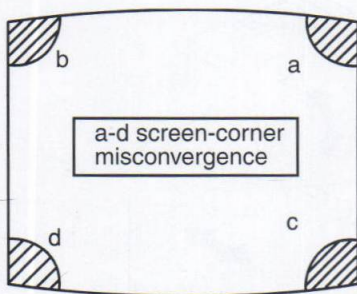
(2) Dynamic Convergence Adjustment

Preparation:

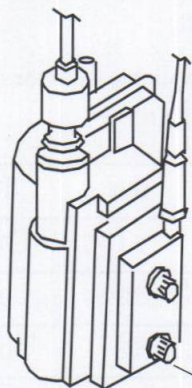
- Before starting, perform the Horizontal and Vertical static convergence adjustment.
1. Slightly loosen the deflection yoke screw.
 2. Remove the deflection yoke spacers.
 3. Move the deflection yoke for best convergence as shown below.
 4. Tighten the deflection yoke screw.
 5. Install the deflection yoke spacers.



(3) Screen-corner Convergence.



3-3. SCREEN (G2), DRIVE, WHITE BALANCE, SUB COLOUR and SUB BRIGHTNESS.



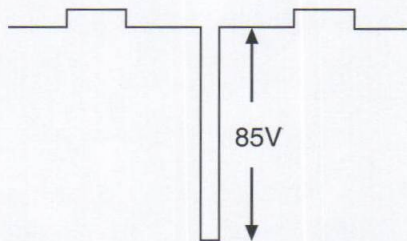
SCREEN

Screen (G2) setting

1. Input a 0 IRE (Black Level) signal from the pattern generator.
2. Enter into the Service Mode "Test""Test" and 38.
3. Adjust the SCREEN VR until the Down arrow is displayed.
4. Adjust the SCREEN VR until the Down arrow just disappears.
5. Press the TV Button on the Remote Commander to store the data.

Drive Level

1. Input a Video signal containing a small area of 100% white on a black background.
2. Connect an oscilloscope to Pin ⑩ of J701 (R OUT) on the C Board.
3. Set the Picture to maximum using "Test""Test" and 01.
4. Enter into the Service mode (Adjust Menu).
5. Using the Blue and Green buttons select "RED HWB".
6. Using the Red and Yellow buttons on the Remote Commander adjust until the oscilloscope waveform has an amplitude of 85V.

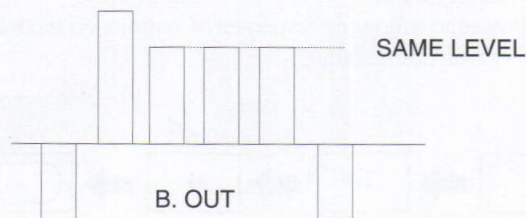


White Balance Adjustment

1. Input an all white pattern from the pattern generator.
2. Adjust the Colour and Brightness controls to the standard level.
3. Enter into the Service Mode.
4. Adjust the Green HWB and Blue HWB so that the White Balance becomes optimum.

Sub Colour Adjustment

1. Input a PAL colour bar pattern from the pattern generator.
2. Connect an oscilloscope to Pin ⑧ of J701 (B OUT) on the C Board.
3. Enter into the Service Mode "Test""Test" and 22.
4. Using the Red and Yellow buttons on the Remote Commander adjust until the oscilloscope waveform becomes as follows :



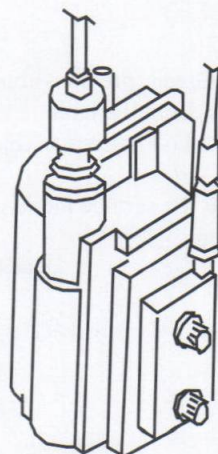
Note : If the TV is able to receive PAL and SECAM transmissions, repeat the above procedure using a Secam colour bar signal.

Sub Brightness Adjustment

1. Input a Philips pattern from the pattern generator.
2. Enter into the Service Mode "Test""Test" and 23.
3. Using the Red and Yellow buttons on the Remote Commander adjust until the 0 IRE of the grey scale and the cut off are only slightly visible on the screen.

3-4. FOCUS

1. Receive a television broadcast.
2. Normalize the picture setting.
3. Adjust the focus control on the flyback transformer to focus the screen centre area properly.
Bring only the centre area of the screen into focus, the magenta-ring appears on the screen. In this case, adjust the focus to optimize the screen uniformly.



Focus

SECTION 4 CIRCUIT ADJUSTMENTS

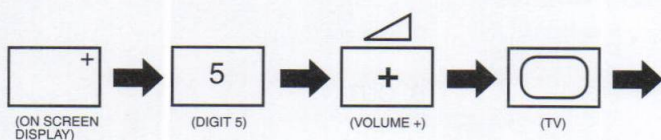
4-1. ELECTRICAL ADJUSTMENTS

Service adjustment to this model can be performed with the supplied Remote Control Commander RM-836.

Range of adjustments available from the on screen menu system.

HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power of the set and enter into stand-by mode.
2. Press the following sequence of buttons on the Remote Control Commander.



"TT--" will appear in the top right corner of the screen
Other status information will also be displayed.

3. Press the MENU button on the Remote Commander to obtain the menu on the screen.

Adjust.			
▷	16:9 ON		
	System		
	Text		
	AGC	33	00-63
	PLL	32	00-63
	V1 00-01	SONY	BE-5

Software version

4. Press the Blue (Next) or Green (previous) buttons to select the adjustment item from the table.
5. Press the Yellow (+) or Red (-) buttons to change the data as required.
6. Turn off the power to quit the service mode when adjustments are completed.

Adjustment	Set	Range
V size	21	0 - 63
V breth	32	0 - 63
Pin amp	12	0 - 63
Para. tilt	43	0 - 63
V linear	42	0 - 63
Corner corr	05	0 - 63
H size	34	0 - 63
V pos	00	0 - 63
H phase	42	0 - 63
Blue	26	0 - 63
Green	32	0 - 63
Red	42	0 - 63
HV blk 1	00	0 - 63
HV blk 2	00	0 - 63
V cent	06	0 - 63
Zwei max	36	0 - 63
zwei min	18	0 - 63

4-2. TEST MODE 2:

TT -- Mode is available by pressing the Test button twice, O.S.D 'TT --' appears. The functions described below are available by pressing two digits. To release the 'TT --' mode, press 0 twice, press 'TEST', press 'TV' or switch the TV into Stand-by mode.

00	Switch 'TT--' Mode off.
01	Set picture level to maximum.
02	Set picture level to minimum.
03	Set volume to 35%.
04	Set volume to 50%.
05	Set volume to 65%.
06	Set volume to 80%.
07	Ageing condition (picture max., brightness max.).
08	Shipping condition (Analog values are RESET to factory setting, Prog 1 is selected, TT--mode switched off, Vol = 35%).
09	Dummy.
10	No function.
11	Dummy
12	Dummy.
13	Dummy.
14	Dummy.
15	Read factory setting from ROM to NVM - Reads Volume, Brightness, Picture, Hue, Sharpness and Colour values from ROM to the actual used values (Last Power Memory).
16	Save actual used values as reset values.
17	Enable / Disable Sharpness Operation.
18	Dummy.
19	RGB priority.
20	No function.
21	No function.
22	Sub Colour (Pal / Secam Different Stores)
23	Sub Brightness.
24	RGB priority on.

25	Destination Systems DKE.
26	Destination Systems I/U.
27	Destination System I/I'.
28	Destination BG only.
29	Dummy.
30-31	No function.
32	Picture level to 50%
33-35	No function.
36	Audio mute ON.
37	OSD off.
38	Enter G2 adjustment mode.
39	Sub-brightness
40	No function.
41	Re-initialise NVM.
42	Dummy.
43	Re-initialise Geometry settings.
44-47	Dummy
48	Set NVM testbyte to 44h in NVM.
49	Erase NVM testbyte
50	No function.
51	Toggle 60/100 programs.

Note : For Test Modes 41 - 51, it is necessary to ensure that the TV is set to Prog 59.

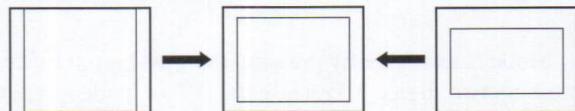
DEFLECTION SYSTEM ADJUSTMENT

1. Enter into the service mode.
2. Using the Blue or Green buttons select the Adjust item.
3. Press the Yellow button to enter the adjustment submenu.
4. Select and adjust each item in order to obtain the optimum image.

See Note on page 23

Adjustment	Set	Range
V size	21	0 - 63
V breth	32	0 - 63
Pin amp	12	0 - 63
Para. tilt	43	0 - 63
V linear	42	0 - 63
Corner corr	05	0 - 63
H size	34	0 - 63
V pos	00	0 - 63
H phase	42	0 - 63
Blue	26	0 - 63
Green	32	0 - 63
Red	42	0 - 63
HV blk 1	00	0 - 63
HV blk 2	00	0 - 63
V cent	06	0 - 63
Zwei max	36	0 - 63
zwei min	18	0 - 63

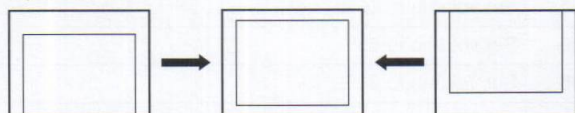
VERT, AMPL



V, LINEAR



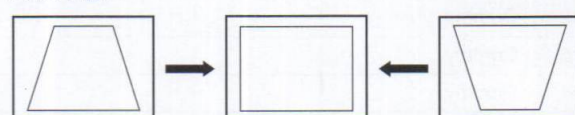
V, CENTRE



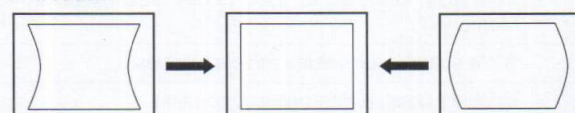
H, CENTRE



PAR TILT

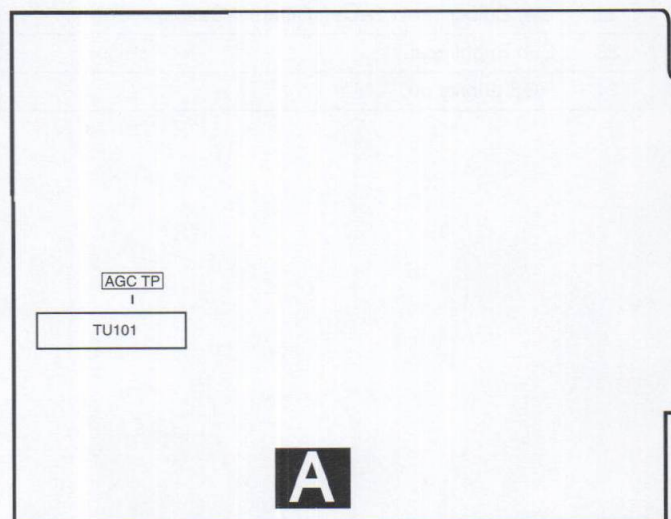


PAR AMP



AGC ADJUSTMENT

1. Receive a signal of 63dBuV / 75 ohm terminated via the tuner socket.
2. Measure the voltage at AGC TP.
3. Adjust TU101 RV to obtain a voltage of $3.0 \pm 0.3V$.



- A Board Component Side -

4-3. BE-5 SELF DIAGNOSTIC SOFTWARE

The identification of errors within the BE-5 chassis is triggered in 1 of 2 ways :- 1: Bus busy or 2: Device failure to respond to I²C. In the event of one of these situations arising the software will first try to release the Bus if busy (Failure to do so will report with a continuous flashing LED) and then communicate with each relevant device in turn to establish if a device is faulty. If a device is found to be faulty the relevant device number will be displayed through the LED by a Series of flashes which must be counted (See Table 1), Non fatal errors are reported with this method.

If a fatal error is found, the set will simply stay in whichever state it was when the error occurred, but if a non fatal error occurs the set will try to continue to operate.

To check error code it is necessary to use the TV error display part number S-188-900-10.

Table 1

No of Flashes	Error Codes	Meaning
2	30	IC301 not acknowledging I ² C transmission, NVM OK.
3	31	IC301 FAULT (Not OK) - flags
4	32	IC301 - No H Flyback
5	40	IC301 - Stack Overflow.
6	90	Overvoltage / Overcurrent Protection (Pin 52) high.
7	10	IC002 not acknowledging I ² C transmission, IC301 OK.
8	20	IC002 and IC301 - No I ² C acknowledgment.
9	01	General I ² C Error (SDA or SCL being held low) (IC301, IC001, IC002, CN001)

Flash Timing Example : e.g. error number 3

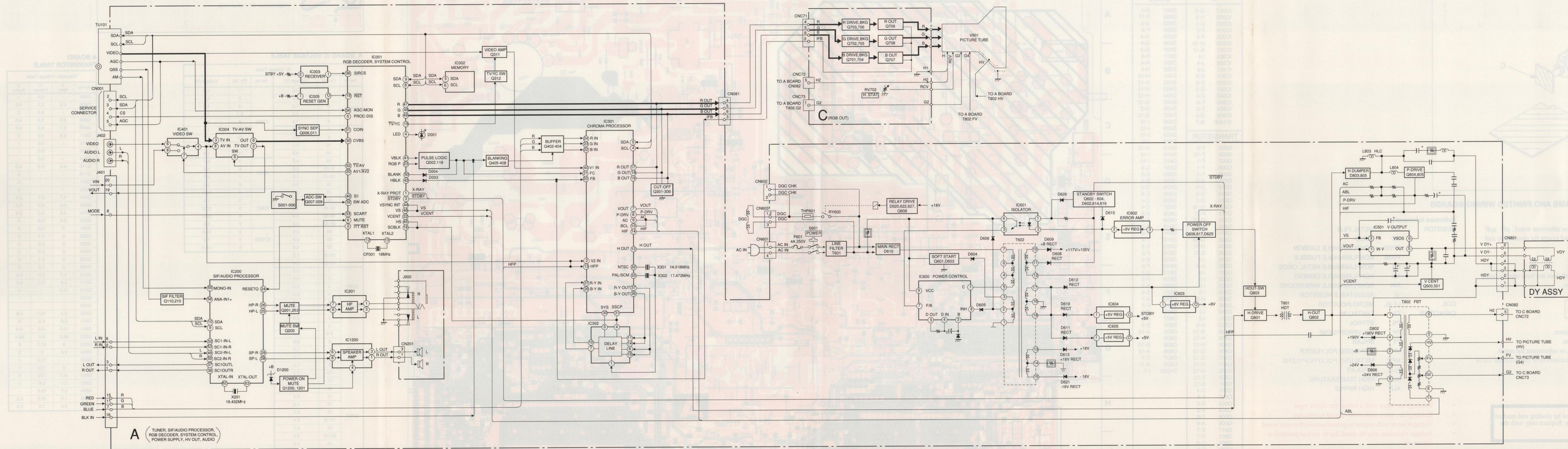
Stby LED



Note : Deflection System Adjustments should not be carried out whilst using an NTSC (60Hz) signal, or if the signal is unlocked.

SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM

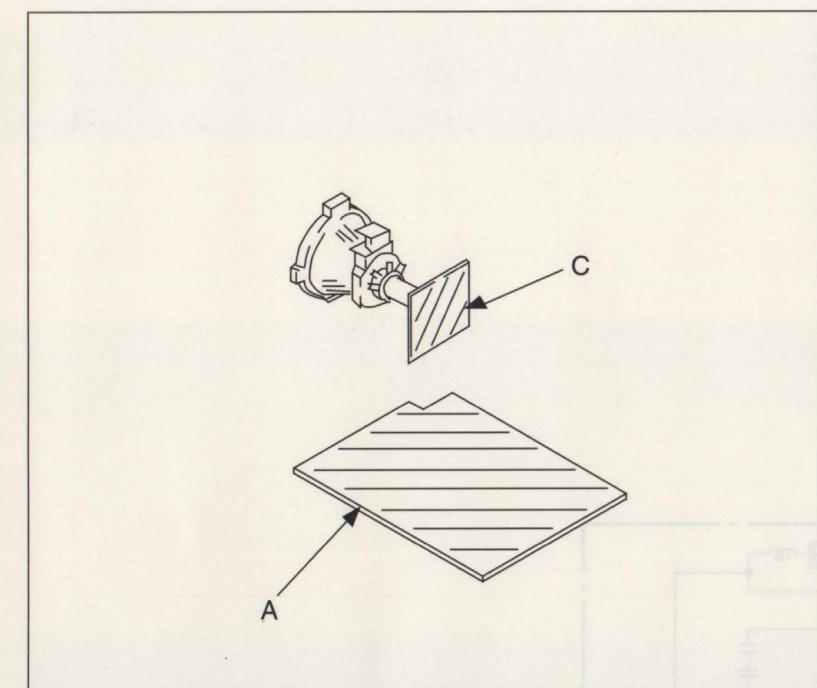


A (TUNER, SIF/AUDIO PROCESSOR, RGB DECODER, SYSTEM CONTROL, POWER SUPPLY, HV OUT, AUDIO)



TUNER, SIF/AUDIO PROCESSOR, RGB DECODER, SYSTEM CONTROL, POWER SUPPLY, HV OUT, AUDIO

5-2. CIRCUIT BOARDS LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

- Note: All capacitors are in µF unless otherwise noted. pF: µµF 50WV or less are not indicated except for electrolytic and tantalums. All resistors are in ohms. k = 1000, M = 1000K. Indication of resistance, which does not have one for rating electrical power, is as follows.

Reference information

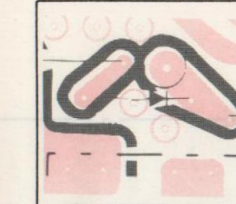
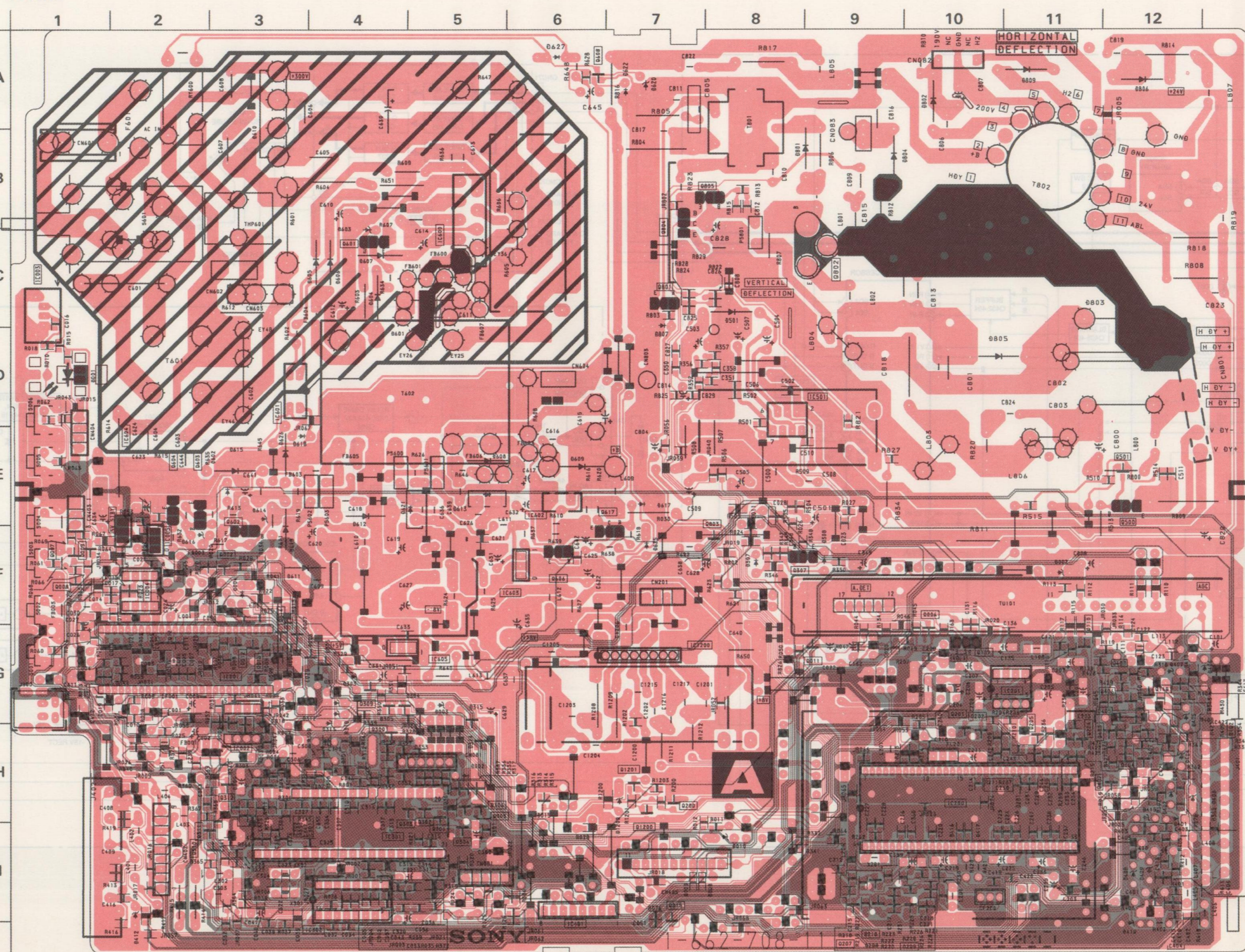
Table with columns for component type (RESISTOR, COIL, CAPACITOR) and their designations (RN, RC, FPRD, etc.).

- Readings are taken with a colour-bar signal input. Readings are taken with 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. Circled numbers are waveform references. B+ bus. Signal path (RF).

A BOARD

Table listing IC, DIODE, and TRANSISTOR components for the A Board, including part numbers and designations.

A Board



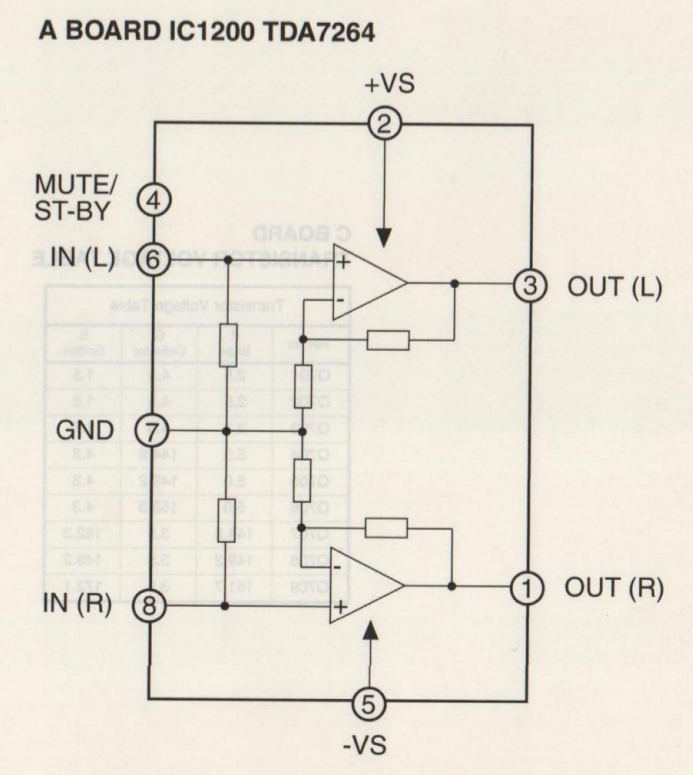
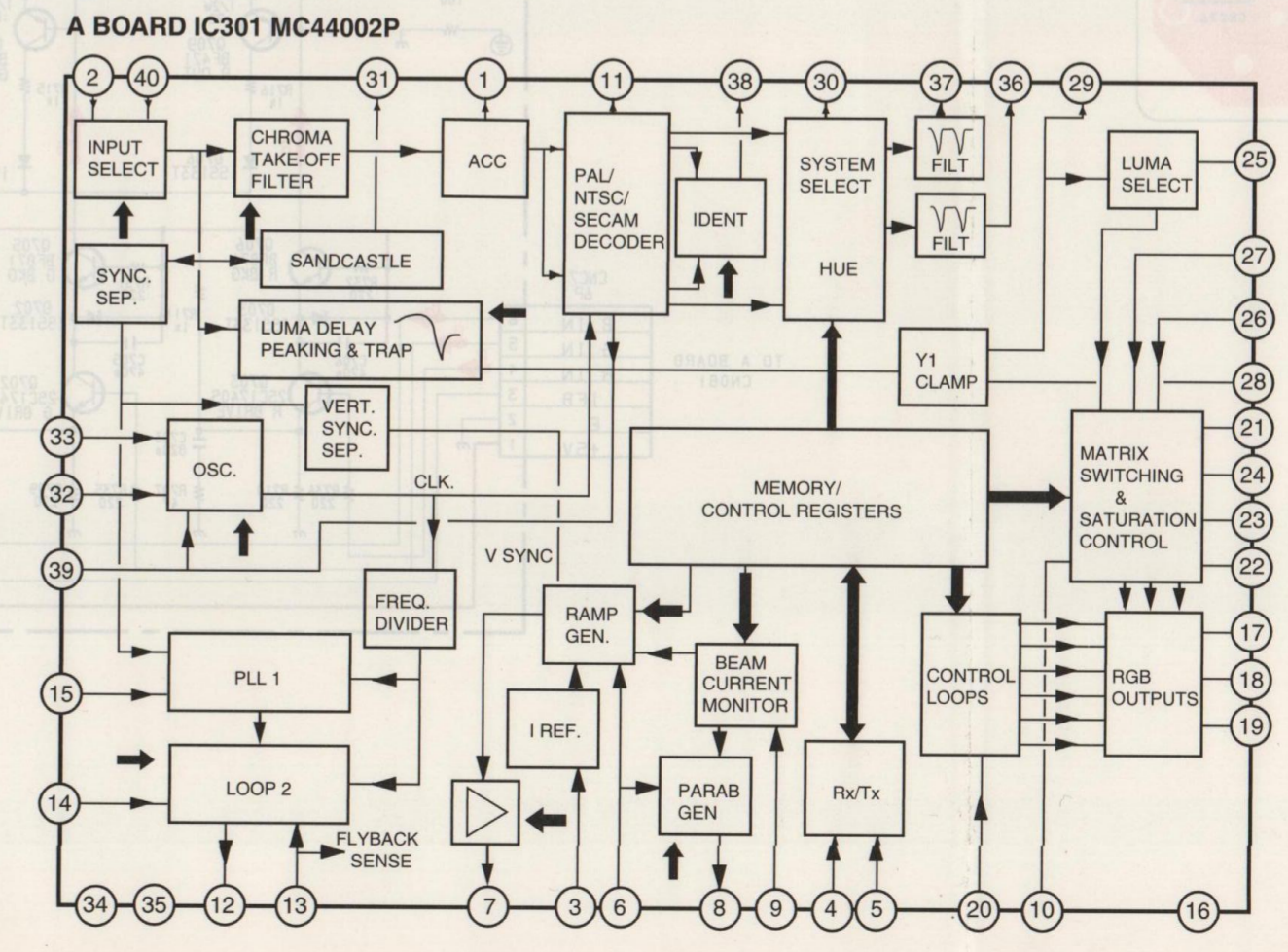
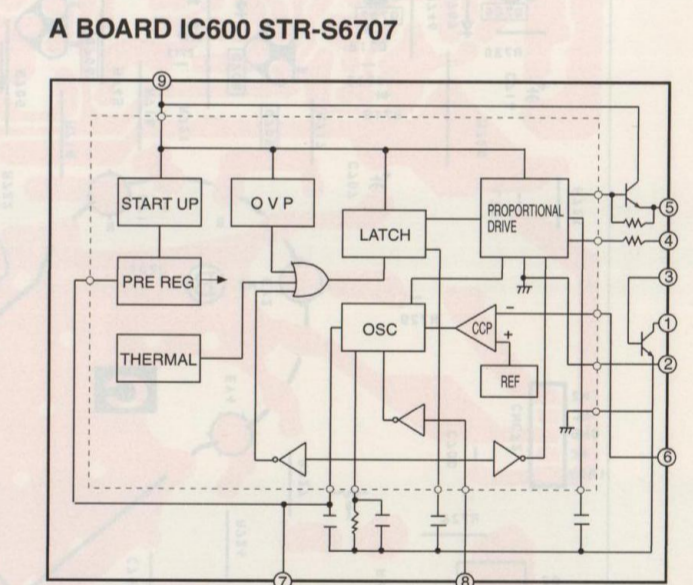
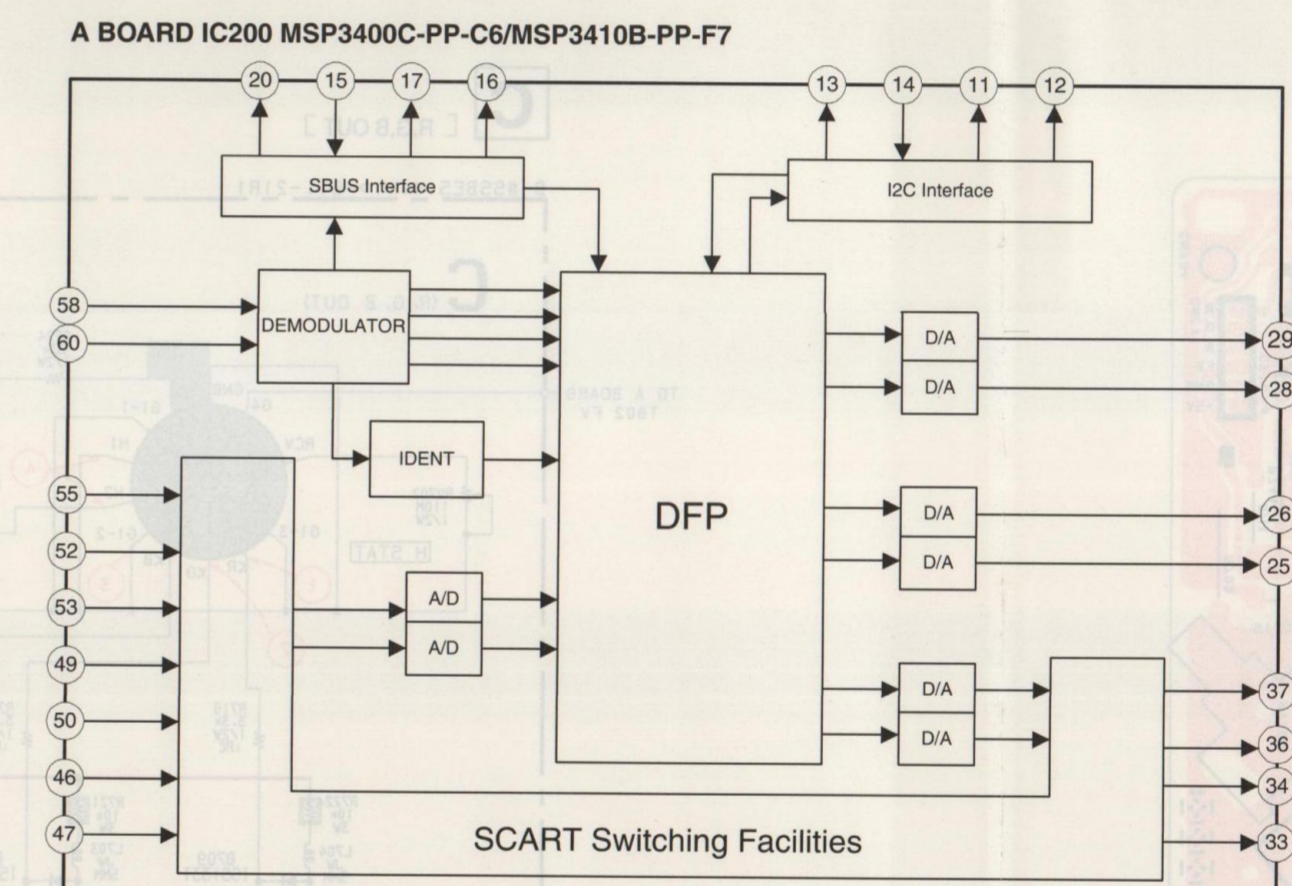
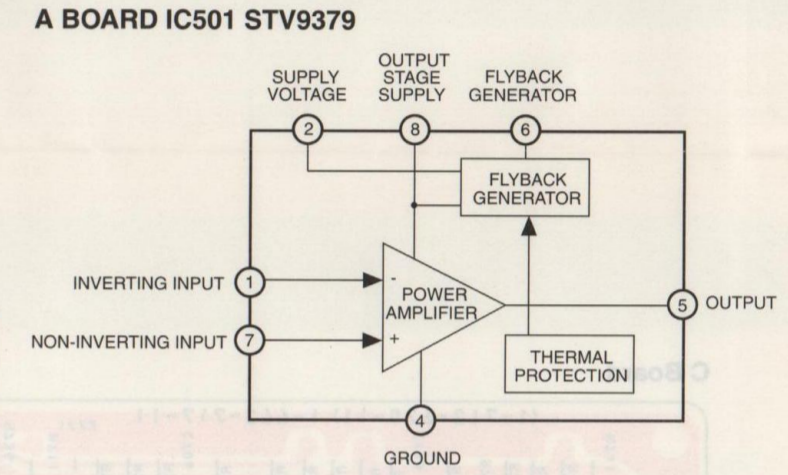
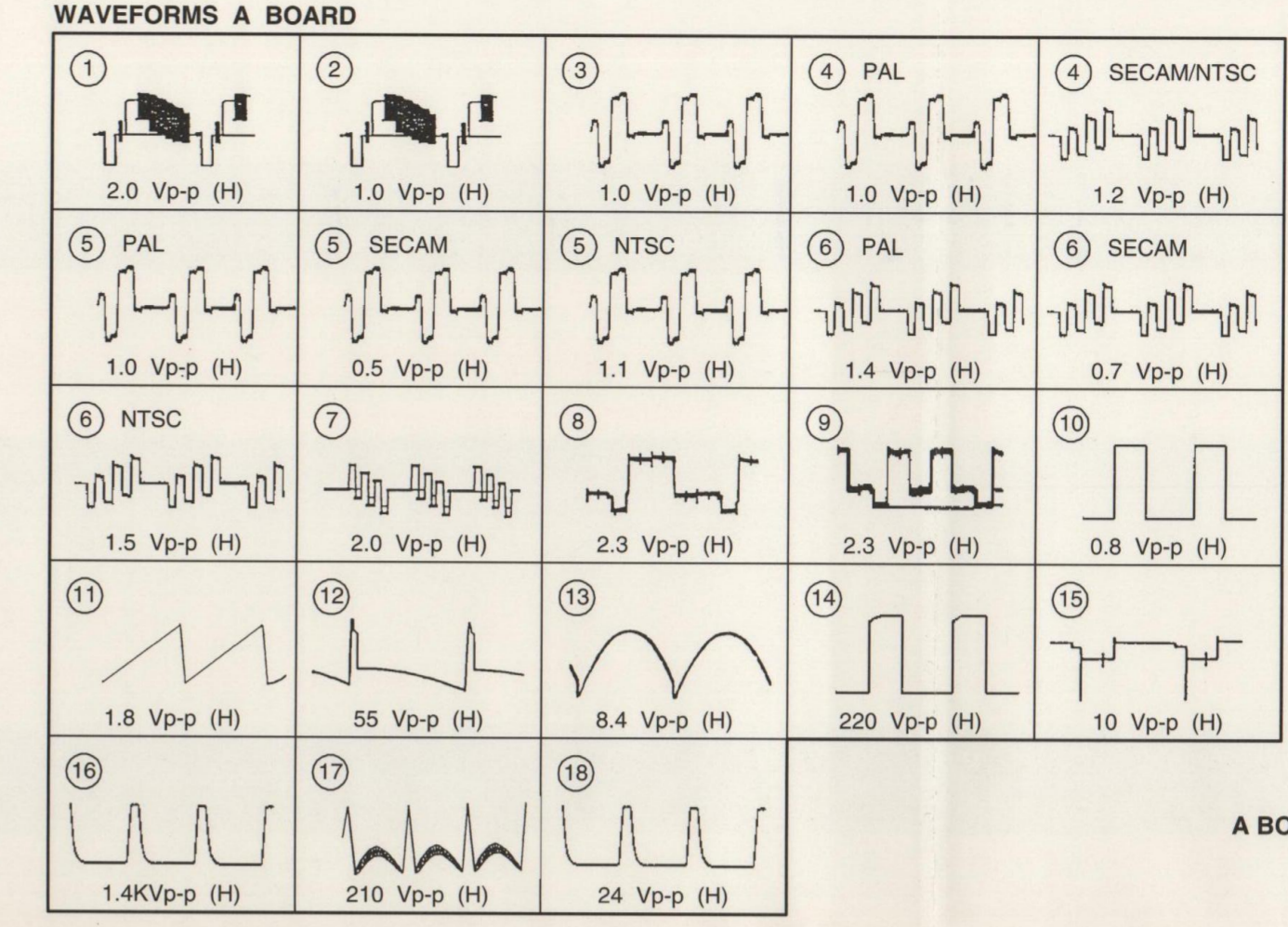
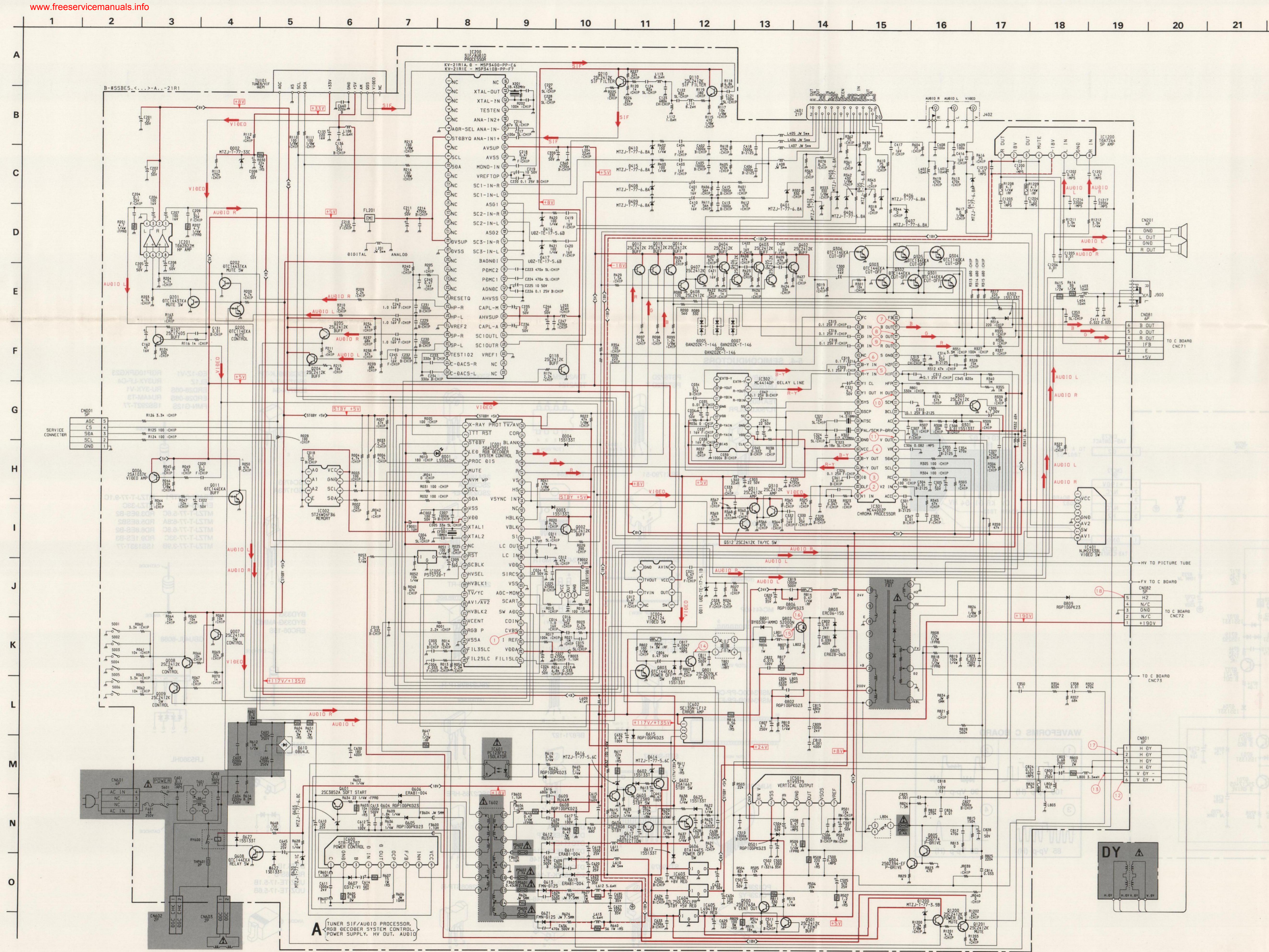
NOTE: The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

A BOARD IC VOLTAGE TABLE

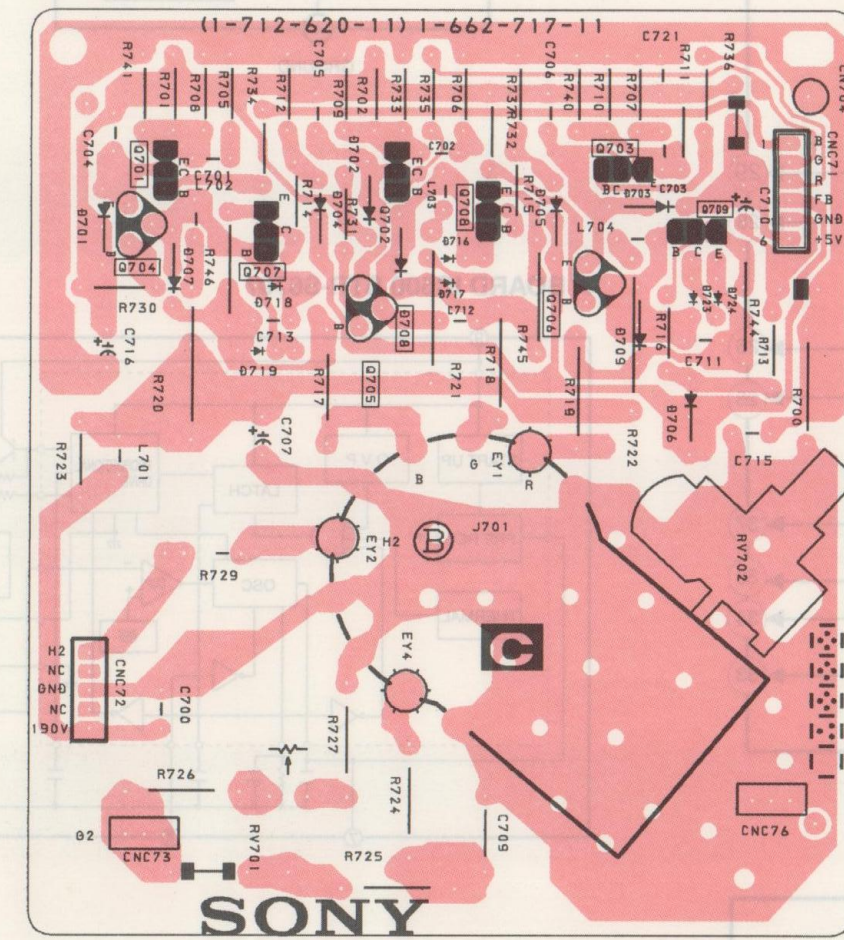
IC Voltage Table with columns for IC (IC004, IC200, IC201, IC301), Pin No, and Voltage (V).

A BOARD TRANSISTOR TABLE

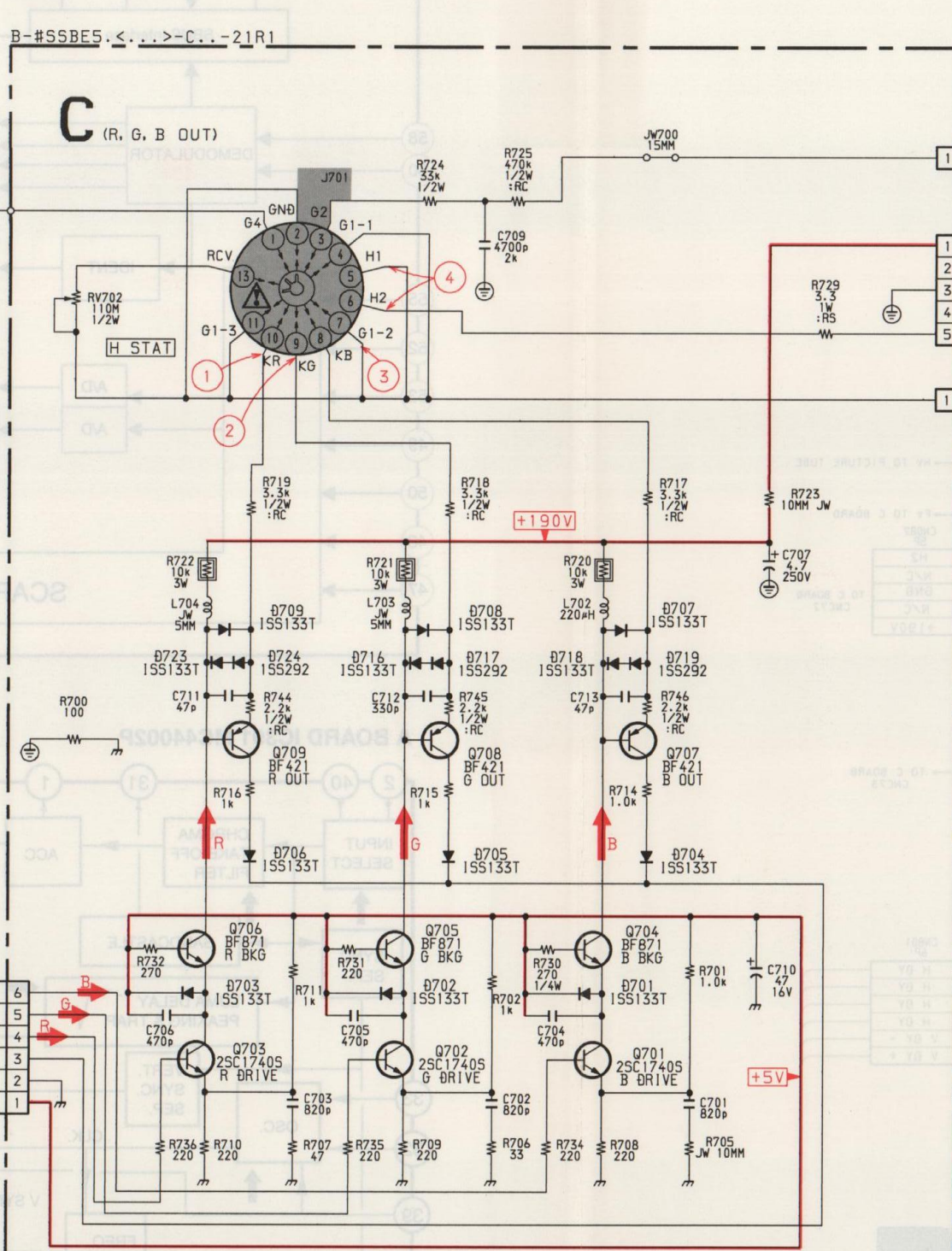
Transistor Voltage Table with columns for Transistor (Q002-Q1201), B (Base), C (Collector), and E (Emitter) voltages.



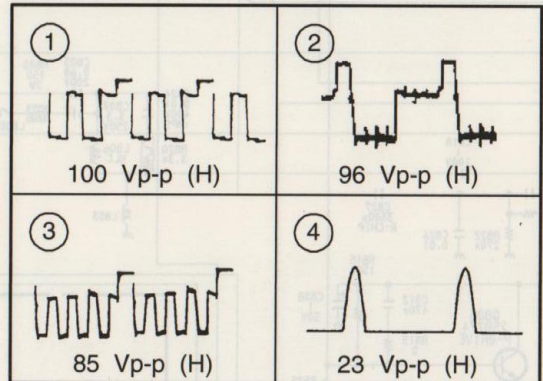
C Board



C [R,G,B OUT]



WAVEFORMS C BOARD



C BOARD TRANSISTOR VOLTAGE TABLE

Ref No	B Base	C Collector	E Emitter
Q701	2.5	4.3	1.8
Q702	2.5	4.3	1.8
Q703	2.3	4.3	1.7
Q704	5.0	144.8	4.3
Q705	5.0	149.2	4.3
Q706	5.0	152.3	4.3
Q707	144.8	3.5	152.3
Q708	149.2	3.5	149.2
Q709	151.7	3.5	172.1

5-4. SEMICONDUCTORS

<p>L4941BV LM7808CT MC7808CT TEA7605 TL750L05CLPR</p>	<p>PST572D PST572D-T</p>	<p>TDA2822M TEA2124</p>	<p>S2000N-16E305A</p>	<p>2SC3209LK-TP 2SD774-T-4 2SD774-34</p>	<p>EG-1Z-V1 EL1Z ERD28-06S ERD28-08S FMN-G12S</p>	<p>RGP10GPKG23 RU3YX-LF-C4 RU-3YX-V1 RU4AM-T3 1SS292T-77</p>
<p>MC44002P</p>	<p>SBX1790-51</p>	<p>TDA7264</p>	<p>2SA1667 2SC3852A 2SD2394-EF</p>	<p>2SC4793 2SD1763A</p>	<p>ERA81-004TP1 ERA83-006 MTZJ-T-77-5.6C MTZJ-T-77-6.8A MTZJ-T-77-6.8C MTZJ-T-77-33C MTZJ-T-77-3.9B</p>	<p>MTZJ-T-77-9.1C MTZJ-33C RD3.9ES-B2 RD5.6ES-B2 RD6.8ES-B2 RD9.1ES-B3 1SS133T-77</p>
<p>MC44140P</p>	<p>SE-135N SE135N-LF12</p>	<p>ST24W04FM6TR</p>	<p>2SC1740S-RT</p>	<p>BYD33G BYD33G-AMMO ERC06-15S</p>	<p>GBU4JL-6088</p>	
<p>MSP3400C-PP-C6 MSP3410B-PP-F7</p>	<p>NJM2233BL</p>	<p>STR-S6707</p>	<p>BF871-127</p>	<p>2SC2389STP-R</p>	<p>DAN202K DAN202K-T-146</p>	<p>LR5360HL</p>
<p>PC123F2 PC123FY2</p>	<p>STV9379</p>	<p>DTA144ESA DTA144ESA-TP DTC114EK DTC114EKA-T146 DTC143TKA-T146 DTC144EKA-T146 2SA1037K-T-146-R 2SA1162-G 2SC2412K-QR 2SC2412K-T-146-R</p>	<p>2SC2785-HFE</p>	<p>2SC2808STP-R</p>	<p>DTZ5.1B RD5.6S-B UDZ-TE-17-5.1B UDZ-TE-17-5.6B</p>	

SECTION 6 EXPLODED VIEWS

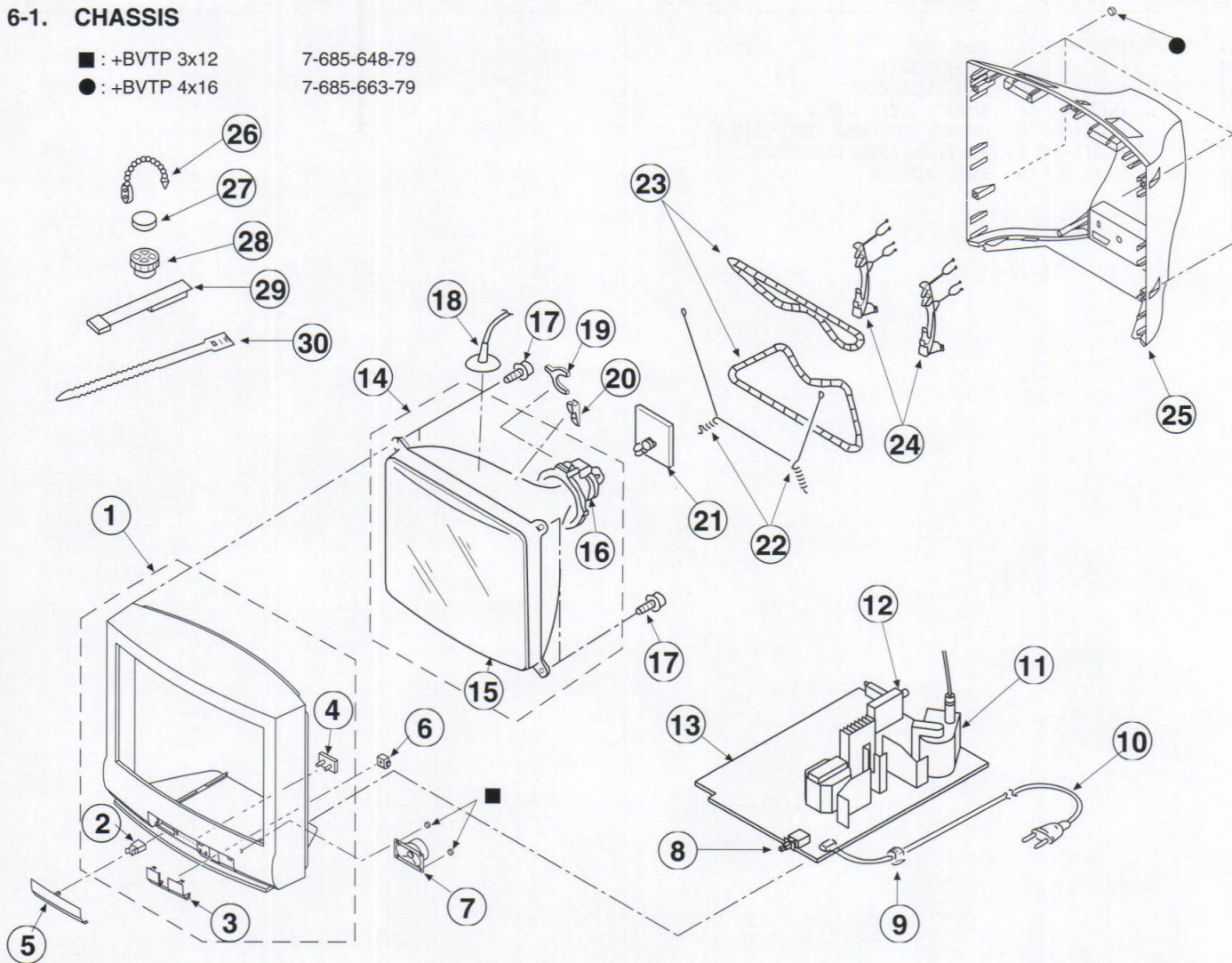
NOTE :

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

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

6-1. CHASSIS

- : +BVTP 3x12 7-685-648-79
- : +BVTP 4x16 7-685-663-79



REF NO	PART NO	DESCRIPTION	REMARK	REF NO	PART NO	DESCRIPTION	REMARK
1	X-4200-282-1	BEZNET ASSY	2-4	13	*A-1632-541-A	A BOARD, COMPLETE (KV-21R1A)	
2	4-047-464-01	CATCHER, PUSH			*A-1632-542-A	A BOARD, COMPLETE (KV-21R1D)	
3	4-203-432-01	WINDOW			*A-1632-453-A	A BOARD, COMPLETE (KV-21R1E)	
4	*4-203-431-01	GUIDE, LIGHT		14	⚠ 8-738-787-71	ITC	15-16
5	4-203-430-01	DOOR (BARE) (KV-21R1A/21R1D)		15	⚠ 8-738-784-05	PICTURE TUBE (SD-169) (A51JXH61X)	
	4-203-435-31	DOOR (PAINTED) (KV-21R1E)		16	⚠ 8-451-295-45	DEFLECTION YOKE (Y21PPA2BA)	
6	4-203-433-01	BUTTON, POWER		17	4-036-190-01	SCREW (5), SELF TAPPING	
7	1-503-258-21	SPEAKER		18	⚠ 1-540-006-22	CAP ASSY, HIGH-VOLTAGE	
8	⚠ 1-571-433-21	SWITCH PUSH (AC POWER)		19	1-452-277-00	MAGNET, BMC	
9	*4-202-531-01	AC CORD LOCK (SC)		20	3-704-495-01	SPACER, DY	
10	⚠ 1-765-286-11	CORD POWER		21	*A-1638-102-A	C BOARD, COMPLETE	
11	⚠ 1-453-199-11	TRANSFORMER ASSY, FLYBACK (NX-1741/U2A)		22	4-369-318-21	SPRING TENSION	
12	1-693-338-11	TUNER (TUVIF) (AEP)		23	⚠ 1-406-828-11	COIL DEGAUSSING	

REF NO	PART NO	DESCRIPTION	REMARK	REF NO	PART NO	DESCRIPTION	REMARK
24	*4-386-622-11	BAND, DGC					
25	4-203-429-01	COVER (REAR)					
26	4-308-870-00	CLIP, LEAD WIRE					
27	1-452-032-00	MAGNET, DISK; 10MM Ø					
28	1-452-094-00	MAGNET, ROTABLE DISK; 15MM Ø					
29	X-4387-214-1	PERMALLOY ASSY, CORRECTION					
30	3-701-007-00	BAND, BINDING					

SECTION 7

ELECTRICAL PARTS LIST

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

CAPACITORS

COILS

MF : mF, PF : mmF

MMH : mH, μ H : mH

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

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

RESISTORS

- All resistors are in ohms
- F : nonflammable

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

A

REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
	*A-1632-541-A	A BOARD, COMPLETE (KV-21R1A) *****		C122	1-163-115-00	CERAMIC CHIP 82PF	5% 50V
	*A-1632-542-A	A BOARD, COMPLETE (KV-21R1D) *****		C123	1-163-137-00	CERAMIC CHIP 680PF	5% 50V
	*A-1632-453-A	A BOARD, COMPLETE (KV-21R1E) *****		C124	1-163-115-00	CERAMIC CHIP 82PF	5% 50V
	4-202-373-01	SPRING, IC		C131	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
	4-202-710-11	SPACER, INSULATING		C135	1-126-934-11	ELECT 220MF	20% 16V
	4-382-854-11	SCREW (M3X10), P, SW (+)		C136	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
	< CAPACITOR >			C162	1-126-967-11	ELECT 47MF	20% 16V
C002	1-126-968-11	ELECT 100MF	20% 50V	C201	1-126-965-11	ELECT 22MF	20% 50V
C003	1-164-492-11	CERAMIC CHIP 0.15MF	10% 16V	C202	1-126-965-11	ELECT 22MF	20% 50V
C004	1-163-034-00	CERAMIC CHIP 0.033MF	50V	C204	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C005	1-163-105-00	CERAMIC CHIP 33PF	5% 50V	C205	1-126-964-11	ELECT 10MF	20% 50V
C006	1-163-105-00	CERAMIC CHIP 33PF	5% 50V	C206	1-126-933-11	ELECT 100MF	20% 16V
C007	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C207	1-126-933-11	ELECT 100MF	20% 16V
C008	1-126-965-11	ELECT 22MF	20% 50V	C208	1-126-964-11	ELECT 10MF	20% 50V
C009	1-124-925-11	ELECT 2.2MF	20% 50V	C209	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C011	1-163-109-00	CERAMIC CHIP 47PF	5% 50V	C210	1-163-033-91	CERAMIC CHIP 0.022MF	50V
C012	1-163-109-00	CERAMIC CHIP 47PF	5% 50V	C211	1-126-965-11	ELECT 22MF	20% 50V
C013	1-163-078-11	CERAMIC CHIP 0.033MF	10% 25V	C214	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
C014	1-163-034-00	CERAMIC CHIP 0.033MF	50V	C216	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C015	1-163-121-00	CERAMIC CHIP 150PF	5% 50V	C217	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
C016	1-164-222-11	CERAMIC CHIP 0.22MF	25V	C218	1-164-005-11	CERAMIC CHIP 0.47MF	25V
C017	1-164-005-11	CERAMIC CHIP 0.47MF	25V	C219	1-126-964-11	ELECT 10MF	20% 50V
C018	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C220	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
C019	1-163-037-11	CERAMIC CHIP 0.022MF	10% 50V	C223	1-163-133-00	CERAMIC CHIP 470PF	5% 50V
C020	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C224	1-163-133-00	CERAMIC CHIP 470PF	5% 50V
C021	1-164-005-11	CERAMIC CHIP 0.47MF	25V	C225	1-126-964-11	ELECT 10MF	20% 50V
C022	1-124-903-11	ELECT 1MF	20% 50V	C226	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
C024	1-126-965-11	ELECT 22MF	20% 50V	C227	1-163-084-00	CERAMIC CHIP 1.5PF	0.25PF 50V
C025	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V	C228	1-163-084-00	CERAMIC CHIP 1.5PF	0.25PF 50V
C026	1-126-965-11	ELECT 22MF	20% 50V	C229	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C027	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V	C230	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C028	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C231	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C034	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C232	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C035	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C233	1-163-003-11	CERAMIC CHIP 330PF	10% 50V
C036	1-126-965-11	ELECT 22MF	20% 50V	C234	1-163-003-11	CERAMIC CHIP 330PF	10% 50V
C037	1-164-346-11	CERAMIC CHIP 1MF	16V	C235	1-126-964-11	ELECT 10MF	20% 50V
C038	1-164-346-11	CERAMIC CHIP 1MF	16V	C236	1-126-964-11	ELECT 10MF	20% 50V
C039	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C240	1-107-823-11	CERAMIC CHIP 0.47MF	10% 16V
C040	1-163-037-11	CERAMIC CHIP 0.022MF	10% 50V	C242	1-164-346-11	CERAMIC CHIP 1MF	16V
C041	1-126-965-11	ELECT 22MF	20% 50V	C243	1-164-346-11	CERAMIC CHIP 1MF	16V
C042	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C244	1-164-346-11	CERAMIC CHIP 1MF	16V
C121	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	C245	1-164-346-11	CERAMIC CHIP 1MF	16V
				C246	1-126-965-11	ELECT 22MF	20% 50V
				C247	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
				C300	1-126-934-11	ELECT 220MF	20% 16V

The components identified by shading and marked **A** are critical for safety.
Replace only with the part number specified.

A

REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
C301	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C423	1-164-346-11	CERAMIC CHIP 1MF	16V
C302	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C500	1-130-489-00	FILM 0.033MF	5% 50V
C303	1-126-965-11	ELECT 22MF	20% 50V	C501	1-126-963-11	ELECT 4.7MF	20% 50V
C304	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C502	1-163-077-00	CERAMIC CHIP 0.1MF	50V
C305	1-124-257-00	ELECT 2.2MF	20% 50V	C503	1-126-952-11	ELECT 1000MF	20% 35V
C306	1-107-380-91	FILM 0.0082MF	5% 200V	C504	1-126-968-11	ELECT 100MF	20% 50V
C307	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C505	1-126-941-11	ELECT 470MF	20% 25V
C308	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C506	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C309	1-126-163-11	ELECT 4.7MF	20% 50V	C507	1-126-965-11	ELECT 22MF	20% 50V
C310	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C508	1-130-785-11	MYLAR 0.47MF	10% 100V
C312	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C510	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C313	1-163-145-00	CERAMIC CHIP 0.0015MF	5% 50V	C511	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
C314	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C601	1-136-516-12	FILM 0.1MF	20% 300V
C315	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C602	1-136-516-12	FILM 0.1MF	20% 300V
C316	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C603	1-113-890-61	ELECT 0.0022MF	20% 250V
C318	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C604	1-113-890-61	ELECT 0.0022MF	20% 250V
C319	1-163-077-00	CERAMIC CHIP 0.1MF	50V	C605	1-161-964-91	CERAMIC 0.0047MF	250V
C320	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C606	1-161-964-91	CERAMIC 0.0047MF	250V
C321	1-126-963-11	ELECT 4.7MF	20% 50V	C609	1-102-228-00	CERAMIC 470PF	10% 500V
C322	1-163-101-00	CERAMIC CHIP 22PF	5% 50V	C610	1-104-665-11	ELECT 100MF	20% 25V
C323	1-163-099-00	CERAMIC CHIP 18PF	5% 50V	C611	1-161-754-00	CERAMIC 0.001MF	10% 2KV
C324	1-163-119-00	CERAMIC CHIP 120PF	5% 50V	C612	1-107-929-11	ELECT 10MF	20% 100V
C325	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V	C613	1-162-318-11	CERAMIC 0.001MF	10% 500V
C326	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C614	1-104-666-11	ELECT 220MF	20% 25V
C327	1-163-005-11	CERAMIC CHIP 470PF	10% 50V	C615	1-124-347-00	ELECT 100MF	20% 160V
C328	1-163-035-00	CERAMIC CHIP 0.047MF	50V	C616	1-162-116-00	CERAMIC 680PF	10% 2KV
C329	1-163-016-00	CERAMIC CHIP 0.0039MF	10% 50V	C617	1-107-929-11	ELECT 10MF	20% 100V
C330	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C618	1-102-228-00	CERAMIC 470PF	10% 500V
C332	1-164-346-11	CERAMIC CHIP 1MF	16V	C619	1-126-942-61	ELECT 1000MF	20% 25V
C333	1-164-346-11	CERAMIC CHIP 1MF	16V	C620	1-126-941-11	ELECT 470MF	20% 25V
C341	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C621	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
C345	1-163-139-00	CERAMIC CHIP 820PF	5% 50V	C622	1-126-965-11	ELECT 22MF	20% 50V
C347	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C623	1-124-618-11	ELECT 2200MF	20% 35V
C350	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C624	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
C353	1-163-125-00	CERAMIC CHIP 220PF	5% 50V	C625	1-126-967-11	ELECT 47MF	20% 50V
C354	1-163-197-00	CERAMIC CHIP 470PF	10% 50V	C626	1-102-228-00	CERAMIC 470PF	10% 500V
C355	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C627	1-111-097-11	ELECT 0.0022F	20% 35V
C358	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C628	1-126-964-11	ELECT 10MF	20% 50V
C359	1-126-965-11	ELECT 22MF	20% 50V	C629	1-124-455-00	ELECT 100MF	20% 16V
C360	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V	C630	1-113-473-11	ELECT (BLOCK) 180MF	20% 400V
C401	1-126-967-11	ELECT 47MF	20% 16V	C632	1-106-220-00	FILM 0.1MF	10% 100V
C402	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C633	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
C403	1-164-346-11	CERAMIC CHIP 1MF	16V	C634	1-104-665-11	ELECT 100MF	20% 25V
C404	1-164-346-11	CERAMIC CHIP 1MF	16V	C635	1-111-097-11	ELECT 0.0022F	20% 35V
C405	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C636	1-102-228-00	CERAMIC 470PF	10% 500V
C406	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C638	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C408	1-101-810-00	CERAMIC 100PF	5% 500V	C639	1-102-228-00	CERAMIC 470PF	10% 500V
C409	1-101-810-00	CERAMIC 100PF	5% 500V	C640	1-102-110-00	CERAMIC 220PF	10% 50V
C410	1-126-967-11	ELECT 47MF	20% 16V	C641	1-104-797-11	ELECT 0.47MF	20% 100V
C411	1-137-372-11	FILM 0.022MF	5% 50V	C645	1-104-665-11	ELECT 100MF	20% 25V
C412	1-137-372-11	FILM 0.022MF	5% 50V	C800	1-107-650-11	ELECT 3.3MF	20% 250V
C413	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C801	1-129-746-00	FILM 0.039MF	10% 400V
C415	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C802	1-136-079-00	FILM 0.01MF	3% 2KV
C416	1-164-346-11	CERAMIC CHIP 1MF	16V	C803	1-136-109-00	FILM 0.68MF	5% 200V
C417	1-164-346-11	CERAMIC CHIP 1MF	16V	C804	1-124-902-00	ELECT 0.47MF	20% 50V
C418	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C806	1-102-244-00	CERAMIC 220PF	10% 500V
C419	1-164-346-11	CERAMIC CHIP 1MF	16V	C807	1-107-651-11	ELECT 4.7MF	20% 250V
C420	1-164-346-11	CERAMIC CHIP 1MF	16V	C809	1-161-754-00	CERAMIC 0.001MF	10% 2KV
C421	1-164-346-11	CERAMIC CHIP 1MF	16V	C810	1-129-702-00	FILM 0.001MF	10% 400V
C422	1-164-346-11	CERAMIC CHIP 1MF	16V	C811	1-102-228-00	CERAMIC 470PF	10% 500V

The components identified by shading and marked \dagger are critical for safety.
Replace only with the part number specified.

A

REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
C812	1-163-197-00	CERAMIC CHIP	470PF 10%	50V	D415	8-719-109-97	DIODE RD6.8ES-B2
C814	1-136-159-00	FILM	0.033MF 5%	50V	D416	8-719-158-15	DIODE RD5.6S-B
C815	1-162-116-00	CERAMIC	680PF 10%	2KV	D417	8-719-158-15	DIODE RD5.6S-B
C817	1-136-559-11	MYLAR	0.0047MF 10%	400V	D501	8-719-302-43	DIODE EL1Z
C818	1-136-933-11	FILM	1MF 5%	100V	D602	8-719-991-33	DIODE 1SS133T-77
C819	1-162-318-11	CERAMIC	0.001MF 10%	500V	D603	8-719-109-97	DIODE RD6.8ES-B2
C820	1-126-951-11	ELECT	470MF 20%	35V	D604	8-719-302-43	DIODE EL1Z
C822	1-104-696-11	FILM	0.015MF 10%	100V	D605	8-719-302-43	DIODE EL1Z
C823	1-106-375-12	MYLAR	0.022MF 10%	250V	D606	8-719-980-78	DIODE ERA83-006
C824	1-106-367-00	MYLAR	0.01MF 10%	400V	D607	8-719-046-78	DIODE EG-1Z-V1
C825	1-163-205-00	CERAMIC CHIP	0.001MF 10%	50V	D608	8-719-302-43	DIODE EL1Z
C826	1-164-232-11	CERAMIC CHIP	0.01MF 10%	100V	D609	8-719-312-10	DIODE RU4AM-T3
C827	1-164-182-11	CERAMIC CHIP	0.0033MF 10%	50V	D610	8-719-025-88	DIODE GBU4JL-6088
C828	1-124-903-11	ELECT	1MF 20%	50V	D611	8-719-980-78	DIODE ERA83-006
C1200	1-136-165-00	FILM	0.1MF 5%	50V	D612	8-719-046-76	DIODE RU-3YX-V1
C1201	1-136-173-00	FILM	0.47MF 5%	50V	D613	8-719-058-38	DIODE FMN-G12S
C1202	1-136-173-00	FILM	0.47MF 5%	50V	D614	8-719-109-89	DIODE RD5.6ESB2
C1203	1-136-169-00	FILM	0.22MF 5%	50V	D615	8-719-302-43	DIODE EL1Z
C1204	1-136-169-00	FILM	0.22MF 5%	50V	D616	8-719-109-89	DIODE RD5.6ESB2
C1205	1-101-004-00	CERAMIC	0.01MF 50V	D617	8-719-991-33	DIODE 1SS133T-77	
C1206	1-101-004-00	CERAMIC	0.01MF 50V	D619	8-719-980-78	DIODE ERA83-006	
C1215	1-136-173-00	FILM	0.47MF 5%	50V	D620	8-719-110-14	DIODE RD9.1ES-B3
C1216	1-137-366-11	FILM	0.0022MF 5%	50V	D621	8-719-058-38	DIODE FMN-G12S
C1217	1-137-366-11	FILM	0.0022MF 5%	50V	D622	8-719-991-33	DIODE 1SS133T-77
< FILTER >				D625	8-719-991-33	DIODE 1SS133T-77	
CF001	1-767-120-21	VIBRATOR, CERAMIC (18MHZ)		D626	8-719-302-43	DIODE EL1Z	
< CONNECTOR >				D627	8-719-991-33	DIODE 1SS133T-77	
CN001	*1-568-880-51	PIN, CONNECTOR 5P		D801	8-719-950-57	DIODE BYD33G	
CN081	*1-568-881-51	PIN, CONNECTOR 6P		D802	8-719-302-43	DIODE EL1Z	
CN082	*1-568-880-51	PIN, CONNECTOR 5P		D803	8-719-945-80	DIODE ERC06-15S	
CN201	*1-568-879-11	PIN, CONNECTOR 4P		D805	8-719-928-08	DIODE ERD28-08S	
CN601	\dagger 1-580-844-11	PIN, CONNECTOR (POWER)		D806	8-719-302-43	DIODE EL1Z	
CN602	\dagger 1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P		D807	8-719-991-33	DIODE 1SS133T-77	
CN603	\dagger 1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P		D809	8-719-302-43	DIODE EL1Z	
CN801	*1-580-798-11	CONNECTOR PIN (DY) 6P		D1200	8-719-109-72	DIODE RD3.9ES-B2	
< DIODE >				< FUSE >			
D001	8-719-057-56	DIODE LS5360HL		F601	\dagger 1-532-504-41	FUSE (4A 250V)	
D002	8-719-982-27	DIODE MTZJ-33C		< FERRITE BEAD >			
D003	8-719-991-33	DIODE 1SS133T-77		FB001	1-412-911-11	INDUCTOR, FERRITE BEAD 1.1UH	
D004	8-719-991-33	DIODE 1SS133T-77		FB002	1-412-911-11	INDUCTOR, FERRITE BEAD 1.1UH	
D005	8-719-914-43	DIODE DAN202K		FB003	1-412-911-11	INDUCTOR, FERRITE BEAD 1.1UH	
D006	8-719-914-43	DIODE DAN202K		FB600	1-410-397-21	FERRITE BEAD INDUCTOR 1.1UH	
D007	8-719-914-43	DIODE DAN202K		FB601	1-410-397-21	FERRITE BEAD INDUCTOR 1.1UH	
D011	8-719-976-XX	DIODE DTZ5.1B		FB602	1-412-911-11	INDUCTOR, FERRITE BEAD 1.1UH	
D301	8-719-991-33	DIODE 1SS133T-77		FB603	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
D302	8-719-991-33	DIODE 1SS133T-77		FB605	1-412-911-11	INDUCTOR, FERRITE BEAD 1.1H	
D401	8-719-109-97	DIODE RD6.8ES-B2		FB606	1-412-911-11	INDUCTOR, FERRITE BEAD 1.1H	
D402	8-719-109-97	DIODE RD6.8ES-B2		FB607	1-412-911-11	INDUCTOR, FERRITE BEAD 1.1H	
D403	8-719-109-97	DIODE RD6.8ES-B2		< ENCAPSULATED FILTER >			
D404	8-719-109-97	DIODE RD6.8ES-B2		FL201	1-239-803-11	FILTER, EMI	
D405	8-719-109-97	DIODE RD6.8ES-B2		< IC >			
D406	8-719-109-97	DIODE RD6.8ES-B2		IC001	8-759-429-99	IC SDA5255/001	
D407	8-719-109-97	DIODE RD6.8ES-B2		IC002	8-759-432-32	IC ST24W04FM6TR	
D408	8-719-109-97	DIODE RD6.8ES-B2		IC003	8-747-014-00	RAY CATCHER ELEMENT SBX1981-51	
D409	8-719-109-97	DIODE RD6.8ES-B2		IC004	8-759-250-69	IC TEA2124	
D410	8-719-109-97	DIODE RD6.8ES-B2		IC005	8-759-510-54	IC PST572D	
D412	8-719-109-97	DIODE RD6.8ES-B2					

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



REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
IC200	8-759-429-97	IC MSP3400C-PP-C6 (KV-21R1A/21R1D)		Q014	8-729-920-74	TRANSISTOR 2SC2412K-QR	
	8-759-429-98	IC MSP3410B-PP-F7 (KV-21R1E)		Q107	8-729-119-78	TRANSISTOR 2SC2785-HFE	
IC201	8-759-502-21	IC TDA2822M		Q110	8-729-920-74	TRANSISTOR 2SC2412K-QR	
IC301	8-759-333-45	IC MC44002P		Q118	8-729-920-74	TRANSISTOR 2SC2412K-QR	
IC302	8-759-333-46	IC MC44140P		Q200	8-729-900-53	TRANSISTOR DTC114EK	
IC401	8-759-064-91	IC NJM2233BL		Q201	8-729-027-56	TRANSISTOR DTC143TKA-T146	
IC501	8-759-192-71	IC STV9379		Q202	8-729-027-56	TRANSISTOR DTC143TKA-T146	
IC600	8-749-924-99	IC STR-S6707		Q204	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Δ IC601	8-749-010-64	IC PC123F2		Q205	8-729-920-74	TRANSISTOR 2SC2412K-QR	
IC602	8-749-920-61	IC SE-135N		Q210	8-729-920-74	TRANSISTOR 2SC2412K-QR	
IC603	8-759-507-29	IC LM7808CT		Q300	8-729-920-74	TRANSISTOR 2SC2412K-QR	
IC604	8-759-250-63	IC TL750L05CLPR		Q301	8-729-900-53	TRANSISTOR DTC114EK	
IC605	8-759-510-52	IC TEA7605		Q302	8-729-900-53	TRANSISTOR DTC114EK	
IC1200	8-759-250-68	IC TDA7264		Q303	8-729-900-53	TRANSISTOR DTC114EK	
	< SOCKET >			Q304	8-729-900-53	TRANSISTOR DTC114EK	
J401	1-561-534-00	SOCKET PIN 21P		Q305	8-729-900-53	TRANSISTOR DTC114EK	
J402	1-778-670-11	JACK, PIN 3P		Q306	8-729-900-53	TRANSISTOR DTC114EK	
J900	1-764-606-11	JACK		Q310	8-729-920-74	TRANSISTOR 2SC2412K-QR	
	< COIL >			Q311	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L001	1-408-405-00	INDUCTOR	4.7UH	Q312	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L108	1-412-522-41	INDUCTOR	5.6UH	Q402	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L111	1-408-408-00	INDUCTOR	8.2UH	Q403	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L112	1-408-397-00	INDUCTOR	1UH	Q404	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L113	1-408-408-00	INDUCTOR	8.2UH	Q405	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L203	1-410-385-11	INDUCTOR CHIP	22UH	Q406	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L204	1-410-385-11	INDUCTOR CHIP	22UH	Q407	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L302	1-408-607-31	INDUCTOR	22UH	Q408	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L401	1-408-409-00	INDUCTOR	10UH	Q500	8-729-017-06	TRANSISTOR 2SC4793	
L402	1-408-409-00	INDUCTOR	10UH	Q501	8-729-920-74	TRANSISTOR 2SC2412K-QR	
L403	1-408-409-00	INDUCTOR	10UH	Q601	8-729-025-04	TRANSISTOR 2SC3852A	
L404	1-408-409-00	INDUCTOR	10UH	Q602	8-729-320-28	TRANSISTOR 2SA1667	
L609	1-412-533-21	INDUCTOR	47UH	Q603	8-729-027-08	TRANSISTOR 2SC2389STP-R	
L611	1-412-533-21	INDUCTOR	47UH	Q604	8-729-024-35	TRANSISTOR 2SC2808STP-R	
L612	1-412-522-41	INDUCTOR	5.6UH	Q606	8-729-029-56	TRANSISTOR DTA144ESA	
L613	1-412-522-41	INDUCTOR	5.6UH	Q608	8-729-027-59	TRANSISTOR DTC144EKA-T146	
L800	1-412-553-11	INDUCTOR	3.3MMH	Q617	8-729-119-78	TRANSISTOR 2SC2785-HFE	
L801	1-420-872-00	COIL, AIR-CORE		Q801	8-729-140-96	TRANSISTOR 2SD774-34	
L802	1-411-635-11	COIL, AIR-CORE		Q802	8-729-033-85	TRANSISTOR S2000N-16E305A	
L803	1-459-390-00	COIL (WITH CORE)		Q803	8-729-027-59	TRANSISTOR DTC144EKA-T146	
L804	1-459-105-21	COIL (WITH CORE)		Q804	8-729-019-01	TRANSISTOR 2SD2394-EF	
L805	1-412-531-31	INDUCTOR	33UH	Q805	8-729-140-96	TRANSISTOR 2SD774-T-4	
L806	1-459-652-12	HLC		Q1200	8-729-920-74	TRANSISTOR 2SC2412K-QR	
	< IC LINK >			Q1201	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Δ PS600	1-532-686-21	LINK, IC 2.7A (ICP-F75)		JR003	1-216-295-00	METAL GLAZE 0 5%	1/10W
Δ PS601	1-532-686-21	LINK, IC 2.7A (ICP-F75)		JR004	1-216-295-00	METAL GLAZE 0 5%	1/10W
Δ PS602	1-532-686-21	LINK, IC 2.7A (ICP-F75)		JR005	1-216-296-00	METAL GLAZE 0 5%	1/8W
Δ PS603	1-532-686-21	LINK, IC 2.7A (ICP-F75)		JR006	1-216-295-00	METAL GLAZE 0 5%	1/10W
Δ PS801	1-532-605-00	LINK, IC 0.4A (ICP-N10)		JR007	1-216-295-00	METAL GLAZE 0 5%	1/10W
	< TRANSISTOR >			JR008	1-216-295-00	METAL GLAZE 0 5%	1/10W
Q002	8-729-920-74	TRANSISTOR 2SC2412K-QR		JR009	1-216-296-00	METAL GLAZE 0 5%	1/8W
Q006	8-729-216-22	TRANSISTOR 2SA1162-G		JR010	1-216-296-00	METAL GLAZE 0 5%	1/8W
Q007	8-729-920-74	TRANSISTOR 2SC2412K-QR		JR011	1-216-296-00	METAL GLAZE 0 5%	1/8W
Q008	8-729-920-74	TRANSISTOR 2SC2412K-QR		JR012	1-216-296-00	METAL GLAZE 0 5%	1/8W
Q009	8-729-920-74	TRANSISTOR 2SC2412K-QR		JR013	1-216-295-00	METAL GLAZE 0 5%	1/10W
Q011	8-729-027-59	TRANSISTOR DTC144EKA-T146		JR014	1-216-295-00	METAL GLAZE 0 5%	1/10W
Q012	8-729-920-74	TRANSISTOR 2SC2412K-QR		JR015	1-216-296-00	METAL GLAZE 0 5%	1/8W
Q013	8-729-920-74	TRANSISTOR 2SC2412K-QR		JR016	1-216-295-00	METAL GLAZE 0 5%	1/10W
	< RESISTOR >			JR018	1-216-296-00	METAL GLAZE 0 5%	1/8W



REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
JR019	1-216-296-00	METAL GLAZE	0 5% 1/8W	R050	1-216-089-00	METAL GLAZE	47K 5% 1/10W
JR020	1-216-296-00	METAL GLAZE	0 5% 1/8W	R051	1-247-807-31	CARBON	100 5% 1/4W
JR021	1-216-296-00	METAL GLAZE	0 5% 1/8W	R052	1-249-429-11	CARBON	10K 5% 1/4W
JR022	1-216-296-00	METAL GLAZE	0 5% 1/8W	R053	1-249-421-11	CARBON	2.2K 5% 1/4W
JR023	1-216-295-00	METAL GLAZE	0 5% 1/10W	R054	1-216-129-00	METAL GLAZE	2.2M 5% 1/10W
JR024	1-216-295-00	METAL GLAZE	0 5% 1/10W	R060	1-216-061-00	METAL GLAZE	3.3K 5% 1/10W
JR025	1-216-296-00	METAL GLAZE	0 5% 1/8W	R061	1-216-073-00	METAL GLAZE	10K 5% 1/10W
JR026	1-216-296-00	METAL GLAZE	0 5% 1/8W	R062	1-216-073-00	METAL GLAZE	10K 5% 1/10W
JR028	1-216-296-00	METAL GLAZE	0 5% 1/8W	R063	1-216-061-00	METAL GLAZE	3.3K 5% 1/10W
JR029	1-216-296-00	METAL GLAZE	0 5% 1/8W	R064	1-216-073-00	METAL GLAZE	10K 5% 1/10W
JR030	1-216-296-00	METAL GLAZE	0 5% 1/8W	R065	1-216-073-00	METAL GLAZE	10K 5% 1/10W
JR032	1-216-296-00	METAL GLAZE	0 5% 1/8W	R066	1-216-073-00	METAL GLAZE	10K 5% 1/10W
JR033	1-216-295-00	METAL GLAZE	0 5% 1/10W	R067	1-216-081-00	METAL GLAZE	22K 5% 1/10W
JR034	1-216-296-00	METAL GLAZE	0 5% 1/8W	R068	1-216-073-00	METAL GLAZE	10K 5% 1/10W
JR036	1-216-296-00	METAL GLAZE	0 5% 1/8W	R069	1-216-081-00	METAL GLAZE	22K 5% 1/10W
JR038	1-216-295-00	METAL GLAZE	0 5% 1/10W	R070	1-216-049-00	METAL GLAZE	1K 5% 1/10W
JR039	1-216-296-00	METAL GLAZE	0 5% 1/8W	R078	1-216-071-00	METAL GLAZE	8.2K 5% 1/10W
JR040	1-216-295-00	METAL GLAZE	0 5% 1/10W	R088	1-216-027-00	METAL GLAZE	120 5% 1/10W
JR041	1-216-295-00	METAL GLAZE	0 5% 1/10W	R089	1-216-037-00	METAL GLAZE	330 5% 1/10W
JR042	1-216-295-00	METAL GLAZE	0 5% 1/10W	R090	1-216-043-91	METAL GLAZE	560 5% 1/10W
JR044	1-216-295-00	METAL GLAZE	0 5% 1/10W	R097	1-216-051-00	METAL GLAZE	1.2K 5% 1/10W
JR046	1-216-296-00	METAL GLAZE	0 5% 1/8W	R098	1-216-051-00	METAL GLAZE	1.2K 5% 1/10W
R001	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W	R099	1-216-200-11	METAL GLAZE	1.2K 5% 1/8W
R002	1-216-025-00	METAL GLAZE	100 5% 1/10W	R110	1-216-174-00	METAL GLAZE	100 5% 1/8W
R003	1-216-025-00	METAL GLAZE	100 5% 1/10W	R111	1-216-174-00	METAL GLAZE	100 5% 1/8W
R004	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W	R112	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R005	1-216-025-00	METAL GLAZE	100 5% 1/10W	R113	1-216-113-71	METAL GLAZE	470K 5% 1/10W
R006	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W	R115	1-216-190-00	METAL GLAZE	470 5% 1/8W
R007	1-216-089-00	METAL GLAZE	47K 5% 1/10W	R116	1-216-049-00	METAL GLAZE	1K 5% 1/10W
R010	1-216-031-00	METAL GLAZE	180 5% 1/10W	R117	1-216-222-00	METAL GLAZE	10K 5% 1/8W
R013	1-216-069-00	METAL GLAZE	6.8K 5% 1/10W	R118	1-216-069-00	METAL GLAZE	6.8K 5% 1/10W
R014	1-216-071-00	METAL GLAZE	8.2K 5% 1/10W	R119	1-216-031-00	METAL GLAZE	180 5% 1/10W
R015	1-216-049-00	METAL GLAZE	1K 5% 1/10W	R120	1-216-049-00	METAL GLAZE	1K 5% 1/10W
R016	1-216-069-00	METAL GLAZE	6.8K 5% 1/10W	R124	1-216-025-00	METAL GLAZE	100 5% 1/10W
R017	1-216-097-00	METAL GLAZE	100K 5% 1/10W	R125	1-216-025-00	METAL GLAZE	100 5% 1/10W
R018	1-216-025-00	METAL GLAZE	100 5% 1/10W	R126	1-216-061-00	METAL GLAZE	3.3K 5% 1/10W
R019	1-216-067-00	METAL GLAZE	5.6K 5% 1/10W	R134	1-216-037-00	METAL GLAZE	330 5% 1/10W
R020	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W	R163	1-216-029-00	METAL GLAZE	150 5% 1/10W
R021	1-216-270-00	METAL GLAZE	1M 5% 1/8W	R174	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R022	1-216-238-91	METAL GLAZE	47K 5% 1/8W	R200	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R023	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W	R201	1-249-389-11	CARBON	4.7 5% 1/4W F
R025	1-216-091-00	METAL GLAZE	56K 5% 1/10W	R202	1-216-097-00	METAL GLAZE	100K 5% 1/10W
R026	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W	R203	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R027	1-216-073-00	METAL GLAZE	10K 5% 1/10W	R204	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R028	1-216-025-00	METAL GLAZE	100 5% 1/10W	R205	1-216-295-00	METAL GLAZE	0 5% 1/10W
R029	1-216-039-00	METAL GLAZE	390 5% 1/10W	R207	1-249-389-11	CARBON	4.7 5% 1/4W F
R030	1-215-900-11	METAL OXIDE	22K 5% 2W F	R209	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R031	1-216-025-00	METAL GLAZE	100 5% 1/10W	R210	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R032	1-216-025-00	METAL GLAZE	100 5% 1/10W	R211	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R033	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W	R213	1-216-174-00	METAL GLAZE	100 5% 1/8W
R036	1-216-295-00	METAL GLAZE	0 5% 1/10W	R214	1-216-174-00	METAL GLAZE	100 5% 1/8W
R037	1-216-093-00	METAL GLAZE	68K 5% 1/10W	R215	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R038	1-216-295-00	METAL GLAZE	0 5% 1/10W	R225	1-216-037-00	METAL GLAZE	330 5% 1/10W
R040	1-216-089-00	METAL GLAZE	47K 5% 1/10W	R226	1-216-081-00	METAL GLAZE	22K 5% 1/10W
R041	1-216-238-91	METAL GLAZE	47K 5% 1/8W	R227	1-216-081-00	METAL GLAZE	22K 5% 1/10W
R044	1-216-073-00	METAL GLAZE	10K 5% 1/10W	R236	1-216-089-00	METAL GLAZE	47K 5% 1/10W
R045	1-216-081-00	METAL GLAZE	22K 5% 1/10W	R237	1-216-093-00	METAL GLAZE	68K 5% 1/10W
R046	1-216-254-00	METAL GLAZE	220K 5% 1/8W	R238	1-216-089-00	METAL GLAZE	47K 5% 1/10W
R047	1-216-075-00	METAL GLAZE	12K 5% 1/10W	R239	1-216-093-00	METAL GLAZE	68K 5% 1/10W
R049	1-216-041-71	METAL GLAZE	470 5% 1/10W	R240	1-216-073-00	METAL GLAZE	10K 5% 1/10W

The components identified by shading and marked **A** are critical for safety.
Replace only with the part number specified.

A

REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
R301	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R408	1-216-089-00	METAL GLAZE 47K	5% 1/10W
R302	1-216-037-00	METAL GLAZE 330	5% 1/10W	R409	1-216-089-00	METAL GLAZE 47K	5% 1/10W
R303	1-216-090-00	METAL GLAZE 51K	5% 1/10W	R410	1-216-171-00	METAL GLAZE 75	5% 1/8W
R304	1-216-025-00	METAL GLAZE 100	5% 1/10W	R411	1-216-091-00	METAL GLAZE 56K	5% 1/10W
R305	1-216-025-00	METAL GLAZE 100	5% 1/10W	R412	1-216-041-71	METAL GLAZE 470	5% 1/10W
R306	1-216-113-71	METAL GLAZE 470K	5% 1/10W	R413	1-216-113-71	METAL GLAZE 470K	5% 1/10W
R307	1-216-121-71	METAL GLAZE 1M	5% 1/10W	R414	1-202-539-00	SOLID 39	10% 1/2W
R308	1-216-085-00	METAL GLAZE 33K	5% 1/10W	R415	1-202-539-00	SOLID 39	10% 1/2W
R309	1-216-121-71	METAL GLAZE 1M	5% 1/10W	R416	1-216-022-00	METAL GLAZE 75	5% 1/10W
R310	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R417	1-216-296-00	METAL GLAZE 0	5% 1/8W
R311	1-216-025-00	METAL GLAZE 100	5% 1/10W	R418	1-216-113-71	METAL GLAZE 470K	5% 1/10W
R312	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R419	1-216-113-71	METAL GLAZE 470K	5% 1/10W
R313	1-216-045-00	METAL GLAZE 680	5% 1/10W	R420	1-247-807-31	CARBON 100	5% 1/4W
R314	1-216-045-00	METAL GLAZE 680	5% 1/10W	R421	1-247-807-31	CARBON 100	5% 1/4W
R315	1-216-045-00	METAL GLAZE 680	5% 1/10W	R422	1-216-085-00	METAL GLAZE 33K	5% 1/10W
R316	1-216-033-71	METAL GLAZE 220	5% 1/10W	R423	1-216-085-00	METAL GLAZE 33K	5% 1/10W
R317	1-216-033-71	METAL GLAZE 220	5% 1/10W	R424	1-216-085-00	METAL GLAZE 33K	5% 1/10W
R318	1-216-019-00	METAL GLAZE 56	5% 1/10W	R425	1-216-049-00	METAL GLAZE 1K	5% 1/10W
R322	1-216-022-00	METAL GLAZE 75	5% 1/10W	R426	1-216-049-00	METAL GLAZE 1K	5% 1/10W
R323	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R427	1-216-049-00	METAL GLAZE 1K	5% 1/10W
R325	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R428	1-216-081-00	METAL GLAZE 22K	5% 1/10W
R327	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R429	1-216-053-00	METAL GLAZE 1.5K	5% 1/10W
R328	1-216-077-00	METAL GLAZE 15K	5% 1/10W	R430	1-216-009-00	METAL GLAZE 22	5% 1/10W
R332	1-216-093-00	METAL GLAZE 68K	5% 1/10W	R501	1-208-806-11	METAL CHIP 10K	0.50% 1/10W
R333	1-216-037-00	METAL GLAZE 330	5% 1/10W	R502	1-216-677-11	METAL CHIP 12K	0.50% 1/10W
R334	1-216-033-71	METAL GLAZE 220	5% 1/10W	R503	1-216-230-00	METAL GLAZE 22K	5% 1/8W
R335	1-216-295-00	METAL GLAZE 0	5% 1/10W	R504	1-216-095-00	METAL GLAZE 82K	5% 1/10W
R336	1-216-295-00	METAL GLAZE 0	5% 1/10W	R505	1-216-075-00	METAL GLAZE 12K	5% 1/10W
R337	1-216-295-00	METAL GLAZE 0	5% 1/10W	R506	1-216-080-00	METAL GLAZE 20K	5% 1/10W
R339	1-216-061-00	METAL GLAZE 3.3K	5% 1/10W	R507	1-216-350-11	METAL OXIDE 1.2	5% 1W F
R340	1-216-270-00	METAL GLAZE 1M	5% 1/8W	R508	1-215-865-11	METAL OXIDE 220	5% 1W F
R341	1-216-069-00	METAL GLAZE 6.8K	5% 1/10W	R509	1-249-383-11	CARBON 1.5	5% 1/4W F
R342	1-216-189-00	METAL GLAZE 430	5% 1/8W	R513	1-249-417-11	CARBON 1K	5% 1/4W
R343	1-216-295-00	METAL GLAZE 0	5% 1/10W	R514	1-216-089-00	METAL GLAZE 47K	5% 1/10W
R344	1-216-295-00	METAL GLAZE 0	5% 1/10W	R515	1-216-079-00	METAL GLAZE 18K	5% 1/10W
R345	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R601	1-202-962-11	WIREWOUND 3.3	5% 10W
R351	1-216-133-00	METAL GLAZE 3.3M	5% 1/10W	R602	1-249-417-11	CARBON 1K	5% 1/4W
R352	1-216-113-71	METAL GLAZE 470K	5% 1/10W	R603	1-215-875-11	METAL OXIDE 10K	5% 1W F
R354	1-216-025-00	METAL GLAZE 100	5% 1/10W	R604	1-215-902-11	METAL OXIDE 47K	5% 2W F
R355	1-216-121-71	METAL GLAZE 1M	5% 1/10W	R605	1-216-364-71	METAL OXIDE 0.39	5% 2W F
R356	1-216-119-00	METAL GLAZE 820K	5% 1/10W	R607	1-215-858-00	METAL OXIDE 15	5% 1W F
R357	1-216-093-00	METAL GLAZE 68K	5% 1/10W	R608	1-216-365-00	METAL OXIDE 0.47	5% 2W F
R359	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R609	1-249-420-11	CARBON 1.8K	5% 1/4W
R360	1-216-049-00	METAL GLAZE 1K	5% 1/10W	R610	1-249-415-11	CARBON 680	5% 1/4W
R361	1-216-022-00	METAL GLAZE 75	5% 1/10W	R611	1-216-354-11	METAL OXIDE 2.7	5% 1W F
R362	1-216-022-00	METAL GLAZE 75	5% 1/10W	R612	1-260-135-11	CARBON 1M	5% 1/2W
R363	1-216-022-00	METAL GLAZE 75	5% 1/10W	R613	1-249-417-11	CARBON 1K	5% 1/4W
R364	1-216-081-00	METAL GLAZE 22K	5% 1/10W	R614	1-218-265-11	METAL 8.2M	5% 1W
R365	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R615	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R366	1-216-041-71	METAL GLAZE 470	5% 1/10W	R616	1-215-479-00	METAL 270K	1% 1/4W
R367	1-216-081-00	METAL GLAZE 22K	5% 1/10W	R617	1-215-877-11	METAL OXIDE 22K	5% 1W F
R368	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R618	1-247-863-91	CARBON 22K	5% 1/4W
R369	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R619	1-249-424-11	CARBON 3.9K	5% 1/4W
R401	1-216-041-71	METAL GLAZE 470	5% 1/10W	R620	1-247-895-91	CARBON 470K	5% 1/4W
R402	1-247-807-31	CARBON 100	5% 1/4W	R621	1-216-057-00	METAL GLAZE 2.2K	5% 1/10W
R403	1-247-807-31	CARBON 100	5% 1/4W	R622	1-249-437-11	CARBON 47K	5% 1/4W
R404	1-216-022-00	METAL GLAZE 75	5% 1/10W	R623	1-216-065-00	METAL GLAZE 4.7K	5% 1/10W
R405	1-216-113-71	METAL GLAZE 470K	5% 1/10W	R627	1-216-425-11	METAL OXIDE 56	5% 1W F
R406	1-216-091-00	METAL GLAZE 56K	5% 1/10W	R628	1-249-417-11	CARBON 1K	5% 1/4W F
R407	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R632	1-247-807-31	CARBON 100	5% 1/4W

The components identified by shading and marked **A** are critical for safety. Replace only with the part number specified.



REF.NO.	PART NO.	DESCRIPTION	REMARK
R634	1-249-397-11	CARBON	22 5% 1/4W F
R635	1-249-437-11	CARBON	47K 5% 1/4W
R636	1-249-417-11	CARBON	1K 5% 1/4W
R637	1-247-815-91	CARBON	220 5% 1/4W
R638	1-247-863-91	CARBON	22K 5% 1/4W
R640	1-216-425-11	METAL OXIDE	56 5% 1W F
R645	1-249-422-11	CARBON	2.7K 5% 1/4W
R646	1-249-377-11	CARBON	0.47 5% 1/4W F
R647	1-202-933-61	FUSIBLE	0.1 10% 1/2W F
R648	1-249-407-11	CARBON	150 5% 1/4W
R651	1-215-902-11	METAL OXIDE	47K 5% 2W F
R800	1-215-887-00	METAL OXIDE	150 5% 2W F
R801	1-216-109-00	METAL GLAZE	330K 5% 1/10W
R802	1-216-174-00	METAL GLAZE	100 5% 1/8W
R803	1-216-081-00	METAL GLAZE	22K 5% 1/10W
R804	1-215-917-11	METAL	1K 5% 3W F
R806	1-216-349-00	METAL OXIDE	1 5% 1W F
R807	1-249-399-11	CARBON	33 5% 1/4W
R808	1-260-115-11	CARBON	22K 5% 1/2W
R809	1-215-911-11	METAL OXIDE	100 5% 3W F
R810	1-247-895-91	CARBON	470K 5% 1/4W
R811	1-215-889-00	METAL OXIDE	330 5% 2W F
R813	1-216-295-00	METAL GLAZE	0 5% 1/10W
R814	1-217-811-11	FUSIBLE	0.47 5% 1/4W
R815	1-216-101-00	METAL GLAZE	150K 5% 1/10W
R816	1-216-366-00	METAL OXIDE	0.56 5% 2W F
R817	1-216-447-00	METAL OXIDE	27 5% 2W F
R818	1-260-115-11	CARBON	22K 5% 1/2W
R819	1-249-441-11	CARBON	100K 5% 1/4W
R820	1-217-820-11	FUSIBLE	3.3K 5% 1/4W
R821	1-216-295-00	METAL GLAZE	0 5% 1/10W
R822	1-216-107-00	METAL GLAZE	270K 5% 1/10W
R823	1-249-413-11	CARBON	470 5% 1/4W
R824	1-216-125-00	METAL GLAZE	1.5M 5% 1/10W
R825	1-216-105-71	METAL GLAZE	220K 5% 1/10W
R826	1-216-296-00	METAL GLAZE	0 5% 1/8W
R828	1-216-115-00	METAL GLAZE	560K 5% 1/10W
R1200	1-216-206-00	METAL GLAZE	2.2K 5% 1/8W
R1201	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R1202	1-216-081-00	METAL GLAZE	22K 5% 1/10W
R1203	1-216-069-00	METAL GLAZE	6.8K 5% 1/10W
R1208	1-212-849-00	FUSIBLE	4.7 5% 1/4W F
R1209	1-212-849-00	FUSIBLE	4.7 5% 1/4W F
R1211	1-249-424-11	CARBON	3.9K 5% 1/4W
R1212	1-249-424-11	CARBON	3.9K 5% 1/4W
<p>< RELAY ></p>			
RY600	A 1-755-018-11	RELAY	
<p>< SWITCH ></p>			
S001	1-571-532-21	SWITCH, TACTIL	
S002	1-571-532-21	SWITCH, TACTIL	
S003	1-571-532-21	SWITCH, TACTIL	
S004	1-571-532-21	SWITCH, TACTIL	
S005	1-571-532-21	SWITCH, TACTIL	
S006	1-571-532-21	SWITCH, TACTIL	
S601	A 1-571-433-21	SWITCH, PUSH (AC POWER)	

REF.NO.	PART NO.	DESCRIPTION	REMARK
<p>< TRANSFORMER ></p>			
T601	A 1-427-962-21	TRANSFORMER, LINE FILTER	
T602	A 1-429-840-11	TRANSFORMER, CONVERTER	
T801	1-437-090-31	HDT	
T802	A 1-453-199-11	TRANSFORMER ASSY, FLYBACK (NX-1741/U2A)	
<p>< THERMISTOR ></p>			
THP601	A 1-809-827-11	THERMISTOR, POSITIVE	
<p>< TUNER ></p>			
TU101	1-693-338-11	TUNER (TUVIF) (AEP)	
<p>< CRYSTAL ></p>			
X201	1-760-628-11	VIBRATOR, CRYSTAL (18.432MHz)	
X301	1-760-907-21	VIBRATOR, CRYSTAL (14.318MHz)	
X302	1-760-710-21	VIBRATOR, CRYSTAL (17.472MHz)	
<p>*****</p>			
<p>*A-1638-102-A C BOARD, COMPLETE</p>			
<p>*****</p>			
<p>< CAPACITOR ></p>			
C701	1-102-117-00	CERAMIC	820PF 10% 50V
C702	1-102-117-00	CERAMIC	820PF 10% 50V
C703	1-102-117-00	CERAMIC	820PF 10% 50V
C704	1-102-824-00	CERAMIC	470PF 5% 50V
C705	1-102-824-00	CERAMIC	470PF 5% 50V
C706	1-102-824-00	CERAMIC	470PF 5% 50V
C707	1-107-651-11	ELECT	4.7MF 20% 250V
C709	1-162-114-00	CERAMIC	0.0047MF 2KV
C710	1-126-967-11	ELECT	47MF 20% 16V
C711	1-101-880-00	CERAMIC	47PF 5% 50V
C712	1-102-820-00	CERAMIC	330PF 5% 50V
C713	1-101-880-00	CERAMIC	47PF 5% 50V
<p>< CONNECTOR ></p>			
CNC71	*1-568-881-51	PIN, CONNECTOR 6P	
CNC72	*1-568-880-51	PIN, CONNECTOR 5P	
CNC73	1-695-915-21	TAB (CONTACT)	
CNC76	1-695-915-21	TAB (CONTACT)	
<p>< DIODE ></p>			
D701	8-719-991-33	DIODE 1SS133T-77	
D702	8-719-991-33	DIODE 1SS133T-77	
D703	8-719-991-33	DIODE 1SS133T-77	
D704	8-719-991-33	DIODE 1SS133T-77	
D705	8-719-991-33	DIODE 1SS133T-77	
D706	8-719-991-33	DIODE 1SS133T-77	
D707	8-719-991-33	DIODE 1SS133T-77	
D708	8-719-991-33	DIODE 1SS133T-77	
D709	8-719-991-33	DIODE 1SS133T-77	
D716	8-719-991-33	DIODE 1SS133T-77	
D717	8-719-054-81	DIODE 1SS292T-77	
D718	8-719-991-33	DIODE 1SS133T-77	
D719	8-719-054-81	DIODE 1SS292T-77	
D723	8-719-991-33	DIODE 1SS133T-77	
D724	8-719-054-81	DIODE 1SS292T-77	

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



REF.NO.	PART NO.	DESCRIPTION	REMARK
< CRT SOCKET >			
J701	Δ 1-526-990-22	SOCKET, CRT	
< INDUCTOR >			
L702	1-408-425-00	INDUCTOR 220UH	
< TRANSISTOR >			
Q701	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q702	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q703	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q704	8-729-906-70	TRANSISTOR BF871-127	
Q705	8-729-906-70	TRANSISTOR BF871-127	
Q706	8-729-906-70	TRANSISTOR BF871-127	
Q707	8-729-200-17	TRANSISTOR 2SA1091-O	
Q708	8-729-200-17	TRANSISTOR 2SA1091-O	
Q709	8-729-200-17	TRANSISTOR 2SA1091-O	
< RESISTOR >			
R700	1-247-807-31	CARBON 100 5% 1/4W	
R701	1-249-417-11	CARBON 1K 5% 1/4W	
R702	1-249-417-11	CARBON 1K 5% 1/4W	
R706	1-249-399-11	CARBON 33 5% 1/4W	F
R707	1-249-401-11	CARBON 47 5% 1/4W	
R708	1-247-815-91	CARBON 220 5% 1/4W	
R709	1-247-815-91	CARBON 220 5% 1/4W	
R710	1-247-815-91	CARBON 220 5% 1/4W	
R711	1-249-417-11	CARBON 1K 5% 1/4W	
R714	1-249-417-11	CARBON 1K 5% 1/4W	
R715	1-249-417-11	CARBON 1K 5% 1/4W	
R716	1-249-417-11	CARBON 1K 5% 1/4W	
R717	1-260-105-11	CARBON 3.3K 5% 1/2W	
R718	1-260-105-11	CARBON 3.3K 5% 1/2W	
R719	1-260-105-11	CARBON 3.3K 5% 1/2W	
R720	1-215-923-51	METAL OXIDE 10K 5% 3W	F
R721	1-215-923-51	METAL OXIDE 10K 5% 3W	F
R722	1-215-923-51	METAL OXIDE 10K 5% 3W	F
R724	1-202-814-91	SOLID 33K 10% 1/2W	
R725	1-202-846-00	SOLID 470K 10% 1/2W	
R729	1-216-355-11	METAL OXIDE 3.3 5% 1W	F
R730	1-249-410-11	CARBON 270 5% 1/4W	
R731	1-247-815-91	CARBON 220 5% 1/4W	
R732	1-249-410-11	CARBON 270 5% 1/4W	
R734	1-247-815-91	CARBON 220 5% 1/4W	
R735	1-247-815-91	CARBON 220 5% 1/4W	
R736	1-247-815-91	CARBON 220 5% 1/4W	
R744	1-260-103-11	CARBON 2.2K 5% 1/2W	
R745	1-260-103-11	CARBON 2.2K 5% 1/2W	
R746	1-260-103-11	CARBON 2.2K 5% 1/2W	
< VARIABLE RESISTOR >			
RV702	1-241-656-21	RES, ADJ, METAL GLAZE 110M	

REF.NO.	PART NO.	DESCRIPTION	REMARK
MISCELLANEOUS *****			
Δ	1-406-828-11	COIL, DEGAUSSING	
	1-452-032-00	MAGNET, DISC; 10MM Ø	
	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM Ø	
	1-452-277-00	MAGNET, BMC	
Δ	1-453-199-11	TRANSFORMER ASSY, FLYBACK (NX-1741/U2A)	
	1-503-258-21	SPEAKER	
Δ	1-540-006-22	CAP ASSY, HIGH-VOLTAGE	
Δ	1-571-433-21	SWITCH, PUSH (AC POWER)	
Δ	1-765-286-11	CORD, POWER	
	1-693-338-11	TUNER (TUVIF) (AEP)	
Δ	8-738-784-05	PICTURE TUBE (SD-169) (A51JXH61X)	
Δ	8-738-787-71	ITC	
Δ	8-451-295-45	DEFLECTION YOKE (Y21PFA2BA)	

ACCESSORIES AND PACKING MATERIALS *****			
*4-042-477-01	BAG, PROTECTION		
*4-203-444-01	CUSHION (LOWER) (ASSY)		
*4-203-445-01	CUSHION (UPPER) (ASSY)		
*4-203-447-01	INDIVIDUAL CARTON		
4-203-574-41	MANUAL, INSTRUCTION (KV-21R1A) (ITALIAN)		
4-203-574-11	MANUAL, INSTRUCTION (KV-21R1D) (GERMAN/ENGLISH/DUTCH/ITALIAN/FRENCH/ GREEK/TURKISH)		
4-203-574-71	MANUAL, INSTRUCTION (KV-21R1E) (SPANISH)		
4-203-574-81	MANUAL, INSTRUCTION (KV-21R1E) (PORTUGUESE)		

REMOTE COMMANDER *****			
1-473-194-11	COMMANDER, STANDARD TYPE (RM-836)		

SERVICE MANUAL

BE-5 CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-21R1A	RM-836	Italian	SCC-K31A-A				
KV-21R1D	RM-836	AEP	SCC-K32A-A				
KV-21R1E	RM-836	Spanish	SCC-K30A-A				

SUPPLEMENT - 1

SUBJECT : ADDITION OF M BOARD

File this supplement with the service manual

INTRODUCTION : New M Board has been added to the above models

• **SECTION 4 CIRCUIT ADJUSTMENTS**

4-2 TEST MODE 2 (Page 21) See page 2

• **SECTION 5 DIAGRAMS**

(A board, Page 33) See page 3

(M board, NEW) See page 9

• **SECTION 6 EXPLODED VIEWS**

6-1. CHASSIS (Page 43) See page 11

• **SECTION 7 ELECTRICAL PARTS LIST (Page 45) See page 12**



TRINITRON® COLOR TV
SONY®

4-2. TEST MODE 2:

Is available by pressing the Test button twice, OSD "TT" appears. The functions described below are available by pressing two digits. To release Test Mode 2, press 0 twice, press 'TEST', press 'TV' or switch the TV into Standby Mode.

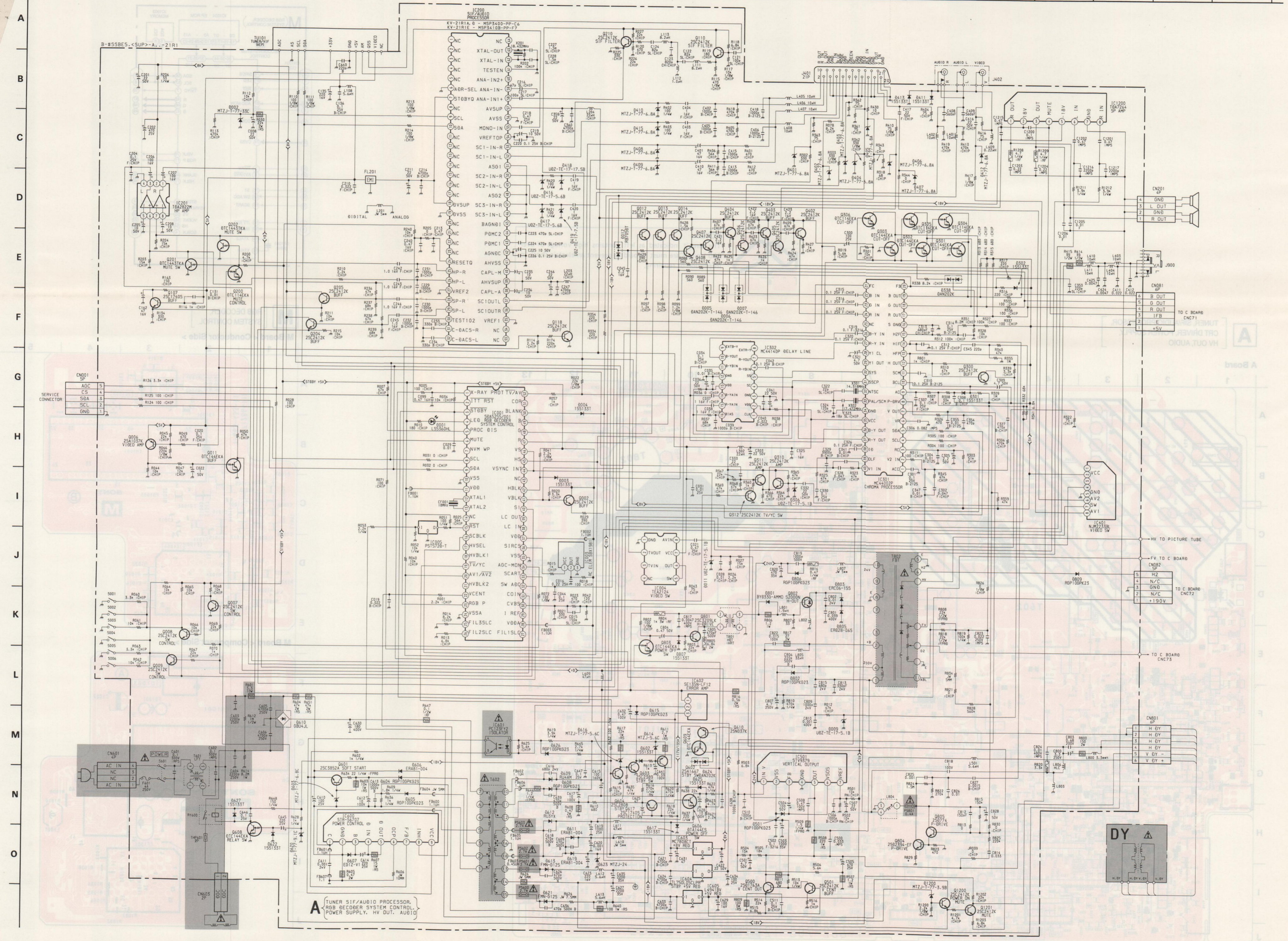
00	Switch 'TT--' mode off
01	Set picture level to maximum
02	Set picture level to minimum
03	Set volume to 35%
04	Set volume to 50%
05	Set volume to 65%
06	Set Volume to 80%
07	Aging condition (picture max. brightness max.)
08	Shipping Condition (prog 1. Zoom1(16"). Zoom2(21" & 25"). Volume, loudspeaker & headphones 35%)
09-10	No function
11	Sets zoom mode in 4:3 mode
12-14	No function
15	Read factory setting from ROM to NVM. Reads volume, Brightness, Picture, Hue, Sharpness and Colour values from ROM to the actual used values (last power memory)
16	Save actual used values as reset values.
17	Meshing enable/disable.
18	No function
19	RGB priority enable/disable
20-21	No function
22	Sub Colour (Pal / Secam different stores)
23	Sub Brightness
24	Destination B, system BG/L, L by default, RGB priority off
25	Destination E, system BG/DK, BG by default, RGB priority off
26	Destination U, system I only, RGB priority off
27	Destination L, system I/I, RGB priority off
28	Destination A, system BG only, RGB priority off
29	Destination K, system DK/BG, DK by default, RGB priority off
30	Destination D, system BG/DK, BG by default RGB priority off

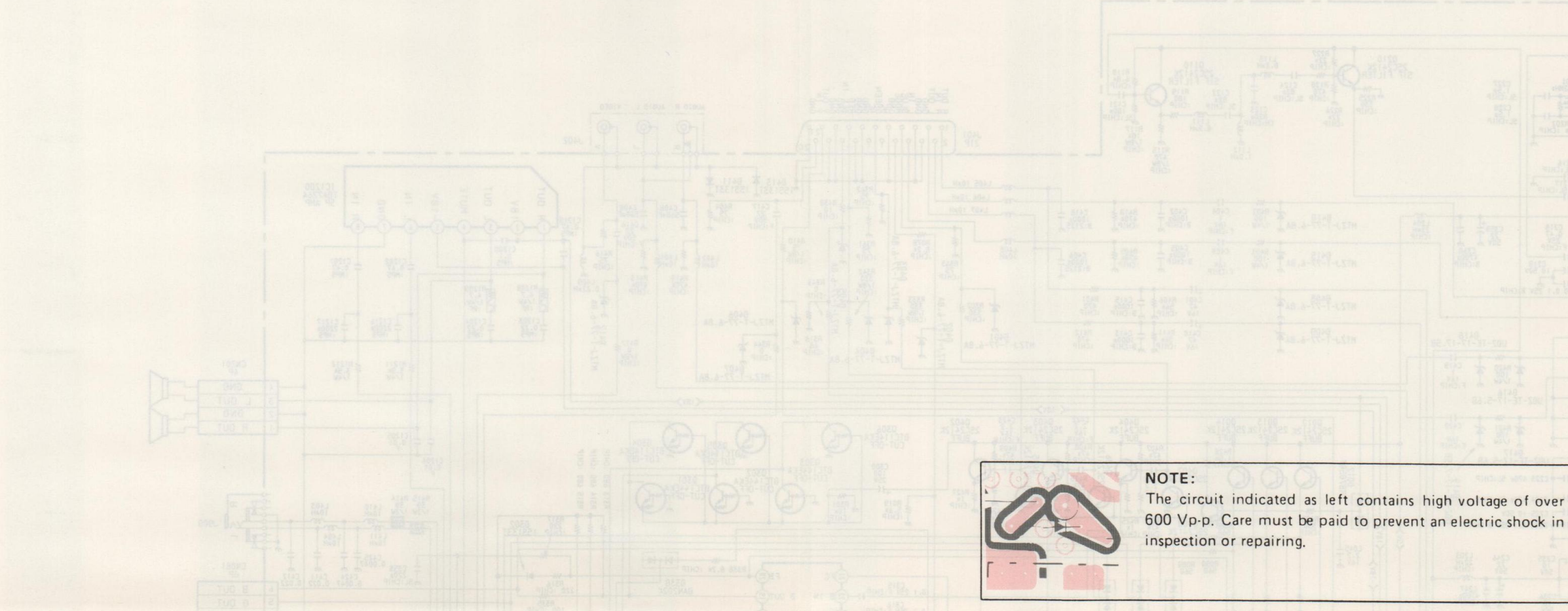
31	no function
32	Picture level to 50%
33-35	no function
36	Audio mute ON.
37	OSD off.
38	Enter G2 adjustment mode.
39	Sub-brightness
40	no function
41	Re-initialise NVM.
42	Dummy.
43	Re-initialise Geometry settings.
44-47	no function
48	Set NVM testbyte to 44h in NVM.
49	Erase NVM testbyte
50	Toggle 16:9 / 4:3 models
51	Toggle 60 / 100 programmes
55	OSD horizontal adjustment, left side.
66	OSD horizontal adjustment, right side.
75	Text not interlaced and odd field
76	Text not interlaced and even field
77	Toggle text destination west or east
88	Sets V size to minimum and zoom1 (blankings adjustment for wide model)
99	Recovers V size and sets zoom3 (blankings adjustment for wide model)

Note : For Test Modes 41-51, it is necessary to ensure that the TV is set to Prog 59.

Note : TT modes are available from the following software versions onwards:

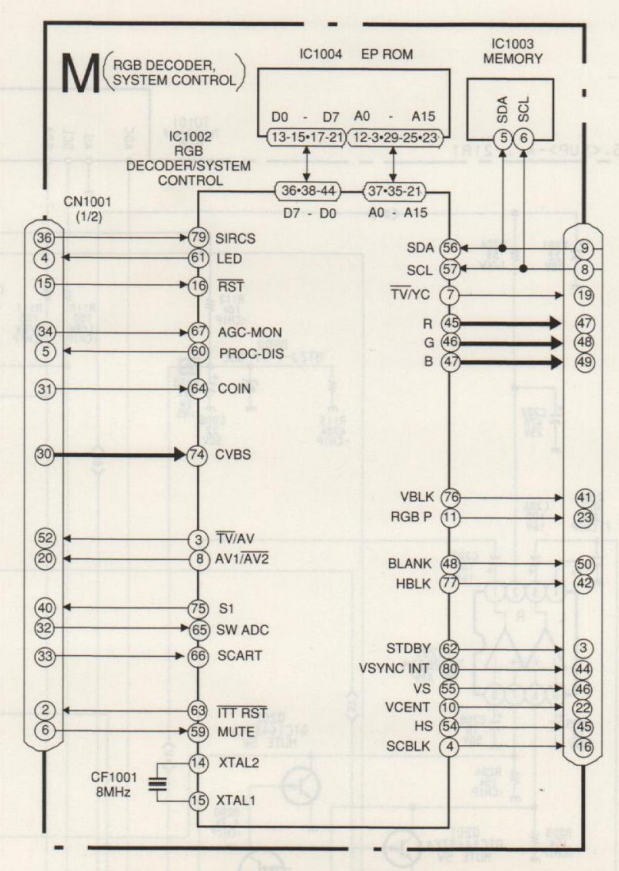
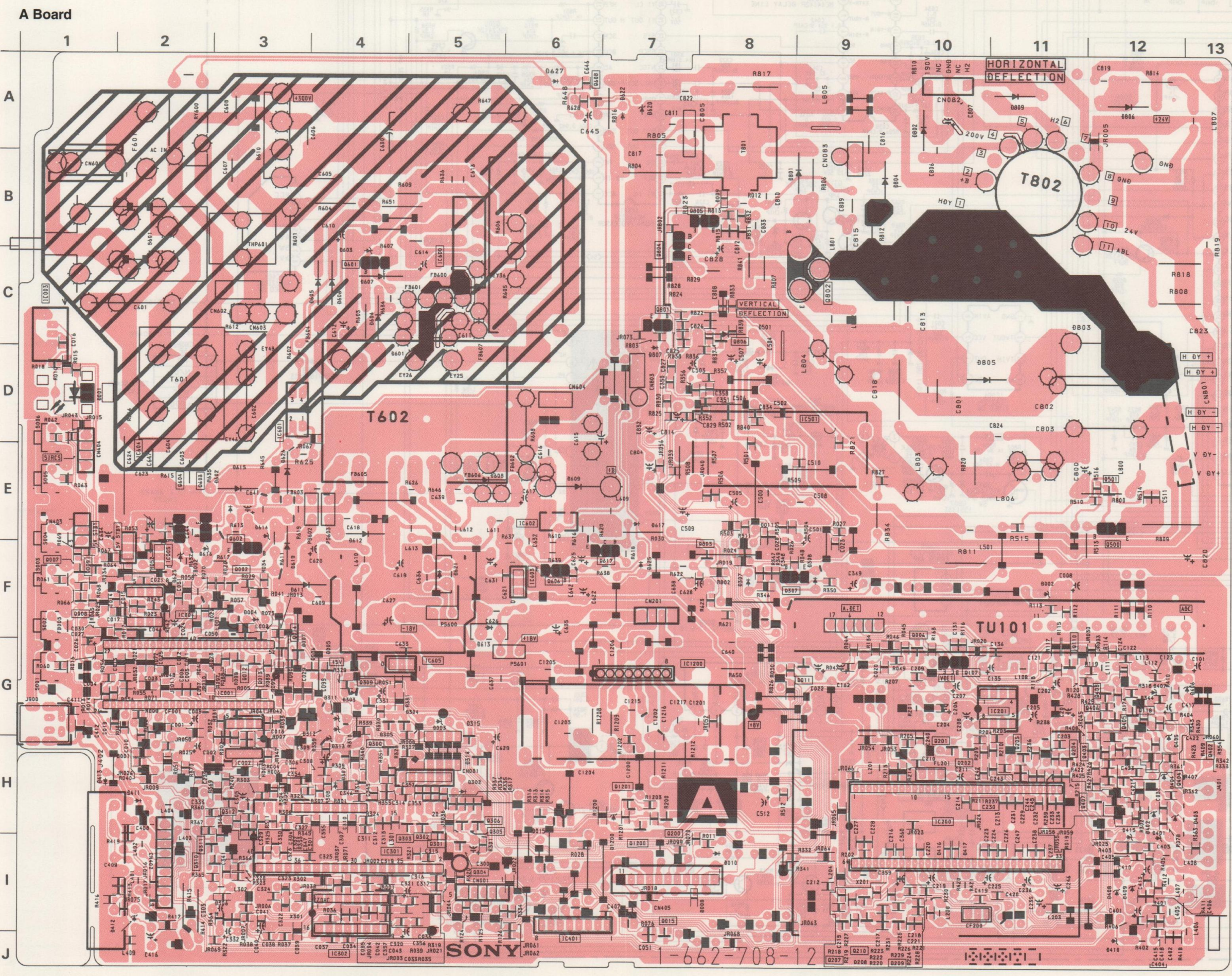
●	8-759-456-22	M27C512-90C1-BE5-7
	8-759-458-83	M27C512-90C1-BE5-R2 (RUSSIA)
■	8-759-440-74	M27C512-90C1-BE5-1
	8-759-444-78	M27C512-90C1-BE5-R1 (RUSSIA)
○	8-759-460-03	M27C512-90C1-BE5-10
	8-759-464-73	M27C512-90C1-BE5-12 (RUSSIA)



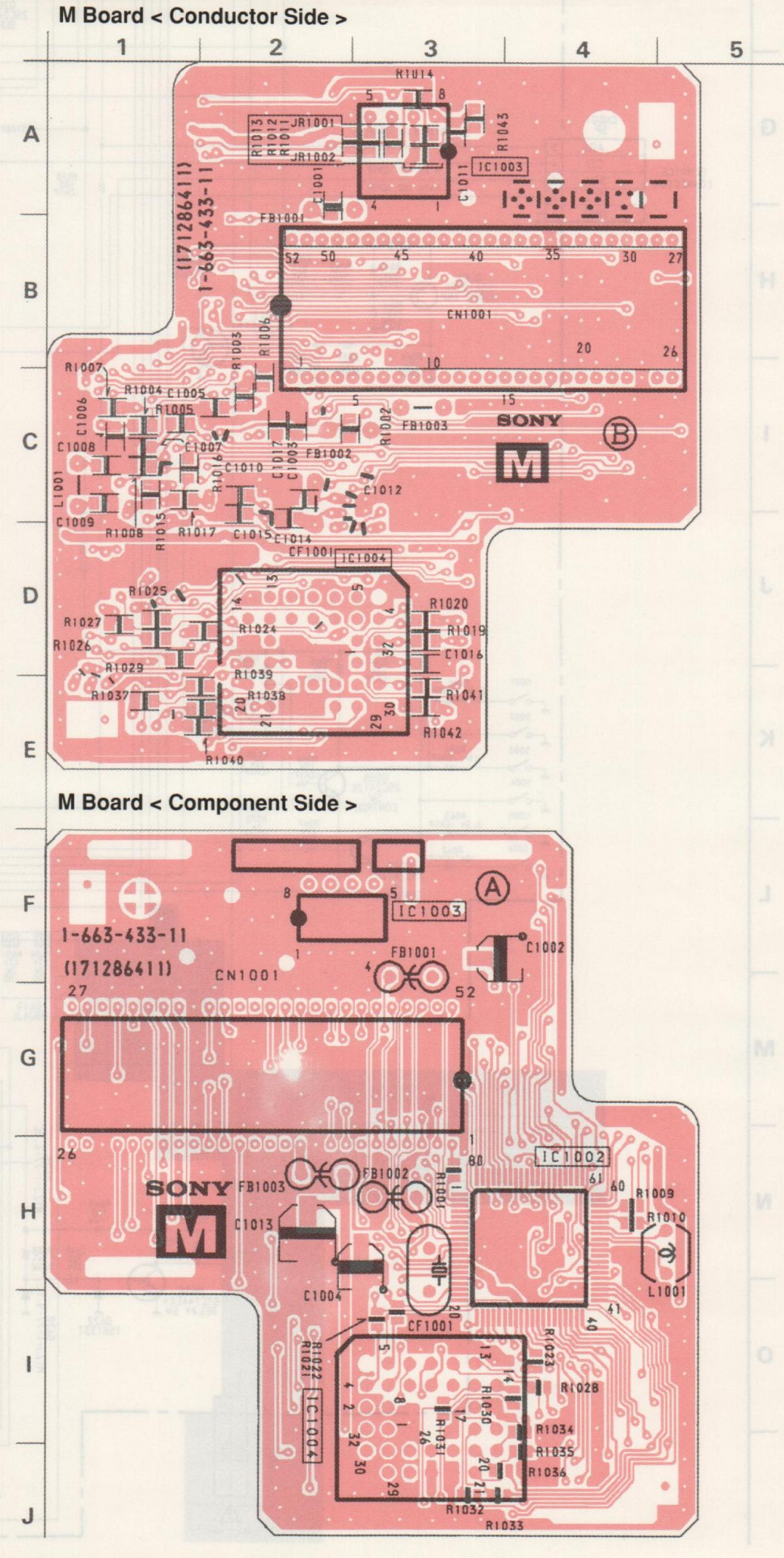


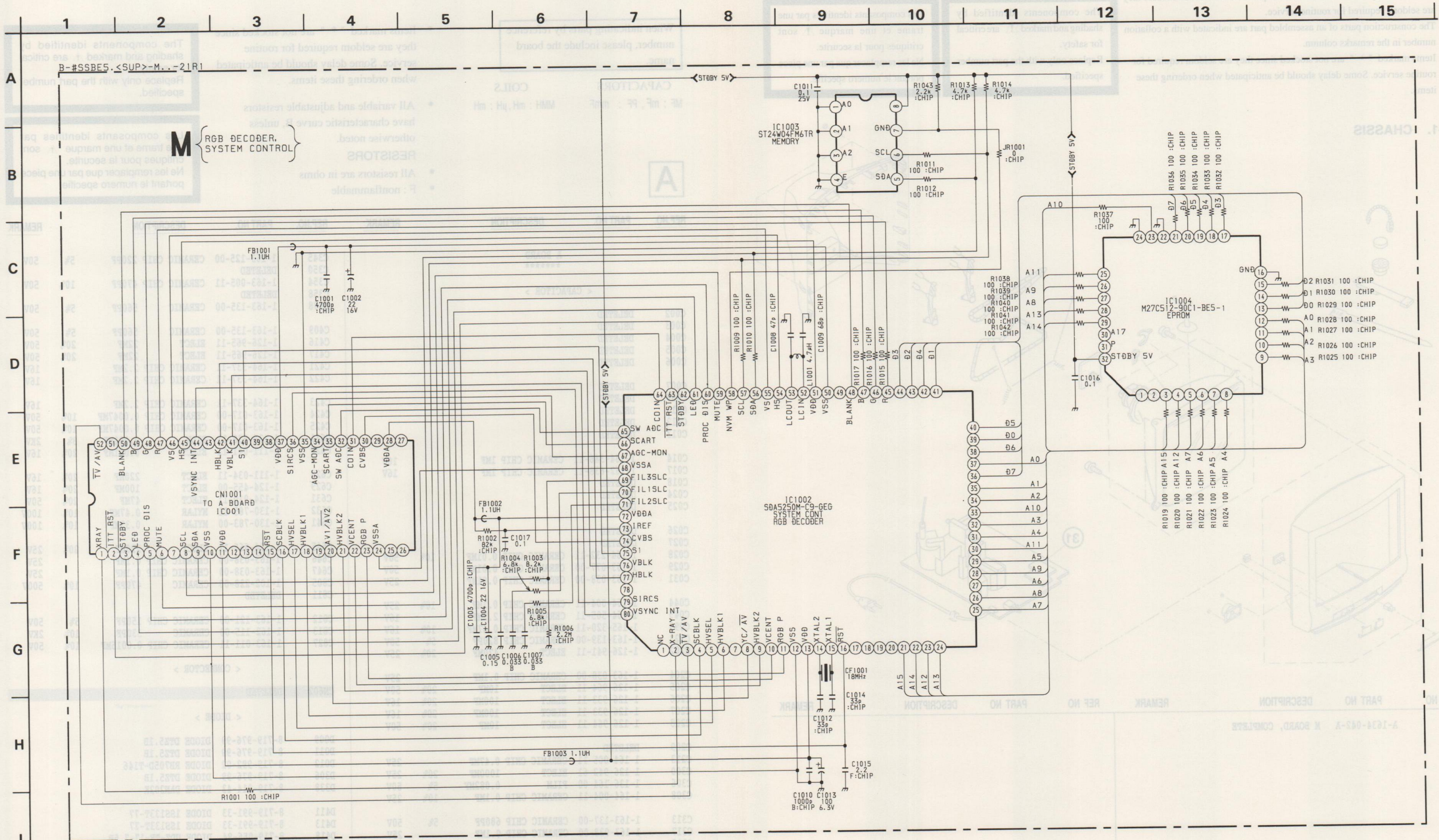
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

A TUNER, SIF/AUDIO PROCESSOR, CRT DRIVER, POWER SUPPLY, HV OUT, AUDIO



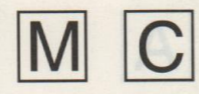
M RGB DECODER, SYSTEM CONTROL





SERVICE MANUAL

BE-5 CHASSIS



REF.NO.	PART NO.	DESCRIPTION	QTY	REMARK
	*A-1634-042-A	M BOARD, COMPLETE *****		
	1-750-797-11	SOCKET, PLCC		
< CAPACITOR >				
C1001	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C1002	1-126-395-11	ELECT 22MF	20%	16V
C1003	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C1004	1-126-395-11	ELECT 22MF	20%	16V
C1005	1-164-492-11	CERAMIC CHIP 0.15MF	10%	16V
C1006	1-163-078-11	CERAMIC CHIP 0.033MF	10%	25V
C1007	1-163-078-11	CERAMIC CHIP 0.033MF	10%	25V
C1008	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C1009	1-163-247-91	CERAMIC CHIP 68PF	5%	50V
C1010	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C1011	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1012	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C1013	1-126-206-11	ELECT 100MF	20%	6.3V
C1014	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C1015	1-164-505-11	CERAMIC CHIP 2.2MF		16V
C1016	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C1017	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
< FILTER >				
CF1001	1-767-120-21	VIBRATOR, CERAMIC (8MHz)		
< FERRITE BEAD >				
FB1001	1-410-397-21	FERRITE BEAD INDUCTOR 1.1UH		
FB1002	1-410-397-21	FERRITE BEAD INDUCTOR 1.1UH		
FB1003	1-410-397-21	FERRITE BEAD INDUCTOR 1.1UH		
< IC >				
IC1002	8-759-440-72	IC SDA5250M-C9-GEG		
IC1003	8-759-432-32	IC ST24W04FM6TR		
IC1004	8-759-440-74	IC M27C512-90C1-BE5-1		
< COIL >				
L1001	1-408-405-00	INDUCTOR 4.7UH		
< RESISTOR >				
JR1001	1-216-295-00	METAL GLAZE 0	5%	1/10W
R1001	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1002	1-216-095-00	METAL GLAZE	82K	5% 1/10W
R1003	1-216-071-00	METAL GLAZE	8.2K	5% 1/10W
R1004	1-216-069-00	METAL GLAZE	6.8K	5% 1/10W
R1005	1-216-069-00	METAL GLAZE	6.8K	5% 1/10W
R1006	1-216-129-00	METAL GLAZE	2.2M	5% 1/10W
R1009	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1010	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1011	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1012	1-216-025-00	METAL GLAZE	100	5% 1/10W

REF.NO.	PART NO.	DESCRIPTION	QTY	REMARK
R1013	1-216-065-00	METAL GLAZE	4.7K	5% 1/10W
R1014	1-216-065-00	METAL GLAZE	4.7K	5% 1/10W
R1015	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1016	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1017	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1019	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1020	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1021	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1022	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1023	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1024	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1025	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1026	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1027	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1028	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1029	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1030	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1031	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1032	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1033	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1034	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1035	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1036	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1037	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1038	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1039	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1040	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1041	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1042	1-216-025-00	METAL GLAZE	100	5% 1/10W
R1043	1-216-057-00	METAL GLAZE	2.2K	5% 1/10W

C BOARD				

< CAPACITOR >				
C701	1-102-115-00	CERAMIC	560PF	10% 50V
C702	1-102-115-00	CERAMIC	560PF	10% 50V
C703	1-102-115-00	CERAMIC	560PF	10% 50V
< RESISTOR >				
R700	1-202-549-00	SOLID	100	20% 1/2W
R729	1-216-350-11	METAL OXIDE	1.2	5% 1W

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-21R1A	RM-836	Italian	SCC-K31A-A				
KV-21R1D	RM-836	AEP	SCC-K32A-A				
KV-21R1E	RM-836	Spanish	SCC-K30A-A				

SUPPLEMENT - 2

SUBJECT : DELETION OF M BOARD

File this supplement with the service manual

INTRODUCTION : 1. This supplement refers to models where the M Board has been deleted, and the circuitry incorporated onto the A Board.

- SECTION 5 DIAGRAMS
(A Board, Page 33) See page 3
- SECTION 6 EXPLODED VIEWS
6-1. CHASSIS (Page 43) See page 8
- SECTION 7 ELECTRICAL PARTS LIST (Page 45) See page 9



BE-5 CHASSIS

SERVICE MANUAL

DEL	COMMANDER	DEST	CHASSIS NO	MODEL	COMMANDER	DEST	CHASSIS NO
V-21R1A	FM-838	Italian	SCC-K31A-A				
V-21RID	FM-838	ARP	SCC-K32A-A				
V-21RIE	FM-838	Spanish	SCC-K30A-A				

SUPPLEMENT - 2

SUBJECT : DELETION OF M BOARD

File this supplement with the service manual

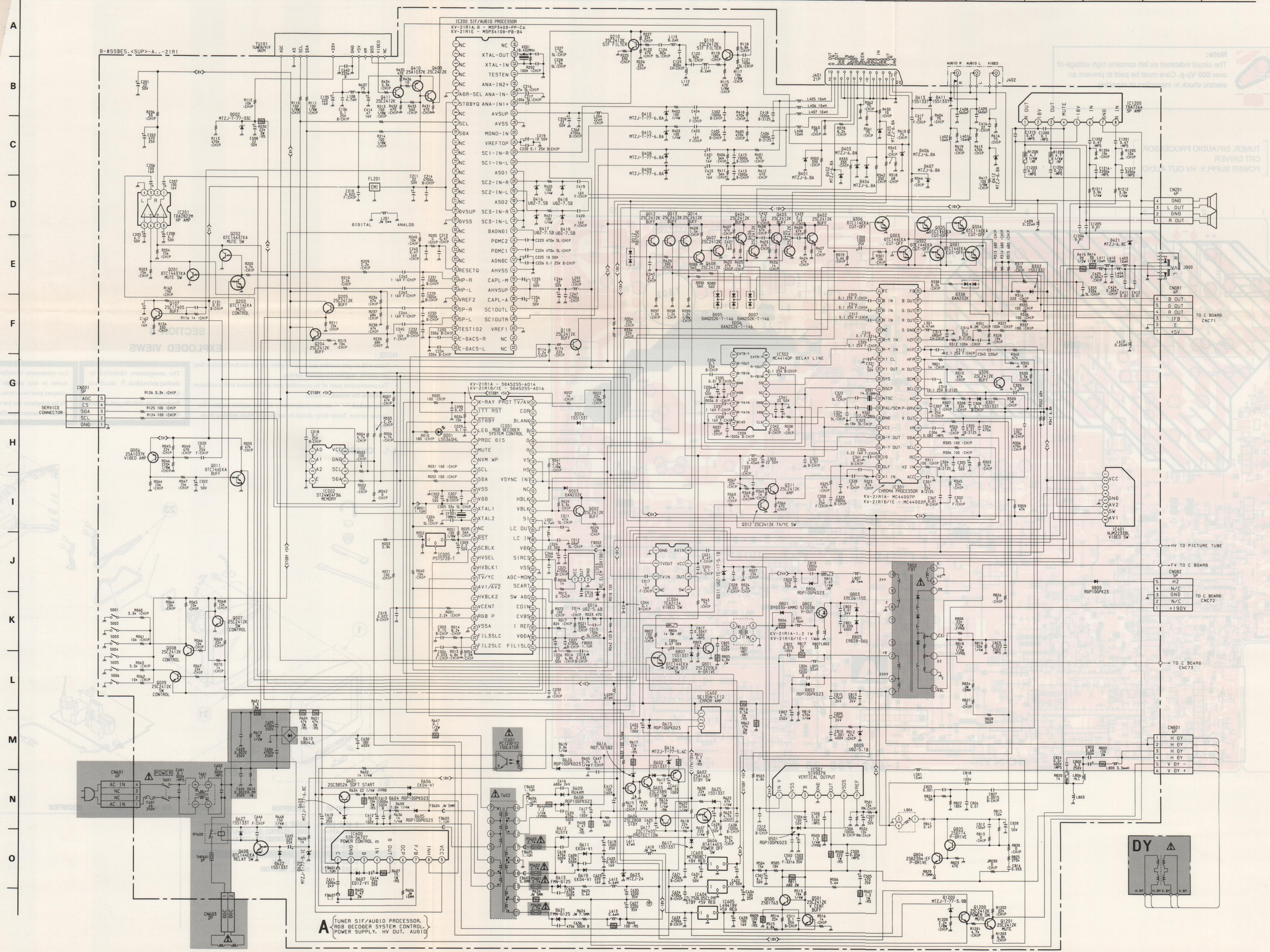
INTRODUCTION : 1. This supplement refers to models where the M Board has been deleted, and the circuitry incorporated onto the A Board.

SECTION 5 DIAGRAMS
(A Board, Page 33) See page 3

SECTION 6 EXPLODED VIEWS
6-1. CHASSIS (Page 43) See page 8

SECTION 7 ELECTRICAL PARTS LIST (Page 45) See page 9

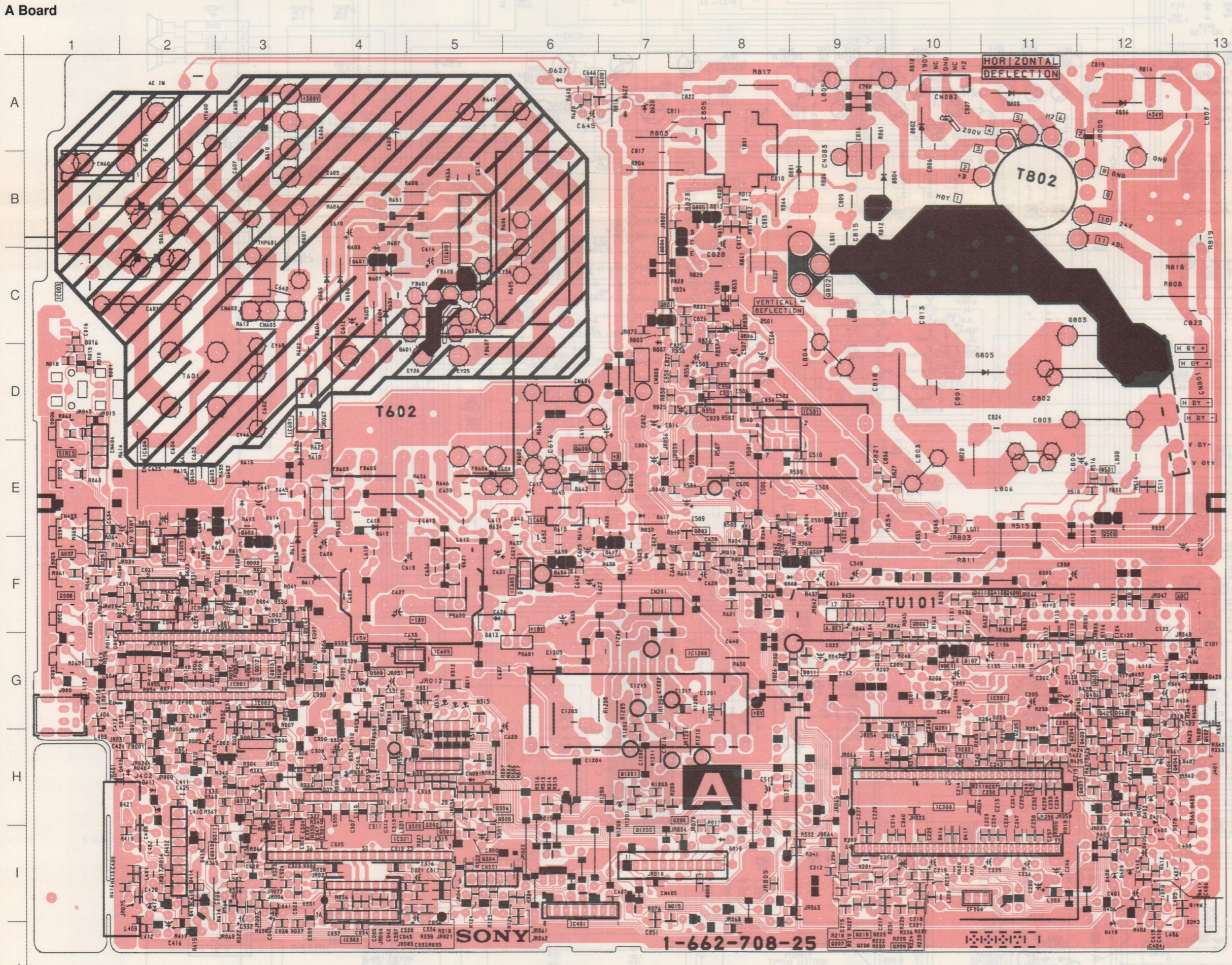




A TUNER SIF/AUDIO PROCESSOR, RGB DECODER SYSTEM CONTROL, POWER SUPPLY, HV OUT, AUDIO


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


A TUNER, SIF/AUDIO PROCESSOR
CRT DRIVER
POWER SUPPLY, HV OUT AUDIO



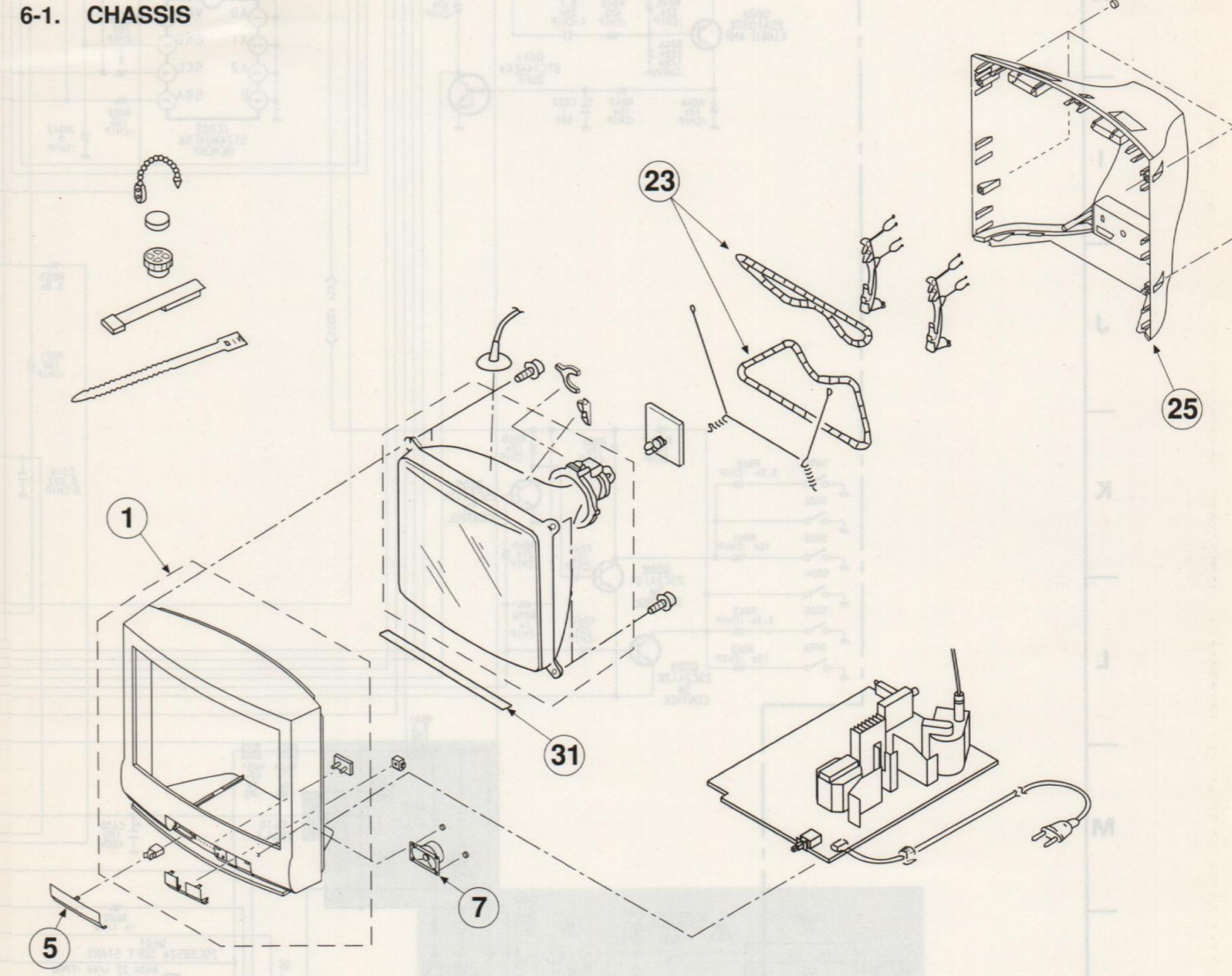
**SECTION 6
EXPLODED VIEWS**

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

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

Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.

6-1. CHASSIS



REF NO	PART NO	DESCRIPTION	REMARK	REF NO	PART NO	DESCRIPTION	REMARK
1	X-4200-282-2	BEZNET ASSY	2-4				
5	4-203-435-41	DOOR (PRINTED) (KV-21R1A/21R1D)					
	4-203-435-31	DOOR (PRINTED) (KV-21R1E)					
7	1-505-598-11	SPEAKER					
23	1-411-922-11	COIL DEGAUSSING					
25	4-203-429-04	COVER (REAR)					
31	4-203-128-01	SHEET, BLOTTING					

SECTION 7

ELECTRICAL PARTS LIST



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

The components identified by shading and marked **A** are critical for safety. Replace only with the part number specified.

CAPACITORS COILS
 MF : mF, PF : mmF MMH : mH, μH : mH



- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

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

RESISTORS

- All resistors are in ohms
- F : nonflammable

REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
A BOARD, COMPLETE *****				< CONNECTOR >			
< CAPACITOR >				CN001	*1-564-508-11	PIN, CONNECTOR 5P	
C009	1-124-961-11	ELECT 2.2MF	20% 50V	< DIODE >			
C012	1-163-113-00	CERAMIC CHIP 68PF	5% 50V	D003	8-719-914-43	DIODE DAN202K	
C022	1-126-960-11	ELECT 1MF	20% 50V	D016	8-719-158-15	DIODE RD5.6S-B	
C030	1-163-077-00	CERAMIC CHIP 0.1MF	50V	D408	8-719-110-14	DIODE RD9.1ES-B3	
C039	1-163-205-00	CERAMIC CHIP 0.001MF	10% 50V	D409	8-719-110-14	DIODE RD9.1ES-B3	
C046	1-163-125-00	CERAMIC CHIP 220PF	5% 50V	D410	8-719-110-14	DIODE RD9.1ES-B3	
C122	1-163-249-11	CERAMIC CHIP 82PF	5% 50V	D415	8-719-110-14	DIODE RD9.1ES-B3	
C124	1-163-249-11	CERAMIC CHIP 82PF	5% 50V	D416	8-719-056-84	DIODE UDZ-TE-17-7.5B	
C204	DELETED			D417	8-719-056-84	DIODE UDZ-TE-17-7.5B	
C205	1-126-963-11	ELECT 4.7MF	20% 50V	D421	8-719-109-97	DIODE RD6.8ES-B2	
C208	1-126-963-11	ELECT 4.7MF	20% 50V	D606	8-719-028-89	DIODE EK04-V1	
C218	DELETED			D611	8-719-028-89	DIODE EK04-V1	
C302	1-163-038-00	CERAMIC CHIP 0.1MF	25V	D616	8-719-110-03	DIODE RD7.5ESB2	
C307	1-163-077-00	CERAMIC CHIP 0.1MF	10% 25V	D619	8-719-028-89	DIODE EK04-V1	
C310	1-163-077-00	CERAMIC CHIP 0.1MF	10% 25V	D623	8-719-924-16	DIODE MTZJ-T-77-24	
C325	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	D802	8-719-302-43	DIODE EL1Z	
C326	1-164-489-11	CERAMIC CHIP 0.22MF	10% 16V	< FUSE >			
C328	1-163-038-00	CERAMIC CHIP 0.1MF	25V	F601	* 1-532-350-00	FUSE (4A 250V)	
C332	DELETED			< FERRITE BEAD >			
C345	1-163-259-91	CERAMIC CHIP 220PF	5% 50V	FB003	1-410-397-21	INDUCTOR, FERRITE BEAD 1.1UH	
C355	1-163-059-91	CERAMIC CHIP 0.01MF	10% 50V	FB603	1-535-303-00	LEAD, JUMPER (5.0MM)	
C411	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	FB604	1-535-303-00	LEAD, JUMPER (5.0MM)	
C412	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	< IC >			
C414	1-126-967-11	ELECT 47MF	20% 16V	IC001	8-759-473-01	IC SDA5255-A014 (KV-21R1A)	
C500	1-137-465-11	FILM 0.056MF	5% 50V		8-759-472-99	IC SDA5255-A016 (KV-21R1D/21R1E)	
C601	* 1-136-212-12	FILM 0.1MF	20% 300V	IC002	8-759-437-34	IC ST24W04FB6	
C602	* 1-136-212-12	FILM 0.1MF	20% 300V	IC003	8-747-014-11	RAY CATCHER ELEMENT SBX1981-51	
C603	* 1-117-700-61	CERAMIC 0.0022MF	99% 250V	IC200	8-759-493-49	IC MSP3410D-PB-B4 (KV-21R1E)	
C604	* 1-117-700-61	CERAMIC 0.0022MF	99% 250V	IC301	8-759-333-44	IC MC44007P(KV-21R1A)	
C605	* 1-162-599-12	CERAMIC 0.0047MF	250V		8-759-333-45	IC MC44002P(KV-21R1D/21R1E)	
C606	* 1-162-599-12	CERAMIC 0.0047MF	250V	< SOCKET >			
C629	1-126-933-11	ELECT 100MF	20% 16V	J401	1-695-551-11	SOCKET PIN 21P	
C638	1-163-205-00	CERAMIC CHIP 0.001MF	10% 50V	< COIL >			
C804	1-126-959-11	ELECT 0.47MF	20% 50V	L108	1-414-740-21	INDUCTOR 4.7UH	
C809	1-162-134-11	CERAMIC 470PF	10% 2KV	L112	1-414-177-11	INDUCTOR 1UH	
C815	1-162-134-11	CERAMIC 470PF	10% 2KV				
C825	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V				
C826	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V				
C828	1-126-960-11	ELECT 1MF	20% 50V				



The component identified by shading and marked + is critical for safety. Replace only with the part number specified.

REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
K436	1-218-001-00	METAL GLAZE	10 2# 1/10W	K437	1-218-003-00	METAL GLAZE	75 2# 1/10W
K501	1-218-625-11	METAL CHIP	10K 0.20# 1/10W	K502	1-218-625-11	METAL CHIP	10K 0.20# 1/10W
K503	1-218-669-11	METAL CHIP	2.5K 0.20# 1/10W	K504	1-218-669-11	METAL CHIP	2.5K 0.20# 1/10W
K505	1-218-930-11	METAL OXIDE	10K 2# 1/10W	K506	1-218-143-11	LEAD JUMPER (10.0MM)	
K507	1-218-303-00	LEAD JUMPER (2.0MM)		K508	1-218-049-00	METAL GLAZE	1K 2# 1/10W
K509	1-218-350-00	METAL OXIDE	1.1 2# 1/10W	K510	1-218-349-00	METAL OXIDE	1 2# 1/10W
K511	1-218-869-11	METAL OXIDE	1K 2# 1/10W	K512	1-218-103-00	METAL GLAZE	180K 2# 1/10W
K513	1-218-107-00	METAL GLAZE	370K 2# 1/10W	K514	1-218-143-11	LEAD JUMPER (10.0MM)	
K515	1-218-313-11	LEAD JUMPER (7.5MM)		K516	1-218-313-11	LEAD JUMPER (10.0MM)	
K517	1-218-317-11	CARBON	0.47 2# 1/10W	K518	1-218-803-11	METAL OXIDE	47K 2# 1/10W
K1304	1-218-333-00	METAL GLAZE	10K 2# 1/10W	K1305	1-218-333-00	METAL GLAZE	20K 2# 1/10W

C BOARD, COMPLETE

> CONNECTOR

CW23	1-692-215-11	TAB (CONTACT)
CW26	1-692-215-11	TAB (CONTACT)

> CRT SOCKET

> INDUCTOR

L203	1-408-415-00	INDUCTOR 330UH
L204	1-218-303-00	LEAD JUMPER (2.0MM)
L205	1-218-303-00	LEAD JUMPER (2.0MM)

* RESISTOR

R206	1-260-087-81	CARBON	100 2# 1/10W
R207	1-218-143-11	LEAD JUMPER (10.0MM)	
R208	1-218-213-00	METAL OXIDE	10K 2# 1/10W
R209	1-218-213-00	METAL OXIDE	10K 2# 1/10W
R210	1-218-213-00	METAL OXIDE	10K 2# 1/10W
R211	1-218-143-11	LEAD JUMPER (10.0MM)	
R212	1-260-117-11	CARBON	23K 10# 1/10W
R213	1-260-117-11	CARBON	470K 10# 1/10W

MISCELLANEOUS

1-692-208-11 SPEAKER