TOSHIBA

FILE NO. 060-200559

SERVICE MANUAL

Color Television

S5E series

21CZ3R
21CZ5R

The above models are classified as green product (s) (*1), as indicated by the underlined serial number (s).
This Service Manual describes replacement parts for green product (s). When repairing any green product (s), use the parts described in this manual and lead-free solder (*2).
For (*1) and (*2), see the next page.

Published in Singapore, September 2005 GREEN

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(*1)

GREEN PRODUCT PROCUREMENT

The EC is actively promoting the WEEE & RoHS Directives that define standards for recycling and reuse of Waste Electrical and Electronic Equipment and for the Restriction of the use of certain Hazardous Substances. From July 1, 2006, the RoHS Directive will prohibit any marketing of new products containing lead.

Increasing attention is given to issues related to the global environmental. Toshiba Corporation recognizes environmental protection as a key management tasks, and is doing its utmost to enhance and improve the quality and scope of its environmental activities. In line with this, Toshiba proactively promotes Green Procurement, and seeks to purchase and use products, parts and materials that have low environmental impacts.

Green procurement of parts is not only confined to manufacture. The same green parts used in manufacture must also be used as replacement parts.

(*2)

LEAD-FREE SOLDER

This product is manufactured using lead-free solder as a part of a movement within the CE industry at large to be environmentally responsible. Lead-free solder must be used in the servicing and repair of this product.

WARNING

This product is manufactured using lead free solder.

DO NOT USE LEAD BASED SOLDER TO REPAIR THIS PRODUCT!

The melting temperature of lead-free solder is higher than that of leaded solder by 86˚F to 104˚F (30˚C to 40˚C). Use of a soldering iron designed for lead-based solders to repair product made with lead-free solder may result in damage to the component and or PCB being soldered. Great care should be made to ensure high-quality soldering when servicing this product – especially when soldering large components, through-hole pins, and on PCBs – as the level of heat required to melt lead-free solder is high.

CHAPTER 1 GENERAL ADJUSTMENTS

SAFETY INSTRUCTIONS

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is (A) kV at zero beam current (minimum brightness) under a (C) V AC power source. The high voltage must not, under any circumstances, exceed (B) kV.

   Refer to table-1 for high voltage (A), (B) & AC voltage (C). (See SETTING & ADJUSTING DATA on page 13)

   Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure in this manual. It is recommended that the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
3. Some part in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

SAFETY PRECAUTION

WARNING : Service should not be attempted by anyone unfamiliar with the necessary precautions on this receiver. The following are the necessary precautions to be observed before servicing this chassis.

1. An isolation transformer should be connected in the power line between the receiver and the AC line before any service is performed on the receiver.
2. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled. Use shatter proof goggles and keep picture tube away from the unprotected body while handling.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; nonmetallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the international hazard symbols on the schematic diagram and the parts list.
Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire, X-ray radiation or other hazards.

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 3 OF THIS MANUAL.

SET-UP ADJUSTMENT

■ The following adjustments should be made when a complete realignment is required or a new picture tube is installed. Perform the adjustments in order as follows :

1. Color Purity
2. Convergence
3. White Balance

Note: The PURITY/CONVERGENCE MAGNET assembly and rubber wedges need mechanical positioning. Refer to figure 1.
Mounting position of the purity magnet assembly should fit to same position as old one because slightly difference to the position depend on a kind of tube.

* There are no adjustment of purity and convergence in some picture tube (Unified with purity magnet)

COLOR PURITY ADJUSTMENT

NOTE : Before attempting any purity adjustments, the receiver should be operated for at least fifteen minutes.

1. Demagnetize the picture tube and cabinet using a degaussing coil.
2. Set the brightness and contrast to maximum.
3. Use a green raster from among the built-in test signals.
4. Loosen the clamp screw holding the yoke and slide the yoke backward or forward to provide vertical green belt (zone) in the picture screen.
5. Remove the Rubber Wedges.
6. Rotate and spread the tabs of the purity magnet (See figure 2.) around the neck of the picture tube until the green belt is in the center of the screen. At the same time, enter the raster vertically.
7. Slowly move the yoke forward or backward until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.
8. Check the purity of the red and blue raster.

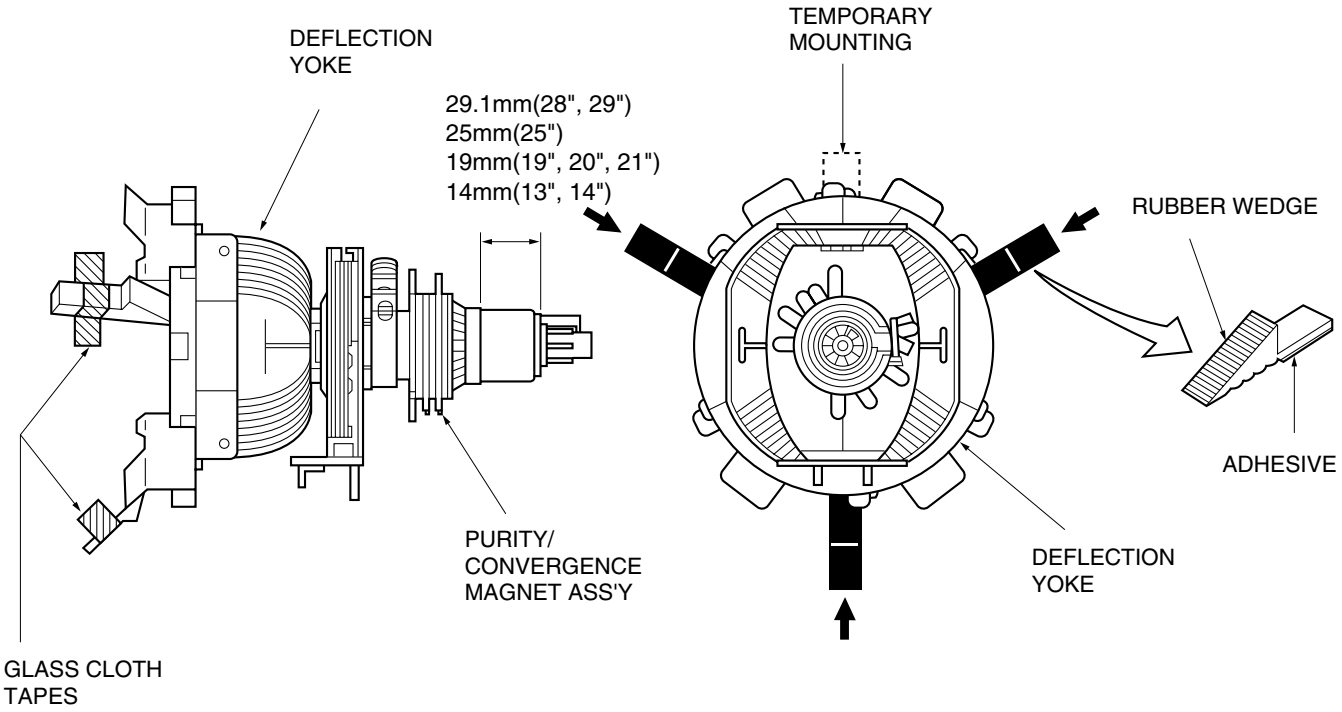


Figure 1.

CONVERGENCE ADJUSTMENTS

NOTE: Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

■ CENTER CONVERGENCE ADJUSTMENT

1. Use the cross-dot pattern from among the built-in test signals.
2. Set the brightness and contrast for well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 2.) and superimpose red and blue vertical lines in the center area of the picture screen.
4. Turn the both tabs at the same time keeping the angle constant to superimpose red and blue horizontal lines at the center of the screen.
5. Adjust two tabs of 6-Pole Magnets to superimpose red/ blue line and green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 3, 4, 5 keeping in mind red, green and blue movement, because 4-Pole Magnets and 6-Pole Magnets have mutual interaction and make dot movement complex.

■ CIRCUMFERENCE CONVERGENCE ADJUSTMENT

1. Loosen the clamping screw of deflection yoke slightly to allow the yoke to tilt.
2. Temporarily put a wedge as shown in figure 1. (Do not remove cover paper on adhesive part of the wedge.)
3. Tilt front of the deflection yoke up or down to obtain better convergence in circumference. (See figure 3.) Push the mounted wedge into the space between picture tube and the yoke to fix the yoke temporarily.
4. Put other wedge into bottom space and remove the cover paper to stick.
5. Tilt front of the yoke right or left to obtain better convergence in circumference. (See figure 3.)
6. Keep the yoke position and put another wedge in either upper space. Remove cover paper and stick the wedge on picture tube to fix the yoke.
7. Detach the temporarily mounted wedge and put it in another upper space. Stick it on picture tube to fix the yoke.
8. After fixing three wedges, recheck overall convergence. Tighten the screw firmly to fix the yoke and check the yoke is firm.
9. Stick three adhesive tapes on wedges as shown in figure 1.

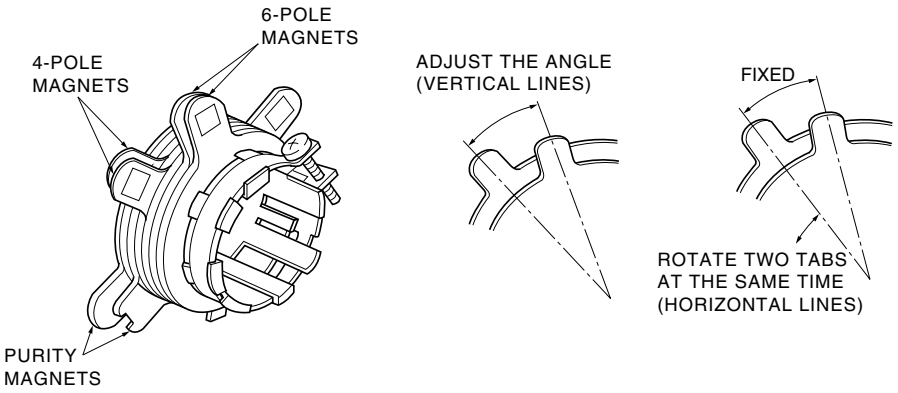
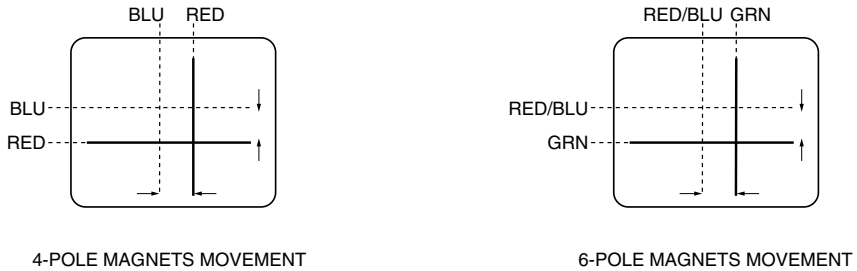


Figure 2.



Center Convergence by Convergence Magnets

Circumference Convergence by DEF Yoke

Figure 3. Dot Movement Pattern

SERVICE MODE

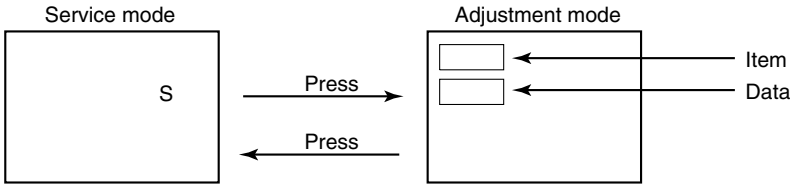
1. ENTERING TO SERVICE MODE

1) Press 🔇 button once on Remote Control.
2) Press 🔇 button again to keep pressing.
3) While pressing the 🔇 button, press MENU button on TV set.

(Service mode display)

2. DISPLAYING THE ADJUSTMENT MENU

1) Press MENU button on TV.



3. KEY FUNCTION IN THE SERVICE MODE

The following key entry during display of adjustment menu provides special functions.

A single horizontal line ON/OFF:	- / - - button (on Remote) or ⊖ button (on TV)
Test signal selection :	⊖ button (on Remote)
Selection of the adjustment items :	Channel ▲/▼ (on TV or Remote)
Change of the data value :	Volume ◿ +/– (on TV or Remote)
Adjustment menu mode ON/OFF :	MENU button (on TV)
Initialization of the memory (QA02) :	CALL + Channel button on TV (▲)
Reset the count of operating protect circuit to “00”:	CALL + Channel button on TV (▼)
“RCUT” selection :	1 button
“GCUT” selection :	2 button
“BCUT” selection :	3 button
“CNTX” (or “SCNT”) selection :	4 button
“COLC” selection :	5 button – – – – – Color thickness correction
“TNTC” selection :	6 button
“SBY” selection :	7 button
“SRY” selection :	8 button
Self diagnostic display ON/OFF :	9 button

note: Displayed differently as shown below, depending on the setting of the receiving color system.
COLP (PAL)
COLC (NTSC)
COLS (SECAM)

CAUTION : Never try to perform initialization unless you have changed the memory IC.

4. SELECTING THE ADJUSTING ITEMS

1) Every pressing of CHANNEL ▲ button in the service mode changes the adjustment items in the order of table-2. (▼ button for reverse order)

Refer to table-2 for preset data of adjustment mode.
(See SETTING & ADJUSTING DATA on page 13)

5. ADJUSTING THE DATA

1) Pressing of VOLUME +/– button will change the value of data in the range from 00H to FFH. The variable range depends on the adjusting item.

6. EXIT FROM SERVICE MODE

1) Pressing POWER button to turn off the TV once.

■ INITIALIZATION OF MEMORY DATA OF QA02

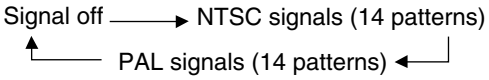
After replacing QA02, the following initialization is required.

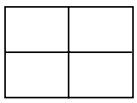
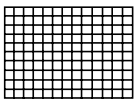
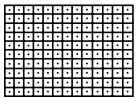
1. Enter the service mode, then select any register item.
2. Press and hold the CALL button on the Remote, then press the CHANNEL ▲ button on the TV. The initialization of QA02 has been complated.
3. Check the picture carefully. If necessary, adjust any adjustment item above. Perform “Auto search Memory” on the owner’s manual.

CAUTION: Never attempt to initialize the data unless QA02 has been replaced.

7. TEST SIGNAL SELECTION

1) Every pressing of ⊖ button on the Remote Control changes the built-in test patterns on screen as described below in SERVICE MODE.

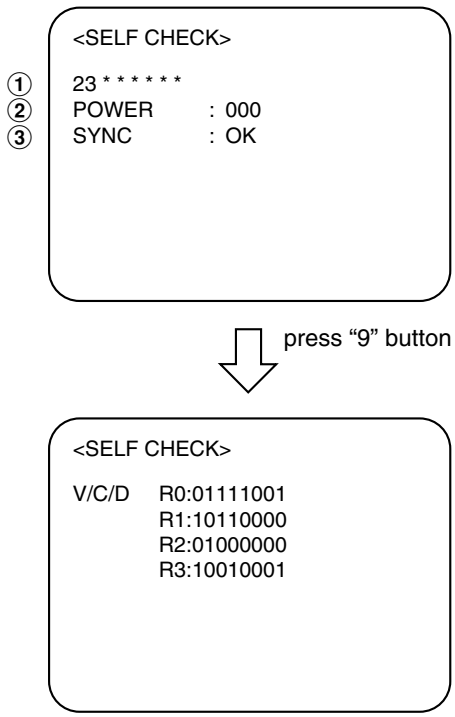


Signals	Picture
• Red raster • Green raster • Blue raster • All Black • All White	
• Black & White	
• Black cross-bar • White cross-bar • Black cross-bar on green raster	
• Black cross-hatch • White cross-hatch	
• Black cross-dot • White cross-dot	
• H signal (white) • H signal (black)	

* The signals marked with ▒ are not usable to display in the Test signal for some model.

8. SELF DIAGNOSTIC FUNCTION

1) Press “9” button on Remote Control during display of adjustment menu in the service mode.
   The diagnosis will begin to check if interface among IC’s are executed properly.
2) During diagnosis, the following displays are shown.



① Part number of microprocessor (Q100)
② Operation number of protecting circuit ----“00” is normal.
③ RF signal center frequency is locked.

Read Data

	D7	D6	D5	D4	D3	D2	D1	D0
R0	POR	IF LOCK	AFT WINDOW	AFT CENTER	H LOCK	COLOR SYSTEM		
R1	V LOCK	HOUT	VOUT	RGB OUT	G DRIVE DATA		B DRIVE DATA	
R2	V FREQ	STDM	R CUTOFF DATA		G CUTOFF DATA		B CUTOFF DATA	
R3	CIN DC	NOISE DET		IF LEVEL	ADJ TIME	PIF VCO error det		SYNC DET

DESIGN MODE

1. ENTERING TO DESIGN MODE

1) Select the Service mode. (See page 6)
2) While pressing 🔇(or CALL) button on the remote controller and press MENU button on TV.
3) Press MENU button on TV.

(Design mode) (Adjustment mode)

When QA02 is initialized, items “OPT” and “OPT1” of DESIGN MODE are set to the data of the representative model of this chassis family.
Therefore, because ON-SCREEN specification remains in the state of the representative of model. This model is required to reset the data of items “OPT” and “OPT1”.

2. SELECTING THE ADJUSTING ITEMS

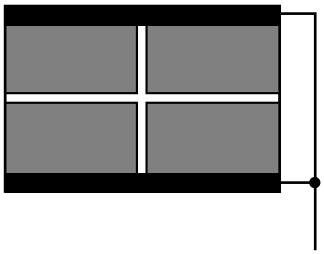
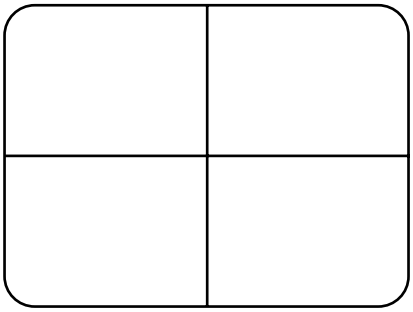
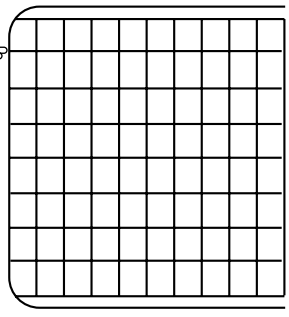
Every pressing of CH ▼ button in the design mode changes the adjustment items in the order of table-3.
(▲ button for reverse order)

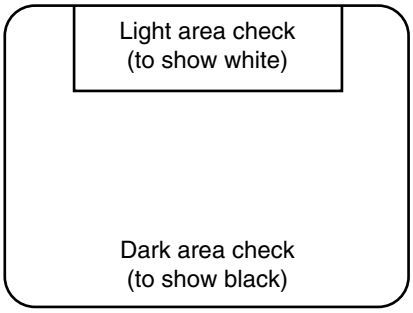
Refer to table-3 for data of design mode.
(See SETTING & ADJUSTING DATA on page 13)

3. ADJUSTING THE DATA

Pressing of ◿ -/+ button will change the value of data.

ELECTRICAL ADJUSTMENTS

ITEM	ADJUSTMENT PROCEDURE
FOCUS VR ADJ	1. Enter the service mode, then select any register item. 2. Press the ⊖ button on the remote controller until the black cross-bar pattern appears on the screen. 3. Adjust the FOCUS control (on T461) for well defined scanning lines on the picture screen.
SUB-BRIGHTNESS (BRTC) Note: Constrict the picture height until the vertical retrace line appears adjusting the item HIT (HEIGHT).	1. Set CONTRAST to minimum, and BRIGHTNESS to center by adjusting user controls. 2. Set the TV in service mode to get white cross-bar of inside pattern. 3. Select BRTC (brightness correction), and press ◿ –/+ buttons to reduce the value so that white portion of inside pattern slightly light. 4. Press ◿ –/+ buttons to increase the data value of BRTC, and set it just before the difference between the belt of vertical retrace and the border of black portion of inside pattern is visible. After that, return vertical height and contrast.  Belt of vertical retrace
HORIZONTAL POSITION ADJUSTMENT (HPOS) VERTICAL POSITION ADJUSTMENT (VPOS)	1. Set the TV in service mode, and get black or white cross-bar signal with ⊖ button on the remote controller. 2. Select either HPOS (Horizontal picture phase) or VPOS (Vertical picture phase) with CH ▲/▼ buttons, and adjust horizontal or vertical picture position in the center of screen with ◿ –/+ buttons. 
VERTICAL AMPLITUDE ADJUSTMENT (HIT)	1. Set the TV in service mode, and get black or white cross-hatch signal with ⊖ button on the remote controller. 2. Select HIT (Vertical amplitude) with CH ▲/▼ buttons, and adjust vertical amplitude with ◿ –/+ buttons so that vertical amplitude lacks a little. 3. Adjust vertical amplitude with ◿ –/+ buttons so that the first bar on cross-hatch signal touches edge of screen. The first 

ITEM	ADJUSTMENT PROCEDURE
WHITE BALANCE ADJUSTMENT • CUTOFF ADJUSTMENT (RCUT) (GCUT) (BCUT) • DRIVE ADJUSTMENT (GDRV) (BDRV)	1. Set Contrast to 40, and brightness to +20 by picture control. 2. Set the TV in service mode, and get the inside W/B adjusting signal with –⊕ button. 3. Select RCUT, GCUT and BCUT with CH ▲/▼ buttons, to set individual values to Initial reference data, and to set GDRV and BDRV to Initial reference data with ◿ – /+ buttons. 4. Press -/- - button on the remote control and rotate Screen VR to get one slight horizontal line on screen. Note: Every pressing of -/- - button provides Horizontal line picture and Normal picture alternately. 5. Press -/- - button to release horizontal line picture, and select the two other colors which did not light in the above step with CH ▲/▼ buttons. Then tap ◿ – /+ buttons so that three colors slightly light in the same level. ※ To correct white balance in light area, select GDRV and BDRV with CH ▲/▼ buttons to adjust. ※ To correct white balance in dark area, perform fine adjustment of RCUT, GCUT and BCUT. 
NOTE: It is released built-in test pattern by changing the adjustment item for some model. In this case, select the adjustment item with CH ▲/▼ button first and then select the built-in test pattern with -/- - button.	

CIRCUIT CHECK

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis. Checking should be done following the steps below.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage must be measured below (B) kV.

Refer to table-1 for high voltage (B).
(See SETTING & ADJUSTING DATA on page 13)

4. Vary the BRIGHTNESS control to both extremes to be sure the high voltage does not exceed the limit under any conditions.

CHAPTER 2 SPECIFIC INFORMATIONS

SETTING & ADJUSTING DATA

【 SAFETY INSTRUCTIONS 】

		21"
HIGH VOLTAGE AT ZERO BEAM:	(A)	30.0 kV
MAX HIGH VOLTAGE:	(B)	32.0 kV
AC VOLTAGE	(C)	110-240 V

Table-1

【 SERVICE MODE 】

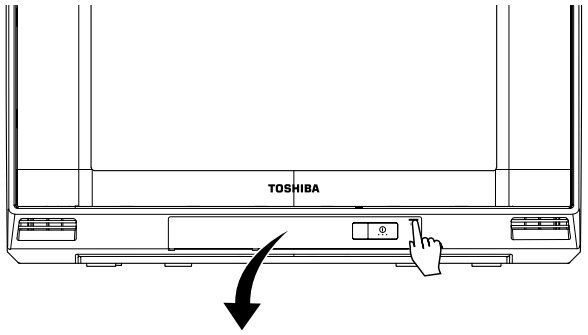
ADJUSTING ITEMS AND DATAS IN THE SERVICE MODE:

Item	Adjustment	Reference data	Data
RCUT	R CUTOFF (B/W)	20H	←
GCUT	G CUTOFF (B/W)	20H	←
BCUT	B CUTOFF (B/W)	20H	←
GDRV	G DRIVE	40H	←
BDRV	B DRIVE	40H	←
BRTC	SUB BRIGHT CEN	40H	←
COLC	SUB COLOR CEN NTSC	30H	←
TNTC	SUB TINT CEN	45H	←
COLP	SUB COLOR CEN PAL	09H	←
COLS	SUB COLOR CEN SECAM	30H	←
SCNT	SUB CONTRAST	08H	←
HPOS	50Hz H-POSITION	0DH	←
VPOS	V-POSITION	04H	←
HIT	HEIGHT	1EH	←
VLIN	V-LINEARITY	0AH	←
SBY	SECAM R-Y	08H	←
SRY	SECAM-B-Y	08H	←
RAGC	RF AGC	2AH	←

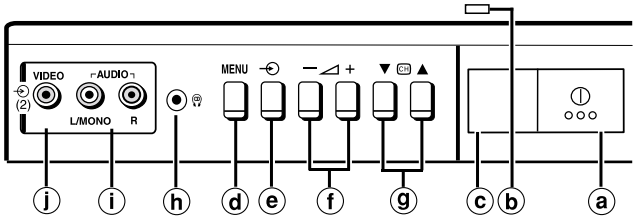
Table-2

NAMES AND FUNCTIONS OF CONTROLS

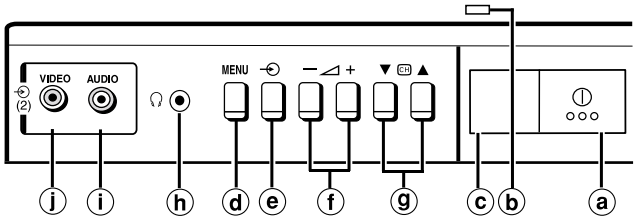
TV Front and Remote control

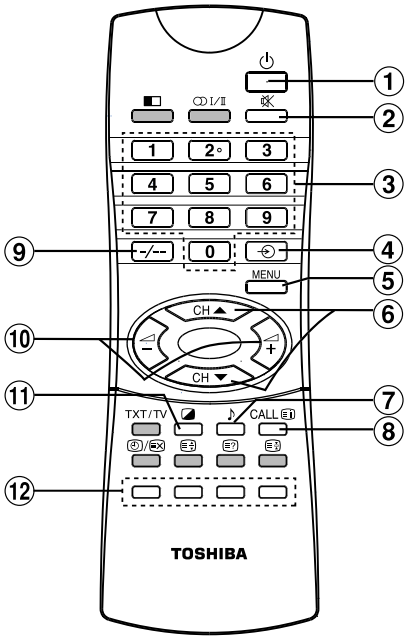


For 21CZ5R



For 21CZ3R





*1 For 21CZ5R, when there is a DVD PB/CB input, "DVD" mark will display instead of ⊣⊖1.

TV					Remote Control
ⓐ	⏻	Main power on/off	①	⏻	Power on/standby
ⓑ		Power indicator (red)	②	🔇	Sound Mute, press again or ◿ -/+ to restore the sound.
ⓒ		Remote sensor			
ⓓ	**MENU**	Turn on menu display	③	**0~9**	Number buttons
ⓔ	⊣⊖	Input source selection, press repeatedly to select ⊣⊖1/DVD*, ⊣⊖2 or channel position number cyclically	④	⊣⊖	Input source selection, press repeatedly to select ⊣⊖1/DVD, ⊣⊖2 or channel position number cyclically
ⓕ	-◿+	Volume down/up Menu selection or item adjust	⑤	**MENU**	Turn on menu display
ⓖ	▼CH▲	Channel down/up Menu item selection	⑥	**CH ▲/▼**	Channel up/down Menu item selection
ⓗ	🎧	Stereo headphones jack (3.5mm) For private listening. The sound from the speakers will be cut off automatically.	⑦	**CALL**	On-screen on/off Turn off the menu
			⑧	**-/--**	Digit selection
ⓘ	**AUDIO**	Audio input terminals	⑨	◿ -/+	Volume down/up Menu selection or item adjust
ⓙ	**VIDEO**	Video input terminal	⑩	◪	Picture menu
			⑪	♪	Sound menu
			⑫		Colored buttons for game mode

Note: The shaded buttons are not available for your TV. If you press the button, "MODE NOT AVAILABLE" will appear on the screen.

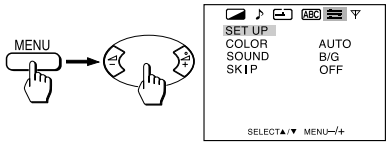
PROGRAMMING CHANNEL MEMORY

Preset the channels automatically (ASM function)

Use remote control for this operation. The buttons on the TV with similar name may also be use.

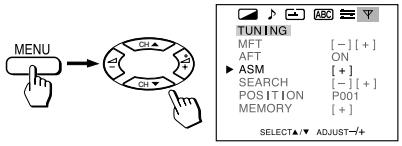
1 Select the starting position for channel to be preset. Press the Number buttons **(-/--, 0~9)** or **CH ▲/▼**.

2 Set the correct broadcast system for your region. Press **MENU** and then ◿ -/+ to highlight the "⇆ SET UP" icon.



Confirm "COLOR" is set to "AUTO" and "SOUND" is set to proper system. If not, press **CH ▲/▼** to select "COLOR" or "SOUND" and press ◿ -/+ to set each proper system.

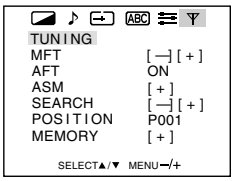
3 Press **MENU** and then ◿-/+ to highlight the "⩛ TUNING" icon. Select "ASM", then press ◿ + to start the search. When the TV screen returns to the start position, the procedure is complete.



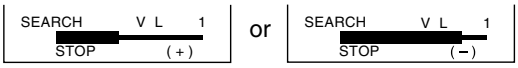
To use the SEARCH function

- First, use the ASM (Automatic Search Memory) function to preset all active channels in your area automatically. Then, arrange the preset channels with the SEARCH, SKIP and MFT (Manual Fine Tuning) functions so that you can tune into only desired channels.
- Use the SEARCH function if desired channels cannot be preset with the ASM or if you would like to preset channels to specific position numbers one by one.

1 Press **MENU** and then ◿ -/+ to highlight the "⩛ TUNING" icon.

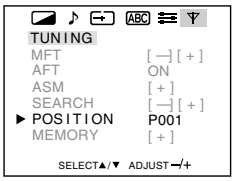


2 Press **CH ▲/▼** to select "SEARCH". Press ◿ -/+ to start searching. Pressing "–" searches for channels at lower frequencies while pressing "+" searches for channels at higher frequencies. While searching, pressing the opposite direction button, + and - respectively, will cancel SEARCH function.

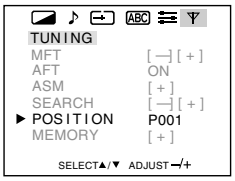


Repeat this process until you can get the desired channel.

3 When the desired channel is shown, press **CH ▼** to select "POSITION". Press the ◿ -/+ buttons repeatedly until the position number to be preset is shown.



4 Press **CH ▲/▼** to select "MEMORY", then press ◿ + to memorize the channel at the current position.



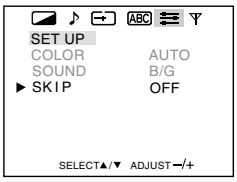
5 When you program other channels, repeat steps 2 to 4.

To skip a position number

After presetting the channels, you may skip unnecessary position numbers so that only the channels you want to watch are selected using **CH ▲/▼**.

1 First, select the position number to be skipped with **CH ▲/▼** or digit selection and number buttons (**-/--, 0~9**).

2 Highlight the "≅ SET UP" icon and press **CH ▲/▼** to select "SKIP".



3 Press the ◿ -/+ to set "SKIP" to "ON". This completes the setting for skipping the selected position number.

Notes

- When "SKIP" is set to "ON" for the selected position number, a " * " mark appears to the left of the position number.

  The position number will then be skipped when you select the position with the **CH ▲/▼** buttons.
- If you want to restore a skipped position number, select it using the **-/--** and **0~9** buttons then switch the "SKIP" setting to "OFF".

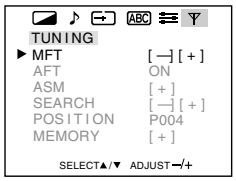
Manual fine tuning (MFT)

The adjustments below are not necessary under normal conditions. However, under some reception conditions, fine tuning may be necessary to improve the picture quality. In such cases, adjust the manual fine tuning (MFT).

1 Select the position number where the channel you want to fine-tune with **CH ▲/▼** or digit selection and number buttons (**-/--**, **0~9**).

2 Press **MENU** and then ◿ -/+ to highlight the "⅄ TUNING" icon.

3 Press **CH ▲/▼** to select "MFT". Press ◿ -/+ to start fine tuning. Press ◿ -/+ repeatedly until the best possible picture and sound are obtained.



Auto fine tuning (AFT)

If the signal frequency is unstable due to environmental conditions, use auto fine tuning.

1 Select the position number where the channel you want to fine-tune with **CH ▲/▼** or the digit selection and number buttons (**-/--**, **0~9**).

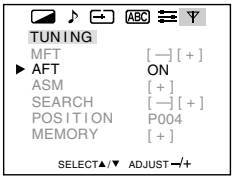
Note

When the position is set to "AFT OFF" status, the "■" mark appears to the left of the position number.

When the channel is set to "AFT ON" status,the position number is displayed without the "■" mark.

2 Press **MENU** then ◿ -/+ to highlight the "⅄ TUNING" icon.

3 Press **CH ▲/▼** to select "AFT". Press ◿ -/+ to select the "ON" indication.



Notes

- When you operate MFT, AFT is switched "OFF" automatically. If you switch on AFT after fine tuning with MFT, MFT may be canceled.
- AFT may be set independently for each position.

PROCEDURES TO SET HOTEL MODE

1. Set the Channel Programs which you want the Customer to watch.

1) Use ASM (see page 15) or SEARCH (see page 15) to select the programs.
2) Choice the position you want the programs to be stored in TUNING menu.
3) Save the programs by MEMORY operation in TUNING menu (see page 15).

2. Set the Channels which you don't want the Customer to access

1) Select the channel by pressing the number buttons or CH ▲/▼ buttons.
2) Set the SKIP from OFF to ON (see page 16).
3) Repeat above 1) & 2) for all the channels which need to be blocked.

3. Activate the HOTEL Mode:

1) Select startup channel (TV, ⊖1, ⊖2, DVD) first, then enter into design mode (see page 9).
2) Press CH ▼ button on the remote controller to show the Design Item "OPT".
3) Add "0x80" to the data of "OPT" to activate the HOTEL Mode with panel buttons unlocked, or add "0x08" to the data of "OPT2" to activate the HOTEL Mode with panel buttons locked.
4) AC Power OFF the TV, then next time AC Power ON the TV will in HOTEL Mode with all the customer settings taking effect.

4. Set the maximum volume:

1) Enter Service Mode (see page 6).
2) Enter Design Mode (see page 9).
3) Use the CH ▼ button on the remote controller to show the Design Item "VOLX".
4) Adjust the "VOLX" data by pressing ◿+/- buttons (Default 0x64 is equal to Volume 100 in Decimal).

5. Set the following Items in HOTEL Mode:

1) Picture mode
   Press ◪ button to select the desired picture quality. "DYNAMIC", "STANDARD", "MILD" and "MEMORY" will appear cyclically.
2) Sound mode
   Press ♪ button to select the desired sound quality. "THEATER", "NEWS" and "MEMORY" will appear cyclically.

(Every time AC Power ON the TV will call back the above customer setting.)

CHASSIS AND CABINET REPLACEMENT PARTS LIST

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 3 OF THIS MANUAL.

CAUTION: The international hazard symbols "⚠" in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE. Do not degrade the safety of the receiver through improper servicing.

NOTICE:
- *The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.*
- *The PC board assembly with ∗ mark is no longer available after the end of the production.*

Model: 21CZ3R/21CZ5R

Capacitors ..... CD : Ceramic Disk PF : Plastic Film EL : Electrolytic
Resistors ..... CF : Carbon Film CC : Carbon Composition MF : Metal Film
OMF : Oxide Metal Film VR : Variable Resistor FR : Fusible Resistor
(All CD and PF capacitors are ±5%, 50V and all resistors, ±5%, 1/6W unless otherwise noted.)

Location No.		Parts No.	Description
#1: [21CZ3R]			
#2: [21CZ5R]			
CAPACITORS			
C101		76763101	ELECTROLYTIC 16V 100UF M
C102		76763221	ELECTROLYTIC 16V 220UF M
C103		76109103	CERAMIC CHIP 50V B 0.01UF K
C104		76105470	CERAMIC CHIP 50V CH 47PF J
C105		76105220	CERAMIC CHIP 50V CH 22PF J
C106		76796479	ELECTROLYTIC 35V 4.7UF M
C107		76105220	CERAMIC CHIP 50V CH 22PF J
C108		76503049	PLASTIC FILM 63V 0.47UF J
C109		76203100	ELECTORLYTIC 16V 10UF M 7L 3A
C110		76109103	CERAMIC CHIP 50V B 0.01UF K
C113		76109102	CERAMIC CHIP 50V B 1000PF K
C114		76109102	CERAMIC CHIP 50V B 1000PF K
C116		76109103	CERAMIC CHIP 50V B 0.01UF K
C118		76109102	CERAMIC CHIP 50V B 1000PF K
C120		76203100	ELECTORLYTIC 16V 10UF M 7L 3A
C121		76109103	CERAMIC CHIP 50V B 0.01UF K
C123		76206010	ELECTROLYTIC 50V 1.0UF M 7L 3A
C129		76109102	CERAMIC CHIP 50V B 1000PF K
C130		76797479	ELECTROLYTIC 50V 4.7UF M
C131		76814103	CERAMIC CHIP 50V F 0.01UF Z
C132		76100104	CERAMIC CHIP 25V F 0.1UF Z
C133		76105101	CERAMIC CHIP 50V CH 100PF J
C135		76109222	CERAMIC CHIP 50V B 2200PF K
C136		76206228	ELECTROLYTIC 50V 0.22UF M 7L 3A
C137		76100103	CERAMIC CHIP 50V F 0.01UF Z
C141		76105101	CERAMIC CHIP 50V CH 100PF J
C150		76814103	CERAMIC CHIP 50V F 0.01UF Z
C166		76109103	CERAMIC CHIP 50V B 0.01UF K
C167		76794101	ELECTROLYTIC 16V 100UF M
C170		76109103	CERAMIC CHIP 50V B 0.01UF K
C171		76203100	ELECTORLYTIC 16V 10UF M 7L 3A
C172		76203100	ELECTORLYTIC 16V 10UF M 7L 3A
C173		76203100	ELECTORLYTIC 16V 10UF M 7L 3A
C174		76105330	CERAMIC CHIP 50V CH 33PF J
C175		76105330	CERAMIC CHIP 50V CH 33PF J
C176		76105330	CERAMIC CHIP 50V CH 33PF J
C189		76206478	ELECTROLYTIC 50V 0.47UF M 7L 3A
C192		76206478	ELECTROLYTIC 50V 0.47UF M 7L 3A
C216		76206010	ELECTROLYTIC 50V 1.0UF M 7L 3A
C221		76105330	CERAMIC CHIP 50V CH 33PF J
C222		76105330	CERAMIC CHIP 50V CH 33PF J
C223		76105330	CERAMIC CHIP 50V CH 33PF J
C224		76203100	ELECTORLYTIC 16V 10UF M 7L 3A
C226		76590104	CERAMIC DISC 50V 0.1UF J
C227		76590104	CERAMIC DISC 50V 0.1UF J
C231	#2	76206010	ELECTROLYTIC 50V 1.0UF M 7L 3A
C232	#2	76206010	ELECTROLYTIC 50V 1.0UF M 7L 3A
C233	#2	76206010	ELECTROLYTIC 50V 1.0UF M 7L 3A
C234	#1	76109103	CERAMIC CHIP 50V B 0.01UF K
C235	#1	76109103	CERAMIC CHIP 50V B 0.01UF K
C236		76105120	CERAMIC CHIP 50V CH 12PF J
C237		76105120	CERAMIC CHIP 50V CH 12PF J
C304		76435330	CERAMIC DISC 500V SL 33PF J
C305		76617915	ELECTROLYTIC 50V 1UF K
C306		76794102	ELECTROLYTIC 16V 1000UF M
C307		76693473	PLASTIC FILM 100V 0.047UF J
C308		76765101	ELECTROLYTIC 35V 100UF M
C309		76797229	ELECTROLYTIC 50V 2.2UF M
C312		76796102	ELECTROLYTIC 35V 1000UF M
C313		76082280	PLASTIC FILM 100V 0.22UF J
C314		76212272	CERAMIC DISC 50V B 2700PF K
C315		76503049	PLASTIC FILM 63V 0.47UF J
C317		76214471	CERAMIC DISC 500V B 470PF K
C320		76765101	ELECTROLYTIC 35V 100UF M
C322	#2	76100104	CERAMIC CHIP 25V F 0.1UF Z
C410		76693472	PLASTIC FILM 100V 4700PF J
C417		76214102	CERAMIC DISC 500V B 1000PF K
C420		76794220	ELECTROLYTIC 16V 22UF M
C421		76794470	ELECTROLYTIC 16V 47UF M
C431		76797479	ELECTROLYTIC 50V 4.7UF M
C432		76203100	ELECTORLYTIC 16V 10UF M 7L 3A
C433		76100103	CERAMIC CHIP 50V F 0.01UF Z
C434		76100103	CERAMIC CHIP 50V F 0.01UF Z
C435		76794102	ELECTROLYTIC 16V 1000UF M
C436		76206478	ELECTROLYTIC 50V 0.47UF M 7L 3A
C437		76109822	CERAMIC CHIP 50V B 8200PF K
C440		76503211	PLASTIC FILM 1500VH 1200PF H
C442		76082994	PLASTIC FILM 250V 0.3UF J
C444		76503278	PLASTIC FILM 1500VH 8700PF H
C445		76693104	PLASTIC FILM 100V 0.1UF J
C446		76700100	ELECTROLYTIC 250V 10UF M
C448		76073118	ELECTROLYTIC 160V 33UF M
C449		76763471	ELECTROLYTIC 16V 470UF M
C463		76109152	CERAMIC CHIP 50V B 1500PF K
C467		76828563	PLASTIC FILM 200V 0.056UF J
C470		76797220	ELECTROLYTIC 50V 22UF M
C472		76503049	PLASTIC FILM 63V 0.47UF J
C473		76206010	ELECTROLYTIC 50V 1.0UF M 7L 3A
C479		76105271	CERAMIC CHIP 50V CH 270PF J
C484		76590104	CERAMIC DISC 50V 0.1UF J
C485		76590104	CERAMIC DISC 50V 0.1UF J
C498		76590103	PLASTIC FILM 50V 0.01UF J
C502		76590103	PLASTIC FILM 50V 0.01UF J
C517		76203100	ELECTORLYTIC 16V 10UF M 7L 3A

Location No.	Parts No.	Description
C523	76203100	ELECTORLYTIC 16V 10UF M 7L 3A
C524	76203470	ELECTROLYTIC 16V 47UF M 7L 3A
C526	76109102	CERAMIC CHIP 50V B 1000PF K
C528	76206478	ELECTROLYTIC 50V 0.47UF M 7L 3A
C565	76109103	CERAMIC CHIP 50V B 0.01UF K
C566	76763471	ELECTROLYTIC 16V 470UF M
C567	76109103	CERAMIC CHIP 50V B 0.01UF K
C606	76206010	ELECTROLYTIC 50V 1.0UF M 7L 3A
C607	76764101	ELECTROLYTIC 25V 100UF M
C608	76206010	ELECTROLYTIC 50V 1.0UF M 7L 3A
C609	76796479	ELECTROLYTIC 35V 4.7UF M
C610	76667102	ELECTROLYTIC 25V 1000UF M
C611	76100103	CERAMIC CHIP 50V F 0.01UF Z
C612	76795100	ELECTROLYTIC 25V 10UF M
C615	76795471	ELECTROLYTIC 25V 470UF M
C616	76667471	ELECTROLYTIC 25V 470UF M
C630	76667471	ELECTROLYTIC 25V 470UF M
C631	76797229	ELECTROLYTIC 50V 2.2UF M
C632	76109102	CERAMIC CHIP 50V B 1000PF K
C635	76797229	ELECTROLYTIC 50V 2.2UF M
C636	76109102	CERAMIC CHIP 50V B 1000PF K
C651	76206228	ELECTROLYTIC 50V 0.22UF M 7L 3A
C653	76100104	CERAMIC CHIP 25V F 0.1UF Z
C654	76206228	ELECTROLYTIC 50V 0.22UF M 7L 3A
C655	76100104	CERAMIC CHIP 25V F 0.1UF Z
C656	76100104	CERAMIC CHIP 25V F 0.1UF Z
C657	76794220	ELECTROLYTIC 16V 22UF M
C658	76109472	CERAMIC CHIP 50V B 4700PF K
C669	76109103	CERAMIC CHIP 50V B 0.01UF K
C673	76109103	CERAMIC CHIP 50V B 0.01UF K
C674	76109103	CERAMIC CHIP 50V B 0.01UF K
C675	76109822	CERAMIC CHIP 50V B 8200PF K
C678	76109822	CERAMIC CHIP 50V B 8200PF K
C679	76797479	ELECTROLYTIC 50V 4.7UF M
C680	76669101	ELECTROLYTIC 50V 100UF M
C681	76206478	ELECTROLYTIC 50V 0.47UF M 7L 3A
C682	76206478	ELECTROLYTIC 50V 0.47UF M 7L 3A
C683	76109472	CERAMIC CHIP 50V B 4700PF K
C684	76109222	CERAMIC CHIP 50V B 2200PF K
C686	76100104	CERAMIC CHIP 25V F 0.1UF Z
C688	76109103	CERAMIC CHIP 50V B 0.01UF K
C689	76100104	CERAMIC CHIP 25V F 0.1UF Z
C691	76100104	CERAMIC CHIP 25V F 0.1UF Z
C692	76100104	CERAMIC CHIP 25V F 0.1UF Z
C693	76100104	CERAMIC CHIP 25V F 0.1UF Z
C694	76100104	CERAMIC CHIP 25V F 0.1UF Z
C695	76100104	CERAMIC CHIP 25V F 0.1UF Z
C696	76100104	CERAMIC CHIP 25V F 0.1UF Z
C697	76100104	CERAMIC CHIP 25V F 0.1UF Z
⚠ C801	76503507	PLASTIC FILM AC275V 0.22UF K
⚠ C802	76503507	PLASTIC FILM AC275V 0.22UF K
C805	76092281	CERAMIC DISC AC250V E 4700PF
C806	76092281	CERAMIC DISC AC250V E 4700PF
C808	76765101	ELECTROLYTIC 35V 100UF M
C810	76086857	ELECTROLYTIC 400V 560UF
⚠ C813	76166008	CERA CAP E 250 102K AH08E102MD0
⚠ C814	76166008	CERA CAP E 250 102K AH08E102MD0
C817	76092338	CERAMIC DISC 2KV R 270PF K
C818	76092341	CERAMIC DISC 2KV R 470PF K
C821	76214561	CERAMIC DISC 500V B 560PF K
C822	76214102	CERAMIC DISC 500V B 1000PF K
C823	76214471	CERAMIC DISC 500V B 470PF K
C829	76212471	CERAMIC DISC 50V B 470PF K
C830	76797100	ELECTROLYTIC 50V 10UF M
C831	76203100	ELECTORLYTIC 16V 10UF M 7L 3A
C832	76503045	PLASTIC FILM 63V 0.22UF J
C862	76092339	CERAMIC DISC 2KV 330PF K
C883	76214561	CERAMIC DISC 500V B 560PF K
C884	76640018	ELECTROLYTIC 160V 220UF
C885	76214471	CERAMIC DISC 500V B 470PF K
C889	76795102	ELECTROLYTIC 25V 1000UF M
C893	76092338	CERAMIC DISC 2KV R 270PF K
⚠ C897	76166006	CERA CAP B 250V471K YP0AH471K090D04A0B
C898	76214101	CERAMIC DISC 500V B 100PF K
C899	76503049	PLASTIC FILM 63V 0.47UF J
C902	76092347	CERAMIC DISC 2KV R 1500PF K
C904	76436561	CERAMIC DISC 50V SL 560PF J
C905	76436681	CERAMIC DISC 50V SL 680PF J
C907	76436821	CERAMIC DISC 50V SL 820PF J

Location No.	Parts No.	Description
C909	76700220	ELECTROLYTIC 250V 22UF M
C910	76766100	ELECTROLYTIC 50V 10UF M
C912	76763221	ELECTROLYTIC 16V 220UF M
C913	76203220	ELECTROLYTIC 16V 22UF M
C915	76203220	ELECTROLYTIC 16V 22UF M
C930	76214101	CERAMIC DISC 500V B 100PF K
C931	76214101	CERAMIC DISC 500V B 100PF K
CA01	76232103	CERAMIC DISC 50V F 0.01UF Z
CA02	76105101	CERAMIC CHIP 50V CH 100PF J
CA03	76105220	CERAMIC CHIP 50V CH 22PF J
CA04	76105220	CERAMIC CHIP 50V CH 22PF J
CA30	76105270	CERAMIC CHIP 50V CH 27PF J
CA42	76203100	ELECTORLYTIC 16V 10UF M 7L 3A
CA45	76109103	CERAMIC CHIP 50V B 0.01UF K
CA51	76109272	CERAMIC CHIP 50V B 2700PF K
CA52	76109152	CERAMIC CHIP 50V B 1500PF K
CA53	76105181	CERAMIC CHIP 50V CH 180PF J
CA54	76797330	ELECTROLYTIC 50V 33UF M
CA55	76206010	ELECTROLYTIC 50V 1.0UF M 7L 3A
CA68	76203470	ELECTROLYTIC 16V 47UF M 7L 3A
CB01	76794470	ELECTROLYTIC 16V 47UF M
CC01	76109103	CERAMIC CHIP 50V B 0.01UF K
CC02	76109103	CERAMIC CHIP 50V B 0.01UF K
CC08	76105330	CERAMIC CHIP 50V CH 33PF J
CS02	76203100	ELECTORLYTIC 16V 10UF M 7L 3A
CS04	76109102	CERAMIC CHIP 50V B 1000PF K
CS05	76109102	CERAMIC CHIP 50V B 1000PF K
CS07	76109102	CERAMIC CHIP 50V B 1000PF K
CS10 #2	76109102	CERAMIC CHIP 50V B 1000PF K
CS11 #2	76203100	ELECTORLYTIC 16V 10UF M 7L 3A
CS13 #2	76109102	CERAMIC CHIP 50V B 1000PF K
CS14 #2	76109102	CERAMIC CHIP 50V B 1000PF K
CS15	76109102	CERAMIC CHIP 50V B 1000PF K
CS16 #2	76109102	CERAMIC CHIP 50V B 1000PF K
CS23	76203100	ELECTORLYTIC 16V 10UF M 7L 3A
CS25	76203100	ELECTORLYTIC 16V 10UF M 7L 3A
CV10	76762471	ELECTROLYTIC 10V 470UF M
CV28	76203100	ELECTORLYTIC 16V 10UF M 7L 3A
Z101	23303188	CERAMIC VIDEO TRAP TCF1113
Z102	23303191	CERAMIC TRAP TCF1116
ZC01	23303166	CERAMIC TRAP 39.5MHZ TCF1107
ZC02	23303224	CERAMIC TRAP TCF1120AM
RESISTORS		
G101	76000445	CHIP JUMPER 1608TYPE
G218	76366752	CARBON FILM 1/6W 7.5K OHM J
GJ03	76000445	CHIP JUMPER 1608TYPE
GJ06	76000445	CHIP JUMPER 1608TYPE
GJ10	76000445	CHIP JUMPER 1608TYPE
GJ11	76000445	CHIP JUMPER 1608TYPE
GJ12	76000445	CHIP JUMPER 1608TYPE
GJ20 #1	76000445	CHIP JUMPER 1608TYPE
GJ21	76000445	CHIP JUMPER 1608TYPE
GJ25	76000445	CHIP JUMPER 1608TYPE
GJ27	76000445	CHIP JUMPER 1608TYPE
GJ29 #1	76000445	CHIP JUMPER 1608TYPE
GJ30	76000445	CHIP JUMPER 1608TYPE
GL431	76000445	CHIP JUMPER 1608TYPE
GL525	76000445	CHIP JUMPER 1608TYPE
GR01	76011102	CHIP 1/20W 1K OHM J
GR02	76011102	CHIP 1/20W 1K OHM J
GR03	76011102	CHIP 1/20W 1K OHM J
GR04 #2	76011102	CHIP 1/20W 1K OHM J
GR05 #2	76011102	CHIP 1/20W 1K OHM J
GR06 #2	76011102	CHIP 1/20W 1K OHM J
GR160	76011470	CHIP 1/20W 47 OHM J
GR303	76321109	OXIDE METAL FILM 1/2W 1 OHM J
GR400	76000445	CHIP JUMPER 1608TYPE
JR001	76000445	CHIP JUMPER 1608TYPE
JR002	76000445	CHIP JUMPER 1608TYPE
JR003	76000445	CHIP JUMPER 1608TYPE
JR004	76000445	CHIP JUMPER 1608TYPE
JR005	76000445	CHIP JUMPER 1608TYPE
JR007	76000445	CHIP JUMPER 1608TYPE
JR008	76000445	CHIP JUMPER 1608TYPE
JR155	76000445	CHIP JUMPER 1608TYPE
R101	76011563	CHIP 1/20W 56K OHM J
R102	76011123	CHIP 1/20W 12K OHM J
R105	76011331	CHIP 1/20W 330 OHM J

Location No.		Parts No.	Description
R106		76011332	CHIP 1/20W 3.3K OHM J
R107		76011330	CHIP 1/20W 33 OHM J
R108		76011272	CHIP 1/20W 2.7K OHM J
R109		76011682	CHIP 1/20W 6.8K OHM J
R110		76011102	CHIP 1/20W 1K OHM J
R111		76011360	CHIP 1/20W 36 OHM J
R112		76000445	CHIP JUMPER 1608TYPE
R113		76011222	CHIP 1/20W 2.2K OHM J
R114		76011472	CHIP 1/20W 4.7K OHM J
R116		76011682	CHIP 1/20W 6.8K OHM J
R117		76011222	CHIP 1/20W 2.2K OHM J
R121		76011221	CHIP 1/20W 220 OHM J
R122		76011101	CHIP 1/20W 100 OHM J
R123		76011103	CHIP 1/20W 10K OHM J
R124		76011102	CHIP 1/20W 1K OHM J
R130		76011101	CHIP 1/20W 100 OHM J
R131		76011221	CHIP 1/20W 220 OHM J
R132		76011271	CHIP 1/20W 270 OHM J
R133		76011271	CHIP 1/20W 270 OHM J
R134		76011561	CHIP 1/20W 560 OHM J
R136		76011513	CHIP 1/20W 51K OHM J
R139		76011332	CHIP 1/20W 3.3K OHM J
R141		76011331	CHIP 1/20W 330 OHM J
R142		76011102	CHIP 1/20W 1K OHM J
R143		76011333	CHIP 1/20W 33K OHM J
R144		76011103	CHIP 1/20W 10K OHM J
R145		76011303	CHIP 1/20W 30K OHM J
R146		76011224	CHIP 1/20W 220K OHM J
R147		76011152	CHIP 1/20W 1.5K OHM J
R148		76011222	CHIP 1/20W 2.2K OHM J
R149		76011684	CHIP 1/20W 680K OHM J
R150		76000445	CHIP JUMPER 1608TYPE
R156		76553153	OXIDE METAL FILM 1W 15K OHM J
R158		76011122	CHIP 1/20W 1.2K OHM J
R166		76011103	CHIP 1/20W 10K OHM J
R167		76011103	CHIP 1/20W 10K OHM J
R168		76011473	CHIP 1/20W 47K OHM J
R169		76011102	CHIP 1/20W 1K OHM J
R171		76011473	CHIP 1/20W 47K OHM J
R172		76011162	CHIP 1/20W 1.6K OHM J
R173		76011102	CHIP 1/20W 1K OHM J
R174		76011473	CHIP 1/20W 47K OHM J
R175		76011223	CHIP 1/20W 22K OHM J
R176		76011473	CHIP 1/20W 47K OHM J
R177		76011223	CHIP 1/20W 22K OHM J
R178		76011103	CHIP 1/20W 10K OHM J
R179		76011222	CHIP 1/20W 2.2K OHM J
R180		76011473	CHIP 1/20W 47K OHM J
R181		76011223	CHIP 1/20W 22K OHM J
R182		76011162	CHIP 1/20W 1.6K OHM J
R190		76011101	CHIP 1/20W 100 OHM J
R191		76011330	CHIP 1/20W 33 OHM J
R192		76011330	CHIP 1/20W 33 OHM J
R217		76011104	CHIP 1/20W 100K OHM J
R227		76366123	CARBON FILM 1/6W 12K OHM J
R228		76011470	CHIP 1/20W 47 OHM J
R229		76011470	CHIP 1/20W 47 OHM J
R230		76011470	CHIP 1/20W 47 OHM J
R301		76366163	CARBON FILM 1/6W 16K OHM J
R305		76323758	OXIDE METAL FILM 2W 0.75 OHM J
R306		76366823	CARBON FILM 1/6W 82K OHM J
R307		76366103	CARBON FILM 1/6W 10K OHM J
R312		76552152	OXIDE METAL FILM 1/2W 1.5K OHM J
R313		76366513	CARBON FILM 1/6W 51K OHM J
R316		76366392	CARBON FILM 1/6W 3.9K OHM J
R317		76366392	CARBON FILM 1/6W 3.9K OHM J
R333		76546689	FUSIBLE FMR 1/2W6R8JL
R336		76383121	OXIDE METAL FILM 1/2W 120 OHM J
R400		76011101	CHIP 1/20W 100 OHM J
R402	#2	76011103	CHIP 1/20W 10K OHM J
R403	#2	76011102	CHIP 1/20W 1K OHM J
R404	#2	76011470	CHIP 1/20W 47 OHM J
R405	#2	76011101	CHIP 1/20W 100 OHM J
R406	#2	76011101	CHIP 1/20W 100 OHM J
R410		76011181	CHIP 1/20W 180 OHM J
R411		76011561	CHIP 1/20W 560 OHM J
R412		76366560	CARBON FILM 1/6W 56 OHM J
R416		76019323	OXIDE METAL FILM 5W 1.8K OHM J
R421		76011391	CHIP 1/20W 390 OHM J

Location No.		Parts No.	Description
R430		76366103	CARBON FILM 1/6W 10K OHM J
R431		76531120	FUSIBLE 1/2W 12 OHM J
R432		76011472	CHIP 1/20W 4.7K OHM J
R433		76011182	CHIP 1/20W 1.8K OHM J
R434		76552271	OXIDE METAL FILM 1/2W 270 OHM J
R435		76011822	CHIP 1/20W 8.2K OHM J
R436		76011270	CHIP 1/20W 27 OHM J
R441		76532102	FUSIBLE 1W 1K OHM J
R447		76553472	OXIDE METAL FILM 1W 4.7K OHM J
R448		76321228	OXIDE METAL FILM 1/2W 0.22 OHM J
R462		76011223	CHIP 1/20W 22K OHM J
R469		76366183	CARBON FILM 1/6W 18K OHM J
R470		76338758	OXIDE METAL FILM 1W 0.75 OHM J
R471		76011102	CHIP 1/20W 1K OHM J
R472		76552301	OXIDE METAL FILM 1/2W 300 OHM J
R473		76366183	CARBON FILM 1/6W 18K OHM J
R475		76011102	CHIP 1/20W 1K OHM J
R476		76011471	CHIP 1/20W 470 OHM J
R477		76011471	CHIP 1/20W 470 OHM J
R478		76011102	CHIP 1/20W 1K OHM J
R479		76011101	CHIP 1/20W 100 OHM J
R480		76011471	CHIP 1/20W 470 OHM J
R481		76011154	CHIP 1/20W 150K OHM J
R482		76011223	CHIP 1/20W 22K OHM J
R483		76011104	CHIP 1/20W 100K OHM J
R484		76011563	CHIP 1/20W 56K OHM J
R485		76382121	OXIDE METAL FILM 1W 120 OHM J
R490		76011102	CHIP 1/20W 1K OHM J
R491		76011103	CHIP 1/20W 10K OHM J
R498		76011154	CHIP 1/20W 150K OHM J
R603		76011103	CHIP 1/20W 10K OHM J
R611		76011223	CHIP 1/20W 22K OHM J
R612		76011103	CHIP 1/20W 10K OHM J
R621		76011222	CHIP 1/20W 2.2K OHM J
R622		76011101	CHIP 1/20W 100 OHM J
R623	#2	76011222	CHIP 1/20W 2.2K OHM J
R624	#2	76011101	CHIP 1/20W 100 OHM J
R630		76011152	CHIP 1/20W 1.5K OHM J
R631		76011203	CHIP 1/20W 20K OHM J
R633		76011152	CHIP 1/20W 1.5K OHM J
R634		76011203	CHIP 1/20W 20K OHM J
R636		76011512	CHIP 1/20W 5.1K OHM J
R662		76552221	OXIDE METAL FILM 1/2W 220 OHM J
R663		76552221	OXIDE METAL FILM 1/2W 220 OHM J
R667		76011101	CHIP 1/20W 100 OHM J
R668		76011101	CHIP 1/20W 100 OHM J
R669		76011562	CHIP 1/20W 5.6K OHM J
R670		76011562	CHIP 1/20W 5.6K OHM J
R678		76011394	CHIP 1/20W 390K OHM J
R679		76011394	CHIP 1/20W 390K OHM J
R680		76011225	CHIP 1/20W 2.2M OHM K
⚠ R801		76017010	METAL GLAZE 1/2W PRC92M02M20J
R802		76383104	OXIDE METAL FILM 2W 100K OHM J
R803		76011101	CHIP 1/20W 100 OHM J
R805		76366681	CARBON FILM 1/6W 680 OHM J
R807		76376684	CARBON FILM 1/2W 680K OHM J
⚠ R808		76079013	THERMISTOR PTC AC290V 18 DGC3D180M27
R809		76366393	CARBON FILM 1/6W 39K OHM J
R810		76007737	CERAMIC COVERED 15W 2.2 OHM J
R811		76568271	CERAMIC COVERED 7W 270 OHM J
R815		76366562	CARBON FILM 1/6W 5.6K OHM J
R819		76011101	CHIP 1/20W 100 OHM J
R820		76019463	METAL PLATE 2W 0.22 OHM J
R821		76182011	METAL ERX1SJS4R7P
R822		76366562	CARBON FILM 1/6W 5.6K OHM J
R823		76376152	CARBON FILM 1/2W 1.5K OHM J
R825		76011331	CHIP 1/20W 330 OHM J
R829		76988027	METAL FILM 1W 0.47 OHM J
R831		76531120	FUSIBLE 1/2W 12 OHM J
R863		76366132	CARBON FILM 1/6W 1.3K OHM J
R881		76366272	CARBON FILM 1/6W 2.7K OHM J
R888		76546228	FUSIBLE 1/2W 0.22 OHM J
⚠ R899		76017012	METAL GLAZE 1/2W PRC92M08M20J
R901		76376102	CARBON FILM 1/2W 1K OHM J
R902		76376102	CARBON FILM 1/2W 1K OHM J
R903		76376102	CARBON FILM 1/2W 1K OHM J
R904		76366472	CARBON FILM 1/6W 4.7K OHM J
R905		76366150	CARBON FILM 1/6W 15 OHM J
R912		76366102	CARBON FILM 1/6W 1K OHM J

Location No.		Parts No.	Description
R914		76366561	CARBON FILM 1/6W 560 OHM J
R915		76366121	CARBON FILM 1/6W 120 OHM J
R916		76366181	CARBON FILM 1/6W 180 OHM J
R917		76366821	CARBON FILM 1/6W 820 OHM J
R918		76366270	CARBON FILM 1/6W 27 OHM J
R919		76366102	CARBON FILM 1/6W 1K OHM J
R920		76000880	FUSIBLE 1W 5.1 OHM J
R921		76366561	CARBON FILM 1/6W 560 OHM J
R922		76366121	CARBON FILM 1/6W 120 OHM J
R924		76366270	CARBON FILM 1/6W 27 OHM J
R925		76366821	CARBON FILM 1/6W 820 OHM J
R926		76366102	CARBON FILM 1/6W 1K OHM J
R928		76366561	CARBON FILM 1/6W 560 OHM J
R929		76366121	CARBON FILM 1/6W 120 OHM J
R930		76366270	CARBON FILM 1/6W 27 OHM J
R932		76366102	CARBON FILM 1/6W 1K OHM J
R934		76366561	CARBON FILM 1/6W 560 OHM J
R935		76366392	CARBON FILM 1/6W 3.9K OHM J
R936		76552820	OXIDE METAL FILM 1/2W 82 OHM J
R937		76366821	CARBON FILM 1/6W 820 OHM J
R942		76366562	CARBON FILM 1/6W 5.6K OHM J
R943		76366562	CARBON FILM 1/6W 5.6K OHM J
R944		76366562	CARBON FILM 1/6W 5.6K OHM J
R945		76366181	CARBON FILM 1/6W 180 OHM J
R946		76366181	CARBON FILM 1/6W 180 OHM J
R960		76383153	OXIDE METAL FILM 2W 15K OHM J
R961		76383153	OXIDE METAL FILM 2W 15K OHM J
R962		76383153	OXIDE METAL FILM 2W 15K OHM J
R977		76366122	CARBON FILM 1/6W 1.2K OHM J
R992		76366150	CARBON FILM 1/6W 15 OHM J
RA01		76011331	CHIP 1/20W 330 OHM J
RA02		76011103	CHIP 1/20W 10K OHM J
RA03		76000445	CHIP JUMPER 1608TYPE
RA04		76011472	CHIP 1/20W 4.7K OHM J
RA05		76011102	CHIP 1/20W 1K OHM J
RA35		76011102	CHIP 1/20W 1K OHM J
RA36		76011103	CHIP 1/20W 10K OHM J
RA37		76011223	CHIP 1/20W 22K OHM J
RA41		76011101	CHIP 1/20W 100 OHM J
RA42		76011222	CHIP 1/20W 2.2K OHM J
RA43		76011332	CHIP 1/20W 3.3K OHM J
RA51		76011392	CHIP 1/20W 3.9K OHM J
RA52		76011392	CHIP 1/20W 3.9K OHM J
RA53		76011123	CHIP 1/20W 12K OHM J
RA54		76011471	CHIP 1/20W 470 OHM J
RA55		76011683	CHIP 1/20W 68K OHM J
RA56		76011564	CHIP 1/20W 560K OHM J
RA57		76011681	CHIP 1/20W 680 OHM J
RA61		76011103	CHIP 1/20W 10K OHM J
RA62		76011103	CHIP 1/20W 10K OHM J
RA63		76011103	CHIP 1/20W 10K OHM J
RA71		76367163	CARBON FILM 1/6W 16K OHM G
RA72		76367113	CARBON FILM 1/2W 11K OHM J
RA73		76367562	CARBON FILM 1/6W 5.6K OHM G
RA74		76011103	CHIP 1/20W 10K OHM J
RA75		76011103	CHIP 1/20W 10K OHM J
RA76		76011472	CHIP 1/20W 4.7K OHM J
RA77		76011472	CHIP 1/20W 4.7K OHM J
RA78		76367114	CARBON FILM 1/6W 110K OHM G
RA79		76367303	CARBON FILM 1/6W 30K OHM G
RA89		76000445	CHIP JUMPER 1608TYPE
RB01		76011271	CHIP 1/20W 270 OHM J
RB09		76011470	CHIP 1/20W 47 OHM J
RB30		76011103	CHIP 1/20W 10K OHM J
RC02		76011101	CHIP 1/20W 100 OHM J
RS02		76011102	CHIP 1/20W 1K OHM J
RS03		76011103	CHIP 1/20W 10K OHM J
RS04		76011473	CHIP 1/20W 47K OHM J
RS05		76011473	CHIP 1/20W 47K OHM J
RS06		76000445	CHIP JUMPER 1608TYPE
RS07		76000445	CHIP JUMPER 1608TYPE
RS08	#2	76011473	CHIP 1/20W 47K OHM J
RS09	#2	76011473	CHIP 1/20W 47K OHM J
RS11	#2	76011102	CHIP 1/20W 1K OHM J
RS12	#2	76011103	CHIP 1/20W 10K OHM J
RS13		76000445	CHIP JUMPER 1608TYPE
RS14		76000445	CHIP JUMPER 1608TYPE
RV02		76011750	CHIP 1/20W 75 OHM J
RV04		76011750	CHIP 1/20W 75 OHM J

Location No.		Parts No.	Description
RV05	#2	76011750	CHIP 1/20W 75 OHM J
RV06	#2	76011750	CHIP 1/20W 75 OHM J
RV11		76011750	CHIP 1/20W 75 OHM J
RV12		76366181	CARBON FILM 1/6W 180 OHM J
RV13		76011101	CHIP 1/20W 100 OHM J
COILS & TRANSFORMERS			
G102		23103311	FERRITR CHOKE TEM2014AO 3.5X5X2
G103		23103308	FERRITE CORE TEM2011AO 3.5X4.5
G104		23248423	COIL CHOKE TLN3481AC
G105		23248423	COIL CHOKE TLN3481AC
G106		23103308	FERRITE CORE TEM2011AO 3.5X4.5
G107		23103308	FERRITE CORE TEM2011AO 3.5X4.5
G108		23103308	FERRITE CORE TEM2011AO 3.5X4.5
G109		23103308	FERRITE CORE TEM2011AO 3.5X4.5
G110		23103308	FERRITE CORE TEM2011AO 3.5X4.5
G402		23103308	FERRITE CORE TEM2011AO 3.5X4.5
G889		23289043	COIL PEAKING TRF4100AU
GL511		23289043	COIL PEAKING TRF4100AU
GL512		23103311	FERRITR CHOKE TEM2014AO 3.5X5X2
L101		23289053	COIL PEAKING TRF4820AU
L102		23289196	COIL PEAKING 1.0MMHK COLTRF41R0AV
L103		23289197	COIL PEAKING 1.2MMHK CNSS (NP)-1R2J
L104		23289040	COIL PEAKING TRF4229AU
L105		23289040	COIL PEAKING TRF4229AU
L106		23289209	COIL PEAKING 12MMHK COLTRF4120AV
L107		23289209	COIL PEAKING 12MMHK COLTRF4120AV
L108		23289032	COIL PEAKING TRF4270AV
L115		23289041	COIL PEAKING TRF4339AU
L162		23289052	COIL PEAKING TRF4680AU
L301		23103308	FERRITE CORE TEM2011AO 3.5X4.5
L441		23233113	COIL HORIZ LINEARITY TLN2210AA
L443		23248445	COIL CHOKE TLN3441AH
L462		23231497	DEFLECTION YOKE 21LPD AK DY TDY-821EG
L462A		23993696	BOARD CORRECTION
L462B		23949616	CONVER COMPENSATOR TC-R (YV)
L462C		23993081	METAL SHEET CONV. CORRECTION TCRMXH01H
L462D		23948535	SHEET MAGNETIC FERRITE
L462E		23948536	SHEET MAGNETIC FERRITE
L514		23289044	COIL PEAKING TRF4120AU
L661		23221141	COIL CHOKE TRF9240AC
L662		23221141	COIL CHOKE TRF9240AC
L810		23103311	FERRITR CHOKE TEM2014AO 3.5X5X2
L811		23103311	FERRITR CHOKE TEM2014AO 3.5X5X2
L883		23103308	FERRITE CORE TEM2011AO 3.5X4.5
L884		23248422	COIL CHOKE TLN3142AC
L886		23103308	FERRITE CORE TEM2011AO 3.5X4.5
L887		23248449	COIL CHOKE TLN3312AC
L888		23289022	COIL PEAKING TRF4100AT
L889	#2	23103310	FERRITE CORE TEM2028AC 7.5X6.4X8 0.5A
L890	#2	23103310	FERRITE CORE TEM2028AC 7.5X6.4X8 0.5A
L900		23103308	FERRITE CORE TEM2011AO 3.5X4.5
⚠ L901		23200035	COIL DEGAUSSING TSB2301AH
L902		23289056	COIL PEAKING TRF4221AU
L903		23289056	COIL PEAKING TRF4221AU
L904		23289056	COIL PEAKING TRF4221AU
L905		23289050	COIL PEAKING TRF4390AU
L906		23289050	COIL PEAKING TRF4390AU
L907		23289050	COIL PEAKING TRF4390AU
LA01		23289041	COIL PEAKING TRF4339AU
LA03		23103311	FERRITR CHOKE TEM2014AO 3.5X5X2
LA04		23103311	FERRITR CHOKE TEM2014AO 3.5X5X2
LA05		23289022	COIL PEAKING TRF4100AT
LC01		23289187	COIL PEAKING .22MMHK COLTRF4R22AV
LC04		23289022	COIL PEAKING TRF4100AT
LZ02		23221141	COIL CHOKE TRF9240AC
T401		23224391	TRANSFORMER DRIVE TLN1104AH
⚠ T461		23236843	TRANSFORMER FLY-BACK TFB4213AG
⚠ T801		23211845	COIL LINE FILTER TRF3164AW
⚠ T802		23211838	COIL LINE FILTER TRF3202AR
⚠ T862		23217759	TRANSFORMER CONVERTER TPW3543AM
Z103		23303385	FILTER FIL CTRAP 4.5MHZ EFCS4R5MW5CT
Z130		23303230	FILTER 38MHZ MULTI F816KPL F816KPL
SEMICONDUCTORS			
D101		23362105	DIODE ZENER DZ33 BS D
D150		23362140	DIODE KDS160-RTK
D224		23362140	DIODE KDS160-RTK
D230	#2	23357741	DIODE ZENER MA8051-L

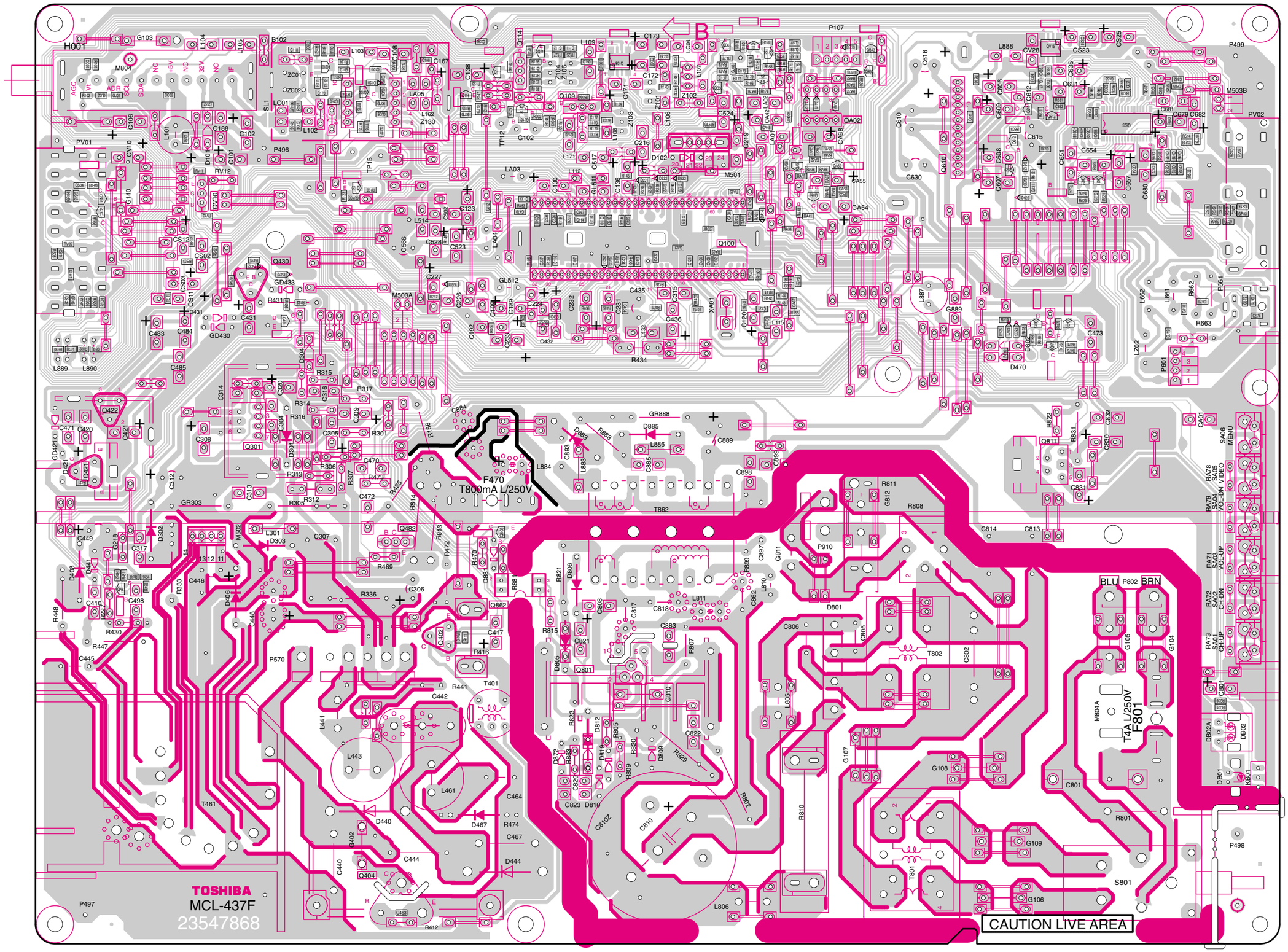
Location No.		Parts No.	Description
D231	#2	23357741	DIODE ZENER MA8051-L
D301		23357372	DIODE EU2JGF-41U2
D302		23357372	DIODE EU2JGF-41U2
D303		23357917	DIODE SC570A
D406		23357372	DIODE EU2JGF-41U2
D408		23357372	DIODE EU2JGF-41U2
D421		23362083	DIODE ZENER DZ10 BS B
D431		23362085	DIODE ZENER DZ11 BS A
D432		23362140	DIODE KDS160-RTK
D440		23357705	DIODE ERC06-15
D441		23362081	DIODE ZENER DZ9.1 BS C
D444		23357364	DIODE RU4JGF- M2
D470		23362070	DIODE ZENER DZ5.6 BS B
D471		23362140	DIODE KDS160-RTK
D472		23362140	DIODE KDS160-RTK
D612		23362140	DIODE KDS160-RTK
D622		23362140	DIODE KDS160-RTK
D801		23362056	DIODE TS4B05G-A1
D802		23362092	DIODE ZENER DZ13 BS C
D803		23362140	DIODE KDS160-RTK
D805		23357104	DIODE 1SS244
D806		23357372	DIODE EU2JGF-41U2
D809		23362070	DIODE ZENER DZ5.6 BS B
D810		23362099	DIODE ZENER DZ27 BS B
D812		23362111	DIODE 1SS133
D819		23362074	DIODE ZENER DZ6.8 BS B
D872		23362089	DIODE ZENER DZ12 BS B
D881		23362074	DIODE ZENER DZ6.8 BS B
D883		23357493	DIODE VRM=600V IF(AV)=2A RL3JG-M14
D885		23357492	DIODE VRM=200IO=2A UG2D-41A-U4
D901		23357450	DIODE ISS133
D903		23357450	DIODE ISS133
D904		23357450	DIODE ISS133
D905		23357450	DIODE ISS133
D906		23357450	DIODE ISS133
D907		23357450	DIODE ISS133
D908		23357450	DIODE ISS133
D909		23357450	DIODE ISS133
D910		23357450	DIODE ISS133
D911		23357449	DIODE DIODE IO=1.0A ERB10JGR-41A-1AU
DB01		23358571	DIODE LED BT-H254N-31-SH
DB30		23362140	DIODE KDS160-RTK
KB01		23085842	IC REMOCON RECEIVER ROM-N338TB
Q100		23085864	IC A8801CPCNG***2
Q101		23205509	TRANSISTOR 2SC4988FRTL-E
Q103		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
Q104		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
Q108		23085604	IC MM1113XF
Q109		23205372	TRANSISTOR 2SA1980-Y (BULK)
Q112		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
Q115		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
Q116		23205276	TRANSISTOR 2SA1586Y (TE85LF)
Q120		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
Q130		23205424	TRANSISTOR KTC2875B/P
Q301		23085848	IC VERT. DEF. OUT TO-220-7H LA78040N ~1.8AP-P
Q402		23205341	TRANSISTOR 2SC2482 (FA-1F)
Q404		23205502	TRANSISTOR 2SD2539 (FAF)
Q421		23205292	TRANSISTOR 2SD2396
Q422		23009843	IC S7805PI
Q430		23205504	TRANSISTOR 2SD2549 P
Q431		23205209	TRANSISTOR NPN R1=2.2K R2=47K SRC1205S (SOT-23)
Q470		23205276	TRANSISTOR 2SA1586Y (TE85LF)
Q471		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
Q482		23205433	TRANSISTOR KTA1024-Y/P
Q610		23085709	IC LA42052
Q611		23205424	TRANSISTOR KTC2875B/P
Q612		23205276	TRANSISTOR 2SA1586Y (TE85LF)
Q613		23205424	TRANSISTOR KTC2875B/P
Q620		23205222	TRANSISTOR PNP R1=R2=47KOHM SRA2204S (SOT-23)
Q621		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
Q622	#2	23205277	TRANSISTOR 2SC4116-Y (TE85LF)
Q623		23085786	IC BD3886FS (ROHM)
Q801		23085437	IC STRG8656
Q805		23205209	TRANSISTOR NPN R1=2.2K R2=47K SRC1205S (SOT-23)
Q811		23085506	IC L78MR05-FA-E
Q819		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
⚠ Q862		23085841	PHOTO COUPLER VCEO=80V IF=50M K1010HB CTR
Q901		23205475	TRANSISTOR 2SC4544 (F)
Q902		23205376	TRANSISTOR 2SC5343-Y (BULK)

Location No.		Parts No.	Description
Q903		23205475	TRANSISTOR 2SC4544(F)
Q904		23205376	TRANSISTOR 2SC5343-Y (BULK)
Q905		23205475	TRANSISTOR 2SC4544 (F)
Q906		23205376	TRANSISTOR 2SC5343-Y (BULK)
Q907		23205372	TRANSISTOR 2SA1980-Y (BULK)
Q908		23205202	TRANSISTOR 2SC5344Y
QA02		23085584	IC CAT24WC08P
QA51		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
QA52		23205276	TRANSISTOR 2SA1586Y (TE85LF)
QA53		23205276	TRANSISTOR 2SA1586Y (TE85LF)
QA61		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
QB30		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
QB43		23205209	TRANSISTOR NPN R1=2.2K R2=47K SRC1205S (SOT-23)
QB60		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
QB61		23205277	TRANSISTOR 2SC4116-Y (TE85LF)
QS01		23205424	TRANSISTOR KTC2875B/P
QS02	#2	23205424	TRANSISTOR KTC2875B/P
QV10		23205372	TRANSISTOR 2SA1980-Y (BULK)
QV15		23085366	IC MM1111XF
MISCELLANEOUS			
⚠ F470		23144296	FUSE CARTRIDGE 250V 0.8A 5.2X20
F470A		23165469	FUSE HOLDER 5.2 DFH-001
⚠ F801		23144302	FUSE CARTRIDGE 250V 4A 5.2X20
F801A		23165469	FUSE HOLDER 5.2 DFH-001
J601A		23171404	WIRE PVC SOLDER-PLATED 300V 7 16 GRN UL CSA
J602B		23171404	WIRE PVC SOLDER-PLATED 300V 7 16 GRN UL CSA
J603C		23171404	WIRE PVC SOLDER-PLATED 300V 7 16 GRN UL CSA
J606F		23171404	WIRE PVC SOLDER-PLATED 300V 7 16 GRN UL CSA
J607G		23171404	WIRE PVC SOLDER-PLATED 300V 7 16 GRN UL CSA
J608H		23171404	WIRE PVC SOLDER-PLATED 300V 7 16 GRN UL CSA
J609I		23171404	WIRE PVC SOLDER-PLATED 300V 7 16 GRN UL CSA
J659A		23960136	ADHESIVE SILICONE TSE3843-W
J659C		23960136	ADHESIVE SILICONE TSE3843-W
J659H		23960136	ADHESIVE SILICONE TSE3843-W
J659I		23960136	ADHESIVE SILICONE TSE3843-W
N724		23965900	TAPE GLASS-CLOTH W/ADHESIVE W=18 T=0.18
N728		23960101	SILICONE RUBBER TSE-382 RTV
P107		23713756	PLUG 5P 2.5MM G B5B-EH-F1-TV4
P501B		23713756	PLUG 5P 2.5MM G B5B-EH-F1-TV4
P502B		23713755	PLUG 4P 2.5MM G B4B-EH-F1-TV4
P601		23713755	PLUG 4P 2.5MM G B4B-EH-F1-TV4
P661		23023116	PLUG HEAD PHONE JACK 3.5MM PJ3-14-7
⚠ P801		23372318	POWER CORD CEE FL250V2.5A V5206-2M
P900		23164725	PLUG 2P
P910		23164725	PLUG 2P
PV01	#1	23023416	JACK JACK 4P (N0 SW) 269V32-36 NI FE LF
	#2	23023415	PLUG JACK 8P (3SW) MSP-269V31-12 NI F
PV02	#1	23023397	JACK PIN 2P 39BB0-430 NIFE LF
	#2	23023258	JACK 3P MTJ-032-39BBA-432
Q301B		23717241	SCREW BITTB3X8ECO
Q404B		23738136	SCREW 3X10MM
Q421B		23717241	SCREW BITTB3X8ECO
Q422B		23717241	SCREW BITTB3X8ECO
Q610B		23717241	SCREW BITTB3X8ECO
Q801B		23717241	SCREW BITTB3X8ECO
Q811B		23717241	SCREW BITTB3X8ECO
⚠ S801		23344520	SWITCH POWER AAPY2211
SA01		23344516	SWITCH TACTING TSV TYP TSVB-1
SA02		23344516	SWITCH TACTING TSV TYP TSVB-1
SA03		23344516	SWITCH TACTING TSV TYP TSVB-1
SA04		23344516	SWITCH TACTING TSV TYP TSVB-1
SA05		23344516	SWITCH TACTING TSV TYP TSVB-1
SA06		23344516	SWITCH TACTING TSV TYP TSVB-1
⚠ V901A		23903174	SOCKET CRT ISH46S-EN ING
V901B		23102959	MAGNET RUBBER
V901M		23102424	MAGNET CONVERGENCE MAG1082
W661		23351328	SPEAKER 50.8X128 8OHM 10W SPK-1474AE
W662		23351328	SPEAKER 50.8X128 8OHM 10W SPK-1474AE
XA01		23153571	CRYSTAL 8.000 MHZ
PC BOARD ASSEMBLIES			
★ U901		23763138	PC BOARD ASSY PD0607J CRT-D
★ U902	#1	23764732	PC BOARD ASSY PD2229A SIGNAL
	#2	23764731	PC BOARD ASSY PD2229 SIGNAL

Location No.	Parts No.	Description
PICTURE TUBE		
⚠ V901	23324236	PICTURE TUBE LPD 21" PF AK A51QDJ420X
⚠	23324239	PICTURE TUBE SDI 21" PF AK A51QGA993X
⚠	23324226	PICTURE TUBE MTPDT PF AK TUBE A51LYZ395X
TUNER		
H001	23321514	TUNER ENV59DA7G3 ASIA HYPER FS D-J
ACCESSORIES		
A701	23015192	CARTON BOX
K902	23306623	REMOCON HAND UNIT IR CT-90229
Y101A	23566800	OWNERS MANUAL ENGLISH
Y101B	23566805	OWNERS MANUAL RUSSIAN
Y120	23943846	BAG POLY
CABINET PARTS		
A201 #1	23533907	COVER ASSY FRONT
A201 #2	23533389	COVER FRONT ASSY
A265	23445918	BUTTON POWER
A266	23428374	DOOR FRONT
A269	23738088	SCREW BTBW3X12 ECO
A275	23738085	SCREW BTB4X12 ECO
A401	23533518	COVER BACK PROPER
A511	23738085	SCREW BTB4X12 ECO
A512	23738085	SCREW BTB4X12 ECO
A520	23738086	SCREW BTB4X16 ECO
A525	23738088	SCREW BTBW3X12 ECO
A702A	23580054	PACKING TOP
A702B	23580055	PACKING BOTTOM
E501	23198694	WIRE CRT EARTH
E505	23845564	CLAMPER
E912	23848729	WEDGE YOKE HOLDING 3 REQUIRED
E961	23929522	WASHER T=1.0

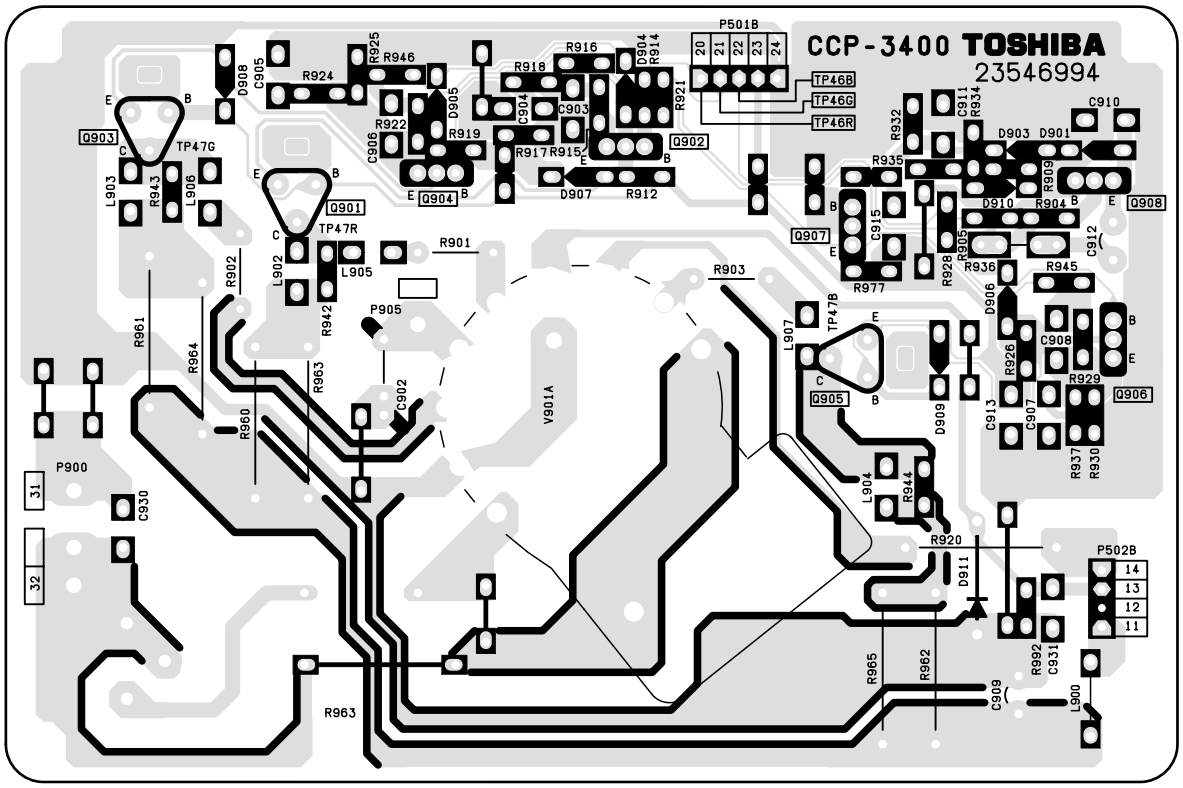
MAIN BOARD PD2229

BOTTOM (FOIL) SIDE



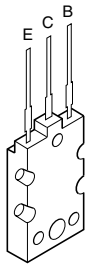
CRT/D BOARD PD0607

BOTTOM (FOIL) SIDE



TERMINAL VIEW OF TRANSISTORS

① 2SD2253
(old)
2SC5243
2SC5859



② 2SA1186A
2SA1306
2SA1788
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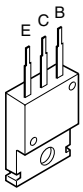
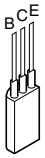
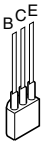
2SA1930
2SC1569
2SC3852
2SC4544
2SC4793
2SC5171
2SD1763A
2SD2396



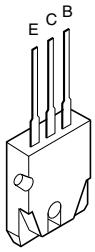
③ 2SA1020
2SC2482
2SC2655
2SC4721P
2SC5343
2SC5344
2SC752GTM



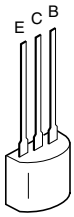
④ 2SA1015
2SA1320 (F)
2SA2980
2SA562TM
2SA9335
2SC1740S
2SC1815
2SC2120
2SC2878
2SC752
KTA1266
KTC3198



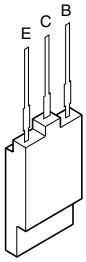
⑥ 2SA1788



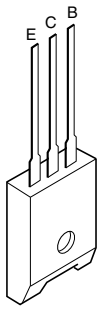
⑥ KRC105M
RN1201
RN1202
RN1203
RN1204
RN1205
RN2201
RN2203
RN2204



⑦ 2SD1554
2SD1556
2SD2253
2SD2396
2SD2553
2SD5143



⑧ ON4409



SCHEMATIC DIAGRAM

MODEL : 21CZ3R/21CZ5R

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE “X-RAY radiation precaution”, “SAFETY PRECAUSTION” and “PRODUCT SAFETY NOTICE” ON THE MANUAL FOR THIS MODEL.

CAUTION: The international hazard symbols “⚠” in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on the MANUAL for this model. Do not degrade the safety of the receiver through improper servicing.

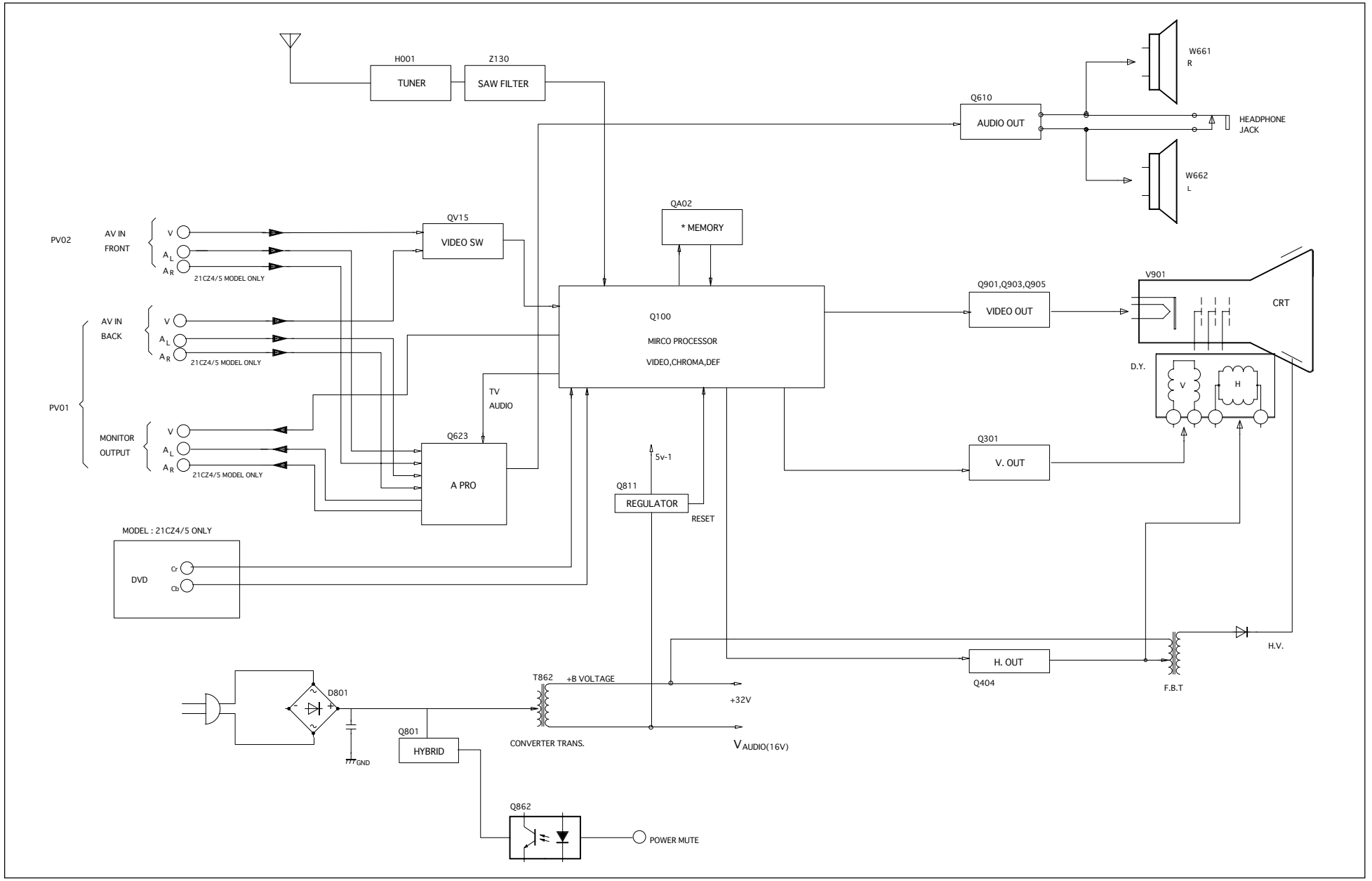
NOTE:

1. RESISTOR Resistance is shown in ohm [K = 1.000, M = 1.000.000]. All resistors are 1/6W and 5% tolerance carbon resistor, unless otherwise noted as the following marks.
   1/2R = Metal or Metal oxide of 1/2 watt 1/2S = Carbon compsistion of 1/2 watt
   1RF = Fuse resistor of 1 watt 10W = Cement of 10 watt
   K = ±10% G = ±2% F = ±1%
2. CAPACITOR Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF, and the values more than 1 in pF.
   All capacitors are ceramic 50V, unless otherwise noted as the following marks.
   ⊣(+ Electolytic capacitor ⊣(M Mylar capacitor

3. The parts indicated with “⚠” have special characteristics, and should be replaced with identical parts only.
4. Voltages read with DIGITAL MULTI-METER from point indicated to chassing ground, using a color bar signal with all controls at normal, line voltage at 220 volts.
5. Waveforms are taken receiving color bar signal with enough sensitivity.
6. Voltage reading shown are nominal values and may vary ±20% except H.V.

■ **SCHEMATIC DIAGRAM STRUCTURE:**

CIRCUIT BLOCK DIAGRAM



SPECIFICATIONS

MODEL		21CZ3R/21CZ5R
Rated voltage		∼ 220 V – 240 V, 50 Hz
Power consumption (at ∼ 220 V, 50 Hz)		94 W
Dimensions (Width × Depth × Height)		597.5(W) × 496.0(D) × 465.0(H) mm
Mass		22.1 kg
Picture tube		Type 21 Flat square picture tube (547.1mm) Overall picture tube measured diagonally (505.0mm) Viewable picture tube measured diagonally 90° deflection
Television system (Aerial input)	Channel coverage	**System** **Channel** **VHF** **UHF** **CATV (Channels)** PAL B/G CCIR 2 – 12 21 – 69 X ~ Z+2, S1 ~ S41 PAL I UK — 21 – 69 — PAL D/K CHINA 1 – 12 13 – 57 Z–1 ~ Z–38 SECAM B/G CCIR 2 – 12 21 – 69 X ~ Z+2, S1 ~ S41 SECAM D/K OIRT 1 – 12 21 – 69 X1 ~ X19 NTSC M US 2 – 13 14 – 69 A–6 ~ A–1, A ~ W, AA ~ ZZ, AAA, BBB NTSC M JAPAN 1 – 12 13 – 62 M1 ~ M10, S1 ~ S41
	Special RF signal	**Color system** NTSC4.43, PAL 60Hz **Sound system** 5.5/6.0/6.5 MHz
Color system		PAL/SECAM/NTSC4.43/NTSC3.58
Sound output		2.5 W × 2
Terminals		For 21CZ3R Input [–⊕(1), –⊕(2)]: Video, Audio (monaural) Output [⊖→(MONITOR)]: Video, Audio (monaural) For 21CZ5R Input [–⊕(1)/DVD]: Video/Y, P_B/C_B, P_R/C_R, Audio L/MONO, Audio R Input [–⊕(2)]: Video, Audio L/MONO, Audio R Output [⊖→(MONITOR)]: Video, Audio L/MONO, Audio R Headphone output: ø 3.5mm (mini jack type)
Speaker		5 × 12.7cm (2)

* Please refer to owner's manual in details.

– END –

TOSHIBA SINGAPORE PTE LTD