TOSHIBA

FILE NO. 060-200105

SERVICE MANUAL

COLOUR TELEVISION

S1E Chassis

21A3E, 21A3TR, 21A3M, 21A3MJ

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FILE NO. 063-200204

SERVICE MANUAL

COLOUR TELEVISION

S1E Chassis

21A3T1

– SUMMARY –

21A3T1 is the same as 21A3E except for the parts tabled on back of this sheet.
Use this service manual together with the original service manual of 21A3E, 21A3TR, 21A3M, 21A3MJ (File No. 060-200105).

May., 2002

REPLACEMENT PARTS LIST DIFFERENCES

Location No.	Part No.	Description
A201	23530356	Front Cover
A701	23064868	Case
K902	23306215	Remote Hand Unit, CT-9899
L102	23238562	Coil, Peaking, TRF4109AJ
L103	23238562	Coil, Peaking, TRF4109AJ
L108	23289829	Coil, Peaking, TRF48R2AF
LF01	23289150	Coil, Peaking, TRF4150AF
⚠P801	23372160	Power Cord
Q132	23314965	Transistor, KTC3198 Y
QA01	23000939	IC, 87CK38N-3H04
QB62	23314965	Transistor, KTC3198 Y
R125	24366103	CF, 10k ohm
R130	24366221	CF, 220 ohm
R137	24366222	CF, 2200 ohm
RA14	24366273	CF, 27k ohm
RA15	24366753	CF, 75k ohm
RA20	24366102	CF, 1k ohm
RA64	24366333	CF, 33k ohm
RA69	24366103	CF, 10k ohm
RF05	24366221	CF, 220 ohm
✻U902	23787694	Main Borad, PD0736
Y101A	23565663	Owner's Manual, English, 21A3T1
Z103	23303188	Ceramic Trap, TCF1113
Z130	23303176	Filter, SAW, OFWK2964M
ZF02	23107856	Ceramic Filter, TCF1030

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN

TABLE OF CONTENTS

CHAPTER 1 **GENERAL ADJUSTMENTS**

SAFETY INSTRUCTIONS 3
SET-UP ADJUSTMENT 4
SERVICE MODE 6
DESIGN MODE 9
ELECTRICAL ADJUSTMENTS 10
CIRCUIT CHECK 15

CHAPTER 2 **SPECIFIC INFORMATIONS**

SETTING & ADJUSTING DATA 16
LOCATION OF CONTROLS 17
PROGRAMMING CHANNEL MEMORY 18
CIRCUIT BLOCK DIAGRAM 20
CHASSIS AND CABINET REPLACEMENT PARTS LIST 21
PC BOARDS BOTTOM VIEW 29
TERMINAL VIEW OF TRANSISTORS 32
SPECIFICATIONS 33
APPENDIX:
CIRCUIT DIAGRAM

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 16)

   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.

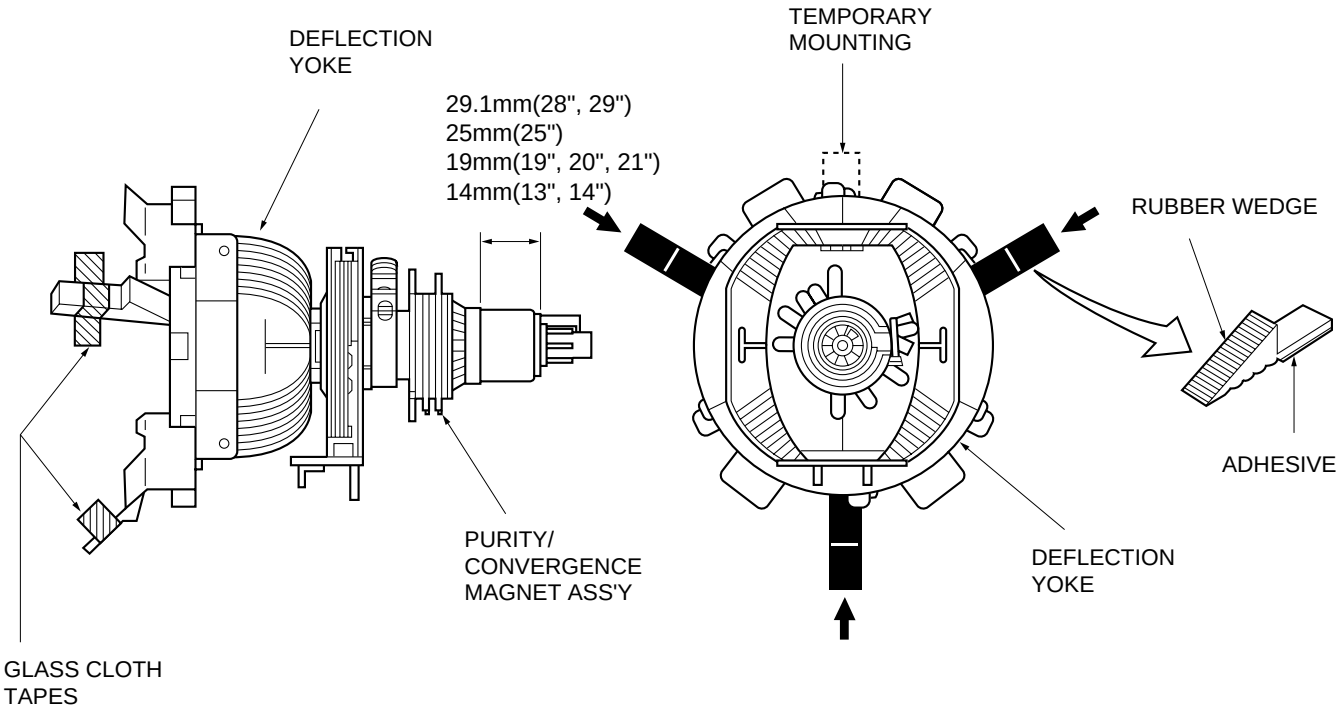


Figure 1.

CONVERGENCE ADJUSTMENTS

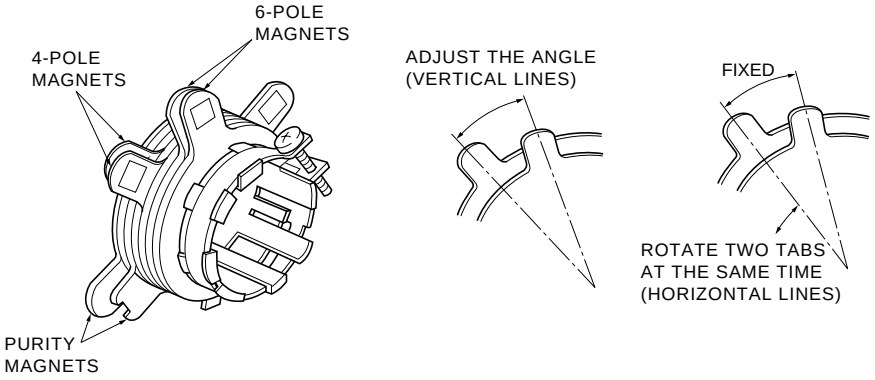
NOTE: Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

■ 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.

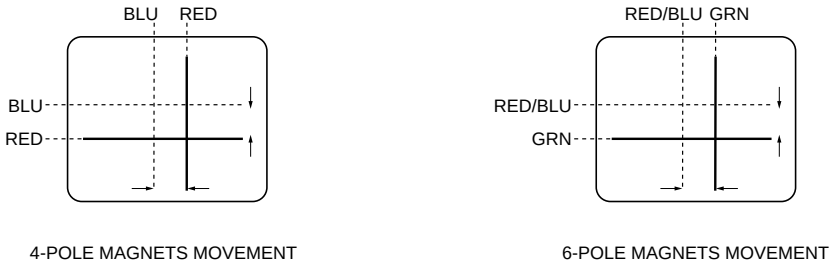
■ CIRCUMFERENCE CONVERGENCE ADJUSTMENT

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.



CONVERGENCE MAGNET ASSEMBLY — ADJUSTMENT OF MAGNETS

Figure 2.



4-POLE MAGNETS MOVEMENT — 6-POLE MAGNETS MOVEMENT

Center Convergence by Convergence Magnets



INCLINE THE YOKE UP (OR DOWN) — INCLINE THE YOKE RIGHT (OR LEFT)

Circumference Convergence by DEF Yoke

Figure 3. Dot Movement Pattern

SERVICE MODE

1. ENTERING TO SERVICE MODE

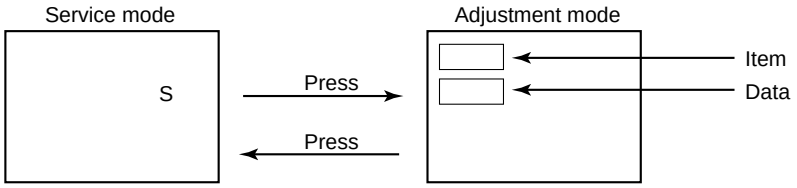
1) Press 🔇 button once on Remote Control.
2) Press 🔇 button again to keep pressing.
3) While pressing the 🔇 button, press MENU button on TV set.



(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 note: Displayed differently as shown below, depending on the setting of the receiving color system.
Test audio signal ON/OFF (1kHz) :	8 button
Self diagnostic display ON/OFF :	9 button

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 16)

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

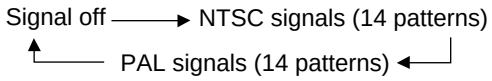
After replacing QA02, the following initialization is required.

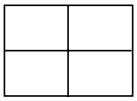
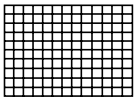
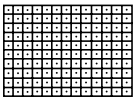
1. Enter the service mode, then select any register item.
2. Press and hold the CALL button on the Remote, then press the CHANNEL ▲ button on the TV. The initialization of QA02 has been complated.
3. Check the picture carefully. If necessary, adjust any adjustment item above. Perform “Auto search Memory”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

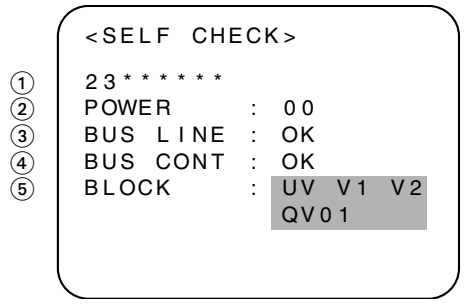


Signals	Picture
• Red raster • Green raster • Blue raster • All Black • All White	
• Black & White	
• Black cross-bar • White cross-bar • Black cross-bar on green raster	
• Black cross-hatch • White cross-hatch	
• Black cross-dot • White cross-dot	
• H signal (white) • H signal (black)	

* 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.



Indicated color of mode now selected : Green and Red
Indicated color of other modes : White

Green : Normal
Red : The microcomputer operates to provide judgement of no video signal. The red color is still indicated though the signal is input, failure may exist in input signal line including QV01.
QV01 : In case of indication green ---Normal
In case of indication red with input signal----
Failure may exist in output line including QV01.

① Part number of microcomputer (QA01)
② Operation number of protecting circuit ----“00” is normal.
When indication is other than “00”, overcurrent apts to flow, and circuit parts may possibly be damaged.
③ BUS LINE CHECK ----“OK” is normal.
“SDA1-GND” ---------- SDA-GND short circuit.
“SCL1-GND” ---------- SCL-GND short circuit.
“SCL1-SDA1” ---------- SCL-SDA short circuit.
④ BUS CONT ----“OK” is normal.
When indication shows “Q ○○○ NG”, the device with the number may possibly be damaged.
⑤ BLOCK
UV : TV reception mode
V1 : VIDEO 1 input mode (→①1)
V2 : VIDEO 2 input mode (→①2)

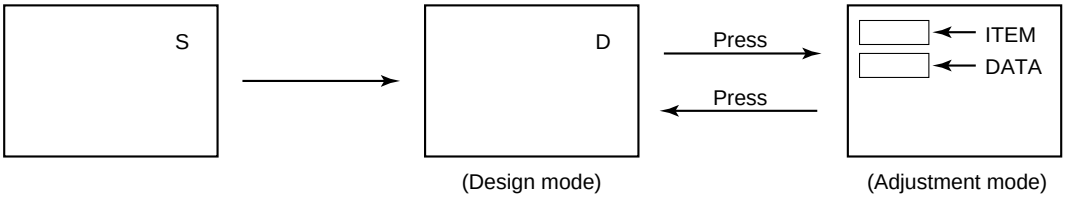
NOTE: Component which controls character display on screen is QT01 (TELETEXT IC.). If this display function fails to operate due to damage in QT01, self diagnosis procedure is as follows.
(1) In case that power indicator is blinking with interval of 0.5 seconds; it means protecting circuit (Current limiter) is operating, and circuit components may possibly be damaged. Check related components.
(2) In case that power indicator is blinking with interval of 1 second; Protecting circuit does not operate, but a part of Bus line does not operate normally. Check Bus line.

* The items marked with ▩ are not usable to display in the SELF DIAGNOSTIC FUNCTION for some model.

DESIGN MODE

1. ENTERING TO DESIGN MODE

1) Select the Service mode. 2) While pressing 🔇 (or CALL) button on Remote and press MENU button on TV. 3) Press MENU button on TV.



(Design mode) (Adjustment mode)

When QA02 is initialized, items “OPT0” 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 “OPT0” and “OPT1”.

2. SELECTING THE ADJUSTING ITEMS

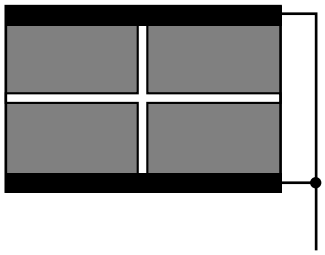
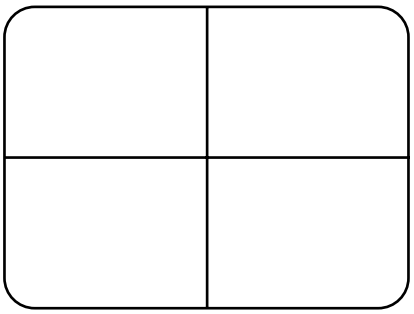
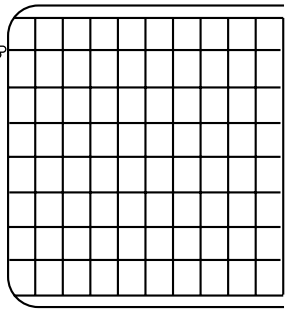
Every pressing of CHANNEL ▼ button in the design mode changes the adjustment items in the order of table-3.
(▲ button for reverse order)

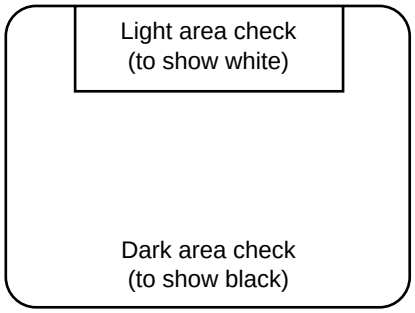
Refer to table-3 for data of design mode.
(See SETTING & ADJUSTING DATA on page 16)

3. ADJUSTING THE DATA

Pressing of VOLUME ▲ or ▼ 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 TV/VIDEO button on the Remote 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 adjust the ◿ – /+ button to reduce the value so that white portion of inside pattern slightly light. 4. Adjust ◿ – /+ button 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 VIDEO button on remote hand unit. 2. Select either HPOS (Horizontal picture phase) or VPOS (Vertical picture phase) with CHANNEL ▲, ▼ buttons, and adjust horizontal or vertical picture position in the center of screen with VOLUME ◿ – /+ buttons. 
VERTICAL AMPLITUDE ADJUSTMENT (HIT)	1. Set the TV in service mode, and get black or white cross-hatch signal with VIDEO button on remote hand unit. 2. Select HIT (Vertical amplitude) with CHANNEL ▲, ▼ buttons, and adjust vertical amplitude with VOLUME ◿ – /+ buttons so that vertical amplitude lacks a little. 3. Adjust vertical amplitude with VOLUME ◿ – /+ 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 VIDEO button. 3. Select RCUT, GCUT and BCUT with CHANNEL ▲, ▼ buttons, to set individual values to Initial reference data, and to set GDRV and BDRV to Initial reference data with VOLUME ◿ – /+ buttons (See page 16). 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 CHANNEL ▲, ▼ buttons. Then tap VOLUME ◿ – /+ buttons so that three colors slightly light in the same level. ※ To correct white balance in light area, select GDRV and BDRV with CHANNEL ▲, ▼ 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 channel ▲▼ buttons first and then select the built-in test pattern with -/- - button.	

S1E: Series (Reference factory adjustment)

1 SUB COLOUR CONTRAST (SCNT)

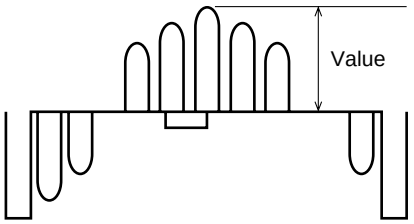
(Measuring point) Q501 #20 (R-OUT)
(Adjusting signal) Sub Bright (NTSC) signal
(Adjusting method)
1) Set user control to the standard 1.
2) Change to adjust SCNT data.
   * It make the point which doesn't have a change and it adjust with screen VR
   SPEC: 2.5±0.2Vp-p

2 SUB BRIGHT (BRTC)

(Adjusting signal) Sub Bright (PAL or NTSC) signal
(Adjusting method)
1) Set user control to the standard 1.
2) Change BRTC data to set black collapse numbers by eye check.
   SPEC: 4±1.5 bars
   * Note: This ITEM Adjust at last

3 SUB COLOUR CENTER (COLP)

(Measuring point) Q501 #22 (B-OUT)
(Adjusting signal) Sub Bright (PAL) signal
(Adjusting method)
1) Set user control to the standard 1.
2) Change COLP data (COLC Difference data) to adjust the 6th peak amplitude of rainbow color bar.



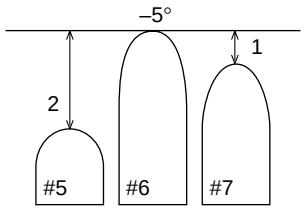
Adjust the amplitude of color bar (p-p value of the upper half)

1.4±0.2V (p-p)

* Note: This ITEM Adjust after (COLC)

4 SUB TINT CENTER (FOR M-NTSC MODEL) (TNTC)

(Measuring point) Q501 #22 (B-OUT)
(Adjusting signal) Sub Bright (NTSC) signal
(Adjusting method) Change TNTC data to adjust the 5th pointion to the 6th level of B-Y signal and the 7th level difference shuld regulate to 2:1



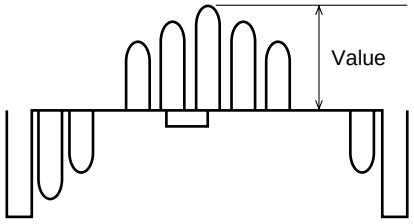
SPEC: –5.0°±5°

* Note: This ITEM Adjust after (COLC)

5 SUB COLOUR NTSC (COLC)

(Measuring point) Q501 #22 (B-OUT)
(Adjusting signal) Sub Bright (NTSC) signal
(Adjusting method)

1) Set BUS data of Q501 to the same value as that SUB TINT adjustment.
2) Set user control to the standard 1.
3) Change COLC data to adjust the 6th peak amplitude of rainbow color bar



Adjust the amplitude of color bar (p-p value of the upper half)

1.4±0.2V (p-p)

6 WHITE BALANCE ADJUSTMENT

(Adjusting method)

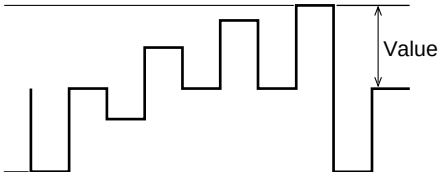
1) Set user control to the standard 1.
2) BUS data of Q501
   GDRV→Initial value (40H)
   BDRV→Initial value (40H)
   RCUT→Initial value (20H)
   GCUT→Initial value (20H)
   BCUT→Initial value (20H)
3) Set the mode to the one horizontal line mode.
4) Change SCREEN VR to set it so that one of the line R, G and B will light slightly.
5) Change CUT-OFF data to set it so that each one of R, G and B will light slightly (for about white).
6) Release the H. Line mode.
7) Change B/G drive data and R/G/B CUT-OFF data to adjust white balance in bright area and dark area.
   * Bright area (High-light area): 103cd/m^2
   * Dark area (Low-light area): 13cd/m^2

SPEC High-light area: 11500°K+0.0075uv
Low-light area: 10500°K+0.0105uv

CA100 DATA	
x=260	y=271
x=260	y=271

7 SUB COLOUR CENTER (COLS) (SECAM)

(Measuring point) Q501 #22 (B-OUT)
(Adjusting signal) SECAM COLOUR BAR
(Adjusting method) Adjusting the amplitude of B-Y (Mute the picture in adjustment)



Adjust the amplitude of color bar (p-p value of the upper half)

SPEC: 1.9±0.2V

* Note: This ITEM Adjust after (COLC)

8 SECAM BELL FILTER ADJUSTMENT

(Measuring point)
(Adjusting signal) **NO ADJUSTMENT**
(Adjusting method)

9 SECAM R-Y ADJUSTMENT

(Measuring point) Q501 #20 R-Y OUT
(Adjusting signal) Colour bar (SECAM) signal
(Adjusting method) Adjust (SRY) the level of the monochrome signal part must be a match to the level of horizontal blanking signal.
SPEC: 0±10 mv (p-p)

10 SECAM B-Y ADJUSTMENT

(Measuring point) Q501 #22 R-Y OUT
(Adjusting signal) Colour bar (SECAM) signal
(Adjusting method) Adjust (SBY) the level of the monochrome signal part must be a match to the level of horizontal blanking signal.
SPEC: 0±10 mv (p-p)

11 VERTICAL POSITION

(Input signal) WG Philip Pattern (Do not use French SECAM)
(Measuring place) On Picture
(Setting) Contrast=Max. Bright=Center Color=Center
(Adjusting method) Adjust VPOS upper and lower position on Philips pattern may become a center. (Turn the direction of CPT to the south or the north when adjusting. Adjust the amount offsetting if it is not possible to do.)

12 VERTICAL HEIGHT

(Input signal) WG Philip Pattern (Do not use French SECAM)
(Measuring place) On Picture
(Setting) Contrast=Max. Bright=Center Color=Center
(Adjusting method) Adjust the Sub address HIT on Philips pattern may hide frag of the upper and lower side in exactly.

13 HORIZONTAL POSITION

(Input signal) WG Philip Pattern (Do not use French SECAM)
(Measuring place) On Picture
(Setting) Contrast=Max. Bright=Center Color=Center
(Adjusting method) Adjust the Sub address HPOS on Philips pattern may become the center location (Minimize D-C in the adjustment magnetic field on CPT.)

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 16)

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)	30.2 kV
MAX HIGH VOLTAGE:	(B)	32.0 kV
AV 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	40H	←
TNTC	SUB TINT CEN	40H	45H
COLP	SUB COLOR CEN PAL	00H	FFH
COLS	SUB COLOR CEN SECAM	00H	←
SCNT	SUB CONTRAST	08H	06H
HPOS	50Hz H-POSITION	0DH	10H
VPOS	V-POSITION	03H	←
HIT	HEIGHT	20H	1AH
VLIN	V-LINEARITY	07H	←
WID	PICTURE WIDTH	30H	34H
PARA	E-W PARABOLA	15H	15H
CNR	E-W CORNER	05H	←
TRAP	TRAPEZIUM	0DH	←
SRY	SECAM R-Y	08H	←
SBY	SECAM-B-Y	08H	←

Table-2

【 DESIGN MODE 】

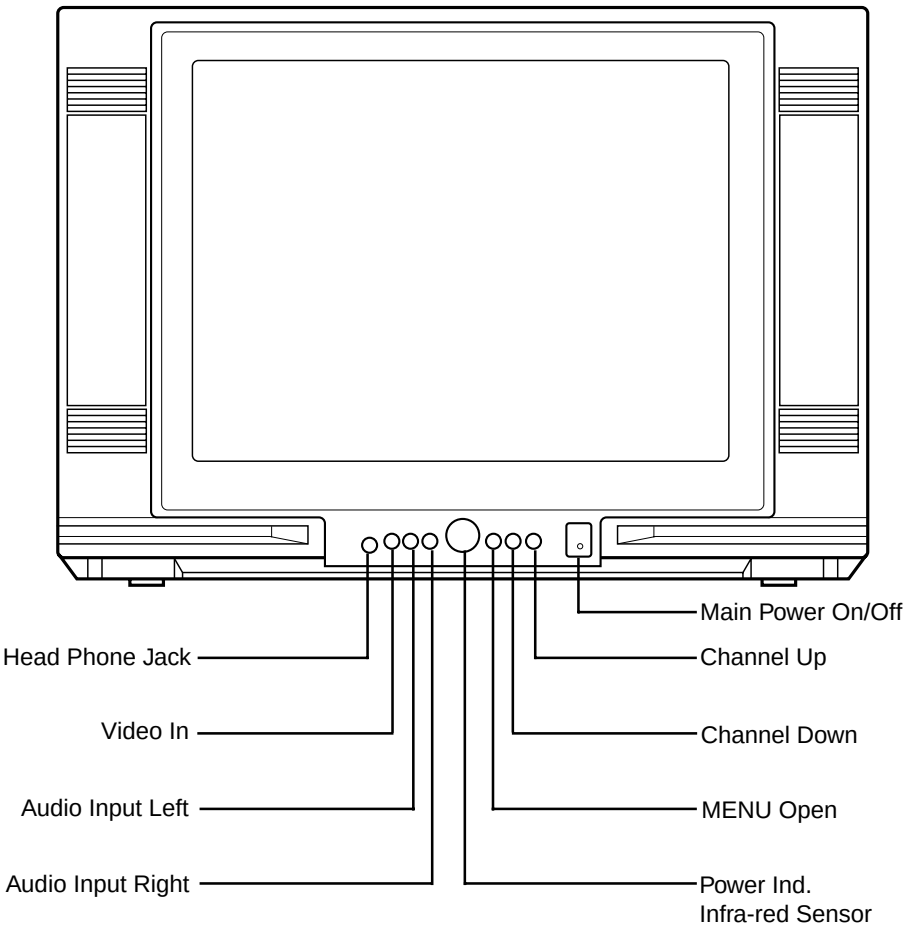
ADJUSTING ITEMS AND DATAS IN THE DESIGN MODE:

Item	Name of adjustment		Data	Remarks
		Preset Data	21"	
* There are no adjusting items in the design mode.				

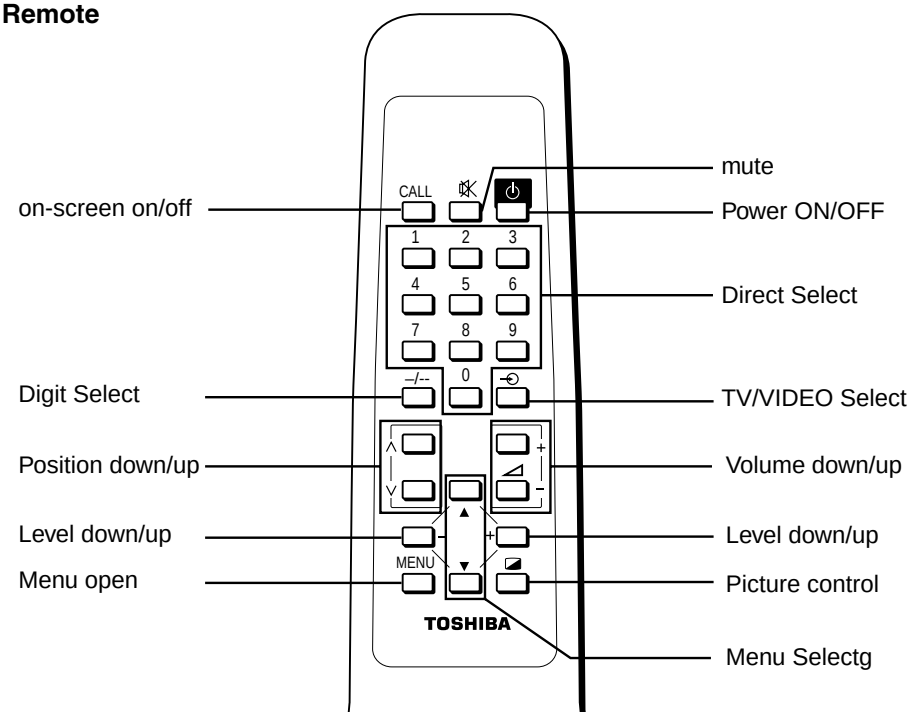
Table-3

LOCATION OF CONTROLS (Representative: 21A3E)

Front



Remote



PROGRAMMING CHANNEL MEMORY

- First, use the ASM (Automatic Search Memory) function to preset all the active channels in your area automatically. Then, arrange the preset channels with the SEARCH (>>>), MFT (Manual Fine Tuning) and AFT (Auto Fine Tuning) functions so that you can tune into only desired channels.
- This section shows how to tune in channels using mainly the Remote Controller. You can also perform the system select, ASM, SEARCH (>>>), SKIP, MFT and AFT operations using the buttons on the TV set.

To preset channels (ASM)

ASM (Automatic Search Memory)

1 Select the head of the position number to start the ASM with the position down (∨)/up (∧) buttons or the digit/direct select buttons.

2 Press the MENU button repeatedly to call up the SET UP menu on the screen.

3 Confirm that “COLOR” is set to “AUTO” and “SOUND” is set to proper system.
If not, press the ▼/▲ buttons to move the cursor (►) to “COLOR” or “SOUND” and press the –/+ buttons to select each proper system.

4 Press the ▼/▲ buttons to move the cursor (►) to “ASM”.

5 Press the "+" button to start the ASM. All active channels will be stored in the memory automatically.
When programming is complete, the initial position number will reappear.

After presetting
Check the preset channels by pressing the position down (∨)/up (∧) buttons.
- If the picture or sound of a certain channel is not good, fine-tune the channel using the MFT function.
- If the colour of a certain channel is abnormal, automatic colour system selection (AUTO) may malfunction, or sound system selection is wrong. In such a case, select another colour and/or sound system.

To preset channels (Manual search, AFT, MFT)

Manual search (>>>)

1 Select a position number with the position down (∨)/up (∧) or digit/direct select buttons.

2 Press the MENU button repeatedly to call up the SET UP menu on the screen.

3 Press the ▼/▲ buttons to move the cursor (►) to “>>>”.

4 Press the –/+ buttons to start searching.
The – button searches for lower-numbered channels; the + button for higher- numbered channels.
Repeat this process until you can get the desired channel.

5 When the desired programme is shown, press the ▼/▲ buttons to move the cursor (►) to “ ”.

6 Press the + button to memorize the channel at the current postion.

7 When you desire to store another channel at another postion, move the cursor (►) to “POSITION” with the ▼/▲ buttons and select a desired position with the –/+ buttons.
Then, press the ▼/▲ buttons to move the cursor (►) to “>>>” and repeat the steps 4 to 7.

- Use the SEARCH function if desired channels could not be preset with the ASM, or if you would like to preset the desired channels to specific position numbers one by one.
- The adjustments below are not necessary under normal conditions. However, in areas of inferior broadcast conditions where adjustment is necessary for a better picutre, adjust the tuning with the MFT (Manual Fine Tuning). The AFT OFF status automatically keeps the condition adjusted with the MFT function.
- The AFT (Auto Fine Tuning) function automatically corrects slight fluctuations when receiving signals.
- When using Manual Search to preset the channel, the AFT will automatically turn ON and SKIP to OFF.

MFT (Manual Fine Tuning)

1 Select the position number you want to fine-tune with the position down (∨)/up(∧) buttons or digit/direct select buttons.

2 Press the MENU button repeatedly to call up the SET UP menu on the screen.

3 Press the ▼/▲ buttons to move the cursor (▶) to “MFT”.

4 Press the –/+ buttons until the best possible picture and sound are obtained.

Note
When operating the MFT function, the AFT status is automatically set to OFF.

AFT (Auto Fine Tuning)

1 Select the position number you want to fine-tune with the position down (∨)/up(∧) buttons or digit/direct select buttons.

2 Press the MENU button repeatedly to call up the SET UP menu on the screen.

3 Press the ▼/▲ buttons to move the cursor (▶) to “AFT”. Press the –/+ buttons to select the "ON" indication.

Note
When 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.

To skip unnecessary position numbers

After presetting the channels, you may skip unnecessary position numbers so that only the channels you want to watch are selected.

To skip a position number

1 Select the position number to be skipped with the position down (∨)/up (∧) buttons or digit/direct select buttons.

2 Press the MENU button repeatedly to call up the SET UP menu on the screen.

3 Press the ▼/▲ buttons to move the cursor (▶) to “SKIP”.

4 Press the –/+ buttons to select “SKIP ON”.

5 Press the MENU button to turn off the SET UP menu display.
Select the position number to be skipped with the direct select buttons. The * mark appears to the left of the position number.
The position number will then be skipped when you select channels with the position down (∨)/up (∧) buttons.

To restore a skipped position number

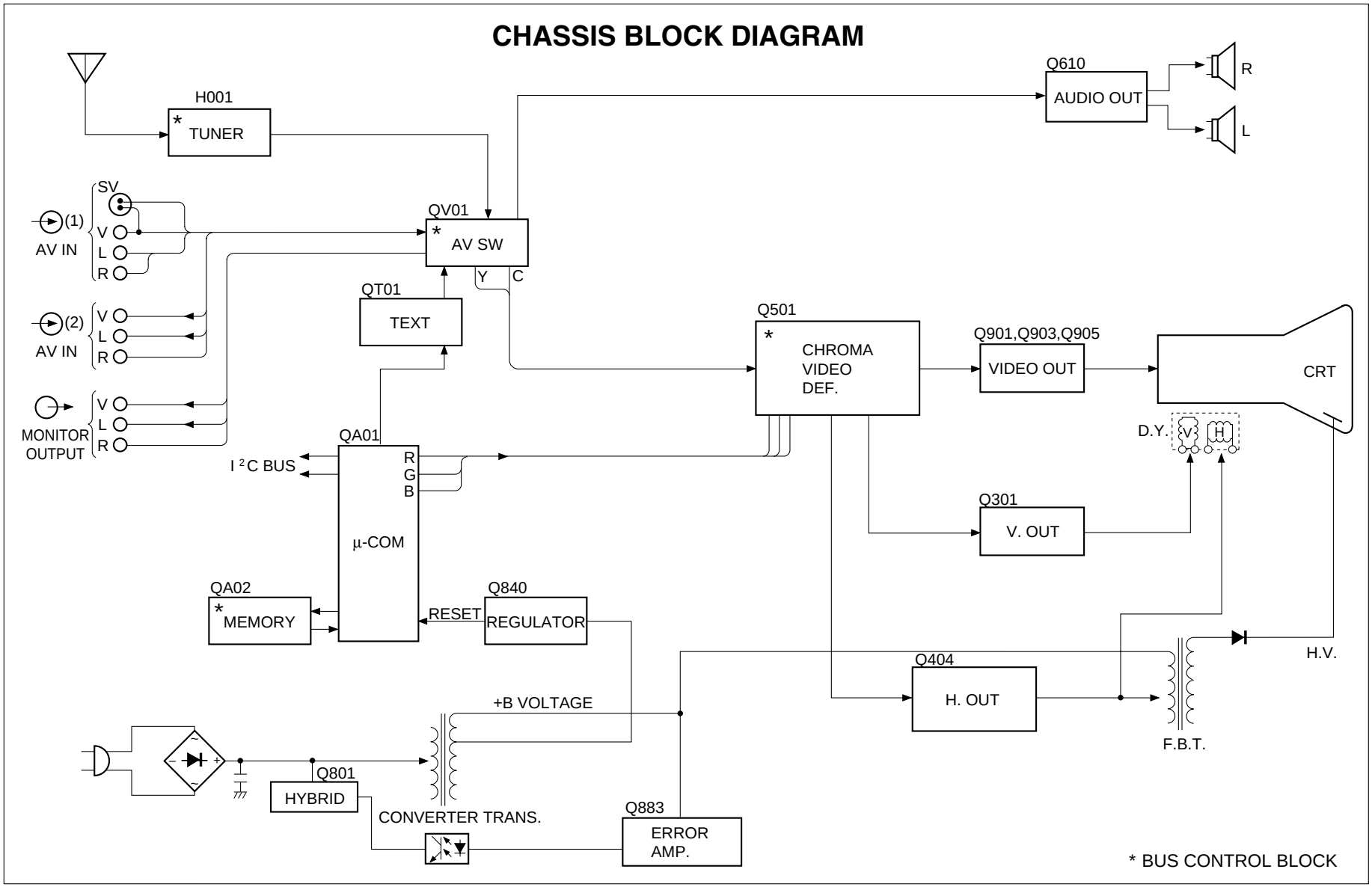
1 Select the position number you want to restore with the direct select (and/or digit select) buttons.

2 Press the MENU button to call up the SET UP menu display and press the ▼/▲ buttons to move the cursor (▶) to “SKIP”.

3 Press the –/+ buttons to select “SKIP OFF”.

* Please refer to owner's manual in detail.

CHASSIS BLOCK DIAGRAM



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 : 21A3E, 21A3TR, 21A3M, 21A3MJ

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.	Part No.	Description
CAPACITORS		
C101	24796479	ELECTROLYTICCE04G35V 4.7UF M
C102	24797101	ELECTROLYTICCE04G50V 100UF M
C104	24797100	ELECTROLYTICCE04G50V 10UF M
C105	24591102	PLASTIC FILMCQ921M 50V 1000PF J
C106	24794221	ELECTROIYTIC CE04G16V 220UF M
C108	24539474	MTPLA CAP M 50V 474J MUL
C116	24591104	PLASTIC FILMCQ921M 50V 0.1MF J
C118	24474102	CERAMIC CK141B 50V 1000PF K
C129	24474102	CERAMIC CK141B 50V 1000PF K
C161	24797478	ELECTROLYTICCE04G50V 0.47UF M
C162	24212332	CERAMIC DISKCK45 B50V 3300PF K
C167	24763101	ELECTROLYTICCE04G16V 100UF M
C168	24794100	ELECTROLYTICCE04G16V 10UF M
C180	24797229	ELECTROLYTICCE04G50V 2.2UF M
C182	24797101	ELECTROLYTICCE04G50V 100UF M
C212	24797010	ELECTROLYTICCE04G50V 1.0UF M
C216	24797010	ELECTROLYTICCE04G50V 1.0UF M
C221	24473100	CERAMIC CC141SL 50V 10PF J
C222	24473100	CERAMIC CC141SL 50V 10PF J
C223	24473100	CERAMIC CC141SL 50V 10PF J
C224	24797100	ELECTROLYTICCE04G50V 10UF M
C225	24591104	PLASTIC FILMCQ921M 50V 0.1MF J
C226	24591104	PLASTIC FILMCQ921M 50V 0.1MF J
C233	24073077	ELECTROLYTICCE04P50V 0.1UF M 3A
C301	24539154	MTPLA CAP M 50V 154J MUL
C302	24591152	PLASTIC FILMCQ921M 50V 1500PF J
C303	24539334	MTPLA CAP M 50V 334J MUL
C305	24617912	ELECTROLYTICCE04CH 50V 2.2UF K3A LI
C306	24073043	ELECTROLYTICCE04P 16V 2200UF M 3A
C307	24693473	PLASTIC FILMCQ921M 100V0.047MFJ
C308	24668101	ELECTROLYTICCE04Q35V 100UF M 3A
C309	24591102	PLASTIC FILMCQ921M 50V 1000PF J
C310	24796102	ELECTROLYTICCE04G35V 1000UF M
C311	24214681	CERAMIC DISKCK45 B500V680PF K
C313	24082057	PLASTIC FILMCF922 M 100V 220000PF J
C314	24591473	PLASTIC FILMCQ921M 50V 0.047MFJ
C317	24214471	CERAMIC DISKCK45 B500V470PF K

Location No.	Part No.	Description
C318	24212102	CERAMIC DISKCK45 B50V 1000PF K (21A3E/21A3M/21A3MJ)
C318	24212821	CK45B1H821K (21A3TR)
C320	24668101	ELECTROLYTICCE04Q35V 100UF M 3A
C370	24794101	ELECTROLYTICCE04G16V 100UF M
C371	24794220	ELECTROLYTICCE04G16V 22UF M
C403	24591822	PLASTIC FILMCQ921M 50V 8200PF J
C404	24797478	ELECTROLYTICCE04G50V 0.47UF M
C408	24591183	PLASTIC FILMCQ921M 50V 0.018MFJ
C409	24212221	CERAMIC DISKCK45 B50V 220PF K
C410	24693472	PLASTIC FILMCQ921M 100V4700PF J
C417	24214102	CERAMIC DISKCK45 B500V1000PF K
C420	24666220	ELECTROLYTICCE04Q16V 22UF M 3A
C421	24666470	ELECTORLYTOC CE04Q16V 47UF M 3A
C431	24794102	ELECTROLYTICCE04G16V 1000UF M
C433	24666100	ELECTROLYTICCE04Q10V 10UF M 3A
C435	24797479	ELECTROLYTICCE04G50V 4.7UF M
C440	24082951	PLASTIC FILMCF92T 1500VH 6000PF H
C442	24082694	PLASTIC FILMCF92T 250VR33UF J
C444	24082934	PLASTIC FILMCF92T 1500VH 1500PF H
C445	24828563	PLASTIC FILMCQ92 T200V56000PF J
C446	24679100	ELECTROLYTICCE04Q250V10UF M 3A
C448	24640908	ELECTROLYTICCE04H 160V33UF M 3A LI
C449	24666101	ELECTROLYTICCE04Q16V 100UF M 3A
C463	24212152	CERAMIC DISKCK45 B50V 1500PF K
C467	24082095	PLASTIC FILM, 0.18MFD, 630V
C470	24794220	ELECTROLYTICCE04G16V 22UF M
C472	24539474	MTPLA CAP M 50V 474J MUL
C504	24591104	PLASTIC FILMCQ921M 50V 0.1MF J
C505	24591104	PLASTIC FILMCQ921M 50V 0.1MF J
C511	24797010	ELECTROLYTICCE04G50V 1.0UF M
C512	24212222	CERAMIC DISKCK45 B50V 2200PF K
C517	24763101	ELECTROLYTICCE04G16V 100UF M
C521	24591104	PLASTIC FILMCQ921M 50V 0.1MF J
C522	24591104	PLASTIC FILMCQ921M 50V 0.1MF J
C523	24591104	PLASTIC FILMCQ921M 50V 0.1MF J
C524	24797101	ELECTROLYTICCE04G50V 100UF M
C526	24591222	PLASTIC FILMCQ921M 50V 2200PF J
C527	24353100	CERAMIC DISCCC45CH 50V CH 10PF C

Location No.	Part No.	Description
C528	24206228	ELECTROLYTICCE04WS 50V 0.22UF M 7L 3A
C606	24797010	ELECTROLYTICCE04G50V 1.0UF M
C607	24797229	ELECTROLYTICCE04G50V 2.2UF M
C608	24797010	ELECTROLYTICCE04G50V 1.0UF M
C609	24795101	ELECTROLYTICCE04G25V 100UF M
C610	24591473	PLASTIC FILM CQ921M 50V 0.047MFJ
C611	24797100	ELECTROLYTICCE04G50V 10UF M
C612	24794470	ELECTORLYTICCE04G16V 47UF M
C613	24797100	ELECTROLYTICCE04G50V 10UF M
C614	24591473	PLASTIC FILM CQ921M 50V 0.047MFJ
C615	24794100	ELECTROLYTICCE04G16V 10UF M
C616	24795471	ELECTROLYTICCE04G25V 470UF M
C617	24797229	ELECTROLYTICCE04G50V 2.2UF M
C621	24591103	PLASTIC FILM CQ921M 50V 0.01MF J
C628	24797339	ELECTROLYTIO CE04G50V 3.3UF M
C629	24795102	ELECTROLYTICCE04G25V 1000UF M
C630	24795471	ELECTROLYTICCE04G25V 470UF M
⚠ C801	24503002	MTPLA AC275V 0.22UF M
C808	24667331	ELECTROLYTICCE04Q25V 330UF M 3A
C810	24086059	ELECTROLYTICCE692J 400V 270UF M 3D
⚠ C813	24092555	CERAMIC DISC CK45B AC250V 1000PF M
⚠ C814	24092555	CERAMIC DISC CK45B AC250V 1000PF M
C817	24092337	CERAMIC DISC CK45R 2KV 220PF K
C818	24082396	PLASTIC FILM CF92T 1250VH 1200PF H
C819	24539474	MTPLA CAP M 50V 474J MUL
C820	24092343	CERAMIC DISC CK45R 2KV 680PF K
C821	24214471	CERAMIC DISK CK45 B 500V 470PF K
C823	24214471	CERAMIC DISK CK45 B 500V 470PF K
C829	24591152	PLASTIC FILM CQ921M 50V 1500PF J
C832	24666470	ELECTORLYTOC CE04Q16V 47UF M 3A
C841	24667100	ELECTROLYTICCE04Q16V 10UF M 3A
C842	24666100	ELECTROLYTICCE04Q10V 10UF M 3A
C843	24591104	PLASTIC FILM CQ921M 50V 0.1MF J
C846	24539224	PLASTIC FILM, 50V 0.22 UF J
C884	24640018	ELECTROLYTIC, 220MFD, 160V
C885	24214471	CERAMIC DISK CK45 B 500V 470PF K
C889	24667102	ELECTROLYTICCE04Q25V 1000UF M 3A
C891	24082229	PLASTIC FILM, 0.1MFD, 250V
C893	24092338	CERAMIC DISC CK45R 2KV 270PF K
C897	24092555	CERAMIC DISC CK45B AC250V 1000PF M
C898	24212271	CERAMIC DISK CK45 B 50V 270PF K
C899	24539224	PLASTIC FILM, 50V 0.22 UF J
C902	24092345	CERAMIC DISC CK45R 2KV 0.001MFK
C904	24436331	CERAMIC DISC CC45 SL 50V330PF J
C905	24436271	CERAMIC DISC CC45SL 50V 270PF J
C907	24436391	CERAMIC DISC CC45 SL 50V390PF J
C910	24669478	ELECTROLYTICCE04Q50V 0.47UF M 3A
C912	24763102	ELECTROLYTICCE04G16V 1000UF M
C913	24794100	ELECTROLYTICCE04G16V 10UF M
C971	24794470	ELECTORLYTICCE04G16V 47UF M
CA01	24473220	CERAMIC,50V 22PF J
CA02	24473330	CERAMIC CC141SL 50V 33PF J
CA22	24473150	CERAMIC CC141SL 50V 15PF J
CA23	24473150	CERAMIC CC141SL 50V 15PF J
CA24	24473150	CERAMIC CC141SL 50V 15PF J
CA25	24473150	CERAMIC CC141SL 50V 15PF J

Location No.	Part No.	Description
CA37	24212101	CERAMIC DISK CK45 B 50V 100PF K
CA38	24212101	CERAMIC DISK CK45 B 50V 100PF K
CA42	24794100	ELECTROLYTICCE04G16V 10UF M
CA43	24591104	PLASTIC FILM CQ921M 50V 0.1MF J
CA51	24212472	CERAMIC DISK CK45 B 50V 4700PF K
CA52	24212222	CERAMIC DISK CK45 B 50V 2200PF K
CA53	24212181	CERAMIC DISK CK45 B 50V 180PF K
CA54	24794330	ELECTROLYTICCE04G16V 33UF M
CA55	24797010	ELECTROLYTICCE04G50V 1.0UF M
CA68	24794100	ELECTROLYTICCE04G16V 10UF M
CB01	24794470	ELECTORLYTICCE04G16V 47UF M
CB20	24212101	CERAMIC DISK CK45 B 50V 100PF K
CB21	24212221	CERAMIC DISK CK45 B 50V 220PF K
CF01	24473470	CERAMIC CC141SL 50V 47PF J
CF02	24436470	CERAMIC DISC CC45 SL 50V47PF J
CF03	24797010	ELECTROLYTICCE04G50V 1.0UF M
CF04	24794470	ELECTORLYTICCE04G16V 47UF M
CS01	24797229	ELECTROLYTICCE04G50V 2.2UF M
CS02	24794100	ELECTROLYTICCE04G16V 10UF M
CS03	24794100	ELECTROLYTICCE04G16V 10UF M
CS04	24797010	ELECTROLYTICCE04G50V 1.0UF M
CS05	24797010	ELECTROLYTICCE04G50V 1.0UF M
CS06	24797010	ELECTROLYTICCE04G50V 1.0UF M
CS07	24797010	ELECTROLYTICCE04G50V 1.0UF M
CS08	24797229	ELECTROLYTICCE04G50V 2.2UF M
CS09	24797229	ELECTROLYTICCE04G50V 2.2UF M
CS10	24797229	ELECTROLYTICCE04G50V 2.2UF M
CS13	24591563	PLASTIC FILM CQ921M 50V 0.056MFJ
CS14	24591563	PLASTIC FILM CQ921M 50V 0.056MFJ
CT01	24794221	ELECTROIYTIC CE04G16V 220UF M (21A3TR)
CT02	24232103	CK45F1H103Z (21A3TR)
CT03	24232103	CK45F1H103Z (21A3TR)
CT04	24794101	ELECTROLYTICCE04G16V 10UF M (21A3TR)
CT05	24591104	PLASTIC FILM CQ921M 50V 0.1MF J (21A3TR)
CT06	24794470	ELECTORLYTICCE04G16V 47UF M (21A3TR)
CT07	24794100	ELECTROLYTICCE04G16V 10UF M (21A3TR)
CT08	24353560	CC45CH1H560J (21A3TR)
CT09	24353560	CC45CH1H560J (21A3TR)
CT10	24794470	ELECTORLYTICCE04G16V 47UF M (21A3TR)
CT11	24591104	PLASTIC FILM CQ921M 50V 0.1MF J (21A3TR)
CT12	24794470	ELECTORLYTICCE04G16V 47UF M (21A3TR)
CT13	24591104	PLASTIC FILM CQ921M 50V 0.1MF J (21A3TR)
CT14	24591104	PLASTIC FILM CQ921M 50V 0.1MF J (21A3TR)
CT16	24353220	CC45CH1H220J (21A3TR)
CT17	24591104	PLASTIC FILM CQ921M 50V 0.1MF J (21A3TR)
CT20	24232103	CK45F1H103Z (21A3TR)
CT21	24794101	ELECTROLYTICCE04G16V 10UF M (21A3TR)
CV01	24794470	ELECTORLYTICCE04G16V 47UF M
CV09	24794101	ELECTROLYTICCE04G16V 100UF M
CV10	24793471	ELECTROLYTICCE04G10V 470UF M
CV11	24797010	ELECTROLYTICCE04G50V 1.0UF M

Location No.	Part No.	Description
CV12	24206228	ELECTROLYTICCE04WS 50V 0.22UF M 7L 3A

RESISTORS

Location No.	Part No.	Description
R101	24366682	CARBON,FILM GSB 1/6W6.8K J
R102	24366121	CARBON FILM, 1/6W120 OHM J
R103	24366472	CARBON FILM, 1/6W4.7K OHM J
R104	24366151	CARBON FILM, 1/6W150 OHM J
R105	24366681	CARBON FILM, 1/6W680 OHM J
R106	24366123	CARBON FILM, 1/6W12K OHM J
R117	24366221	CARBON FILM, 1/6W220 OHM J
R118	24366563	CARBON FILM, 1/6W56K OHM J
R123	24366103	CARBON FILM, 1/6W10K OHM J
R124	24366103	CARBON FILM, 1/6W10K OHM J
R127	24366101	CARBON FILM, 1/6W100 OHM J
R128	24366221	CARBON FILM, 1/6W220 OHM J
R129	24366181	CARBON FILM, 1/6W180 OHM J
R130	24366331	CARBON FILM, 1/6W330 OHM J
R132	24366101	CARBON FILM, 1/6W100 OHM J
R133	24366272	CARBON FILM, 1/6W2.7K OHM J
R134	24366221	CARBON FILM, 1/6W220 OHM J
R135	24366101	CARBON FILM, 1/6W100 OHM J
R136	24366202	CARBON FILM, 1/6W2K OHM J
R144	24366152	CARBON FILM, 1/6W1.5K OHM J
R145	24366152	CARBON FILM, 1/6W1.5K OHM J
R151	24366473	CARBON FILM, 1/6W47K OHM J
R152	24366222	CARBON FILM, 1/6W2.2K OHM J
R153	24366222	CARBON FILM, 1/6W2.2K OHM J
R154	24366682	CARBON,FILM GSB 1/6W6.8K J
R156	24553153	OXIDE METAL FILM, 1W15K OHM J
R157	24366473	CARBON FILM, 1/6W47K OHM J
R167	24366151	CARBON FILM, 1/6W150 OHM J
R170	24366390	CARBON,FILM GSB 1/6W39 J
R199	24366684	CARBON FILM, 1/6W680K OHM J
R209	24366222	CARBON FILM, 1/6W2.2K OHM J
R216	24366224	CARBON FILM, 1/6W220K OHM J
R218	24366104	CARBON FILM SB 1/6W100KJ
R227	24366223	CARBON FILM, 1/6W22K OHM J
R228	24366271	CARBON FILM, 1/6W270 OHM J
R229	24366271	CARBON FILM, 1/6W270 OHM J
R230	24366271	CARBON FILM, 1/6W270 OHM J
R233	24366100	CARBON FILM, 1/6W10 OHM J
R301	24366102	CARBON FILM, 1/6W1K OHM J
R302	24366222	CARBON FILM, 1/6W2.2K OHM J (21A3TR)
R303	24366222	CARBON FILM, 1/6W2.2K OHM J (21A3TR)
R304	24366473	CARBON FILM, 1/6W47K OHM J
R305	24322189	METAL FILM 1W1R8 J
R306	24366223	CARBON FILM, 1/6W22K OHM J
R307	24366564	CARBON FILM, 1/6W560K OHM J
R308	24366102	CARBON FILM, 1/6W1K OHM J
R309	24366222	CARBON FILM, 1/6W2.2K OHM J (21A3TR)
R310	24552822	RS14B2H822JB(21A3TR)
R312	24552122	0XIDE RES B 1/2W122J
R313	24366243	CARBON FILM SB 1/6W24K J
R314	24366103	CARBON FILM, 1/6W10K OHM J (21A3TR)
R333	24339569	METAL FILM 2W5R6 J
R336	24383331	OXIDE FILM 2W330J
R370	24321189	METAL FILM 1/2W1R8 J
R371	24366562	CARBON FILM SB 1/6W5.6K J
R372	24366392	CARBON FILM SB 1/6W3.9K J
R373	24366102	CARBON FILM, 1/6W1K OHM J
R374	24366163	CARBON FILM SB 1/6W16K J
R402	24366102	CARBON FILM, 1/6W1K OHM J
R405	24366104	CARBON FILM SB 1/6W100KJ
R408	24366472	CARBON FILM, 1/6W4.7K OHM J
R409	24366822	CARBON FILM, 1/6W8.2K OHM J
R410	24366181	CARBON FILM, 1/6W180 OHM J
R411	24366561	CARBON FILM, 1/6W560 OHM J
R412	24366560	CARBON FILM, 1/6W56 OHM J
R416	24019325	OXIDE FILM 5W2R2K J
R421	24366391	CARBON FILM, 1/6W390 OHM J
R430	24366103	CARBON FILM, 1/6W10K OHM J
R432	24531120	FUSIBLE, 1/2W12 OHM J
R433	24366562	CARBON FILM SB 1/6W5.6K J
R434	24552271	OXIDE MATEL FILM, 1/2W270 OHM J
R435	24366182	CARBON FILM, 1/6W1.8K OHM J
R441	24532102	FUSIBLE, 1W1K OHM J
R447	24553472	0XIDE RES B 1W472J
R448	24321228	METAL FILM 1/2WR22 J
R470	24322688	METAL FILM 1WR68 J
R471	24552301	0XIDE RES B 1/2W301J
R473	24366153	CARBON FILM, 1/6W15K OHM J
R474	24376393	CARBON FILM 1/2W39K J
R479	24552820	OXIDE METAL FILM, 1/2W82 OHM J
R490	24366101	CARBON FILM, 1/6W100 OHM J
R511	24366562	CARBON FILM SB 1/6W5.6K J
R523	24366303	CARBON FILM, 1/6W30K OHM J
R525	24366222	CARBON FILM, 1/6W2.2K OHM J (21A3TR)
R526	24366222	CARBON FILM, 1/6W2.2K OHM J (21A3TR)
R527	24366222	CARBON FILM, 1/6W2.2K OHM J (21A3TR)
R528	24366222	CARBON FILM, 1/6W2.2K OHM J (21A3TR)
R603	24366183	CARBON FILM SB 1/6W18K J
R604	24366220	CARBON FILM, 1/6W22 OHM J
R605	24366102	CARBON FILM, 1/6W1K OHM J
R606	24366223	CARBON FILM, 1/6W22K OHM J
R607	24366223	CARBON FILM, 1/6W22K OHM J
R608	24366102	CARBON FILM, 1/6W1K OHM J
R609	24366220	CARBON FILM, 1/6W22 OHM J
R612	24366103	CARBON FILM, 1/6W10K OHM J
R624	24366104	CARBON FILM SB 1/6W100KJ
R629	24366123	CARBON FILM, 1/6W12K OHM J
R662	24552221	OXIDE METAL FILM, 1/2W220 OHM J
R663	24552221	OXIDE METAL FILM, 1/2W220 OHM J
⚠ R801	24009954	METAL FILN, 1/2W2.2M OHM J
R802	24383123	OXIDE METAL FILM, 2W12K J
R803	24383123	OXIDE METAL FILM, 2W12K J
R804	24366334	CARBON FILM, 1/6W330K OHM J
R805	24366681	CARBON FILM, 1/6W680 OHM J
R807	24366334	CARBON FILM, 1/6W330K OHM J
R808	24019476	THERMISTOR, POSITIVE, AC290V 18 OHM M
R809	24366393	CARBON FILM, 1/6W39K OHM J
R810	24568229	CEMENT, 7W2.2 OHM J
R814	24366103	CARBON FILM, 1/6W10K OHM J
R815	24366332	CARBON F1LM, 1îÄ6ô• 3.3K OHM J
R816	24366471	CARBON F1LM, 1/6W470 OHM J
R817	24366331	CARBON FILM, 1/6W330 OHM J
R818	24366561	CARBON FILM, 1/6W560 OHM J
R819	24366102	CARBON FILM, 1/6W1K OHM J
R820	24988023	METAL FILM 1WR22 J

Location No.	Part No.	Description
R821	24381100	OXIDE FILM 1/2W10 J
R823	24366272	CARBON FILM, 1/6W2.7K OHM J
R824	24568271	CERAMIC COVERED, 7W270 OHM J
R829	24988031	METAL RES B 1W109J
R830	24321279	OXIDE METAL FILM, 1/2W2.7 OHM J
R831	24366471	CARBON F1LM, 1/6W470 OHM J
R840	24531120	FUSIBLE, 1/2W12 OHM J
R841	24366123	CARBON FILM, 1/6W12K OHM J
R846	24366332	CARBON F1LM, 1îÄ6ô• 3.3K OHM J
R848	24366470	CARBON FILM, 1/6W47 OHM J
R883	24552821	0XIDE RES B 1/2W821J
R884	24366681	CARBON FILM, 1/6W680 OHM J
R888	24546228	FUSIBLE, 1/2W0.22 OHM J
R891	24366102	CARBON FILM, 1/6W1K OHM J
⚠ R899	24005014	METAL FILM 1W8R2M J
R901	24552122	0XIDE RES B 1/2W122J
R902	24552122	0XIDE RES B 1/2W122J
R903	24552122	0XIDE RES B 1/2W122J
R904	24366472	CARBON FILM, 1/6W4.7K OHM J
R905	24366150	CARBON FILM, 1/6W15 OHM J
R914	24366101	CARBON FILM, 1/6W100 OHM J
R915	24366471	CARBON F1LM, 1/6W470 OHM J
R917	24366102	CARBON FILM, 1/6W1K OHM J
R920	24000568	FUSIBLE, 1W4.7 OHM J
R921	24366101	CARBON FILM, 1/6W100 OHM J
R922	24366471	CARBON F1LM, 1/6W470 OHM J
R925	24366102	CARBON FILM, 1/6W1K OHM J
R928	24366101	CARBON FILM, 1/6W100 OHM J
R929	24366471	CARBON F1LM, 1/6W470 OHM J
R931	24366229	CARBON FILM, 1/6W2.2 OHM J
R936	24366272	CARBON FILM, 1/6W2.7K OHM J
R937	24366102	CARBON FILM, 1/6W1K OHM J
R938	24552560	OXIDE METAL FILM, 1/2W56 OHM J
R960	24383183	OXIDE RES B 2W183J
R961	24554183	METAL OXIDE FILM, 2W18K OHM J
R963	24383183	OXIDE RES B 2W183J
R972	24366331	CARBON FILM, 1/6W330 OHM J
R974	24366102	CARBON FILM, 1/6W1K OHM J
R977	24366681	CARBON FILM, 1/6W680 OHM J
RA01	24366681	CARBON FILM, 1/6W680 OHM J
RA01	24366392	CARBON FILM SB 1/6W3.9K J (21A3TR)
RA02	24366681	CARBON FILM, 1/6W680 OHM J
RA02	24366392	CARBON FILM SB 1/6W3.9K J (21A3TR)
RA03	24366681	CARBON FILM, 1/6W680 OHM J
RA03	24366392	CARBON FILM SB 1/6W3.9K J (21A3TR)
RA04	24366102	CARBON FILM, 1/6W1K OHM J
RA05	24366102	CARBON FILM, 1/6W1K OHM J
RA06	24366102	CARBON FILM, 1/6W1K OHM J
RA07	24366102	CARBON FILM, 1/6W1K OHM J
RA08	24366102	CARBON FILM, 1/6W1K OHM J
RA10	24366102	CARBON FILM, 1/6W1K OHM J
RA12	24366103	CARBON FILM, 1/6W10K OHM J
RA13	24366102	CARBON FILM, 1/6W1K OHM J
RA14	24366103	CARBON FILM, 1/6W10K OHM J
RA15	24366752	CARBON FILM SB 1/6W7.5K J
RA15	24366273	RD14G2C273JH (21A3TR)
RA16	24366102	CARBON FILM, 1/6W1K OHM J
RA17	24366102	CARBON FILM, 1/6W1K OHM J
RA18	24366102	CARBON FILM, 1/6W1K OHM J
RA19	24366221	CARBON FILM, 1/6W220 OHM J
RA21	24366681	CARBON FILM, 1/6W680 OHM J
RA21	24366222	CARBON FILM, 1/6W2.2K OHM J (21A3TR)
RA22	24366472	CARBON FILM, 1/6W4.7K OHM J

Location No.	Part No.	Description
RA23	24366472	CARBON FILM, 1/6W4.7K OHM J
RA24	24366472	CARBON FILM, 1/6W4.7K OHM J
RA25	24366152	CARBON FILM, 1/6W1.5K OHM J
RA26	24366102	CARBON FILM, 1/6W1K OHM J
RA27	24366102	CARBON FILM, 1/6W1K OHM J
RA31	24366101	CARBON FILM, 1/6W100 OHM J
RA32	24366101	CARBON FILM, 1/6W100 OHM J
RA33	24366471	CARBON F1LM, 1/6W470 OHM J
RA35	24366102	CARBON FILM, 1/6W1K OHM J
RA36	24366103	CARBON FILM, 1/6W10K OHM J
RA37	24366331	CARBON FILM, 1/6W330 OHM J
RA38	24366331	CARBON FILM, 1/6W330 OHM J
RA39	24366102	CARBON FILM, 1/6W1K OHM J
RA40	24366102	CARBON FILM, 1/6W1K OHM J
RA41	24366102	CARBON FILM, 1/6W1K OHM J
RA42	24366103	CARBON FILM, 1/6W10K OHM J
RA50	24366223	CARBON FILM, 1/6W22K OHM J
RA51	24366392	CARBON FILM SB 1/6W3.9K J
RA52	24366392	CARBON FILM SB 1/6W3.9K J
RA53	24366123	CARBON FILM, 1/6W12K OHM J
RA54	24366471	CARBON F1LM, 1/6W470 OHM J
RA55	24366333	CARBON FILM, 1/6W33K OHM J
RA56	24366394	CARBON FILM, 1/6W390K OHM J
RA57	24366471	CARBON F1LM, 1/6W470 OHM J
RA60	24366103	CARBON FILM, 1/6W10K OHM J
RA61	24366103	CARBON FILM, 1/6W10K OHM J
RA62	24366103	CARBON FILM, 1/6W10K OHM J
RA65	24366333	CARBON FILM, 1/6W33K OHM J
RA67	24366103	CARBON FILM, 1/6W10K OHM J
RA68	24366103	CARBON FILM, 1/6W10K OHM J
RA70	24366333	CARBON FILM, 1/6W33K OHM J
RA71	24366103	CARBON FILM, 1/6W10K OHM J
RA73	24366223	CARBON FILM, 1/6W22K OHM J
RA74	24366103	CARBON FILM, 1/6W10K OHM J
RA75	24366103	CARBON FILM, 1/6W10K OHM J
RB01	24366271	CARBON FILM, 1/6W270 OHM J
RB09	24366470	CARBON FILM, 1/6W47 OHM J
RB11	24366103	CARBON FILM, 1/6W10K OHM J
RB20	24366823	CARBON FILM, 1/6W82K OHM J
RB22	24366472	CARBON FILM, 1/6W4.7K OHM J
RB26	24366472	CARBON FILM, 1/6W4.7K OHM J
RB27	24366103	CARBON FILM, 1/6W10K OHM J
RB28	24366104	CARBON FILM SB 1/6W100KJ
RB30	24366103	CARBON FILM, 1/6W10K OHM J
RB43	24366103	CARBON FILM, 1/6W10K OHM J
RB44	24366682	CARBON,FILM GSB 1/6W6.8K J
RB45	24366221	CARBON FILM, 1/6W220 OHM J
RF01	24366103	CARBON FILM, 1/6W10K OHM J
RF02	24366103	CARBON FILM, 1/6W10K OHM J
RF03	24366102	CARBON FILM, 1/6W1K OHM J
RF04	24366471	CARBON F1LM, 1/6W470 OHM J
RF05	24366471	CARBON F1LM, 1/6W470 OHM J
RF06	24366221	CARBON FILM, 1/6W220 OHM J
RF07	24366471	CARBON F1LM, 1/6W470 OHM J
RF08	24366472	CARBON FILM, 1/6W4.7K OHM J
RF09	24366472	CARBON FILM, 1/6W4.7K OHM J
RF10	24366223	CARBON FILM, 1/6W22K OHM J
RF11	24366101	CARBON FILM, 1/6W100 OHM J
RF12	24366222	CARBON FILM, 1/6W2.2K OHM J
RS01	24366103	CARBON FILM, 1/6W10K OHM J
RS02	24366471	CARBON F1LM, 1/6W470 OHM J
RS03	24366103	CARBON FILM, 1/6W10K OHM J
RS04	24366101	CARBON FILM, 1/6W100 OHM J
RS05	24366223	CARBON FILM, 1/6W22K OHM J

Location No.	Part No.	Description
RS06	24366103	CARBON FILM, 1/6W10K OHM J
RS07	24366101	CARBON FILM, 1/6W100 OHM J
RS08	24366103	CARBON FILM, 1/6W10K OHM J
RS09	24366222	CARBON FILM, 1/6W2.2K OHM J
RS10	24366471	CARBON F1LM, 1/6W470 OHM J
RS11	24366223	CARBON FILM, 1/6W22K OHM J
RS12	24366472	CARBON FILM, 1/6W4.7K OHM J
RS13	24366101	CARBON FILM, 1/6W100 OHM J
RS14	24366472	CARBON FILM, 1/6W4.7K OHM J
RS15	24366103	CARBON FILM, 1/6W10K OHM J
RS16	24366101	CARBON FILM, 1/6W100 OHM J
RS17	24366222	CARBON FILM, 1/6W2.2K OHM J
RS18	24366103	CARBON FILM, 1/6W10K OHM J
RS19	24366101	CARBON FILM, 1/6W100 OHM J
RS20	24366222	CARBON FILM, 1/6W2.2K OHM J
RS21	24366272	CARBON FILM, 1/6W2.7K OHM J
RS22	24366101	CARBON FILM, 1/6W100 OHM J
RS23	24366222	CARBON FILM, 1/6W2.2K OHM J
RS24	24366272	CARBON FILM, 1/6W2.7K OHM J
RS25	24366182	CARBON FILM, 1/6W1.8K OHM J
RS26	24366182	CARBON FILM, 1/6W1.8K OHM J
RT01	24366101	CARBON FILM, 1/6W100 OHM J (21A3TR)
RT02	24366101	CARBON FILM, 1/6W100 OHM J (21A3TR)
RT03	24366102	CARBON FILM, 1/6W1K OHM J (21A3TR)
RT04	24366102	CARBON FILM, 1/6W1K OHM J (21A3TR)
RT05	24366100	CARBON FILM, 1/6W10 OHM J (21A3TR)
RT13	24366102	CARBON FILM, 1/6W1K OHM J (21A3TR)
RT14	24366222	CARBON FILM, 1/6W2.2K OHM J (21A3TR)
RT15	24366333	CARBON FILM, 1/6W33K OHM J (21A3TR)
RT16	24366103	CARBON FILM, 1/6W10K OHM J (21A3TR)
RT17	24366561	CARBON FILM, 1/6W560 OHM J (21A3TR)
RT18	24366152	CARBON FILM, 1/6W1.5K OHM J (21A3TR)
RT19	24366122	RD14G2C122JH (21A3TR)
RT27	24367243	RD14G2C243G (21A3TR)
RT28	24366101	CARBON FILM, 1/6W100 OHM J (21A3TR)
RT30	24366472	CARBON FILM, 1/6W4.7K OHM J (21A3TR)
RT31	24366472	CARBON FILM, 1/6W4.7K OHM J (21A3TR)
RT32	24366472	CARBON FILM, 1/6W4.7K OHM J (21A3TR)
RT33	24366472	CARBON FILM, 1/6W4.7K OHM J (21A3TR)
RT34	24366472	CARBON FILM, 1/6W4.7K OHM J (21A3TR)
RT38	24366151	CARBON FILM, 1/6W150 OHM J (21A3TR)
RT39	24366102	CARBON FILM, 1/6W1K OHM J (21A3TR)
RT40	24366151	CARBON FILM, 1/6W150 OHM J (21A3TR)
RT43	24366151	CARBON FILM, 1/6W150 OHM J (21A3TR)
RT46	24366332	CARBON F1LM, 1/6 3.3K OHM J (21A3TR)
RT47	24366332	CARBON F1LM, 1/6 3.3K OHM J (21A3TR)
RT48	24366332	CARBON F1LM, 1/6 3.3K OHM J (21A3TR)
RV01	24366750	CARBON FILM, 1/6W75 OHM J
RV02	24366101	CARBON FILM, 1/6W100 OHM J
RV03	24366103	CARBON FILM, 1/6W10K OHM J
RV08	24366102	CARBON FILM, 1/6W1K OHM J
RV09	24552101	OXIDE METAL FILM, 1/2W100 OHM J
RV11	24366750	CARBON FILM, 1/6W75 OHM J
RV12	24366391	CARBON FILM, 1/6W390 OHM J
RV13	24366101	CARBON FILM, 1/6W100 OHM J
RV14	24366102	CARBON FILM, 1/6W1K OHM J
RV15	24366102	CARBON FILM, 1/6W1K OHM J
RV16	24366471	CARBON F1LM, 1/6W470 OHM J
RV17	24366750	CARBON FILM, 1/6W75 OHM J
RV18	24366750	CARBON FILM, 1/6W75 OHM J

COILS & TRANSFORMERS

L102	23238560	COIL, PEAKING-0.68MMH K COLTRF4R68AJ
L103	23238560	COIL, PEAKING-0.68MMH K COLTRF4R68AJ
L106	23289829	COIL, PEAKING 8.2MMHJ 405 TRF48R2AF
L107	23289689	COIL, PEAKING 6.8MMHJ 405 TRF46R8AF
L108	23289180	COIL, PEAKING, TRF4180AF
L110	23289229	COIL, PEAKING, TRF4229AF
L111	23289229	COIL, PEAKING, TRF4229AF
L161	23262291	COIL, IF COIL 40MHZ 7K6 TRF1241AF
L183	23289120	COIL, PEAKING-12MMHJ COLTRF4120AF
L301	23103894	FILTER, FERRITE BEAD 3.5X4.5 TEM2011AW
L430	23289470	COIL, PEAKING, TRF4470AF
L431	23289229	COIL, PEAKING, TRF4229AF
L432	23289229	COIL, PEAKING, TRF4229AF
L441	23233987	COIL, HORZ.LINEARITY TLN2112AC
L462	23231054	COIL, DEFLECTION YOKE, TDY621UA, 21INCH
L462A	23997351	CONV.HOSEIHEN YH TC-0
L462B	23199314	COMPENSATOR, DEFLECTION YOKE
L462C	23993623	COMPENSATOR
L499	23238713	COIL, PEAKING, TRF4120AJ
L501	23103824	23103824A NI TOOGO, TEM2028K
L502	23103824	23103824A NI TOOGO, TEM2028K
L511	23289100	COIL, PEAKING, TRF4100AF
L525	23289100	COIL, PEAKING, TRF4100AF
L661	23238554	COIL, PEAKING 0.22MMHK
L805	23248234	COIL, CHOKE 8X10H 2.0MMH 4.0A TLN3481AC
L806	23248234	COIL, CHOKE 8X10H 2.0MMH 4.0A TLN3481AC
L811	23103894	FILTER, FERRITE BEAD 3.5X4.5 TEM2011AW
L814	23221747	COIL, CHOKE, TRF9253D
L883	23103894	FILTER, FERRITE BEAD 3.5X4.5 TEM2011AW
L885	23248230	COIL, CHOKE TLN3142AC

Location No.	Part No.	Description
L886	23103894	FILTER, FERRITEBEAD 3.5X4.5 TEM2011AW
⚠ L901	23200316	DEGAUSSER COIL 21 , 2170XHE TSB-2301AL
LA01	23289100	COIL, PEAKING, TRF4100AF
LA02	23289330	COIL, PEAKING, TRF4330AF
LF01	23289120	COIL, PEAKING-12MMHJ COLTRF4120AF
LT01	23238506	OOLTRF4229AJ (21A3TR)
LT02	23238506	OOLTRF4229AJ (21A3TR)
LT03	23289229	OOLTRF42R2AF (21A3TR)
LT04	23238506	OOLTRF4229AJ (21A3TR)
LT05	23238506	OOLTRF4229AJ (21A3TR)
LT06	24366681	CARBON FILM, 1/6W680 OHM J (21A3TR)
LT07	23238506	OOLTRF4229AJ (21A3TR)
LT08	23238506	OOLTRF4229AJ (21A3TR)
LT09	23238506	OOLTRF4229AJ (21A3TR)
LT10	23238506	OOLTRF4229AJ (21A3TR)
T401	23224983	TRANSFORMER, HORIZONTAL DRIVE, TLN1039
⚠ T461	23236615	TRANSFORMER, FLY-BACKTFB4125DY
⚠ T801	23211745	COIL, LINE FILTER (21A3E/21A3M/21A3MJ)
T801	23211702	COLTRF3221AM (21A3TR)
⚠ T862	23217527	CONV TRS EER35 21A3DE 115

SEMICONDUCTORS

Q101	23114815	TRANSISTOR, 2SC388ATM(FA)
Q108	23314962	TRANSISTOR, KTA1266 Y
Q130	23114623	TRANSISTOR, 2SC2878-A(TEM
Q131	23314962	TRANSISTOR, KTA1266 Y
Q209	23314965	TRANSISTOR, KTC3198 Y
Q301	23319833	IC, TA8403K
Q301B	72471081	SCREW, 3X8MM
Q302	23314962	TRANSISTOR, KTA1266 Y (21A3TR)
Q303	23314962	TRANSISTOR, KTA1266 Y (21A3TR)
Q304	23314962	TRANSISTOR, KTA1266 Y (21A3TR)
Q310	23114462	TRANSISTOR, RN1202 (21A3TR)
Q311	23114460	TRANSISTOR, RN1204 (21A3TR)
Q370	23314962	TRANSISTOR, KTA1266 Y
Q402	23114755	TRANSISTOR, 2SC2482FA-1
Q404	23314375	TRANSISTOR, ON4409
Q404B	72471082	SCREW, 3X10MM
Q421	23314141	TRANSISTOR, 2SC3852
Q430	23314980	TRANSISTOR, POWER AMPLIFIER 2SD2549 P
Q432	23114455	TRANSISTOR, DTC124ES
Q470	23114541	TRANSISTOR, 2SA1320
Q501	23000702	IC, P/N/S 1CHIP IC SDIP56 TB1254AN
Q610	23000867	IC, SOUND OUTPUT 12PIN
Q610B	70391355	SCREW, 3X8MM
Q612	23314962	TRANSISTOR, KTA1266 Y
Q620	23114478	TRANSISTOR, RN2004
Q801	23135010	IC, STR-G6653
Q801B	70391355	SCREW, 3X8MM
Q817	23314965	TRANSISTOR, KTC3198 Y
Q818	23114469	TRANSISTOR, R1=R2=4.7K-OHM TO92SRN2201
Q819	23314965	TRANSISTOR, KTC3198 Y
Q830	23314141	TRANSISTOR, 2SC3852
Q830B	70391355	SCREW, 3X8MM
Q840	23318299	IC, L78MR05-FA
Q843	23114459	TRANSISTOR, RN1205

Location No.	Part No.	Description
Q846	23114540	TRANSISTOR, VCBO250V IC50MA TO922SC3333
⚠ Q862	23906937	IC, PHOTO COUPLER, ON3171-R
Q901	23114756	TRANSISTOR, 2SC2482
Q903	23114756	TRANSISTOR, 2SC2482
Q905	23114756	TRANSISTOR, 2SC2482
Q907	23314962	TRANSISTOR, KTA1266 Y
Q908	23114429	TRANSISITOR, 2SC2120-Y(TE
QA01	23000877	IC, MCU 1CHIP 8BIT 8M 42P (21A3E)
QA01	23000938	IC, 87CK38N (21A3TR/21A3M/21A3MJ)
QA02	23906922	IC, CAT24WC04P
QA51	23314965	TRANSISTOR, KTC3198 Y
QA52	23314962	TRANSISTOR, KTA1266 Y
QB01	23314965	TRANSISTOR, KTC3198 Y
QB20	23114457	TRANSISTOR, DTC143E S
QB21	23314965	TRANSISTOR, KTC3198 Y
QB30	23314965	TRANSISTOR, KTC3198 Y
QB40	23314965	TRANSISTOR, KTC3198 Y
QB60	23314965	TRANSISTOR, KTC3198 Y
QB61	23314965	TRANSISTOR, KTC3198 Y
QF01	B0470153	IC, CMOS 4CH MULTIPLEXER
QF02	23314965	TRANSISTOR, KTC3198 Y
QF03	23314965	TRANSISTOR, KTC3198 Y
QS01	23114623	TRANSISTOR, 2SC2878-A(TEM
QS02	23114623	TRANSISTOR, 2SC2878-A(TEM
QS03	23314965	TRANSISTOR, KTC3198 Y
QS04	23314965	TRANSISTOR, KTC3198 Y
QS05	23314965	TRANSISTOR, KTC3198 Y
QS06	23314965	TRANSISTOR, KTC3198 Y
QT01	23000470	IC, SAA5264PSM3C (21A3TR)
QT02	23314965	TRANSISTOR, KTC3198 Y (21A3TR)
QT03	23114437	TRANSISTOR, 2SC752GTM Y (21A3TR)
QT04	23314962	TRANSISTOR, KTA1266 Y (21A3TR)
QT06	23906484	IC, BA033T (21A3TR)
QT07	23906242	IC, CAT24C02P (21A3TR)
QV01	23318916	MC14053BCP
QV08	23314965	TRANSISTOR, KTC3198 Y
QV10	23314965	TRANSISTOR, KTC3198 Y
QV11	23314965	TRANSISTOR, KTC3198 Y
D101	23316411	DIODE, ZENER, HZT33-12
D111	23357273	DIODE, ZV=6.52-6.79
D150	23357354	DIODE, VR=35V IF=100MA DO-34 MA2C858
D221	23357341	DIODE, VF=1.2V DO-34 1SS133
D222	23357341	DIODE, VF=1.2V DO-34 1SS133
D223	23357341	DIODE, VF=1.2V DO-34 1SS133
D224	23357341	DIODE, VF=1.2V DO-34 1SS133
D301	23118094	DIODE, EU2A
D302	23118094	DIODE, EU2A
D303	23357341	DIODE, VF=1.2V DO-34 1SS133 (21A3TR)
D304	23357341	DIODE, VF=1.2V DO-34 1SS133 (21A3TR)
D305	23357341	DIODE, VF=1.2V DO-34 1SS133 (21A3TR)
D370	23357253	DIODE, ZV=3.47-3.68
D406	23118479	DIODE, BYD33J
D408	23118479	DIODE, BYD33J
D421	23357285	DIODE, ZV=9.48-9.90
D431	23357285	DIODE, ZV=9.48-9.90
D433	23357341	DIODE, VF=1.2V DO-34 1SS133
D436	23357341	DIODE, VF=1.2V DO-34 1SS133
D440	23316254	DIODE, ERC06-15

Location No.	Part No.	Description
D441	23357267	DIODE, ZV=5.46-5.70
D444	23118338	DIODE, RU4AM LF-K2
D470	23357291	DIODE, ZV=11.50-11.92
D490	23357341	DIODE, VF=1.2V DO-34 1SS133
D498	23357341	DIODE, VF=1.2V DO-34 1SS133
D612	23357341	DIODE, VF=1.2V DO-34 1SS133
D620	23357341	DIODE, VF=1.2V DO-34 1SS133
D621	23357341	DIODE, VF=1.2V DO-34 1SS133
D622	23357341	DIODE, VF=1.2V DO-34 1SS133
D801	23357237	DIODE, BRIDGE 600V 4A 4P-SIP TS4B05G-A1
D805	23357341	DIODE, VF=1.2V DO-34 1SS133
D806	23118094	DIODE, EU2A
D809	23357267	DIODE, ZV=5.46-5.70
D810	23357317	DIODE, ZV=24.97-26.26
D812	23118094	DIODE, EU2A
D815	23357317	DIODE, ZV=24.97-26.26
D817	23357341	DIODE, VF=1.2V DO-34 1SS133
D818	23357295	DIODE, ZV=13.03-13.62
D819	23357273	DIODE, ZV=6.52-6.79
D830	23357264	DIODE, ZV=4.97-5.18
D846	23357270	DIODE, ZV=5.99-6.24
D883	23118094	DIODE, EU2A
D885	23118094	DIODE, EU2A
D901	23357341	DIODE, VF=1.2V DO-34 1SS133
D904	23357341	DIODE, VF=1.2V DO-34 1SS133
D905	23357341	DIODE, VF=1.2V DO-34 1SS133
D906	23357341	DIODE, VF=1.2V DO-34 1SS133
DA42	23357270	DIODE, ZV=5.99-6.24
DB01	23358566	LED, LAMP RED
DB30	23357341	DIODE, VF=1.2V DO-34 1SS133
DT01	23357341	DIODE, VF=1.2V DO-34 1SS133 (21A3TR)
DV01	23357341	DIODE, VF=1.2V DO-34 1SS133

MISCELLANEOUS

B405	23451788	HOLDER.(POWER CORD), 1450TE
E912	23848729	WEDGE,YOKE HOLDING, 3 REQUIRED
⚠ F470	23144827	FUSE, CARTRIDGE 5.2X20250V 0.63A
F470A	23165433	FUSE HOLDER, 5.2 SOC
⚠ F801	23144834	FUSE, CARTRIDGE 5.2X20250V 3.15A
F801A	23165433	FUSE HOLDER, 5.2 SOC
G102	23248229	COIL, CHOKE TLN3040AC
G218	24366182	CARBON FILM, 1/6W 1.8K OHM J
G303	24321109	OXIDE METAL FILM, 1/2W 1 OHM J
G410	23103894	FILTER, FERRITE BEAD 3.5X4.5 TEM2011AW
G810	23103894	FILTER, FERRITE BEAD 3.5X4.5 TEM2011AW
G882	23357248	DIODE, ZV=2.69-2.91
G883	23357341	DIODE, VF=1.2V DO-34 1SS133
GA02	24366470	CARBON FILM, 1/6W 47 OHM J
GA21	23357341	DIODE, VF=1.2V DO-34 1SS133 (21A3TR)
GA22	23357341	DIODE, VF=1.2V DO-34 1SS133 (21A3TR)
GA23	23357341	DIODE, VF=1.2V DO-34 1SS133 (21A3TR)
GA24	23357341	DIODE, VF=1.2V DO-34 1SS133 (21A3TR)
GJ07	24366472	CARBON FILM, 1/6W 4.7K OHM J
GJ08	24366472	CARBON FILM, 1/6W 4.7K OHM J
KB01	23906805	IC, REMOTE PHOTO RECIEVER PIC-TB17

Location No.	Part No.	Description
N724	23965900	TAPE, GLASS-CLOTH, W/ADHESIVE W=18 T=0.18
P661	23363607	JACK, HEAD PHONE, 3.5MM
⚠ P801	23372159	POWER CORD, CEE 250V 2.5A (21A3E/21A3TR)
⚠ P801	23372160	POWER CORD, CEE 250V 2.5A (21A3M/21A3MJ)
P910	23164725	PLUG, 2P
PV01	23365576	JACK, 0S9P
PV02	23365763	JACK, PIN, 3P
⚠ S801	23344429	SWITCH, POWER PUSH 2C1PTV8 AAP8Y22111N
SA02	23344443	SWITCH, TACTING SWITCH TSV TYP TSVB-1
SA03	23344443	SWITCH, TACTING SWITCH TSV TYP TSVB-1
SA04	23344443	SWITCH, TACTING SWITCH TSV TYP TSVB-1
⚠ V901A	23903142	SOCKET, CRT 22 SMK CVT3325-0221R
V901M	23102409	MAGNET
W661	23351180	SPEAKER,60X120 8-OHM 3W
W662	23351180	SPEAKER,60X120 8-OHM 3W
X501	23153979	CRYSTAL,4.43MHZ PAL-APC
XA01	23153436	CERAMIC RESONATOR, 8.00MHZ, EFOEC8004
XT01	23153930	CRYSTAL (21A3TR)
Z101	23303188	CERAMIC TRAP, TCF1113
Z102	23303191	CERAMIC TRAP, TCF1116
Z103	23303271	FIL CTRAP 4.5MHZ TRAP
Z130	23303230	FILTER, 38MHZ MULTIF816KPL F816KPL
Z801	23144480	PROTECT0R, CURRENT, AC125V 3.15A
ZF01	23303269	FIL CFILT 6.0MHZ BPF
ZF02	23303267	FIL CFILT 4.5MHZ BPF
ZF03	23303268	FIL CFILT 5.5MHZ BPF
ZF04	23303270	FIL CFILT 6.5MHZ BPF

PC BOARD ASSEMBLIES

✻ U901	23786375	PC BOARD ASSY, PD0157 CRT
✻ U902	23786376	PC BOARD ASSY, PD0158 MAI (21A3E)
✻ U902	23786773	PC BOARD ASSY, PD0303 MAI (21A3TR)
✻ U902	23786772	PC BOARD ASSY, PD0302 MAI (21A3M/21A3MJ)

PICTURE TUBE

⚠ V901	23312804	PICTURE TUBE, 54SX503Y22-DC21, 20VITCLH2.72LV20

TUNER

H001	23321417	ETNW AM 1UIFIFIPLL 5V

ACCESSORIES

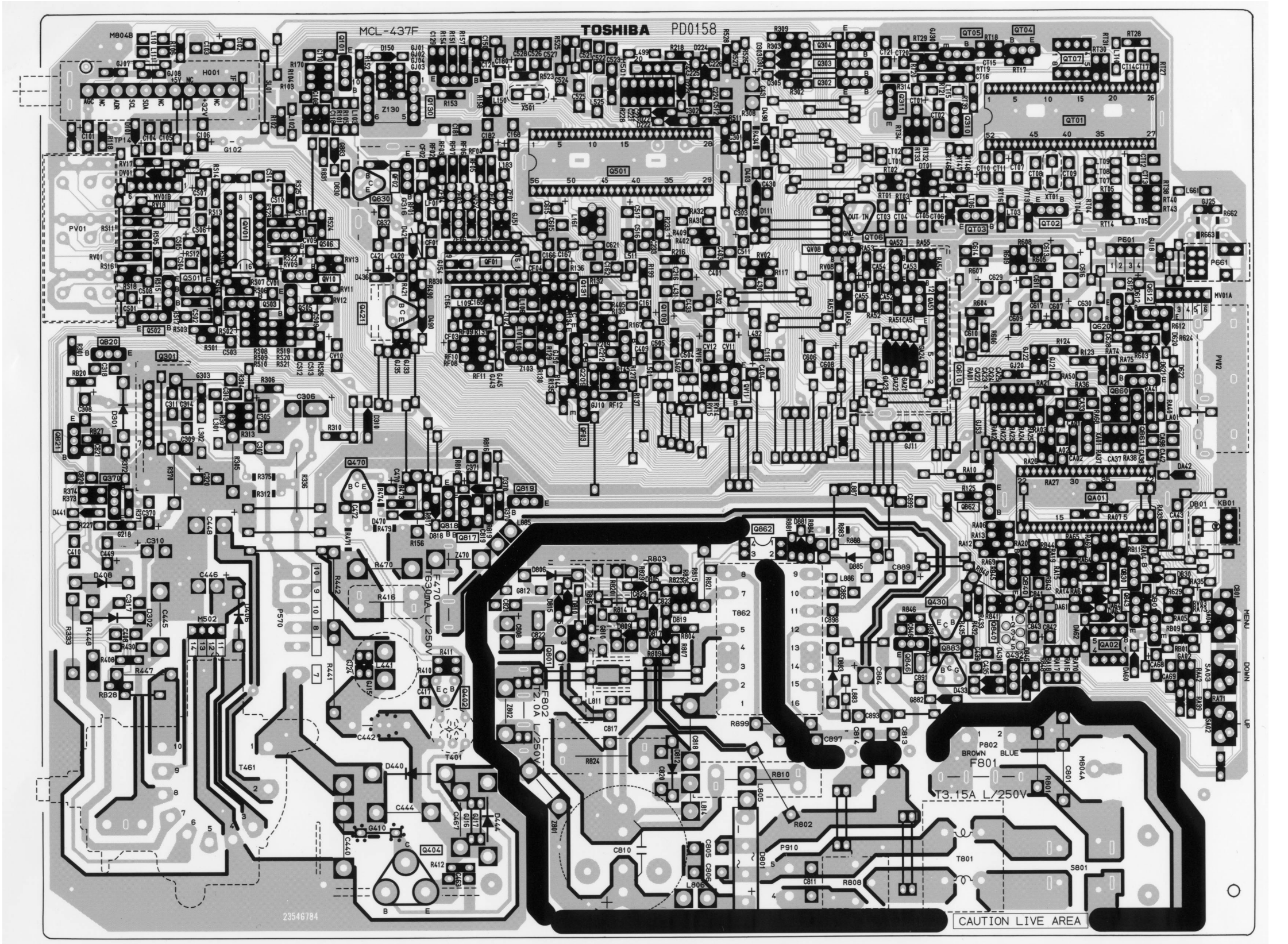
K902	23306237	REMOTE CONTROL TRANSMITTER, CT-9922 (21A3E/21A3M/21A3MJ)
K902	23306167	CT-9858 (21A3TR)
Y101A	23565281	OWNER'S MANUAL, ENG 21A3E/21A3M/21A3MJ
Y101A	23565331	OWNER'S MANUAL, ENG 21A3TR
Y102	23565282	OWNER'S MANUAL, SAFETY IN
Y108	23122780	ADAPTER (21A3M/21A3MJ)
Y120	23943846	COVER POLY
Y125	23142010	ANT ADAPTOR (21A3M/21A3MJ)
Y126	23323051	ANTENNER (21A3M/21A3MJ)

Location No.	Part No.	Description
CABINET PARTS		
A201	23540637	COVER, FRONT COVER (21A3E/21A3M/21A3MJ)
A201	23540798	FRONT COVER (21A3TR)
A264	23445497	KNOB,POWER BUTTON
A265	23445498	KNOB,CONTROLBUTTON
A270	23836867	SPRING
A275	23035412	SCREW
A276	23035412	SCREW
A277	23035412	SCREW
⚠ A401	23540631	COVER, BACK COVER
A403	23553194	LABEL (21A3E)
A403	23553240	LABEL (21A3TR)
A403	23553238	LABEL (21A3M)
A403	23553239	LABEL (21A3MJ)
A511	23035412	SCREW
A512	23035412	SCREW
A525	23037312	SCREW
A701	23064567	CARTON, CASE 21A3E (21A3E)
A701	23064596	CASE (21A3TR)
A701	23064594	CASE (21A3M)
A701	23064595	CASE (21A3MJ)
A702A	23946218	PACKING,TOP PACKING 21A3
A702B	23946219	PACKING,BOTTOM PACKING 2

Location No.	Part No.	Description

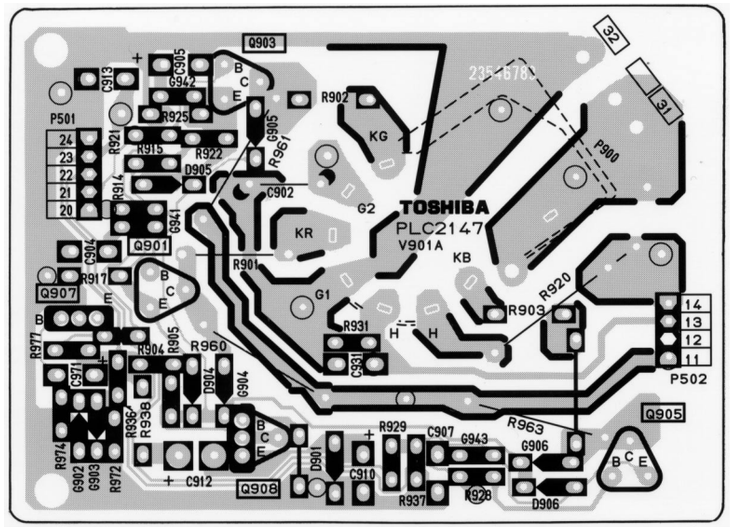
MAIN BOARD PD0302
MAIN BOARD PD0303
MAIN BOARD PD0158

BOTTOM (FOIL) SIDE



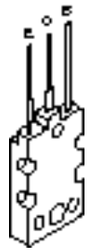
CRT-D BOARD PD0157

BOTTOM (FOIL) SIDE

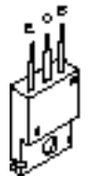


TERMINAL VIEW OF TRANSISTORS

① 2SD2253 (old) 2SC5243



② 2SC3852
2SD1763A
2SC1569
2SC4544
2SA1788
2SA1306
2SA1186A



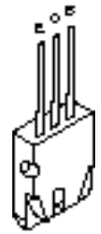
③ 2SC752GTM
2SC2482
2SC2655
2SC4721P



④ 2SC752
2SA562TM
2SA1015
2SC1815
2SC2878
2SC1740S
2SC2120
2SA9335



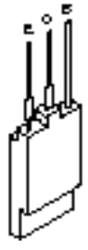
⑤ 2SA1788



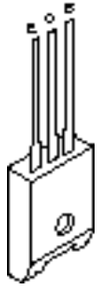
⑥ RN2203
RN2201
RN2004
RN1203
RN1204
RN2204
RN1205
RN1202
RN1201



⑦ 2SD1554
2SD2253
2SD1556
2SC5143
2SD2553



⑧ ON4409



SCHEMATIC DIAGRAM

MODEL : 21A3E / 21A3TR
21A3M / 21A3MJ

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" 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  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 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 MODEL : 21A3E / 21A3TR 21A3M / 21A3MJ

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" 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 —||— 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 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.

U902 MAIN BOARD PD0158

TEXT BLOCK

U901 CRT DRIVE BOARD PD0157

PAL/NTSC Q501 ICHIP TB1254AN

× KETSU means to open the circuit.

× MARK ARE DIFFERENCE POINTS.

21A3E 21A3TR 21A3MX
21A3H 21A3G 21A3VE
21A3M/MJ 21A3T 21A3VX
21A3R

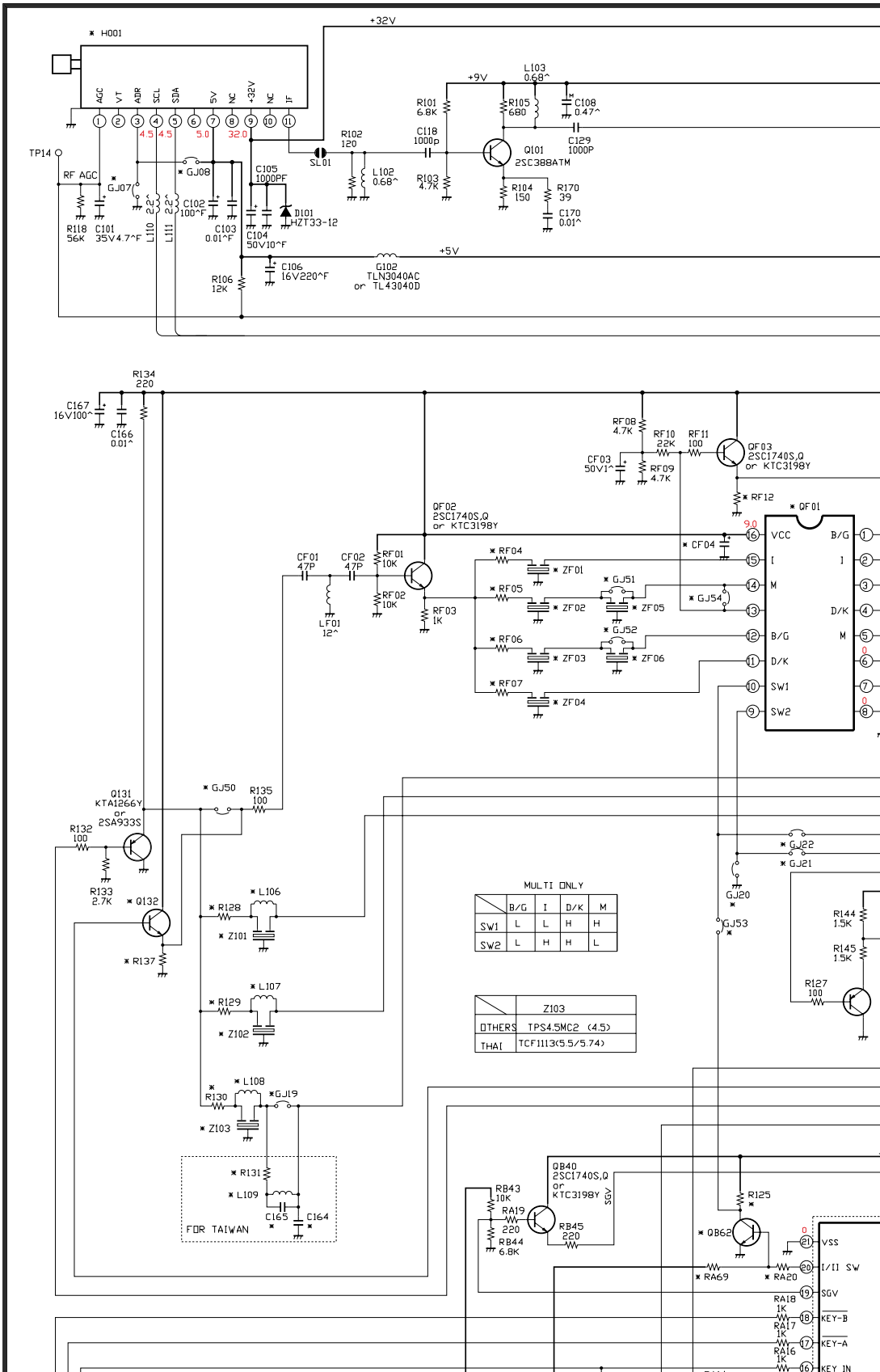
MAIN/CRT (SIE)

CAUTION
DO NOT USE DIGITAL VOLTMETER FOR MEASURING COLLECTOR VOLTAGE OF Q404.

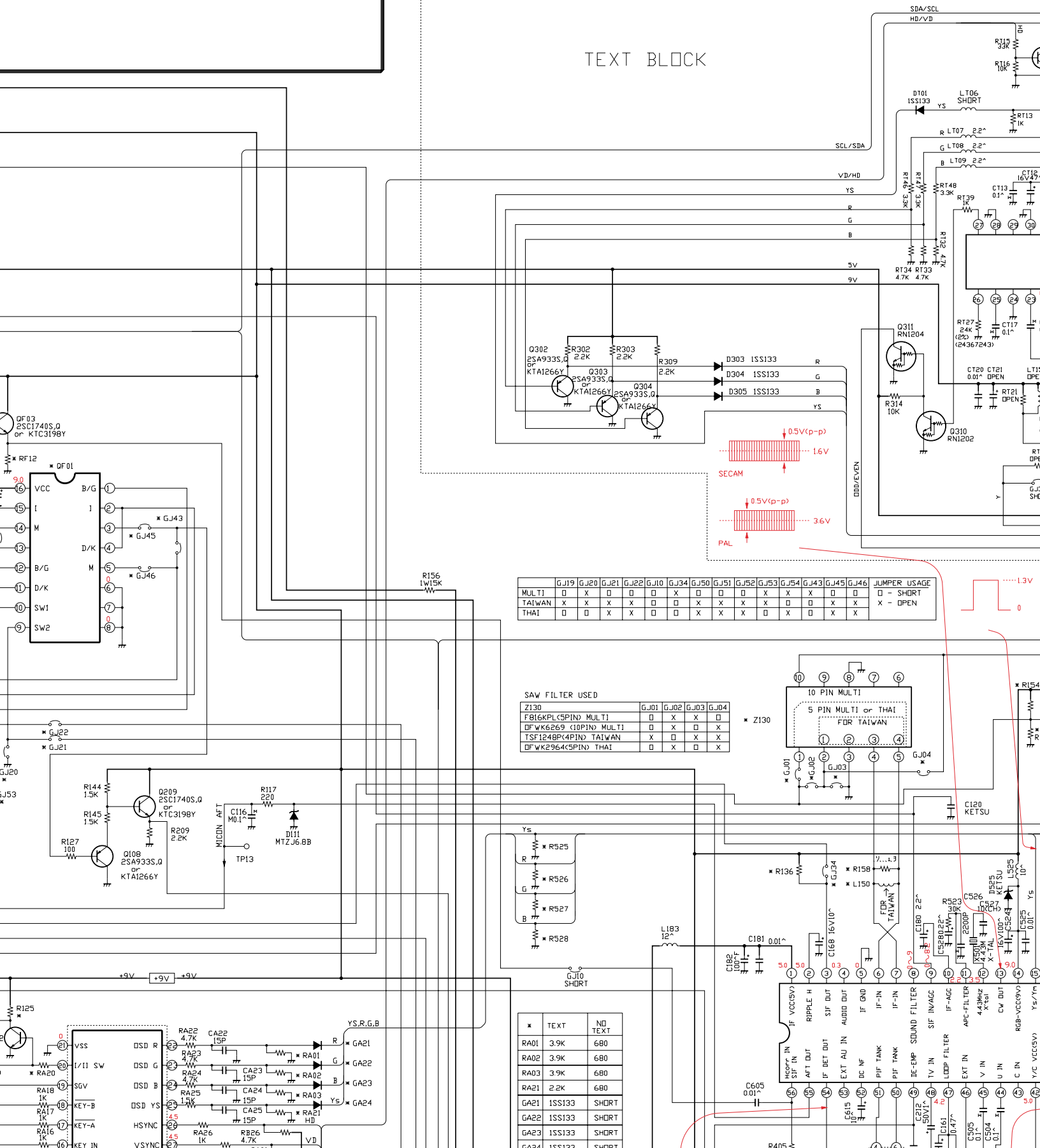
H001 USAGE (ECA33LX1/2/36 ONLY)

	ECA33LX6	ECA33LX3	ECA33LX1	ECA33LX2
GJ07	4.7K	OPEN	OPEN	OPEN
GJ08	4.7K	OPEN	OPEN	OPEN

U902 MAIN BOARD PD0158



TEXT BLOCK

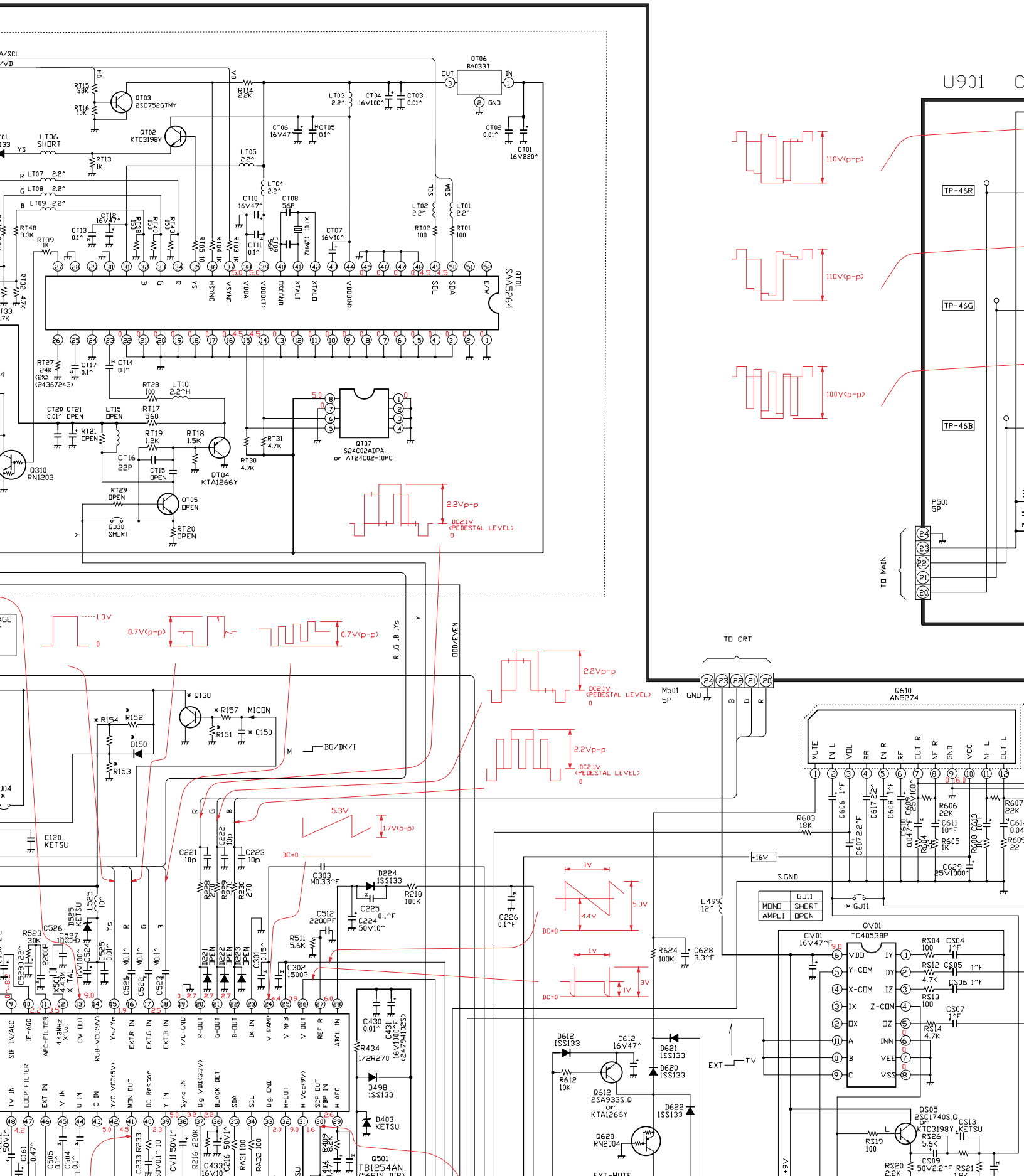


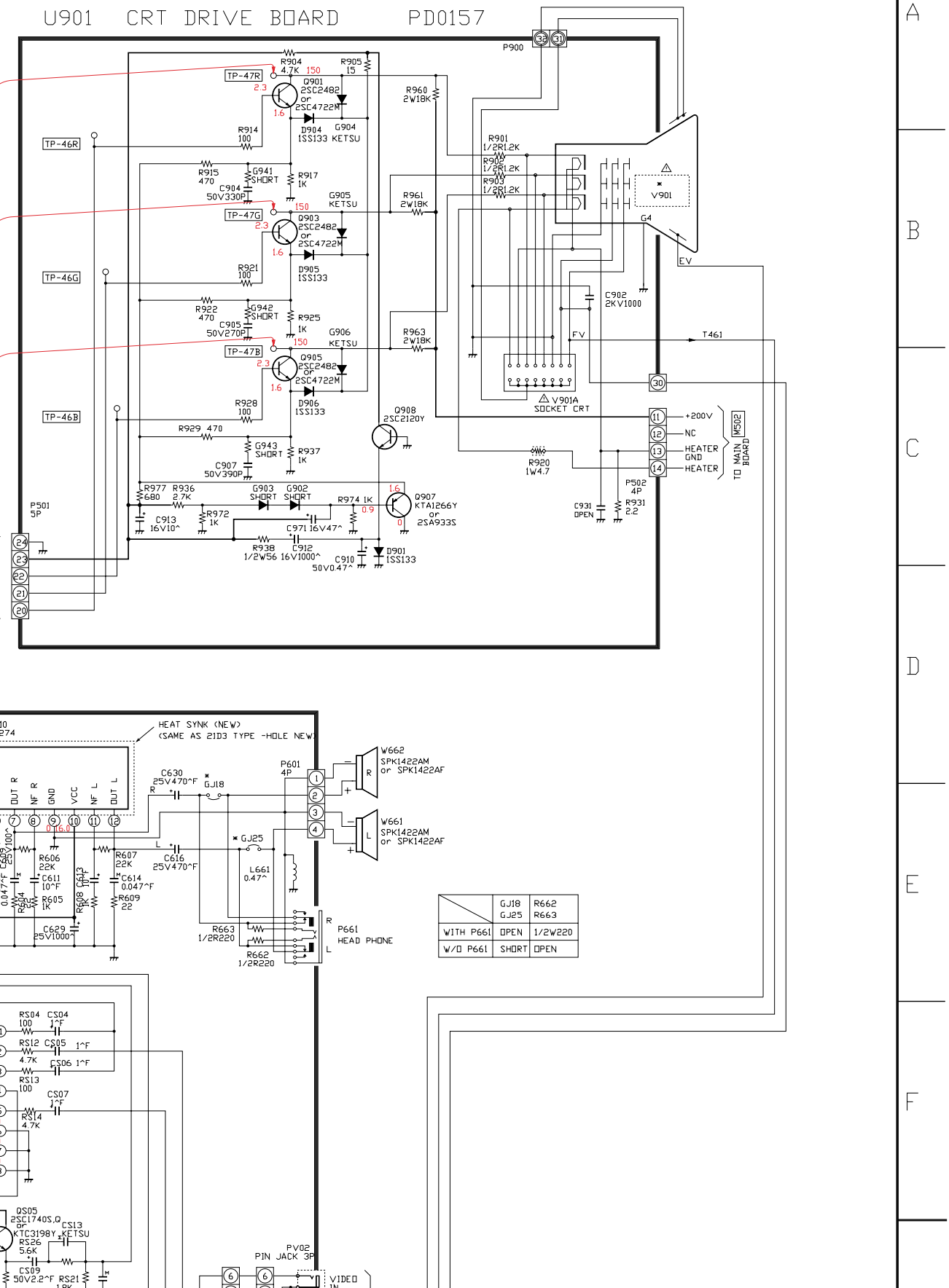
SAW FILTER USED

Z130	GJ01	GJ02	GJ03	GJ04
F816KPL(5PIN) MULTI	□	X	X	□
DFWK6269 (10PIN) MULTI	□	X	□	X
TSF1248P(4PIN) TAIWAN	X	□	X	X
DFWK2964(5PIN) THAI	□	X	□	X

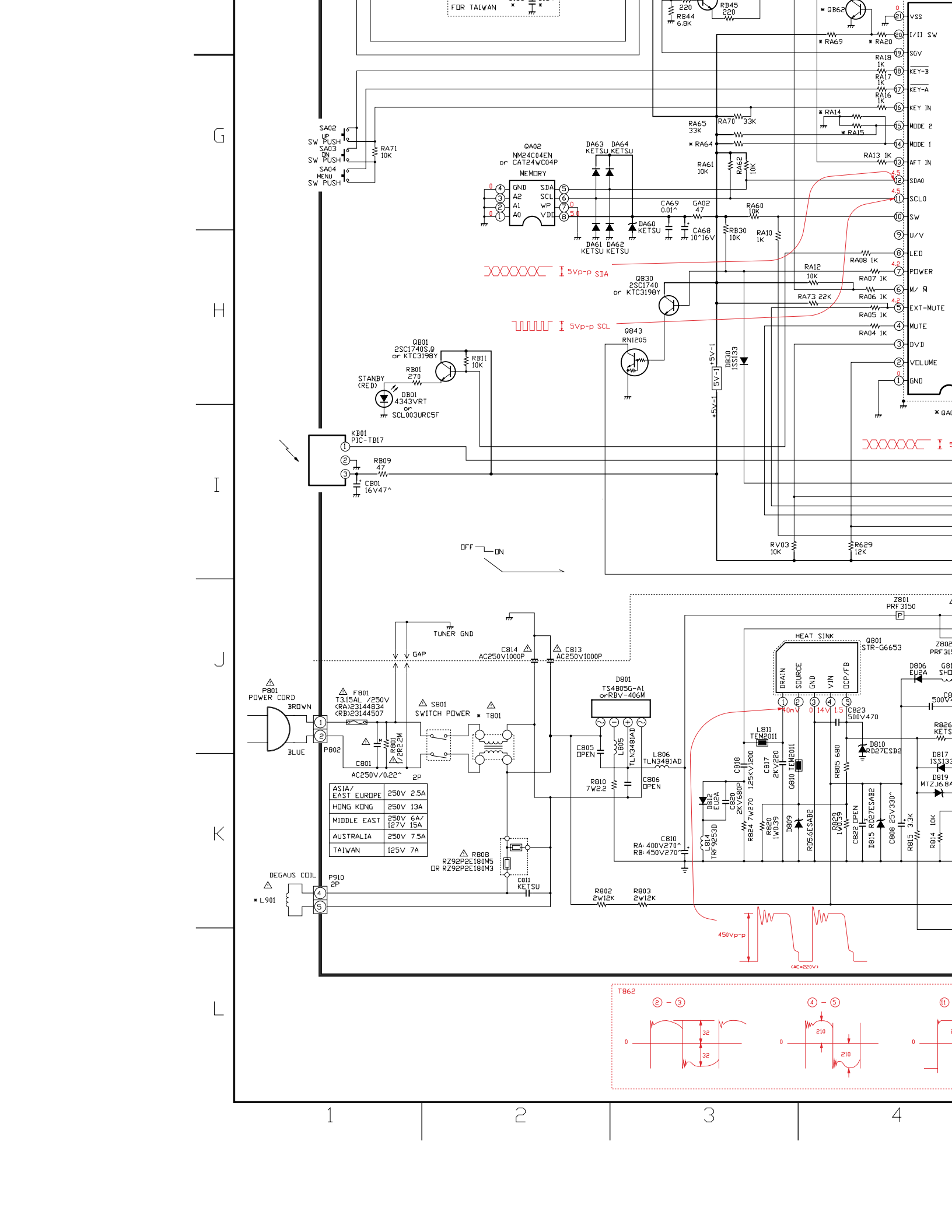
	GJ19	GJ20	GJ21	GJ22	GJ10	GJ34	GJ50	GJ51	GJ52	GJ53	GJ54	GJ43	GJ45	GJ46	JUMPER USAGE
MULTI	□	X	□	□	□	X	□	□	□	X	X	X	□	□	□ - SHORT
TAIWAN	X	X	X	X	□	□	X	X	X	X	□	□	X	X	X - OPEN
THAI	□	□	X	X	□	□	X	X	X	□	X	□	X	X	

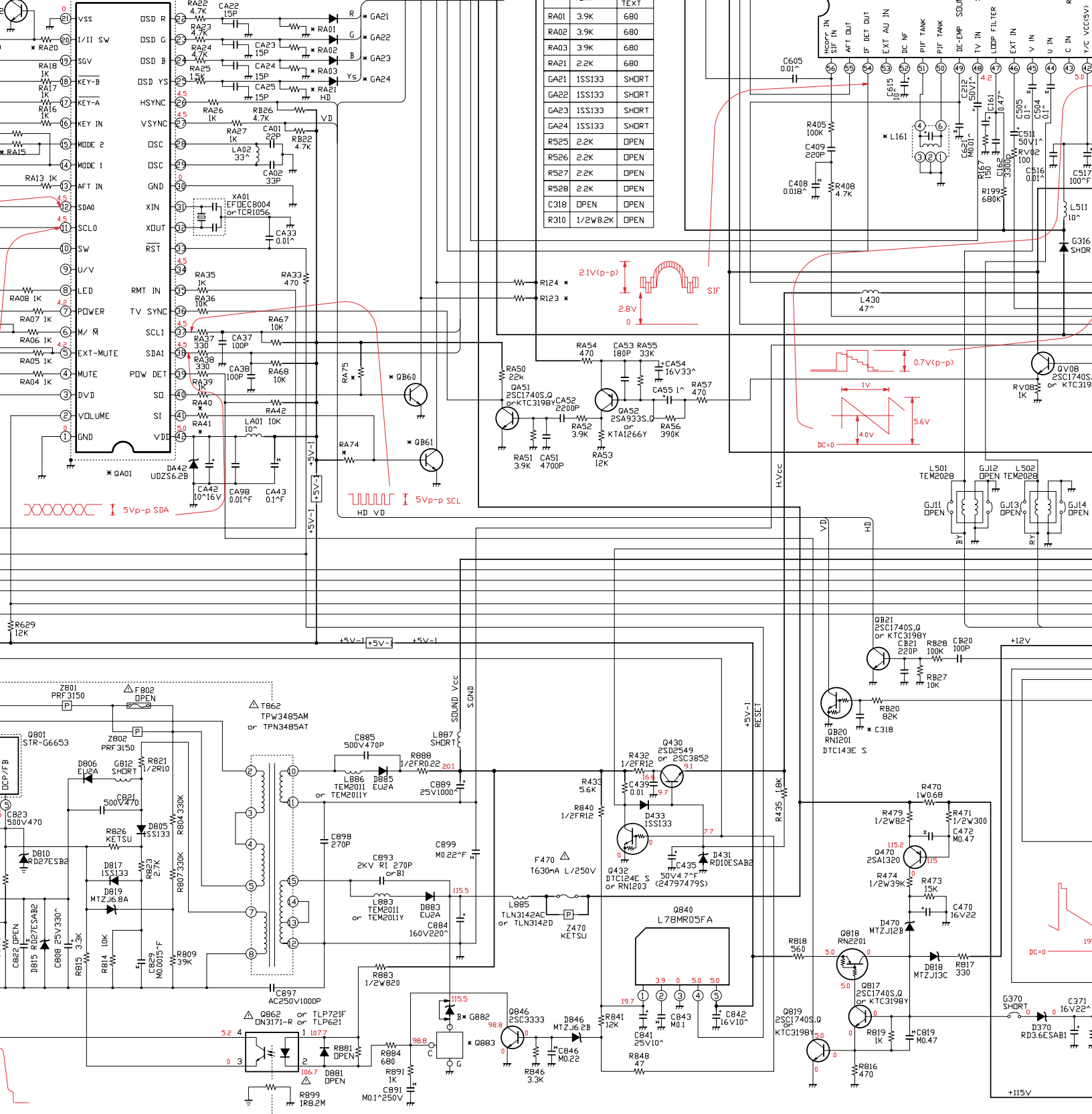
*	TEXT	NO TEXT
RA01	3.9K	680
RA02	3.9K	680
RA03	3.9K	680
RA21	2.2K	680
GA21	1SS133	SHORT
GA22	1SS133	SHORT
GA23	1SS133	SHORT
GA24	1SS133	SHORT


U901
TP-46R
TP-46G
TP-46B
110V(p-p)
110V(p-p)
100V(p-p)
P501
5P
TO MAIN
TO CRT
M501
5P
GND
QT06
BA033T
QT03
2SC752GTMY
QT02
KTC3198Y
QT01
STA5264
QT07
S24C02ADPA
or AT24C02-10PC
QT04
KTA1266Y
QT05
OPEN
Q310
RN1202
2.2Vp-p
DC2.1V
(PEDESTAL LEVEL)
0
0.7V(p-p)
1.3V
5.3V
1.7V(p-p)
Q610
AN5274
MUTE
IN L
VOL
RR
IN R
RF
OUT R
NF R
GND
VCC
NF L
OUT L
QV01
TC4053BP
CV01
16V47^F
VDD
Y-COM
X-COM
VEE
VSS
Z-COM
+16V
S.GND
GJ11
MONO
AMPLI
SHORT
OPEN
Q612
2SA933S,Q
or
KTA1266Y
Q620
RN2004
QS05
2SC1740S,Q
or
KTC3198Y
KETSU
EXT
TV
EXT-MUTE
+9V
TB1254AN
Q501
C120
KETSU
Q130
D150
R152
R153
R154
R157
MICON
R151
C150
BG/DK/I
C221
C222
C223
C303
D224
1SS133
C225
C224
C512
2200PF
R511
5.6K
C302
1500P
R218
100K
C226
0.1^F
R434
1/2R270
D498
1SS133
D403
KETSU
C430
C431
R624
100K
C628
3.3^F
L499
12^
D612
1SS133
C612
16V47^
R612
10K
D621
1SS133
D620
1SS133
D622
1SS133
R603
18K
R606
22K
R605
1K
R607
22K
C629
25V1000^
C606
1^F
C607
2.2^F
C617
2.2^
C608
1^F
C610
0.047^F
C611
10^F
R609
22
R610
1K
R608
10K
C613
10^F
RS04
100
CS04
1^F
RS12
4.7K
CS05
1^F
CS06
1^F
RS13
100
CS07
1^F
RS14
4.7K
RS19
100
CS13
RS26
5.6K
CS09
50V2.2^F
RS21
RS20
2.2K
SIF IN/AGC
IF-AGC
APC-FILTER
4.43MHz X'tal
CW OUT
RGB-VCC(9V)
Ys/Yn
EXTR IN
EXTG IN
EXTB IN
Y/C-GND
R-OUT
G-OUT
B-OUT
IK IN
V RAMP
V NFB
V OUT
REF R
ABCL IN
TV IN
LOOP FILTER
EXT IN
V IN
U IN
C IN
Y/C VCC(5V)
MON OUT
DC Restor
Y IN
Sync IN
Dig VDD(3.3V)
BLACK DET
SDA
SCL
Dig GND
H-OUT
H Vcc(9V)
SDP OUT
EBP IN
H AFC



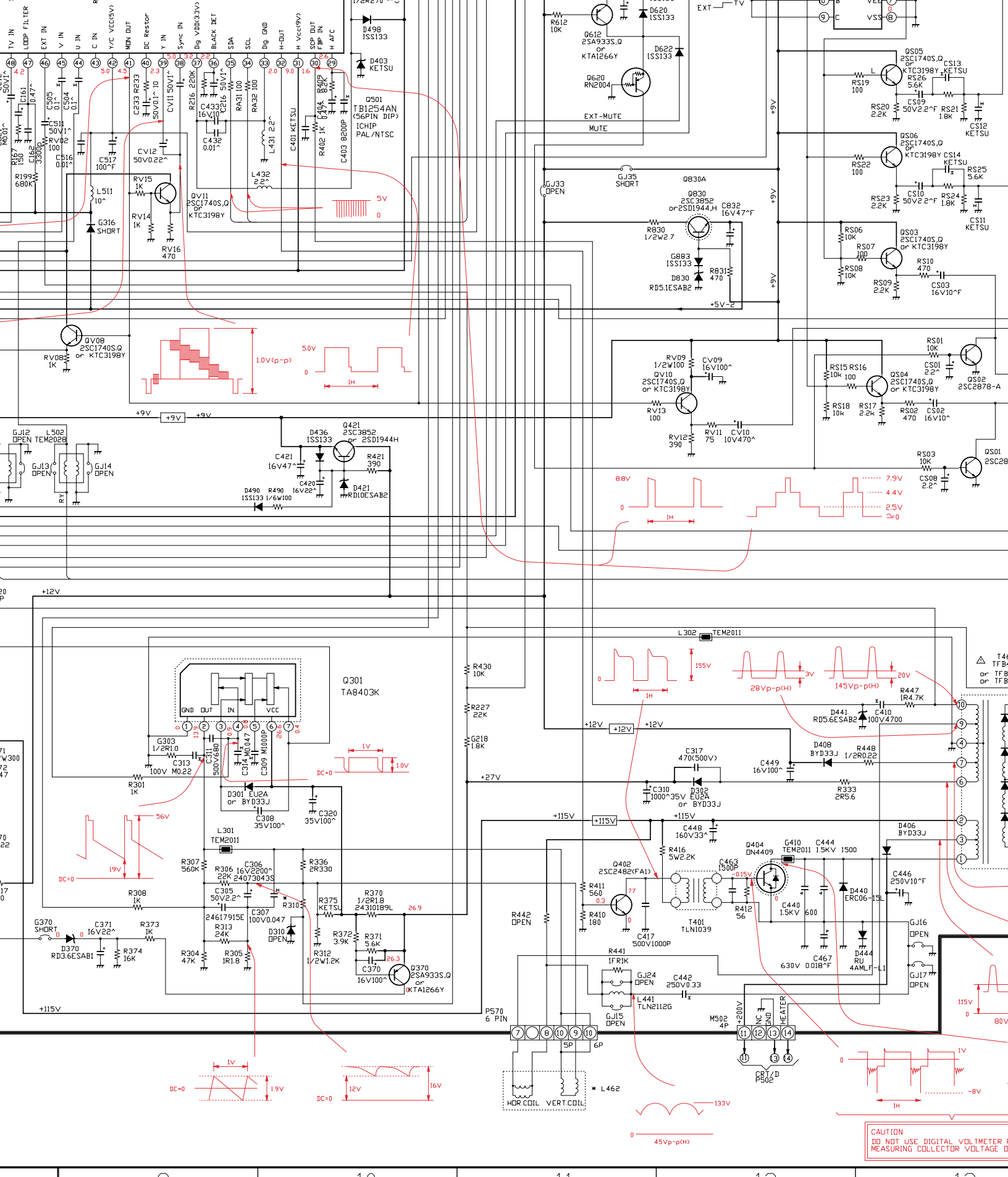
	GJ18 GJ25	R662 R663
WITH P661	OPEN	1/2W220
W/O P661	SHORT	OPEN

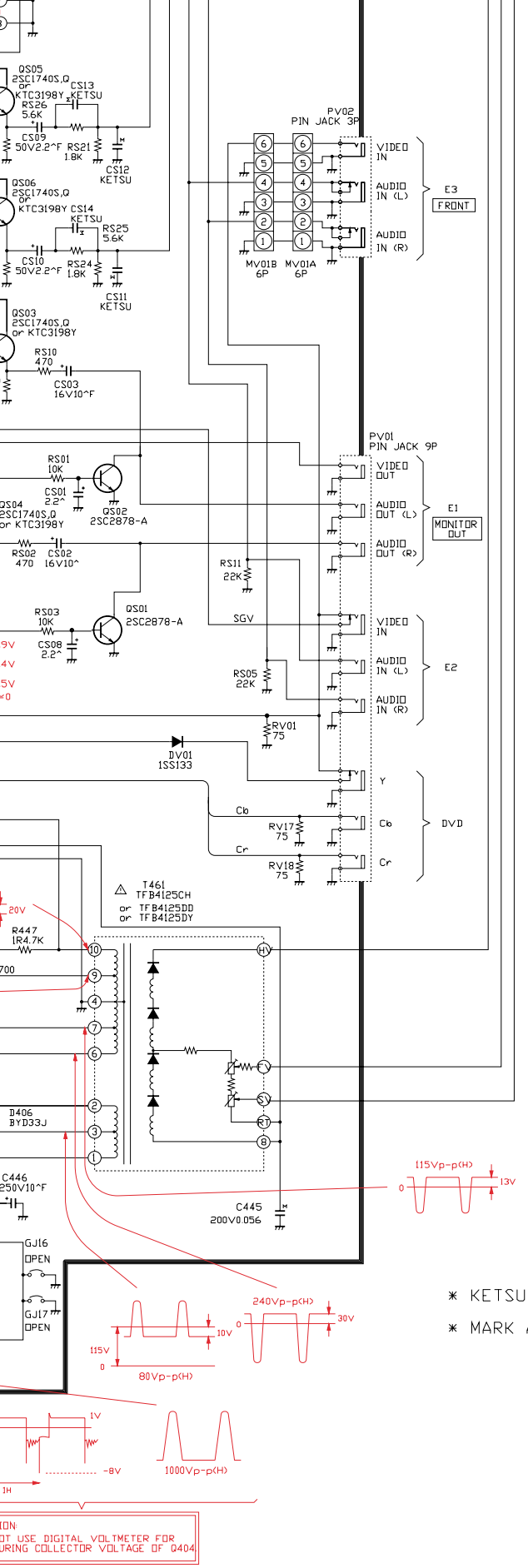

FOR TAIWAN
RB44 6.8K
RB45 220
Q862
RA69
RA20
VSS
I/II SW
SGV
KEY-B
KEY-A
KEY IN
MODE 2
MODE 1
AFT IN
SDA0
SCL0
SW
U/V
LED
POWER
M/ M
EXT-MUTE
MUTE
DVD
VOLUME
GND
SA02 UP SW PUSH
SA03 DN SW PUSH
SA04 MENU SW PUSH
RA71 10K
QA02 NM24C04EN or CAT24WC04P MEMORY
DA63 DA64 KETSU KETSU
DA61 DA62 KETSU KETSU
DA60 KETSU
RA65 33K
RA70 33K
RA64
RA61 10K
RA62 10K
RA13 1K
CA69 0.01^
GA02 47
CA68 10^16V
RB30 10K
RA10 1K
RA60 10K
RA08 1K
RA07 1K
RA06 1K
RA05 1K
RA04 1K
RA12 10K
RA73 22K
5Vp-p SDA
5Vp-p SCL
QB30 2SC1740 or KTC3198Y
Q843 RN1205
QB01 2SC1740S,Q or KTC3198Y
RB11 10K
RB01 270
STANBY (RED)
DB01 4343VRT or SCL003URC5F
DB30 1SS133
+5V-1
KB01 PJC-TB17
RB09 47
CB01 16V47^
RV03 10K
R629 12K
OFF
ON
TUNER GND
GAP
C814 AC250V1000P
C813 AC250V1000P
P801 POWER CORD
BROWN
BLUE
P802
F801 T3.15AL /250V (RA)23144834 (RB)23144507
S801 SWITCH POWER
T801
RB01 1.2K2W
CB01 AC250V/0.22^ 2P
ASIA/ EAST EUROPE 250V 2.5A
HONG KONG 250V 13A
MIDDLE EAST 250V 6A/ 127V 15A
AUSTRALIA 250V 7.5A
TAIWAN 125V 7A
D801 TS4805G-A1 or RBV-406M
C805 OPEN
L805
TLN3481AD
L806 TLN3481AD
R810 7W2.2
C806 OPEN
C810 RA: 400V270^ RB: 450V270^
R808 RZ92P2E180M5 OR RZ92P2E180M3
C811 KETSU
DEGAUS COIL
P910 2P
L901
R802 2W12K
R803 2W12K
Z801 PRF3150
HEAT SINK
Q801 STR-G6653
DRAIN
SOURCE
GND
VIN
OCP/FB
40mV
0
14 V
1.5
C823 500V470
L811 TEM2011
C818 2KV680P
C817 2KV220
G810 TEM2011
R805 680
D810 RD27ESB2
R824 7W270
R820 1W0.39
D809
RD56ES4B2
C822 OPEN
RD15 RD27ESAB2
C808 25V330^
R815 3.3K
R814 10K
450Vp-p
(AC=220V)
T862
2 - 3
4 - 5
32
210



		TEXT
RA01	3.9K	680
RA02	3.9K	680
RA03	3.9K	680
RA21	2.2K	680
GA21	1SS133	SHORT
GA22	1SS133	SHORT
GA23	1SS133	SHORT
GA24	1SS133	SHORT
R525	2.2K	OPEN
R526	2.2K	OPEN
R527	2.2K	OPEN
R528	2.2K	OPEN
C318	OPEN	OPEN
R310	1/2W8.2K	OPEN

PAIR USE	
Q883	G882
S1854(FA4)	RD2.7ESAB2
S1854(FA1)	SHORT

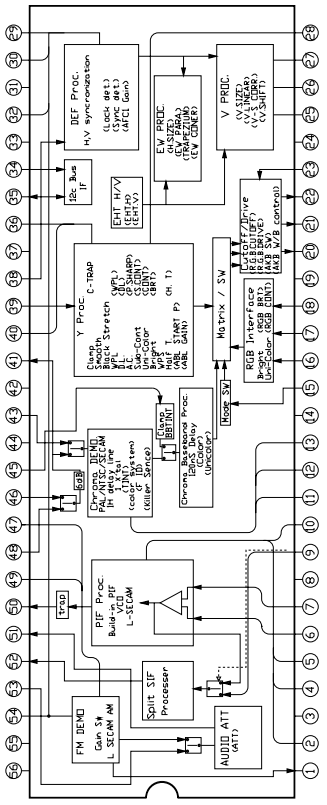

Q501
TB1254AN
(56PIN DIP)
ICHIP
PAL/NTSC
Q301
TA8403K
GND OUT IN VCC
Q612
2SA933S,Q
or
KTA1266Y
Q620
RN2004
EXT-MUTE
MUTE
Q830A
Q830
2SC3852
or2SD1944,H
Q831
RD5.1ESAB2
Q421
2SC3852
or 2SD1944H
D421
RD10ESAB2
Q370
2SA933S,Q
or
KTA1266Y
Q402
2SC2482(FA1)
Q404
DN4409
QV08
2SC1740S,Q
or KTC3198Y
QV10
2SC1740S,Q
or KTC3198Y
QV11
2SC1740S,Q
or
KTC3198Y
QS05
2SC1740S,Q
or
KTC3198Y
QS06
2SC1740S,Q
or
KTC3198Y
QS03
2SC1740S,Q
or KTC3198Y
QS04
2SC1740S,Q
or KTC3198Y
QS02
2SC2878-A
QS01
2SC28
D620
1SS133
D622
1SS133
D498
1SS133
D403
KETSU
D436
1SS133
D490
1SS133
D441
RD5.6ESAB2
D408
BYD33J
D406
BYD33J
D440
ERC06-15L
D444
RU
4AMLF-L1
D301
EU2A
or BYD33J
D302
EU2A
or BYD33J
D370
RD3.6ESAB1
D310
OPEN
D401 KETSU
L301
TEM2011
L302
TEM2011
L401
TLN1039
L441
TLN2112G
L502
TEM2028
L511
10^
L431 2.2^
L432
2.2^
G316
SHORT
G370
SHORT
GJ33
OPEN
GJ35
SHORT
GJ12
OPEN
GJ13
OPEN
GJ14
OPEN
GJ15
OPEN
GJ16
OPEN
GJ17
OPEN
GJ24
OPEN
T401
TLN1039
P570
6 PIN
5P
6P
M502
4P
CRT/D
P502
HOR.COIL
VERT.COIL
* L462
+9V
+12V
+27V
+115V
+5V-2
EXT
TV
5V
0
1.0V(p-p)
5.0V
1H
8.8V
7.9V
4.4V
2.5V
155V
28Vp-p(H)
145Vp-p(H)
133V
45Vp-p(H)
36V
19V
1.9V
16V
12V
1V
115V
80V
-8V
DC=0
CAUTION:
DO NOT USE DIGITAL VOLTMETER
MEASURING COLLECTOR VOLTAGE



PAL/NTSC

Q501 ICHIP

TB1254AN



* KETSU means to open the circuit.
* MARK ARE DIFFERENCE POINTS.

21A3E 21A3TR 21A3MX
21A3H 21A3G 21A3VE
21A3M/MJ 21A3T 21A3VX
21A3R

MAIN/CRT (S1E)

MODEL(JOB) MAIN UNIT	21A3E (LJ256) PD0158 21A3H (LJ---) PDXXXX	21A3M (LJ---) PDXXXX 21A3MJ (LJ---) PDXXXX	21A3TR (LJ---) PDXXXX	21A3G (LJ---) PDXXXX	21A3T (LJ---) PDXXXX	21A3MX (LJ---) PDXXXX 21A3VE (LJ---) PDXXXX	21A3VX (LJ---) PDXXXX	21A3R (LJ---) PDXXXX
LOC. NO.								
TEXT BLOCK	NOT USED	NOT USED	USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
C150	0.01^	0.01^	0.01^	OPEN	OPEN	0.01^F	0.01^F	0.01^
C164	OPEN	OPEN	OPEN	27pF	OPEN	OPEN	OPEN	OPEN
C165	OPEN	OPEN	OPEN	56pF	OPEN	OPEN	OPEN	OPEN
CF04	16V 47^	16V 47^	16V 47^	OPEN	16V 47^	16V 47^	16V 47^	16V 47^
D150	1SS110	1SS110	1SS110	OPEN	OPEN	1SS110	1SS110	1SS110
GJ01	SHORT OR SHORT	SHORT OR SHORT	SHORT OR SHORT	OPEN	SHORT	SHORT OR SHORT	SHORT OR SHORT	SHORT OR SHORT
GJ02	OPEN OR OPEN	OPEN OR OPEN	OPEN OR OPEN	SHORT	OPEN	OPEN OR OPEN	OPEN OR OPEN	OPEN OR OPEN
GJ03	OPEN OR SHORT	OPEN OR SHORT	OPEN OR SHORT	OPEN	SHORT	OPEN OR SHORT	OPEN OR SHORT	OPEN OR SHORT
GJ04	SHORT OR OPEN	SHORT OR OPEN	SHORT OR OPEN	OPEN	OPEN	SHORT OR OPEN	SHORT OR OPEN	SHORT OR OPEN
GJ10	SHORT	SHORT	SHORT	SHORT	SHORT	SHORT	SHORT	SHORT
GJ19	SHORT	SHORT	SHORT	OPEN	SHORT	SHORT	SHORT	SHORT
GJ20	OPEN	OPEN	OPEN	OPEN	SHORT	OPEN	OPEN	OPEN
GJ21	SHORT	SHORT	SHORT	OPEN	OPEN	SHORT	SHORT	SHORT
GJ22	SHORT	SHORT	SHORT	OPEN	OPEN	SHORT	SHORT	SHORT
GJ34	OPEN	OPEN	OPEN	SHORT	SHORT	OPEN	OPEN	OPEN
GJ43	OPEN	OPEN	OPEN	SHORT	SHORT	OPEN	OPEN	OPEN
GJ45	SHORT	SHORT	SHORT	OPEN	OPEN	SHORT	SHORT	SHORT
GJ46	SHORT	SHORT	SHORT	OPEN	OPEN	SHORT	SHORT	SHORT
GJ50	SHORT	SHORT	SHORT	OPEN	OPEN	SHORT	SHORT	SHORT
GJ51	SHORT	SHORT	SHORT	SHORT	SHORT	SHORT	SHORT	SHORT
GJ52	SHORT	SHORT	SHORT	OPEN	OPEN	SHORT	SHORT	SHORT
GJ53	OPEN	OPEN	OPEN	OPEN	SHORT	OPEN	OPEN	OPEN
GJ54	OPEN	OPEN	OPEN	SHORT	OPEN	OPEN	OPEN	OPEN
H001	ECA33LX1/2/3/6	ECA33LX1/2/3/6	ECA33LX1/2/3/6	ELA51L	ECA33LX1/2/3/6	ECA33LX1/2/3/6	ECA33LX1/2/3/6	ECA33LX1/2/3/6
L106	8.2^H	8.2^H	8.2^H	OPEN	OPEN	8.2^H	8.2^H	8.2^H
L107	6.8^H	6.8^H	6.8^H	OPEN	OPEN	6.8^H	6.8^H	6.8^H
L108	18^H	18^H	18^H	18^H	8.2^H	18^H	18^H	18^H
L109	OPEN	OPEN	OPEN	18^H	OPEN	OPEN	OPEN	OPEN
L150	OPEN	OPEN	OPEN	0.82^H	OPEN	OPEN	OPEN	OPEN
L161	TRF1241AF/AV	TRF1241AF/AV	TRF1241AF/AV	TRF1243AF	TRF1241AF/AV	TRF1241AF/AV	TRF1241AF/AV	TRF1241AF/AV
Q130	2SC2878A	2SC2878A	2SC2878A	OPEN	OPEN	2SC2878A	2SC2878A	2SC2878A
Q132	OPEN	OPEN	OPEN	KTC3198Y	KTC3198Y	OPEN	OPEN	OPEN
QF01	TC4052BP	TC4052BP	TC4052BP	OPEN	TC4052BP	TC4052BP	TC4052BP	TC4052BP
QA01	TMP87CK38N-XXE	TMP87CK38N-YYY	TMP87CK38N-YYY	TMP87CK38N-ZZZ	TMP87CK38N-AAA	TMP87CK38N-XXE	TMP87CK38N-AAA	TMP87CK38N-YYY
R128	220	220	220	OPEN	OPEN	220	220	220
R129	180	180	180	OPEN	OPEN	180	180	180
R130	330	330	330	330	180	330	330	330
R131	OPEN	OPEN	OPEN	680	OPEN	OPEN	OPEN	OPEN
R136	2K	2K	2K	OPEN	OPEN	2K	2K	2K
R137	OPEN	OPEN	OPEN	2.2K	2.2K	OPEN	OPEN	OPEN
R151	47K	47K	47K	OPEN	OPEN	47K	47K	47K
R152	2.2K	2.2K	2.2K	OPEN	OPEN	2.2K	2.2K	2.2K
R153	2.2K	2.2K	2.2K	OPEN	OPEN	2.2K	2.2K	2.2K
R154	6.8K	6.8K	6.8K	OPEN	OPEN	6.8K	6.8K	6.8K
R157	47K	47K	47K	OPEN	OPEN	47K	47K	47K
R158	OPEN	OPEN	OPEN	2.2K	OPEN	OPEN	OPEN	OPEN
RA14	10K	10K	10K	10K	27K	10K	43K	10K
RA15	7.5K	7.5K	7.5K	7.5K	75K	7.5K	7.5K	7.5K
RA64	OPEN	OPEN	OPEN	OPEN	33K	OPEN	33K	OPEN
RF04	470	470	470	OPEN	OPEN	470	470	470
RF05	470	470	470	470	220	470	470	470
RF06	220	220	220	OPEN	220	220	220	220
RF07	470	470	470	OPEN	OPEN	470	470	470
RF12	2.2K	2.2K	2.2K	OPEN	2.2K	2.2K	2.2K	2.2K
Z101	TCF1113	TCF1113	TCF1113	OPEN	OPEN	TCF1113	TCF1113	TCF1113
Z102	TCF1116	TCF1116	TCF1116	OPEN	OPEN	TCF1116	TCF1116	TCF1116
Z103	TPS4.5MC2	TPS4.5MC2	TPS4.5MC2	TPS4.5MC2	TCF1113	TPS4.5MC2	TPS4.5MC2	TPS4.5MC2
Z130	F816KPL OR	F816KPL OR	F816KPL OR	TSF1248P	OFWK2964	F816KPL OR	F816KPL OR	F816KPL OR
	OFWK6269	OFWK6269	OFWK6269			OFWK6269	OFWK6269	OFWK6269
ZF01	TCF1088	TCF1088	TCF1088	OPEN	OPEN	TCF1088	TCF1088	TCF1088
ZF02	SFE4.5MB	SFE4.5MB	SFE4.5MB	SFE4.5MB	TCF1031	SFE4.5MB	SFE4.5MB	SFE4.5MB
ZF03	TCF1031	TCF1031	TCF1031	OPEN	TCF1030	TCF1031	TCF1031	TCF1031
ZF04	TCF1089	TCF1089	TCF1089	OPEN	OPEN	TCF1089	TCF1089	TCF1089
ZF05	OPEN	OPEN	OPEN	OPEN	TCF1031	OPEN	OPEN	OPEN
ZF06	OPEN	OPEN	OPEN	OPEN	TCF1030	OPEN	OPEN	OPEN
V901(R1)	54SX503Y22-DC21	54SX503Y22-DC21	54SX503Y22-DC21	54SX503Y22-DC21	54SX503Y22-DC21	54SX503Y22-DC21	54SX503Y22-DC21	54SX503Y22-DC21
V901(R2)	A51KST93X(VM)	A51KST93X(VM)	A51KST93X(VM)	A51KST93X(VM)	A51KST93X(VM)	A51KST93X(VM)	A51KST93X(VM)	A51KST93X(VM)
V901(R3)	A51JSW90X(PAK)	A51JSW90X(PAK)	A51JSW90X(PAK)	A51JSW90X(PAK)	A51JSW90X(PAK)	A51JSW90X(PAK)	A51JSW90X(PAK)	A51JSW90X(PAK)
L462(R1)	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU
L462(R2)	TDY-621UA	TDY-621UA	TDY-621UA	TDY-621UA	TDY-621UA	TDY-621UA	TDY-621UA	TDY-621UA
L462(R3)	TDY-621WS	TDY-621WS	TDY-621WS	TDY-621WS	TDY-621WS	TDY-621WS	TDY-621WS	TDY-621WS
V901M(R1)	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU
V901M(R2)	MAG-1070	MAG-1070	MAG-1070	MAG-1070	MAG-1070	MAG-1070	MAG-1070	MAG-1070
V901M(R3)	MAG-1070	MAG-1070	MAG-1070	MAG-1070	MAG-1070	MAG-1070	MAG-1070	MAG-1070
C442(R1)	250V334J	250V334J	250V334J	250V334J	250V334J	250V334J	250V334J	250V334J
C442(R2)	250V334J	250V334J	250V334J	250V334J	250V334J	250V334J	250V334J	250V334J
C442(R3)	250V434J	250V434J	250V434J	250V434J	250V434J	250V434J	250V434J	250V434J
M570(R1)	CONNECTOR 6P	CONNECTOR 6P	CONNECTOR 6P	CONNECTOR 6P	CONNECTOR 6P	CONNECTOR 6P	CONNECTOR 6P	CONNECTOR 6P
M570(R2)	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU
M570(R3)	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU	KETSU
L901 (RA)	TSB-2301AL	TSB-2301AL	TSB-2301AL	TSB-2301AL	TSB-2301AL	TSB-2301AL	TSB-2301AV	TSB-2301AL
L901 (RB)	TSB-2301AG	TSB-2301AG	TSB-2301AG	TSB-2301AG	TSB-2301AG	TSB-2301AG	TSB-2301AG	TSB-2301AG
L901 (RC)	TSB-2301AS	TSB-2301AS	TSB-2301AS	TSB-2301AS	TSB-2301AS	TSB-2301AS	TSB-2301AS	TSB-2301AS
R125	OPEN	OPEN	OPEN	OPEN	10K	OPEN	OPEN	OPEN
RA69	OPEN	OPEN	OPEN	OPEN	10K	OPEN	OPEN	OPEN
RA20	OPEN	OPEN	OPEN	OPEN	1K	OPEN	OPEN	OPEN
QB62	OPEN	OPEN	OPEN	OPEN	KTC3198Y	OPEN	OPEN	OPEN
RA40	1K	1K	1K	OPEN	OPEN	1K	1K	1K
RA41	1K	1K	1K	OPEN	OPEN	1K	1K	1K
RA75	10K	10K	10K	OPEN	OPEN	10K	10K	10K
RA74	10K	10K	10K	OPEN	OPEN	10K	10K	10K
R124	10K	10K	10K	OPEN	OPEN	10K	10K	10K
R123	10K	10K	10K	OPEN	OPEN	10K	10K	10K
QB60	KTC3198Y	KTC3198Y	KTC3198Y	OPEN	OPEN	KTC3198Y	KTC3198Y	KTC3198Y
QB61	KTC3198Y	KTC3198Y	KTC3198Y	OPEN	OPEN	KTC3198Y	KTC3198Y	KTC3198Y
T801 (RA)	TRF3148BC	TRF3148BC	TRF3221AM	TRF3148BC	TRF3148BC	TRF3148BC	TRF3148BC	TRF3221AM
T801 (RB)	TRF3148BQ	TRF3148BQ		TRF3148BQ	TRF3148BQ	TRF3148BQ	TRF3148BQ	
T801 (RC)	TRF3148	TRF3148		TRF3148	TRF3148	TRF3148	TRF3148	

21A3E 21A3TR 21A3MX
21A3H 21A3G 21A3VE
21A3M/MJ 21A3T 21A3VX
21A3R
DIFFERENCE TABLE (S1E)

S1E SERIES
* MARKS DIFFERENCE REFER TO MAIN/CRT CIRCUIT DIAGRAM.

21A3 SERIES (S1E)
21A3E
21A3H
21A3M/MJ
21A3TR
21A3G
21A3T
21A3MX
21A3VE
21A3VX
21A3R

SPECIFICATIONS (Representative: 21A3E)							
Rated voltage		AC 110 V – 240 V, 50/60 Hz					
Power consumption (at AC 220 V, 50 Hz)		105 W (Approx.)					
Dimensions		Width 630 mm × Height 456 mm × Depth 485 mm					
Mass		24.0 kg (Approx.)					
Picture tube		TYPE 21 (54 cm) Overall picture tube measured diagonally (51 cm) Viewable picture tube measured diagonally 90° deflection					
Television system (Aerial input)	Channel coverage	**System**		**Channel**	**VHF**	**UHF**	**CATV**
		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
	Special RF signal	**Colour system**		**Sound system**			
		4.43NTSC		5.5/6.0/6.5 MHz			
		PAL 60Hz		5.5/6.0/6.5 MHz			
Colour system (Video input)		PAL / SECAM / NTSC4.43 / NTSC3.58 / 60 Hz PAL / 50 Hz 3.58NTSC					
Audio power		5 W + 5 W (10% THD)					
Speaker		120 × 60 mm 2 pcs.					
Accessories		Remote Controller × 1 Battery (R6, AA) × 2					

* Please refer to owner's manual in detail.

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