TOSHIBA

FILE NO. 060-9801

SERVICE MANUAL

COLOUR TELEVISION

S8S Chassis

21G5DE, 21G5SXH

PRINTED IN JAPAN. Jun., 1998 (So)

TOSHIBA

FILE NO. 060-9906

SERVICE MANUAL

COLOUR TELEVISION

S8S Chassis

21G5XRT

– SUMMARY –

21G5XRT is the same as 21G5DE except for the parts tabled on back of this sheet.
Use this service manual together with the original service manual 21G5DE, 21G5SXH (File No. 060-9801).

PRINTED IN JAPAN, Apr., 1999 (So)

REPLACEMENT PARTS LIST DIFFERENCES

Location No.	Part No.	Description
A201	23549213	Front Cover
A403	23550502	Label
A701	23525856	Case
C664	24591563	PF, 0.056μF
C665	24591563	PF, 0.056μF
C813	24092569	PF, 2200pF, ±20%, AC250V
C814	24092569	PF, 2200pF, ±20%, AC250V
C870	24820683	PF, 0.068μF, 630V
G110	24797100	EL, 10μF, ±20%, 50V
G501	24797010	EL, 1μF, ±20%, 50V
H002	23148324	Module, MVCM31D
K902	23306313	Remote Hand Unit, CT-9992

Location No.	Part No.	Description
Q501	23906371	IC, TB1226BN
QA01	23906841	IC, M37222M6-087
QT01	23905683	IC, SAA5281ZP/R
R665	24366822	CF, 8200 ohm
R666	24366822	CF, 8200 ohm
R867	24366124	CF, 120k ohm
RA14	24366103	CF, 10k ohm
RA15	24366752	CF, 7500 ohm
* U902		Main Board, PB8751
* U904		Text Board, PB8752
Y101A	23563566	Owner's Manual
Y101B	23563589	Owner's Manual

SPECIFICATIONS

Television system and channel coverage (Aerial input) ● available – not available

SYSTEM	CHANNEL		21G5XRT
PAL B/G	CCIR	VHF 2-12, UHF 21-69, CATV*1	●
PAL D/K	CHINA	VHF 1-12, UHF 13-57, CATV*2	●
PAL I	UK	UHF 21-69	●
SECAM B/G	CCIR	VHF 2-12, UHF 21-69, CATV*1	●
SECAM D/K	OIRT	VHF 1-12, UHF 21-69, CATV*3	●
NTSC M	US	VHF 2-13, UHF 14-69, CATV*4	–
NTSC 4.43	–	5.5/6.0/6.5MHz	●
NTSC 3.58	–	5.5/6.0/6.5MHz	●
PAL 60Hz	–	5.5/6.0/6.5MHz	●
NTSC 3.58 50Hz	–	4.5MHz	●
		*1 X~Z+2, S1~S41 *2 Z-1~Z-38	
		*3 X1~X19 *4 A-6~A-1, A~W, AA~BBB	

Colour system (Video input)

PAL	50/60Hz	●
SECAM	50Hz	●
3.58NTSC	50/60Hz	●
4.43NTSC	50/60Hz	●

Power consumption (W) (at 220V AC, 50Hz)	75W
Sound output (W)	10W × 2speakers

Rated voltage: 220-240V AC 50/60Hz
Terminals: Input: S-Video, Video, Audio L/MONO, Audio R
Monitor output: Video, Audio L/MONO, Audio R
Head phone output: ø3.5 mm (mini jack stereo type)
Speaker: 6×12cm (2)
Picture tube Type 21 (54cm) Overall picture tube measured diagonally
(51cm) Viewable picture tube measured diagonally
90° deflection

Dimensions: 630 (W) × 465 (H) × 457 (D) mm
Mass: 20.0kg
Supplied accessories: Remote controller (1)
Batteries size AA (R6) (2)
Telescopic Aerial (1)
Aerial Adaptor (1)

*Please refer to owner's manual in detail.

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

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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 18)

   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.

* 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.

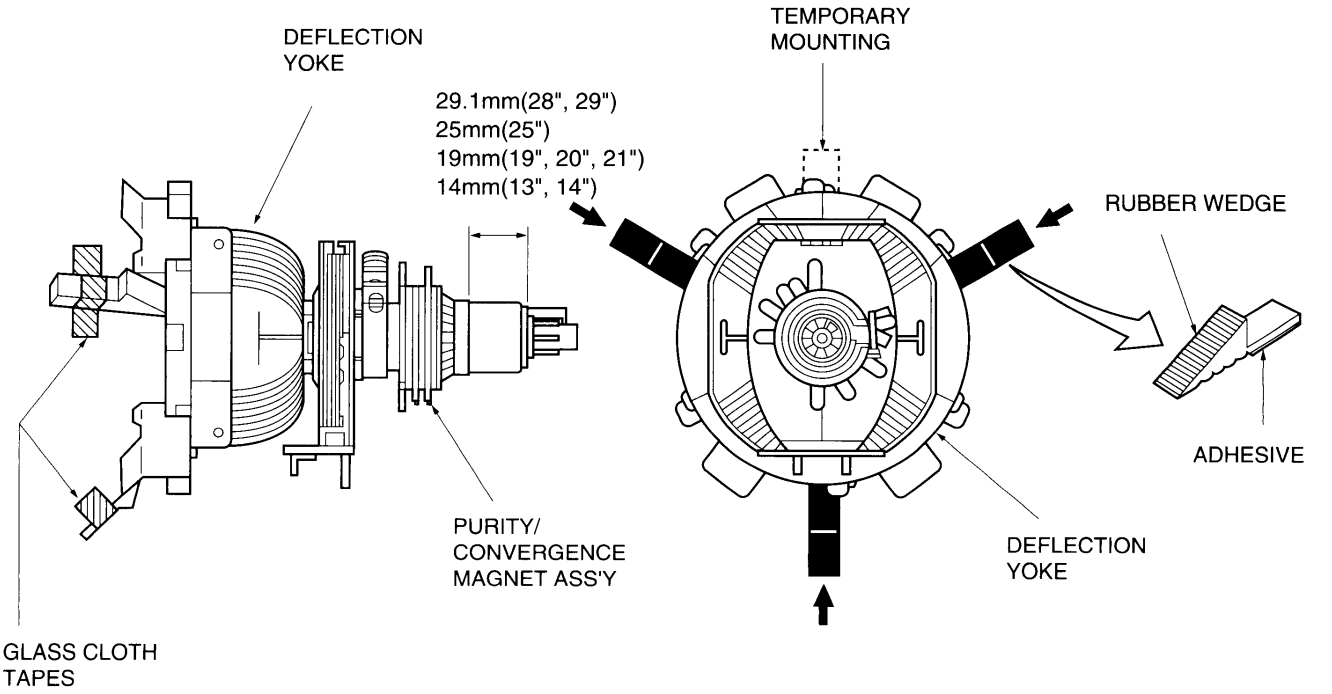


Figure 1.

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.

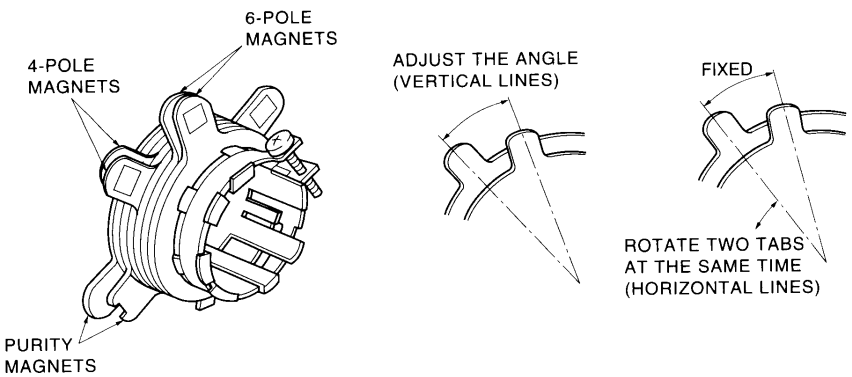
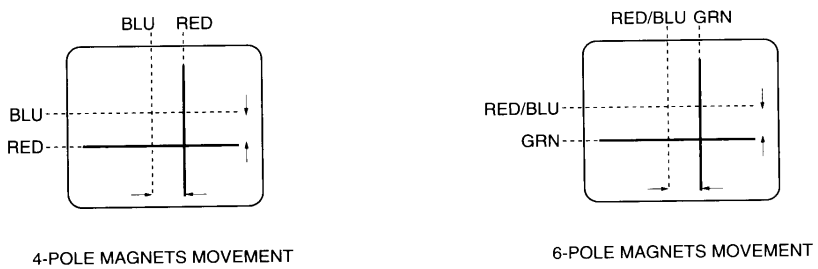


Figure 2.



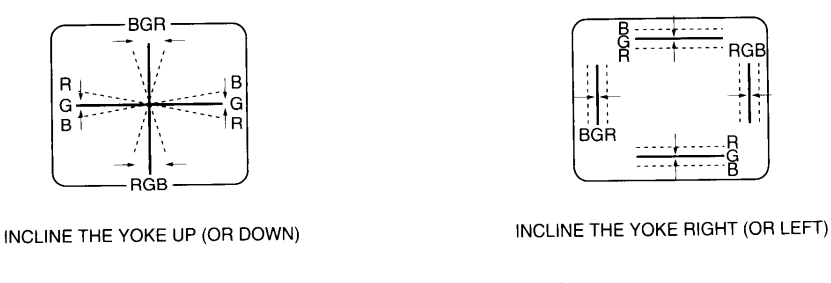


Figure 3. Dot Movement Pattern

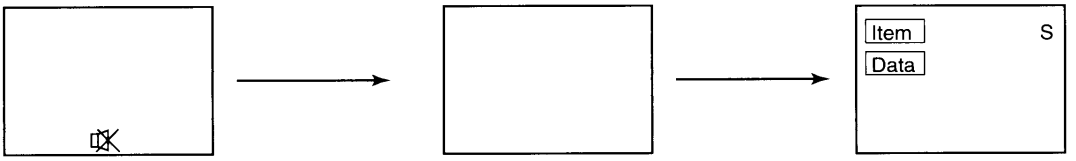
SERVICE MODE

1. ENTERING TO SERVICE MODE

1) Press 🔇 button once on Remote Control.

2) Press 🔇 button again to keep pressing.

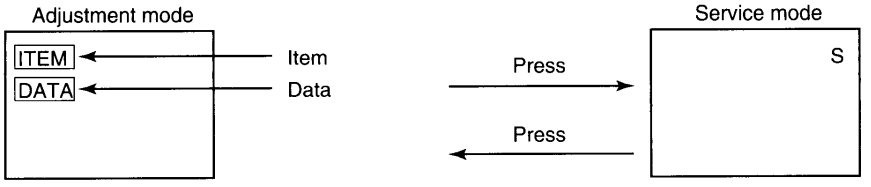
3) While pressing the 🔇 button, press MENU button on TV set.



(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
"TNTC" selection :	6 button– – – – Color thickness correction
Test audio signal ON/OFF (1kHz) :	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 18)

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.

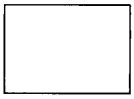
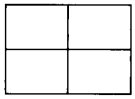
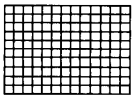
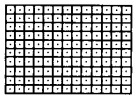
1. Enter the service mode, then select any register item.
2. Press and hold the CALL button on the Remote, then press the CHANNEL ▲ button on the TV. The initialization of QA02 has been complated.
3. Check the picture carefully. If necessary, adjust any adjustment item above. Perform "Auto search Memory"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

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

7. TEST SIGNAL SELECTION

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

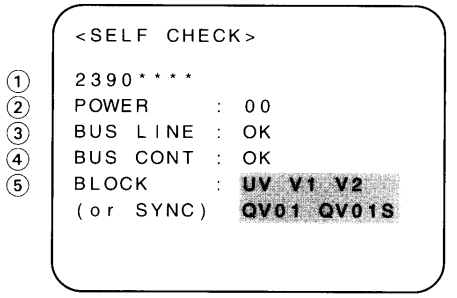
Signal off ⟶ NTSC signals (14 patterns)
↑ ⟵ PAL signals (14 patterns) ⟵ ┘

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.
"SCL(SCL1)-GND" ..... SCL-GND short circuit
"SDA(SDA1)-GND" ..... SDA-GND short circuit
"SCL(SCL1)-SDA (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 ----"OK" is normal.
UV : TV reception mode
V1 : VIDEO 1 input mode (→①)
V2 : VIDEO 2 input mode (→②)

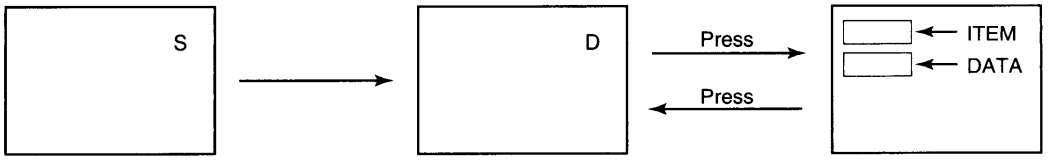
NOTE: Component which controls character display on screen is QT01 (TELETEXT IC.). If this display function fails to operate due to damage in QT01, self diagnosis procedure is as follows.
(1) In case that power indicator is blinking with interval of 0.5 seconds; it means protecting circuit (Current limiter) 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 FUCTION 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.



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

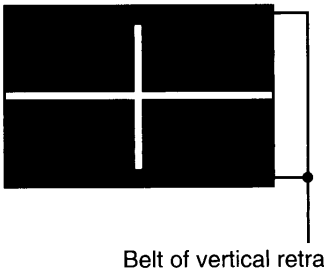
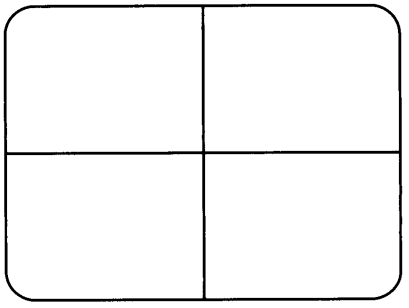
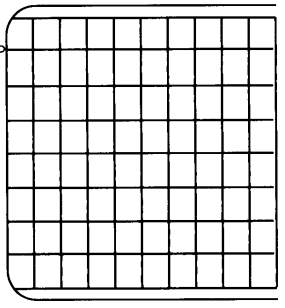
Every pressing of CHANNEL ▼ button in the design mode changes the adjustment items in the order of table-3.

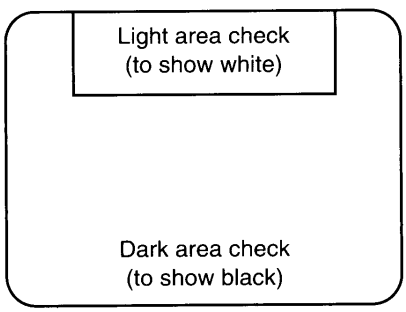
[redacted]

3. ADJUSTING THE DATA

Pressing of VOLUME ▲ or ▼ (◿ +/–) button will change the value of data.

ELECTRICAL ADJUSTMENT

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 20, and to set GDRV and BDRV to 80 with VOLUME ◿ – /+ buttons. 4. Press VIDEO button on TV set and rotate Screen VR to get one slight horizontal line on screen. Note: Every pressing of VIDEO button provides Horizontal line picture and Normal picture alternately. 5. Press VIDEO 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. 

MODEL: S8S Series (Reference factory adjustments)

NO ADJUSTMENT

1. SUB CONTRAST

(Measuring point) Q501 #14 R-OUT

(Adjusting signal) Sub Bright (NTSC) signal

(Adjusting method)

1. BUS data of Q501

RCUT	(Q501 SUB ADDR:0C)	→ Initial value	(20H)
Yγ	(Q501 SUB ADDR:08/D7)	→ OFF	(0)
WPL	(Q501 SUB ADDR:08/D6)	→ OFF	(1)
PACL	(Q501 SUB ADDR:08/D5)	→ OFF	(0)
COLOR	(Q501 SUB ADDR:02/D7-DC)	→ MIN	(00H)

2. Set user control to the standard 1
3. Change to adjust SCNT data (Q501 SUB ADDR:05/D4~D0).
   ※ It makes the point which doesn't have a change and it adjust with screen VR.
4. After adjustment, return the data which are set in steps 1, 2 above, to original data.

SPEC [———————] V p-p

2. SUB COLOR PAL (THIS ADJUSTMENT AFTER SUB COLOR NTSC)

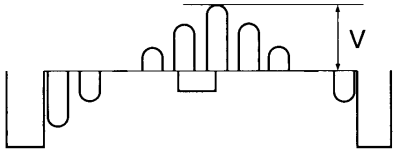
(Measuring point) Q501 #12 B-OUT

(Adjusting signal) Sub Bright (PAL) signal

(Adjusting method)

1. Set BUS data of Q501 to the same value as that of SUB TINT adjustment.
2. Set user control to the standard 1.
3. 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)



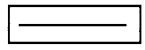
[1.3 ± 0.2] V p-p

4. After adjustment return the data set in steps 1,2 above, to the original data.

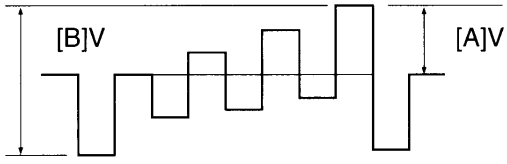
NO ADJUSTMENT

3. SUB COLOR SECAM (THIS ADJUSTMENT AFTER SUB COLOR NTSC)
   (Measuring point) Q501 #12 B-OUT
   (Adjusting signal) SECAM color bar signal
   (Adjusting method)
   1. Set BUS data of Q501 to the same value as that of SUB TINT adjustment.
   2. Set user control to the standard 1.
   3. Change COLS data (COLC Difference data) to adjust the peak amplitude of SECAM color bar.

Adjust the amplitude of color bar.



V p-p

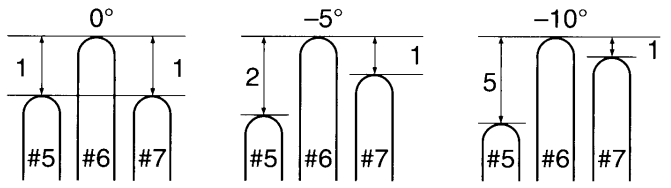


4. After adjustment, return the data set in steps 1, 2 above to the original data.

4. SUB TINT
   (Measuring point) Q501 #12 B-OUT
   (Adjusting signal) Sub Bright (NTSC) signal
   (Adjusting method)
   1. BUS data of Q501

BDRV	(Q501 SUB ADDR:0A)	→ Initial value	(80H)
BCUT	(Q501 SUB ADDR:0E)	→ Initial value	(20H)
COLOR LIMITER	(Q501 SUB ADDR:0F/D2)	→ OFF	(0)
MUTE	(Q501 SUB ADDR:1B/D7~D6)	→ Y mute	(10)
P/N CD ATT	(Q501 SUB ADDR:12/D5~D4)	→ 0dB	(01)
S-field	(Q501 SUB ADDR:1F/D7)	→ OFF	(0)
SCD ATT	(Q501 SUB ADDR:1F/D6)	→ 0dB	(0)
P-ACL	(Q501 SUB ADDR:18/D5)	→ OFF	(0)

   2. Set user control to the standard 1
   3. Change to adjust TNTC data (Q501 SUB ADDR:03/D6D0) so that difference between 6th peak and 5th and 7th peaks of rainbow color bar becomes 2:1.

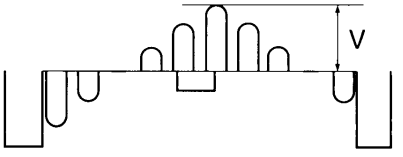


−5 ± 5 (°)

   4. After adjustment, return the data which are set in steps 1, 2 above, to original data.

5. SUB COLOR NTSC
   (Measuring point) Q501 #12 B-OUT
   (Adjusting signal) Sub Bright (NTSC) signal
   (Adjusting method)
   1. Set BUS data of Q501 to the same value as that of Sub TINT adjustment.
   2. Set user control setting to the standard 1
   3. Change COLC data (Q501 SUB ADDR:02/D7~D0) to adjust the 6th peak amplitude of rainbow color bar.

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



1.3 ± 0.2 V p-p

   4. After adjustment, return the data set in steps 1 and 2 above, to the original.

6. SUB BRIGHT
(Adjusting signal) SUB Bright (PAL or NTSC) signal
(Adjusting method)
1. Set user control setting to the standard 1.
2. Change BRTC data (Q501 SUB ADDR:01/D7D0) to set black collapse numbers by eye check.

SPEC 4 ±1.5 BARS

7. WHITE BALANCE ADJUSTMENT
(Adjusting method)
1. Set user control setting to the standard 1.
2. BUS data of Q501

GDRV	(Q501 SUB ADDR:09)	→ Initial value	(80H)
BDRV	(Q501 SUB ADDR:0A)	→ Initial value	(80H)
RCUT	(Q501 SUB ADDR:0C)	→ Initial value	(20H)
GCUT	(Q501 SUB ADDR:0D)	→ Initial value	(20H)
BCUT	(Q501 SUB ADDR:0E)	→ Initial value	(20H)

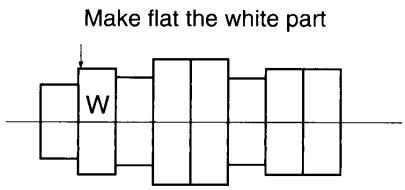
3. Set the mode to the one horizontal line mode

MUTE	(Q501 SUB ADDR:1B/D7~D6)	→ H. Line	(11)
BRIGHT	(Q501 SUB ADDR:01)	→ Initial value	(80H)

4. Change SCREEN VR to set it so that one of lines R, G and B will light slightly.
5. Change CUTOFF data to adjust 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 CUTOFF data to adjust white balance in bright area and dark area.

NO ADJUSTMENT
8. SECAM BELL FILTER ADJUSTMENT
(Measuring point) Q501 #36 B-Y OUT
(Adjusting signal) Color bar (SECAM) signal
(Adjusting method)
1. Connect resistor 1k ohm between color limiter terminal (Q501 #26) and 5V.
2. Connect resistor 100 ohm between Q501 #35 and 5V.
3. Set COLOR control data to "04H".
4. Set MICOM YS output to "H", and set Q501 to DIGITAL RGB mode.
5. Change BELL data (Q501 SUB ADDR:ifD1D0) to set it so that SECAM signal at #36 pip of Q501 (B-Y OUT) can be flat.
6. After adjustment, remove resistor 1k ohm between color limiter terminal (Q501 #26). and 5V, and remove resistor 100 ohm between Q501 #35 and 5V, to return COLOUR control. data to original.

SPEC ——— %



NO ADJUSTMENT

9. SECAM OFFSET ADJUSTMENT

(Measuring point) Q501#35 R-Y OUT
#36 B-Y OUT

(Adjusting signal) Color bar (SECAM) signal

(Adjusting method)

1. Change SRY data (Q501 SUB ADDR:11/D7~D4) to coincide level of black and white part in color differential signal (R-Y) to the level of H. BLK part.

SPEC B-Y/R-Y ——— mV p-p

2. Change SBY data (Q501 SUB ADDR:11/D3~D0) to coincide level of black and white part in color differential signal (B-Y) to the level of H. BLK part.

SPEC B-Y/R-Y ——— mV p-p

10. CHROMA TRAP ADJUSTMENT → NO ADJUSTMENT

11. H. CENT ADJUSTMENT

(Point) Receiving adjustment

(Adjusting signal) WG PHILIPS pattern
Do not use France SECAM pattern.

(Adjusting method) CONT=Maximum BRIGHT=Center COLOR=Center
Vary SUB Address [HPOS] to adjust picture center to screen center. (Set D-C to minimum by CRT adjusting magnetic field.)

12. V. HEIGHT ADJUSTMENT

(Point) Receiving adjustment

(Adjusting signal) WG PHILIPS pattern
Do not use France SECAM pattern.

(Adjusting method) CONT=Maximum BRIGHT=Center COLOR=Center
Vary SUB Address [VPOS] to adjust center of Philips pattern to screen center.
Adjust SUB Address [HIT] so that top and bottom flags of Philips pattern can just be hidden.

13. V901 ADJUSTMENT
(Point) C.CRT adjusting magnetic field
(Adjusting magnetic field)

Correction field		Adjusting	Confirming
		perpendicular field	perpendicular field
Mid Near East Russian Asia, Hongkong New Zealand, Australia	North field North field Zero field South field	35 μT 35 μT 5 μT –50 μT	35 μT 35 μT 5 μT –50 μT

Adjusting procedure is based on working instruction of CPT Adjustment.

CIRCUIT CHECKS

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 18)

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

SETTING & ADJUSTING DATA

【SAFETY INSTRUCTIONS】

		21"
HIGH VOLTAGE AT ZERO BEAM:	(A)	28.3kV
MAX HIGH VOLTAGE:	(B)	29.0 kV
AC VOLTAGE:	(C)	110~240V

Table-1

【SERVICE MODE】

ADJUSTING ITEMS AND DATA IN THE SERVICE MODE:

Item	Name of adjustment	Preset	Data
RCUT	R CUTOFF	20H	←
GCUT	G CUTOFF	20H	←
BCUT	B CUTOFF	20H	←
GDRV	G DRIVE	80H	←
BDRV	B DRIVE	80H	←
SCNT	SUB-CONTRAST	07H	←
BRTC	SUB-BRIGHT	80H	←
COLC	SUB-COLOUR NTSC	80H	←
COLP	SUB COLOUR PAL	F6H	←
COLS	SUB COLOUR SECAM	F6H	←
BELL	BELL FILTER	01H	←

Item	Name of adjustment	Preset	Data
SBY	SECAM B-Y	08H	←
SRY	SECAM R-Y	08H	←
TNTC	SUB-TINT	40H	←
HPOS	HORIZ. POSITION	0AH	←
VPOS	VERT. POSITION	03H	←
HIT	HEIGHT	30H	20H
VLIN	V-LINEARITY	0CH	0DH
WID	PICTURE WIDTH	28H	←
PARA	E-W PARABOLA (DPC)	1FH	←
CNR	E-W CORNER	08H	09H
TRAP	TRAPEZIUM	10H	←

Table-2

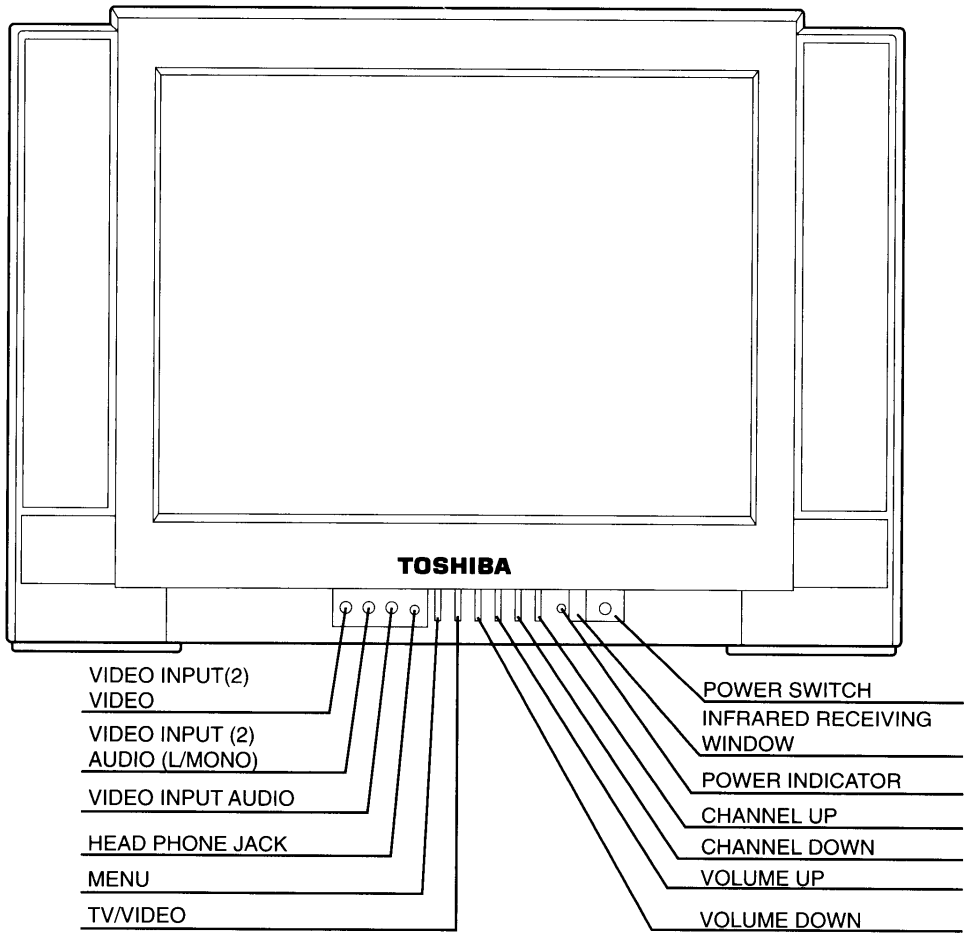
【DESIGN MODE】

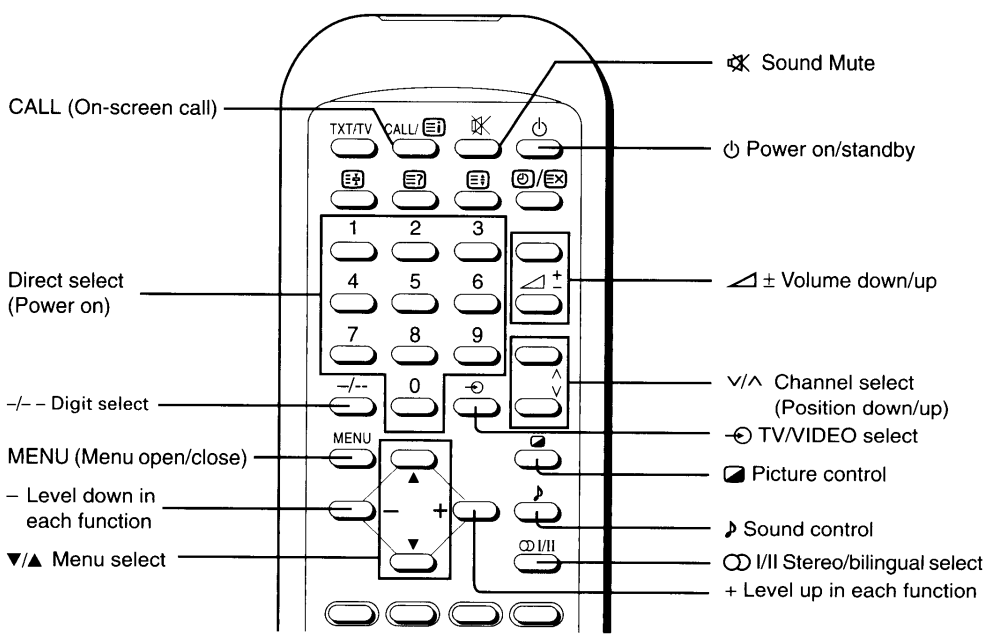
ADJUSTING ITEMS AND DATA IN THE DESIGN MODE:

Item	Name of adjustment	Preset Data	Data		Remarks
* There are no adjustment mode in the DESIGN MODE.					

Table-3

LOCATION OF CONTROLS (Representative: 21G5DE)





PROGRAMMING CHANNEL MEMORY

Auto search memory (ASM)

All the channels that can be received are preset automatically.

1 Select the position for starting ASM, (0~9) or (∨ / ∧).
2 Set the correct broadcast system for your region.
Press (MENU) repeatedly to call up the SET UP menu on the upper right of the screen.
And set COLOR to AUTO and select the SOUND according to the table below by (▼/▲) and (–/+).
3 Select ASM, then press (+) to start the ASM. Return to the start position. This completes the procedure.

Broadcast Transmission Systems in Each Country

Area	Country	System	
		Colour	Sound
Asia M.E.	Bahrain, Kuwait, Israel, Oman, Qatar, United Arab Emirates, Yemen, etc. Indonesia, Malaysia, Singapore, Thailand, etc	PAL	B/G
	China, etc	PAL	D/K
	Hong Kong	PAL	I
	Iraq, Iran, Lebanon, Saudi Arabia, etc	SECAM	B/G
	Russian Federation, etc	SECAM	D/K
	Myanmar, etc	NTSC	M
Oceania	Australia, New Zealand, etc	PAL	B/G

Note.
"B/G" and "D/K" will be displayed as "BG" and "DK" on the screen. PAL, SECAM and 358NTSC are different colour signal broadcast transmission systems applicable to different countries. 443NTSC is used in special VTRs to playback NTSC recorded video tapes through PAL television equipment.
[358NTSC = NTSC 3.58MHz, 443NTSC = NTSC 4.43 MHz]

Manual Search and Changing the assigned position

(Example) Presetting Channel 12 to Position 12

(Method 1) — **When Channel 12 is not preset to either channel→ Manual Search**

1 Select Position 12.
Press (∨ / ∧) repeatedly until 12 is displayed.
Or, press (–/– –) once or twice to display – – on the screen.
Press 1 and 2 at Remote in that order.

2 Press (MENU) several times to display the SET UP menu screen.
Press (▼/▲) and select ">>>". Press (–/+) to search.
Pressing "–" searches lower frequency channel; pressing "+" searches higher frequency channels.

3 When Channel 12 is set, press (▼/▲) to select " ⇳ ". Press "+" (–/+) to complete the presetting.

To turn off the menu function display instantly
Press the (CALL) button.

(Method 2) — **When Channel 12 is preset to another position → Change the assigned position.**

1 Press (0~9) or (∨ / ∧) to find the position preset for Channel 12.

2 When Channel 12 is set, press (MENU) several times to display the SET UP menu screen. Press (▼/▲) to select the item "POSITION". And press (–/+) repeatedly to set the position number "P12". Pressing "–" displays a smaller number; pressing "+" displays a larger number.

3 When Position 12 is set, press (▼/▲) to select the item " ⇳ ". Press "+" (–/+) to complete the presetting.

To turn off the menu function display instantly
Press the (CALL) button.

Skip function
If you set SKIP ON for unnecessary position numbers, when you select channels with (∨ / ∧), that position is skipped.

(Example) Skipping position 13

1 Select Position 13.
Press (∨ / ∧) repeatedly until 13 is displayed.
Or, press (–/– –) once or twice to display – – on the screen.
Press 1 and 3 at Remote in that order.

2 Press (MENU) several times to display the SET UP menu screen. Press (▼/▲) to select the item "SKIP". Press (–/+) to switch from OFF to ON. This completes the setting.

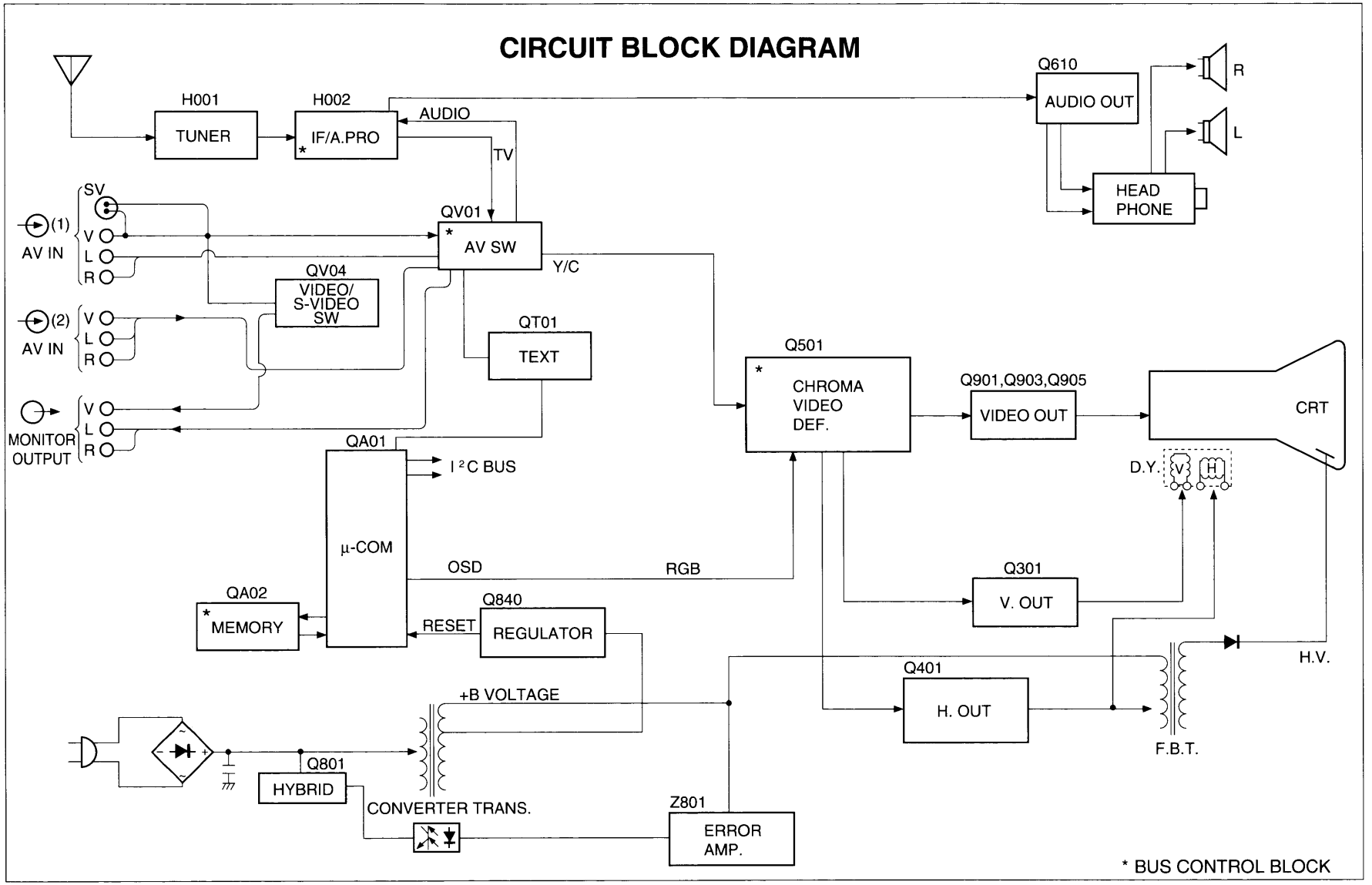
To turn off the menu function display instantly
Press the (CALL) button.

Note • When SKIP is on, "*"is added to the left of the position number. Example: *13
Select position 13 with (–/– –) and (1, 3) to confirm "*"mark.
• If you want to restore a skipped position number, select the skippied position number with (–/– –) and (1, 3) buttons and Switch from ON to OFF on step 2 above.

Manual fine tuning (MFT)
Press (MENU) several times to display the SET UP menu screen.
Press (▼/▲) and select MFT. Press (–/+) to start fine tuning.
Pressing "–" fine tunes to a lower frequency; pressing "+" fine tunes to a higher frequency.

To turn off the menu function display instantly
Press the (CALL) button.

CIRCUIT 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 :21G5DE/21G5SXH

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	EL, 4.7μF, ±20%, 35V
C102	24794221	EL, 220μF, ±20%, 16V
C103	24794101	EL, 100μF, ±20%, 16V
C108	24793101	EL, 100μF, ±20%, 10V
C110	24436221	CD, 220pF
C111	24232103	CD, 0.01μF, +80%, −20%
C112	24797100	EL, 10μF, ±20%, 50V
C113	24591104	PF, 0.1μF
C114	24591104	PF, 0.1μF
C115	24591104	PF, 0.1μF
C116	24206478	EL, 0.47μF, 50V
C117	24206478	EL, 0.47μF, 50V
C199	24232103	CD, 0.01μF, +80%, −20%
C212	24591104	PF, 0.1μF
C213	24797100	EL, 10μF, ±20%, 50V
C214	24232103	CD, 0.01μF, +80%, −20%
C215	24794470	EL, 47μF, ±20%, 16V
C216	24797010	EL, 1μF, ±20%, 50V
C217	24797479	EL, 4.7μF, ±20%, 50V
C218	24591104	PF, 0.1μF
C220	24591104	PF, 0.1μF
C221	24591104	PF, 0.1μF
C222	24591104	PF, 0.1μF
C302	24617912	EL, 2.2μF, ±10%, 50V
C304	24214471	CD, 470pF, ±10%, 500V
C305	24617912	EL, 2.2μF, ±10%, 50V
C306	24795102	EL, 1000μF, ±20%, 25V
C307	24082049	PF, 0.047μF, 100V
C308	24668101	EL, 100μF, ±20%, 35V
C309	24591102	PF, 1000pF
C310	24796102	EL, 1000μF, ±20%, 35V
C311	24214391	CD, 390pF, ±10%, 500V
C313	24082057	PF, 0.22μF, 100V
C314	24591563	PF, 0.056μF
C315	24797010	EL, 1μF, ±20%, 50V
C316	24212222	CD, 2200pF, ±10%
C320	24668101	EL, 100μF, ±20%, 35V
C323	24567684	PF, 0.68μF,
C324	24591334	PF, 0.33μF
C370	24794101	EL, 100μF, ±20%, 16V

Location No.	Part No.	Description
C371	24794220	EL, 22μF, ±20%, 16V
C402	24232103	CD, 0.01μF, +80%, −20%
C403	24591223	PF, 0.022μF
C404	24797229	EL, 2.2μF, ±20%, 50V
C406	24591104	PF, 0.1μF
C407	24232103	CD, 0.01μF, +80%, −20%
C408	24212221	CD, 220pF, ±10%
C409	24214221	CD, 220pF, ±10%, 500V
C413	24214222	CD, 2200pF, ±10%, 500V
C417	24214391	CD, 390pF, ±10%, 500V
C421	24794470	EL, 47μF, ±20%, 16V
C430	24232103	CD, 0.01μF, +80%, −20%
C431	24763471	EL, 470μF, ±20%, 16V
C432	24232103	CD, 0.01μF, +80%, −20%
C433	24794470	EL, 47μF, ±20%, 16V
C434	24793471	EL, 470μF, ±20%, 10V
C438	24212221	CD, 220pF, ±10%
C439	24232103	CD, 0.01μF, +80%, −20%
C440	24082951	PF, 6000pF, ±3%, 1500V
C441	24693562	PF, 5600pF, 100V
C442	24082430	PF, 0.33μF, 250V
C443	24795102	EL, 1000μF, ±20%, 25V
C444	24082934	PF, 1500pF, ±3%, 1500V
C445	24828563	PF, 0.056μF, 200V
C447	24700220	EL, 22μF, ±20%, 250V
C448	24640908	EL, 33μF, ±20%, 160V
C463	24212152	CD, 1500pF, ±10%
C470	24666220	EL, 22μF, ±20%, 16V
C472	24567474	PF, 0.47μF
C499	24763221	EL, 220μF, ±20%, 16V
C501	24797479	EL, 4.7μF, ±20%, 50V
C502	24591103	PF, 0.01μF
C503	24797229	EL, 2.2μF, ±20%, 50V
C504	24591104	PF, 0.1μF
C505	24591104	PF, 0.1μF
C508	24353120	CD, 12pF
C509	24794100	EL, 10μF, ±20%, 16V
C510	24232103	CD, 0.01μF, +80%, −20%
C511	24794101	EL, 100μF, ±20%, 16V
C512	24232103	CD, 0.01μF, +80%, −20%
C513	24232103	CD, 0.01μF, +80%, −20%

Location No.	Part No.	Description
C514	24591104	PF, 0.1μF
C515	24232103	CD, 0.01μF, +80%, –20%
C610	24794470	EL, 47μF, ±20%, 16V
C612	24794470	EL, 47μF, ±20%, 16V
C621	24797479	EL, 4.7μF, ±20%, 50V
C622	24797479	EL, 4.7μF, ±20%, 50V
C661	24591102	PF, 1000pF
C662	24591102	PF, 1000pF
C663	24794100	EL, 10μF, ±20%, 16V
C664	24591103	PF, 0.01μF
C665	24591103	PF, 0.01μF
C673	24669229	EL, 2.2μF, ±20%, 50V
C678	24669229	EL, 2.2μF, ±20%, 50V
C681	24668102	EL, 1000μF, ±20%, 35V
C682	24668101	EL, 100μF, ±20%, 35V
C683	24668102	EL, 1000μF, ±20%, 35V
C688	24232103	CD, 0.01μF, +80%, –20%
C690	24794101	EL, 100μF, ±20%, 16V
C691	24232103	CD, 0.01μF, +80%, –20%
⚠C801	24082374	PF, 0.22μF, AC250V
C805	24092281	CD, 4700pF, ±20%, AC250V
C806	24092281	CD, 4700pF, ±20%, AC250V
C810	24086934	EL, 560μF, ±20%, 450V
⚠C813	24092567	CD, 1000pF, ±20%, AC250V
⚠C814	24092567	CD, 1000pF, ±20%, AC250V
C831	24794470	EL, 47μF, ±20%, 16V
C841	24796100	EL, 10μF, ±20%, 35V
C842	24794100	EL, 10μF, ±20%, 16V
C843	24591104	PF, 0.1μF
C846	24567224	PF, 0.22μF
C860	24214103	CD, 0.01μF, ±10%, 500V
C861	24214471	CD, 470pF, ±10%, 500V
C862	24082857	PF, 680pF, ±2%
C863	24591104	PF, 0.1μF
C864	24092474	CD, 220pF, ±10%, 2kV
C866	24591474	PF, 0.47μF
C867	24591272	PF, 2700pF
C868	24676470	EL, 47μF, ±20%, 100V
C869	24678229	EL, 2.2μF, ±20%, 200V
C870	24820823	PF, 0.082μF, 630V
C871	24092346	CD, 1200pF, ±10%, 2kV
C873	24567224	PF, 0.22μF
C876	24567474	PF, 0.47μF
C877	24667470	EL, 47μF, ±20%, 25V
C883	24567474	PF, 0.47μF
C884	24640019	EL, 220μF, ±20%, 160V
C885	24214471	CD, 470pF, ±10%, 500V
C886	24214471	CD, 470pF, ±10%, 500V
C889	24668222	EL, 2200μF, ±20%, 35V
C891	24082229	PF, 0.1μF, ±10%, 250V
C892	24763221	EL, 220μF, ±20%, 16V
C893	24092338	CD, 270pF, ±10%, 2kV
C894	24092338	CD, 270pF, ±10%, 2kV
C898	24212102	CD, 1000pF, ±10%
C902	24092345	CD, 1000pF, ±10%, 2kV
C904	24436561	CD, 560pF
C905	24436561	CD, 560pF
C907	24436751	CD, 750pF
C910	24669478	EL, 0.47μF, ±20%, 50V
C912	24763471	EL, 470μF, ±20%, 16V
C913	24794100	EL, 10μF, ±20%, 16V
C931	24436101	CD, 100pF
C971	24794221	EL, 220μF, ±20%, 16V
CA02	24436271	CD, 270pF

Location No.	Part No.	Description
CA33	24232103	CD, 0.01μF, +80%, –20%
CA36	24436470	CD, 47pF
CA37	24436101	CD, 100pF
CA38	24436101	CD, 100pF
CA68	24794100	EL, 10μF, ±20%, 16V
CA69	24232103	CD, 0.01μF, +80%, –20%
CA98	24794100	EL, 10μF, ±20%, 16V
CA99	24232103	CD, 0.01μF, +80%, –20%
CB01	24794470	EL, 47μF, ±20%, 16V
CB20	24591182	PF, 1800pF (21G5SXH)
CB21	24212101	CD, 100pF, ±10%
CB99	24212681	CD, 680pF, ±10%
CS02	24206010	EL, 1μF, 50V
CS03	24206010	EL, 1μF, 50V
CS06	24206010	EL, 1μF, 50V
CS07	24206010	EL, 1μF, 50V
CS10	24203100	EL, 10μF, ±20%, 16V
CS11	24203100	EL, 10μF, ±20%, 16V
CS29	24203220	EL, 22μF, ±20%, 16V
CT01	24591104	PF, 0.1μF
CT02	24353100	CD, 10pF, ±0.25pF
CT03	24353150	CD, 15pF
CT04	24212102	CD, 1000pF, ±10%
CT05	24591104	PF, 0.1μF
CT06	24591104	PF, 0.1μF
CT07	24085944	EL, 2.2μF, ±20%, 50V, Non-Polar
CT08	24232103	CD, 0.01μF, +80%, –20%
CT09	24763101	EL, 100μF, ±20%, 16V
CT10	24473220	CD, 22pF
CT14	24794100	EL, 10μF, ±20%, 16V
CT15	24474101	CD, 100pF, ±10%
CT16	24436220	CD, 22pF
CV01	24203101	EL, 100μF, ±20%, 16V
CV02	24203100	EL, 10μF, ±20%, 16V
CV03	24206010	EL, 1μF, 50V
CV04	24206100	EL, 10μF, 50V
CV05	24206010	EL, 1μF, 50V
CV06	24203100	EL, 10μF, ±20%, 16V
CV07	24232103	CD, 0.01μF, +80%, –20%
CV08	24203100	EL, 10μF, ±20%, 16V
CV09	24232103	CD, 0.01μF, +80%, –20%
CV10	24203100	EL, 10μF, ±20%, 16V
CV11	24232103	CD, 0.01μF, +80%, –20%
CV22	24203100	EL, 10μF, ±20%, 16V
CV33	24232103	CD, 0.01μF, +80%, –20%
CV34	24762471	EL, 470μF, ±20%, 10V
CV36	24763221	EL, 220μF, ±20%, 16V
CV39	24203100	EL, 10μF, ±20%, 16V

RESISTORS

R108	24000245	MF, 33k ohm, ±1%, 1/4W
R109	24000245	MF, 33k ohm, ±1%, 1/4W
R110	24366221	CF, 220 ohm
R111	24366223	CF, 22k ohm
R113	24366333	CF, 33k ohm
R114	24366333	CF, 33k ohm
R115	24366225	CF, 2.2M ohm
R116	24942226	CC, 22M ohm, 1/2W
R156	24382153	OMF, 15k ohm, 1W
R210	24366271	CF, 270 ohm
R211	24366271	CF, 270 ohm
R212	24366271	CF, 270 ohm
R213	24366223	CF, 22k ohm

Location No.	Part No.	Description
R214	24366824	CF, 820k ohm
R217	24367223	CF, 22k ohm, ±2%
R301	24366332	CF, 3300 ohm
R303	24321109	MF, 1 ohm, 1/2W
R304	24366154	CF, 150k ohm
R305	24322189	MF, 1.8 ohm, 1W
R306	24366563	CF, 56k ohm
R307	24366913	CF, 91k ohm
R308	24366102	CF, 1k ohm
R310	24552822	OMF, 8200 ohm, 1/2W
R313	24366203	CF, 20k ohm
R314	24366103	CF, 10k ohm
R327	24339689	MF, 6.8 ohm, 2W
R336	24383271	OMF, 270 ohm, 2W
R370	24310159	MF, 1.5 ohm, 1/2W
R371	24366562	CF, 5600 ohm
R372	24366392	CF, 3900 ohm
R373	24366102	CF, 1k ohm
R374	24366163	CF, 16k ohm
R401	24366104	CF, 100k ohm
R402	24366103	CF, 10k ohm
R403	24366472	CF, 4700 ohm
R405	24366104	CF, 100k ohm
R407	24366272	CF, 2700 ohm
R411	24366561	CF, 560 ohm
R413	24366151	CF, 150 ohm
R415	24382103	OMF, 10k ohm, 1W
R416	24019325	OMF, 2200 ohm, 5W
R421	24321129	MF, 1.2 ohm, 1/2W
R422	24366221	CF, 220 ohm
R429	24552560	OMF, 56 ohm, 1/2W
R430	24366103	CF, 10k ohm
R432	24531560	FR, 56 ohm, 1/2W
R434	24381121	OMF, 120 ohm, 1/2W
R435	24366561	CF, 560 ohm
R436	24366391	CF, 390 ohm
R437	24366392	CF, 3900 ohm
R441	24532102	FR, 1k ohm, 1W
R443	24366332	CF, 3300 ohm
R447	24382472	OMF, 4700 ohm, 1W
R448	24338338	MF, 0.33 ohm, 1W
R470	24338688	MF, 0.68 ohm, 1W
R471	24552820	OMF, 82 ohm, 1/2W
R479	24552820	OMF, 82 ohm, 1/2W
R501	24366273	CF, 27k ohm
R513	24366102	CF, 1k ohm
R514	24366102	CF, 1k ohm
R610	24366563	CF, 56k ohm
R612	24366103	CF, 10k ohm
R643	24552331	OMF, 330 ohm, 1/2W
R644	24552331	OMF, 330 ohm, 1/2W
R661	24366122	CF, 1200 ohm
R662	24366122	CF, 1200 ohm
R663	24366333	CF, 33k ohm
R664	24366333	CF, 33k ohm
R667	24366104	CF, 100k ohm
R668	24366103	CF, 10k ohm
R669	24366103	CF, 10k ohm
R680	24366104	CF, 100k ohm
R681	24366104	CF, 100k ohm
R690	24366103	CF, 10k ohm
R691	24366103	CF, 10k ohm
R692	24366511	CF, 510 ohm

Location No.	Part No.	Description
R801	24009954	Metal-Glazed Resistor, 2.2M ohm, 1/2W
⚠R808	24019340	PTC Thermistor, 18 ohm
R810	24569229	Cement, 2.2 ohm, 10W
R830	24548399	FR, 3.9 ohm, 2W
R831	24366331	CF, 330 ohm
R840	24531120	FR, 12 ohm, 1/2W
R842	24552472	OMF, 4700 ohm, 1/2W
R847	24366472	CF, 4700 ohm
R861	24384223	OMF, 22k ohm, 3W
R862	24552220	OMF, 22 ohm, 1/2W
R864	24552102	OMF, 1k ohm, 1/2W
R866	24381470	OMF, 47 ohm, 1/2W
R867	24366134	CF, 130k ohm
R868	24552103	OMF, 10k ohm, 1/2W
R870	24381151	OMF, 150 ohm, 1/2W
R871	24310109	MF, 1.0 ohm, 1/2W
R872	24377224	CF, 220k ohm, 1W
R874	24366104	CF, 100k ohm
R883	24552752	OMF, 7500 ohm, 1/2W
R884	24552752	OMF, 7500 ohm, 1/2W
R890	24381333	OMF, 33k ohm, 1/2W
R891	24366102	CF, 1k ohm
R899	24005015	Metal Glaze, 8.2M ohm, 1W
R901	24552122	OMF, 1200 ohm, 1/2W
R902	24552122	OMF, 1200 ohm, 1/2W
R903	24552122	OMF, 1200 ohm, 1/2W
R904	24366472	CF, 4700 ohm
R905	24366150	CF, 15 ohm
R914	24366561	CF, 560 ohm
R915	24366511	CF, 510 ohm
R917	24366821	CF, 820 ohm
R920	24000568	FR, 4.7 ohm, 1W
R921	24366561	CF, 560 ohm
R922	24366511	CF, 510 ohm
R925	24366821	CF, 820 ohm
R928	24366561	CF, 560 ohm
R929	24366511	CF, 510 ohm
R936	24366272	CF, 2700 ohm
R937	24366821	CF, 820 ohm
R961	24383183	OMF, 18k ohm, 2W
R963	24383183	OMF, 18k ohm, 2W
R965	24383183	OMF, 18k ohm, 2W
R972	24366681	CF, 680 ohm
R974	24366102	CF, 1k ohm
R977	24366681	CF, 680 ohm
RA02	24366102	CF, 1k ohm
RA04	24366102	CF, 1k ohm
RA05	24366102	CF, 1k ohm
RA07	24366102	CF, 1k ohm
RA08	24366102	CF, 1k ohm
RA09	24366102	CF, 1k ohm
RA10	24366102	CF, 1k ohm
RA11	24366102	CF, 1k ohm
RA12	24366102	CF, 1k ohm
RA13	24366102	CF, 1k ohm
RA14	24366154	CF, 150k ohm
RA15	24366433	CF, 43k ohm
RA16	24366102	CF, 1k ohm
RA17	24366102	CF, 1k ohm
RA18	24366102	CF, 1k ohm
RA19	24366101	CF, 100 ohm
RA22	24366272	CF, 2700 ohm
RA23	24366272	CF, 2700 ohm

Location No.	Part No.	Description
RA24	24366272	CF, 2700 ohm
RA25	24366102	CF, 1k ohm
RA26	24366102	CF, 1k ohm
RA27	24366102	CF, 1k ohm
RA28	24366104	CF, 100k ohm
RA29	24366104	CF, 100k ohm
RA30	24366104	CF, 100k ohm
RA33	24366103	CF, 10k ohm
RA34	24366103	CF, 10k ohm
RA35	24366103	CF, 10k ohm
RA36	24366333	CF, 33k ohm
RA37	24366331	CF, 330 ohm
RA38	24366331	CF, 330 ohm
RA40	24366331	CF, 330 ohm
RA41	24366331	CF, 330 ohm
RA61	24366103	CF, 10k ohm
RA62	24366103	CF, 10k ohm
RA64	24366333	CF, 33k ohm
RA65	24366333	CF, 33k ohm
RA67	24366103	CF, 10k ohm
RA68	24366103	CF, 10k ohm
RA70	24366333	CF, 33k ohm
RA71	24366683	CF, 68k ohm
RA72	24366223	CF, 22k ohm
RA73	24366103	CF, 10k ohm
RA75	24366470	CF, 47 ohm
RA509	24366391	CF, 390 ohm
RA510	24366391	CF, 390 ohm
RB01	24366271	CF, 270 ohm
RB02	24366221	CF, 220 ohm
RB09	24366470	CF, 47 ohm
RB11	24366103	CF, 10k ohm
RB12	24366223	CF, 22k ohm
RB20	24366823	CF, 82k ohm
RB22	24366103	CF, 10k ohm
RB26	24366103	CF, 10k ohm
RB27	24366103	CF, 10k ohm
RB28	24366104	CF, 100k ohm
RB30	24366103	CF, 10k ohm
RB43	24366103	CF, 10k ohm
RB44	24366682	CF, 6800 ohm
RB45	24366102	CF, 1k ohm
RB46	24366331	CF, 330 ohm
RB60	24366103	CF, 10k ohm
RB61	24366103	CF, 10k ohm
RR16	24366122	CF, 1200 ohm
RR17	24366122	CF, 1200 ohm
RR18	24366122	CF, 1200 ohm
RR23	24366101	CF, 100 ohm
RR24	24366101	CF, 100 ohm
RR25	24366101	CF, 100 ohm
RS01	24366103	CF, 10k ohm
RS02	24366104	CF, 100k ohm
RS03	24366103	CF, 10k ohm
RS04	24366104	CF, 100k ohm
RS05	24366104	CF, 100k ohm
RS06	24366104	CF, 100k ohm
RS14	24366101	CF, 100 ohm
RS15	24366101	CF, 100 ohm
RS19	24366101	CF, 100 ohm
RS20	24366222	CF, 2200 ohm
RS21	24366101	CF, 100 ohm
RS22	24366222	CF, 2200 ohm
RS23	24366102	CF, 1k ohm
RS24	24366102	CF, 1k ohm
RS27	24366561	CF, 560 ohm
RT01	24366332	CF, 3300 ohm
RT02	24366100	CF, 10 ohm
RT03	24366101	CF, 100 ohm
RT04	24366273	CF, 27k ohm
RT05	24366103	CF, 10k ohm
RT07	24366102	CF, 1k ohm
RT08	24366103	CF, 10k ohm
RT09	24366101	CF, 100 ohm
RT15	24366101	CF, 100 ohm
RT16	24366101	CF, 100 ohm
RT17	24366102	CF, 1k ohm
RT18	24366152	CF, 1500 ohm
RT19	24366122	CF, 1200 ohm
RT20	24366471	CF, 470 ohm
RT21	24366561	CF, 560 ohm
RT97	24366102	CF, 1k ohm
RT98	24366102	CF, 1k ohm
RT99	24366102	CF, 1k ohm
RV02	24366472	CF, 4700 ohm
RV03	24366101	CF, 100 ohm
RV04	24366472	CF, 4700 ohm
RV05	24366223	CF, 22k ohm
RV06	24366272	CF, 2700 ohm
RV07	24366471	CF, 470 ohm
RV08	24366102	CF, 1k ohm
RV09	24366471	CF, 470 ohm
RV10	24366471	CF, 470 ohm
RV11	24366472	CF, 4700 ohm
RV12	24366101	CF, 100 ohm
RV13	24366472	CF, 4700 ohm
RV14	24366101	CF, 100 ohm
RV15	24366223	CF, 22k ohm
RV16	24366562	CF, 5600 ohm
RV17	24366471	CF, 470 ohm
RV18	24366223	CF, 22k ohm
RV19	24366562	CF, 5600 ohm
RV20	24366104	CF, 100k ohm
RV21	24366221	CF, 220 ohm
RV22	24366223	CF, 22k ohm
RV23	24366223	CF, 22k ohm
RV24	24552101	OMF, 100 ohm, 1/2W
RV25	24366750	CF, 75 ohm
RV26	24366101	CF, 100 ohm
RV27	24366103	CF, 10k ohm
RV30	24366750	CF, 75 ohm
RV31	24366820	CF, 82 ohm
RV37	24366820	CF, 82 ohm
RV87	24366332	CF, 3300 ohm
RV88	24366102	CF, 1k ohm
RV89	24366122	CF, 1200 ohm
RV90	24366101	CF, 100 ohm
RV91	24366101	CF, 100 ohm

COILS & TRANSFORMERS

L301	23103938	Coil, Choke, TEM2003
L302	23238704	Coil, Peaking, TRF4680AJ
L430	23289470	Coil, Peaking, TRF4470AF
L431	23289100	Coil, Peaking, TRF4100AF
L441	23233071	Coil, Linearity, TLN2112G
L462	23231054	Deflection Yoke, TDY-621UA
L503	23289100	Coil, Peaking, TRF4100AF
L505	23289100	Coil, Peaking, TRF4100AF

Location No.	Part No.	Description
L805	23248213	Coil, Choke, TLN3481AH
L806	23248150	Coil, Choke, TLN3427
L861	23103880	Coil (Ferrite Bead), TEM2011Y
L862	23103937	Coil (Ferrite Bead), TEM2004
L883	23103775	Coil (Ferrite Bead), TEM2014
L884	23103775	Coil (Ferrite Bead), TEM2014
L885	23248073	Coil, Choke, TLN3299D
L886	23103880	Coil (Ferrite Bead), TEM2011Y
L887	23280016	Coil, Peaking, TRF4100AZ
L888	23103880	Coil (Ferrite Bead), TEM2011Y
⚠L901	23200316	Coil, Degaussing, TSB-2301AL
LA01	23289100	Coil, Peaking, TRF4100AF
LT01	23289339	Coil, Peaking, TRF43R3AF
LT02	23238562	Coil, Peaking, TRF4109AJ
LT03	23289150	Coil, Peaking, TRF4150AF
LT04	23238714	Coil, Peaking, TRF4100AJ
LT05	23238714	Coil, Peaking, TRF4100AJ
LT06	23238714	Coil, Peaking, TRF4100AJ
LT07	23238714	Coil, Peaking, TRF4100AJ
LT08	23103880	Coil (Ferrite Bead), TEM2011Y
LT10	23238506	Coil, Peaking, TRF4229AJ
LT12	23238506	Coil, Peaking, TRF4229AJ
LT13	23238506	Coil, Peaking, TRF4229AJ
LT15	23238710	Coil, Peaking, TRF4220AJ
LT97	23238714	Coil, Peaking, TRF4100AJ
LT98	23238714	Coil, Peaking, TRF4100AJ
LT99	23238714	Coil, Peaking, TRF4100AJ
T401	23224983	Transformer, Horiz. Drive, TLN1039
⚠T461	23236481	Transformer, Flyback, TFB4125CH
⚠T801	23211891	Line Filter, TRF3164
⚠T862	23217391	Transformer, Converter, TPW3395AS

SEMICONDUCTORS

Q102	23114528	Transistor, 2SC1740S-Q
Q301	B0377890	IC, TA8403K
Q301B	72471081	Screw, BRDT2W3X8 SZN
Q310	A6002020	Transistor, RN1202
Q311	A6002040	Transistor, RN1204
Q370	23114530	Transistor, 2SA933S-Q
Q402	A6330069	Transistor, 2SC2482 FA-1
Q404	23314375	Transistor, ON4409(508D)
Q404C	23742030	Screw, N3X0.5 SZN
Q421	23314141	Transistor, 2SC3852
Q421B	70391355	Screw, BITTB3X8 SZN
Q430	23314141	Transistor, 2SC3852
Q430B	70391356	Screw, BITTB3X10 SZN
Q431	23114528	Transistor, 2SC1740S-Q
Q501	B0101549	IC, TB1229BN(21G5DE)
Q501	23906371	IC, TB1226BN(21G5SXH)
Q608	A6342206	Transistor, 2SC2878-A(TE
Q609	A6342206	Transistor, 2SC2878-A(TE
Q610	23906582	IC, AN5277
Q610B	70391355	Screw, BITTB3X8 SZN
Q612	23114530	Transistor, 2SA933S-Q
Q801	23906189	IC, STR-Z4202A
Q830	23314141	Transistor, 2SC3852
Q830B	70391356	Screw, BITTB3X10 SZN
Q840	23318299	IC, L78MR05
Q840B	70391356	Screw, BITTB3X10 SZN
⚠Q862	A8644773	Photo Coupler, TLP721F(D4-G
Q872	23314141	Transistor, 2SC3852
Q872B	70391355	Screw, BITTB3X8 SZN
Q901	A6330059	Transistor, 2SC2482(C)
Q902	23114528	Transistor, 2SC1740S-Q
Q903	A6330059	Transistor, 2SC2482(C)
Q904	23114528	Transistor, 2SC1740S-Q
Q905	A6330059	Transistor, 2SC2482(C)
Q906	23114528	Transistor, 2SC1740S-Q
Q907	23114530	Transistor, 2SA933S-Q
Q908	A6321265	Transistor, 2SC2120-Y(TE)
QA01	23906536	IC, M37222M6-082 (21G5DE)
QA01	23906569	IC, M37222M6-083 (21G5SXH)
QA02	23904666	IC, NM24C08EN
QB01	23114528	Transistor, 2SC1740S-Q
QB02	23114530	Transistor, 2SA933S-Q
QB20	A6002010	Transistor, RN1201
QB21	23114528	Transistor, 2SC1740S-Q
QB30	23114528	Transistor, 2SC1740S-Q
QB40	23114528	Transistor, 2SC1740S-Q
QS01	23114528	Transistor, 2SC1740S-Q
QS02	23114528	Transistor, 2SC1740S-Q
QS03	A6342206	Transistor, 2SC2878-A(TE
QS04	A6342206	Transistor, 2SC2878-A(TE
QT01	23904899	IC, SAA5281ZP/E
QT04	23114530	Transistor, 2SA933S-Q
QT05	23114528	Transistor, 2SC1740S-Q
QV01	23904747	IC, MM1250XD
QV02	23114528	Transistor, 2SC1740S-Q
QV03	23114528	Transistor, 2SC1740S-Q
QV04	23904943	IC, MM1111XS
QV05	23114530	Transistor, 2SA933S-Q
QV06	23114530	Transistor, 2SA933S-Q
QV07	23114528	Transistor, 2SC1740S-Q
QV08	23114528	Transistor, 2SC1740S-Q
QV09	23114528	Transistor, 2SC1740S-Q
QV10	23114528	Transistor, 2SC1740S-Q
QV13	23114530	Transistor, 2SA933S-Q
D101	23115878	Diode, Zener, μPC574J, (L)
D102	23118859	Diode, 1SS133
D103	23118859	Diode, 1SS133
D201	23316687	Diode, Zener, MTZJ9.1B
D202	23316687	Diode, Zener, MTZJ9.1B
D203	23316687	Diode, Zener, MTZJ9.1B
D204	23118859	Diode, 1SS133
D301	23118479	Diode, BYD33J
D308	23118479	Diode, BYD33J
D370	23316652	Diode, Zener, MTZJ2.7A
D401	23316685	Diode, Zener, MTZJ8.2C
D403	23316667	Diode, Zener, MTZJ4.7C
D406	23118479	Diode, BYD33J
D408	A7580658	Diode, 3JH41
D421	23316690	Diode, Zener, MTZJ10B
D430	23118859	Diode, 1SS133
D431	23316683	Diode, Zener, MTZJ8.2A
D441	23316688	Diode, Zener, MTZJ9.1C
D610	23118859	Diode, 1SS133
D611	23118859	Diode, 1SS133
D612	23118859	Diode, 1SS133
D615	23118859	Diode, 1SS133
D616	23118859	Diode, 1SS133
D617	23118859	Diode, 1SS133
D618	23118859	Diode, 1SS133
D619	23118859	Diode, 1SS133
D801	23357041	Diode, LN6SB60-F05
D830	23316673	Diode, Zener, MTZJ5,6C

Location No.	Part No.	Description
D842	23316747	Diode, Zener, MTZJ27C
D844	23316747	Diode, Zener, MTZJ27C
D845	23316686	Diode, Zener, MTZJ9.1A
D862	23118094	Diode, EU2A
D864	23118094	Diode, EU2A
D872	23316724	Diode, Zener, MTZJ15A
D875	23316719	Diode, Zener, MTZJ12B
D876	23118859	Diode, 1SS133
D878	23316747	Diode, Zener, MTZJ27C
D880	23118859	Diode, 1SS133
D883	23316813	Diode, EG1
D884	23316813	Diode, EG1
D885	23316766	Diode, RU2YX
D886	23316766	Diode, RU2YX
D901	23115537	Diode, 1SS131
D904	23115537	Diode, 1SS131
D905	23115537	Diode, 1SS131
D906	23115537	Diode, 1SS131
DA36	23118859	Diode, 1SS133
DA42	23316675	Diode, Zener, MTZJ6.2B
DA97	23118859	Diode, 1SS133
DA98	23118859	Diode, 1SS133
DA99	23316675	Diode, Zener, MTZJ6.2B
DB01	A8636650	Diode (LED), TLSG116
DB30	23118859	Diode, 1SS133

MISCELLANEOUS

E912	23848729	Rubber Wedge
⚠F470	23144827	Fuse, 0.63A
F470A	23165433	Holder, Fuse
⚠F801	23144834	Fuse, 3.15A
F801A	23165433	Holder, Fuse
G101	23289101	Coil, Peaking, TRF4101AF
G402	23103880	Coil (Ferrite Bead), TEM2011Y
G406	23103880	Coil (Ferrite Bead), TEM2011Y
G440	23316254	Diode, ERC06-15
G461	23118338	Diode, RU4AM
G467	24082095	PF, 0.018μF, ±3%, 630V
G501	24366103	CF, 10k ohm(21G5DE)
G501	24797010	EL, 1μF, ±20%, 50V (21G5SXH)
G616	24366102	CF, 1k ohm
G902	23115537	Diode, 1SS131
G903	23115537	Diode, 1SS131
G941	24366300	CF, 30 ohm
G942	24366330	CF, 33 ohm
G943	24366180	CF, 18 ohm
H002	23148282	Module, MVCS45, 38M IF MPX A.PRO
KB01	23904946	Remote Sensor, RPM-676CBR-S
L462A	23997351	Compensator, DY, TC-O
L462B	23199314	Compensator, DY, TC-E
L462C	23993623	Compensator, DY, TC-L
N699	23960136	Adhesive, TSE3843-W
P661	23363607	Headphone Jack, 3.5mm
⚠P801	23372024	Power Cord (21G5DE)
⚠P801	23372027	Power Cord (21G5SXH)
P910	23164725	Plug, 2P
PT01A	23902655	Socket, B-B, 15P
PT01B	23367724	Connector, B-B, 15P
PV02	23363252	Pin Jack, Yellow
PV03	23365508	Jack, Phono
PV05	23365818	Jack, SVHS
PV05A	23902863	Socket, 20P 2MM
PV05B	23368520	Plug, 20P 2MM
⚠S801	23344385	Switch, Power
SA01	23145227	Switch, Push, 1C1P
SA02	23145227	Switch, Push, 1C1P
SA03	23145227	Switch, Push, 1C1P
SA04	23145227	Switch, Push, 1C1P
SA05	23145227	Switch, Push, 1C1P
SA06	23145227	Switch, Push, 1C1P
⚠V901M	23102409	Magnet, P/C, MAG-1070
W661	23351144	Speaker, SPK1401, 60X120mm, 8 ohm
W662	23351144	Speaker, SPK1401, 60X120mm, 8 ohm
X501	23153438	Crystal, 16.2
XA01	23153325	Ceramic Resonator, 8.00M, TCR1056
XT01	23153472	Crystal, 27M
Z801	23904997	IC, HIC1015
Z860	23144451	Protector, PRF5000, 125V, 5A

PC BOARD ASSEMBLIES

* U901		CRT Drive Board, PB8201
* U902		Main Board, PB8202 (21G5DE)
* U902		Main Board, PB8203 (21G5SXH)
* U903		Back/AV Board, PB8207
* U904		Text Board, PB8208 (21G5DE)

PICTURE TUBE

⚠V901	23312780	Picture Tube, A51KSU73X(VM)

TUNER

H001	23321269	Tuner, ECA14

ACCESSORIES

K902	23306194	Remote Hand Unit, CT-9881 (21G5DE)
K902	23306193	Remote Hand Unit, CT-9878 (21G5SXH)
AT03	23588016	Battery Cover
Y101	23563394	Owner's Manual, English, 21G5DE
Y101	23563395	Owner's Manual, Chinese, 21G5SXH
Y120	23943846	Cover, POLY

CABINET PARTS

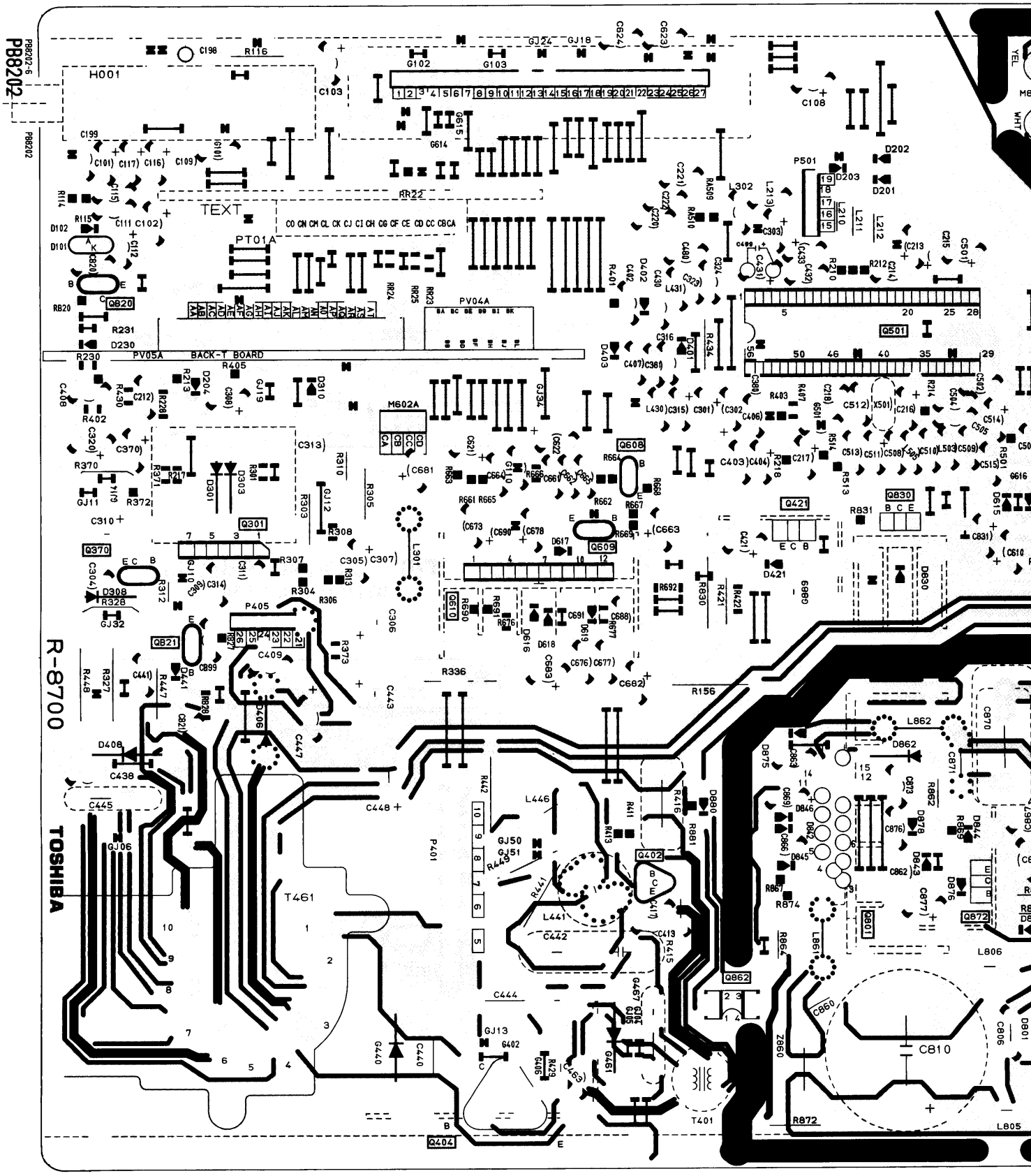
A201	23510499	Front Cover (21G5DE)
A201	23510500	Front Cover (21G5SXH)
A263	23430510	Filter
A264	23836494	Spring, Coil
A270	23445196	Key, Control
A271	23445197	Button, Power
⚠A401	23427523	Back Cover
A403	23550094	Label, Model No.(21G5DE)
A403	23550095	Label, Model No.(21G5SXH)
A511	23035412	Screw, BTB4X12 SZN
A512	23035412	Screw, BTB4X12 SZN
A521	23035412	Screw, BTB4X12 SZN
A522	23035412	Screw, BTB4X12 SZN

Location No.	Part No.	Description
A525	23037312	Screw, BTBW3X12 SZN
A531	23035412	Screw, BTB4X12 SZN
A532	23035412	Screw, BTB4X12 SZN

Location No.	Part No.	Description

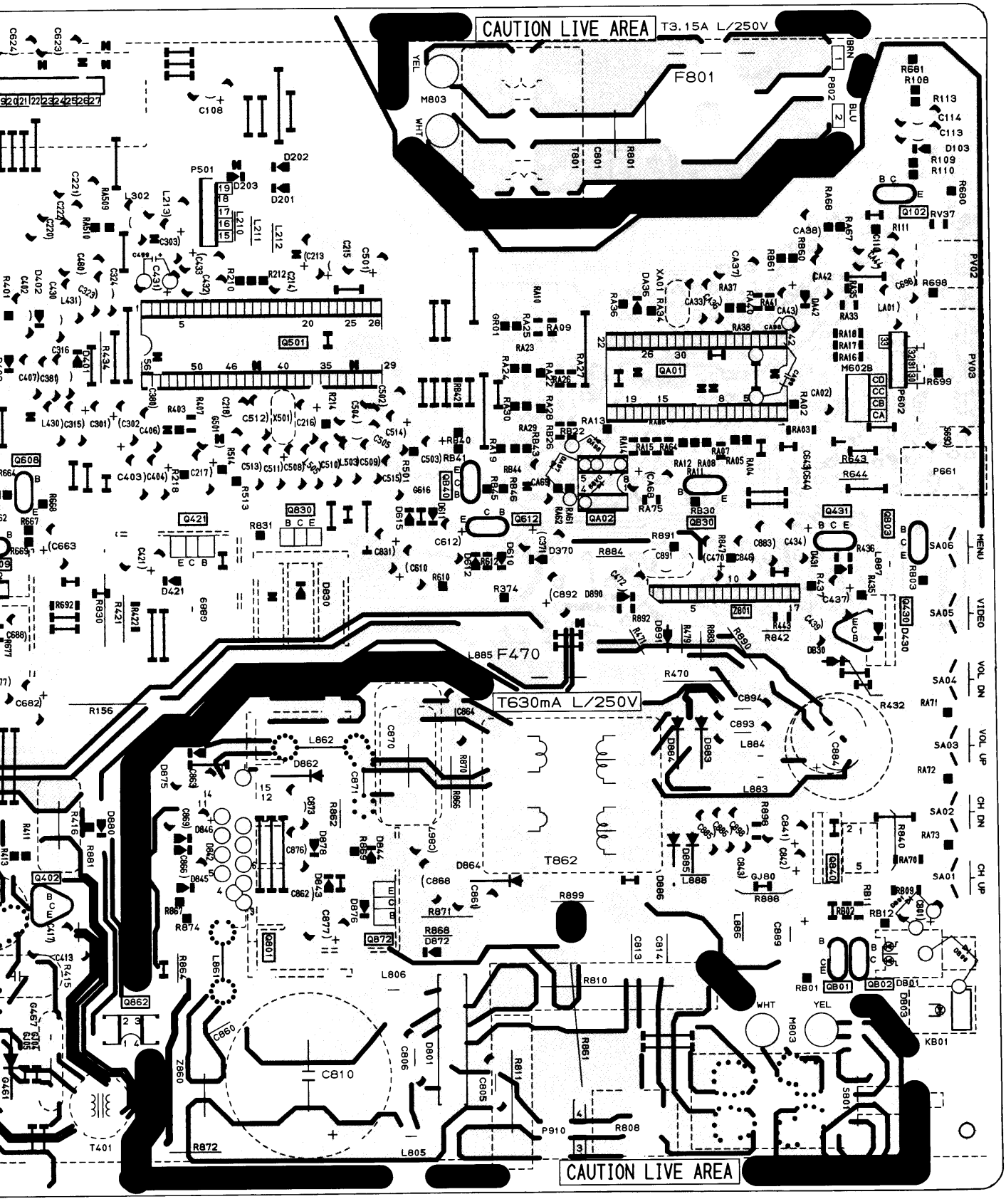
MAIN BOARD PB8202

BOTTOM (FOIL) SIDE



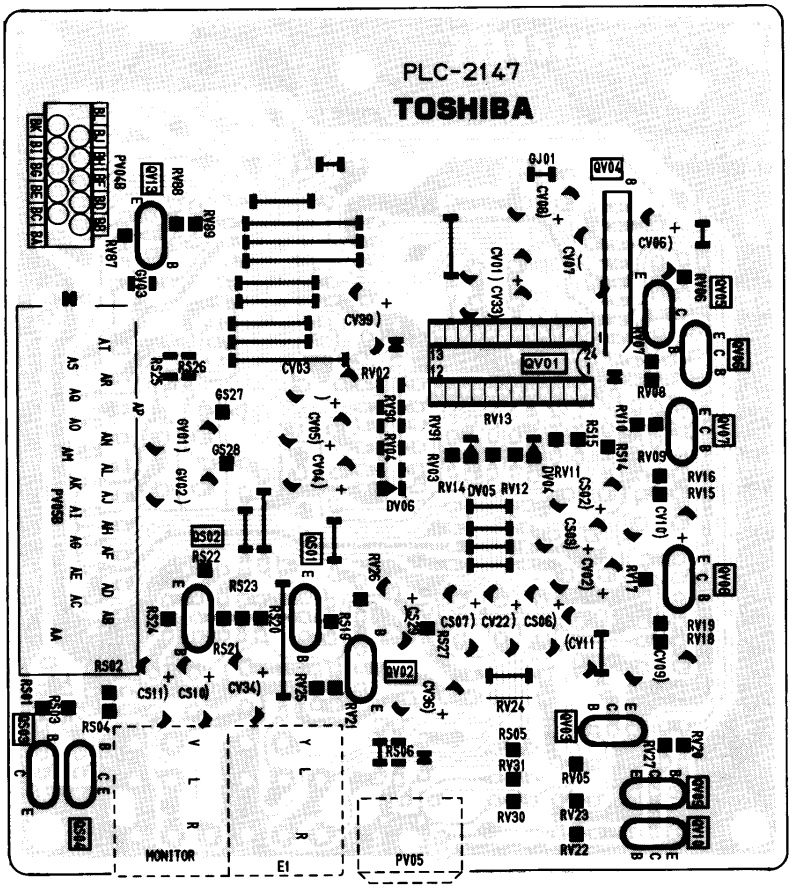
MAIN BOARD PB8202

BOTTOM (FOIL) SIDE



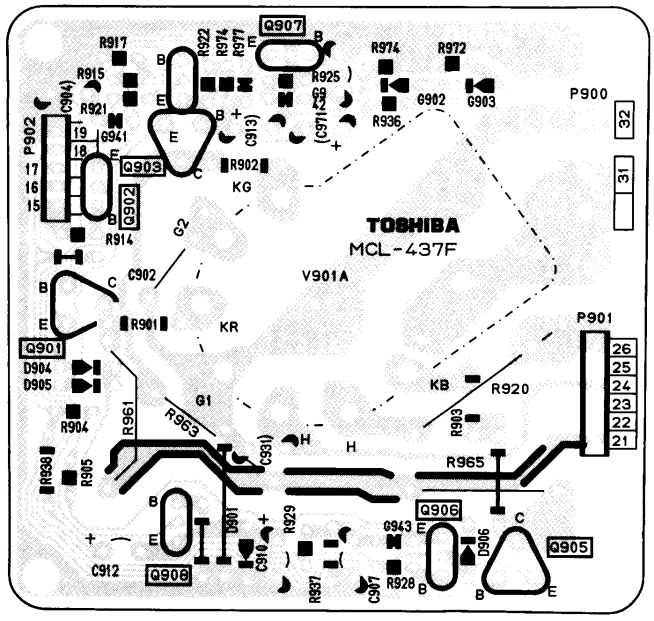
BACK TERM/AV BOARD PB8207

BOTTOM (FOIL) SIDE



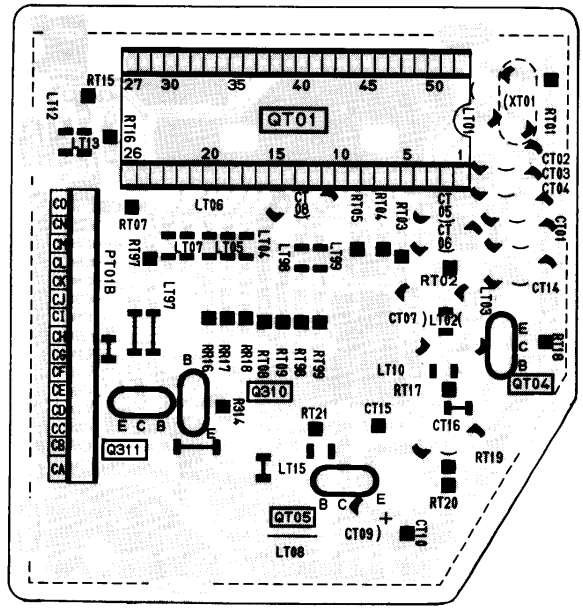
CRT DRIVE BOARD PB8201

BOTTOM (FOIL) SIDE



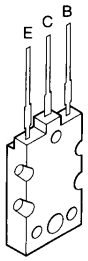
TEXT BOARD PB8208

BOTTOM (FOIL) SIDE

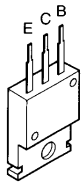


TERMINAL VIEW OF TRANSISTORS

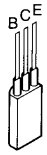
① 2SD2253
(old)
2SC5243



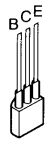
② 2SC3852
2SD1763A
2SC1569
2SC4544
2SA1788
2SA1306
2SA1186A



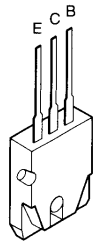
③ 2SC752GTM
2SC2482
2SC2655
2SC4721P



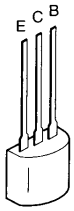
④ 2SC752
2SA562TM
2SA1015
2SC1815
2SC2878
2SC1740S
2SC2120
2SA9335



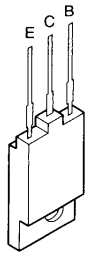
⑤ 2SA1788



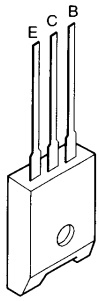
⑥ RN2203
RN2201
RN2004
RN1203
RN1204
RN2204
RN1205
RN1202
RN1201



⑦ 2SD1554
2SD2253
2SD1556
2SC5143



⑧ ON4409



SPECIFIC INFORMATIONS

SCHEMATIC DIAGRAM MODEL : 21G5DE / 21G5SXH (1/2)

060-9801

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 page 3. Do not degrade the safety of the receiver through improper servicing.

OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltages read with VTVM from point shown to chassis ground. line voltage 220 volts, colour bar signal. Voltages reading may vary ±20%.
2. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
3. Waveforms are taken using a standard colour bar signal.
4. Make sure that CONTRAST and COLOUR controls are in mid position and BRIGHTNESS control is almost in maximum position. Set other controls for best picture.

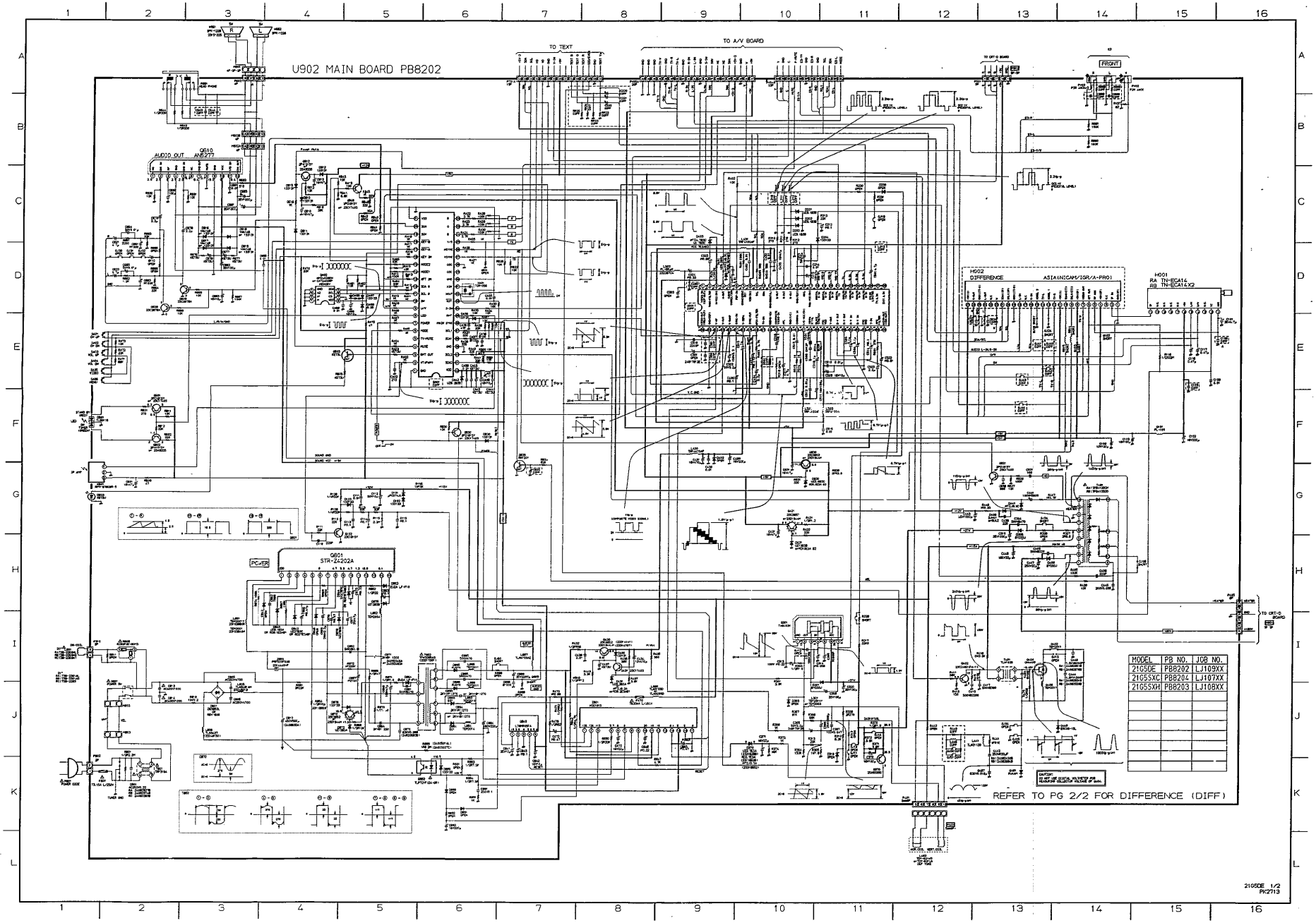
NOTES:

1. D.C. resistance value of a principal transformer is shown in this schematic diagram. These are measured for separated from the circuit.
2. The circuits are subject to change without notice.
3. ● : Solder links.

EXPRESSION

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm, k=1,000, M=1,000,000
2. Unless other wise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.



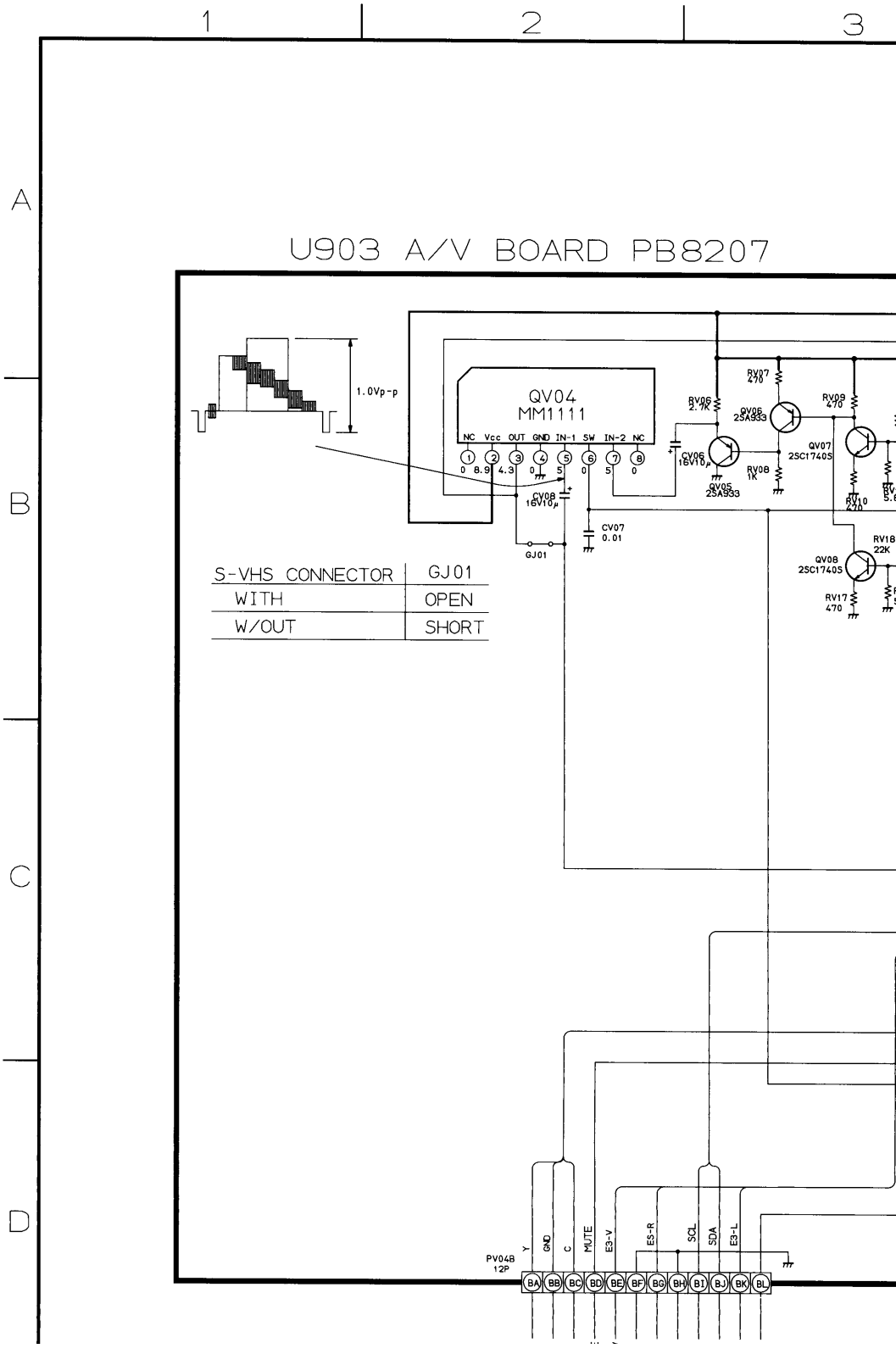
MODEL	PB NO.	JOB NO.
21G5DE	PB8202	LJ109XX
21G5SXC	PB8204	LJ107XX
21G5SXH	PB8203	LJ108XX

SCHEMATIC DIAGRAM MODEL : 21G5DE / 21G5SXH (2/2)

060-9801

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 page 3. Do not degrade the safety of the receiver through improper servicing.

OBSER
1. Volt
volt
2. All v
3. Wav
4. Mak
BRI
pict



(2/2)

OBSERVATION OF VOLTAGES AND WAVEFORMS

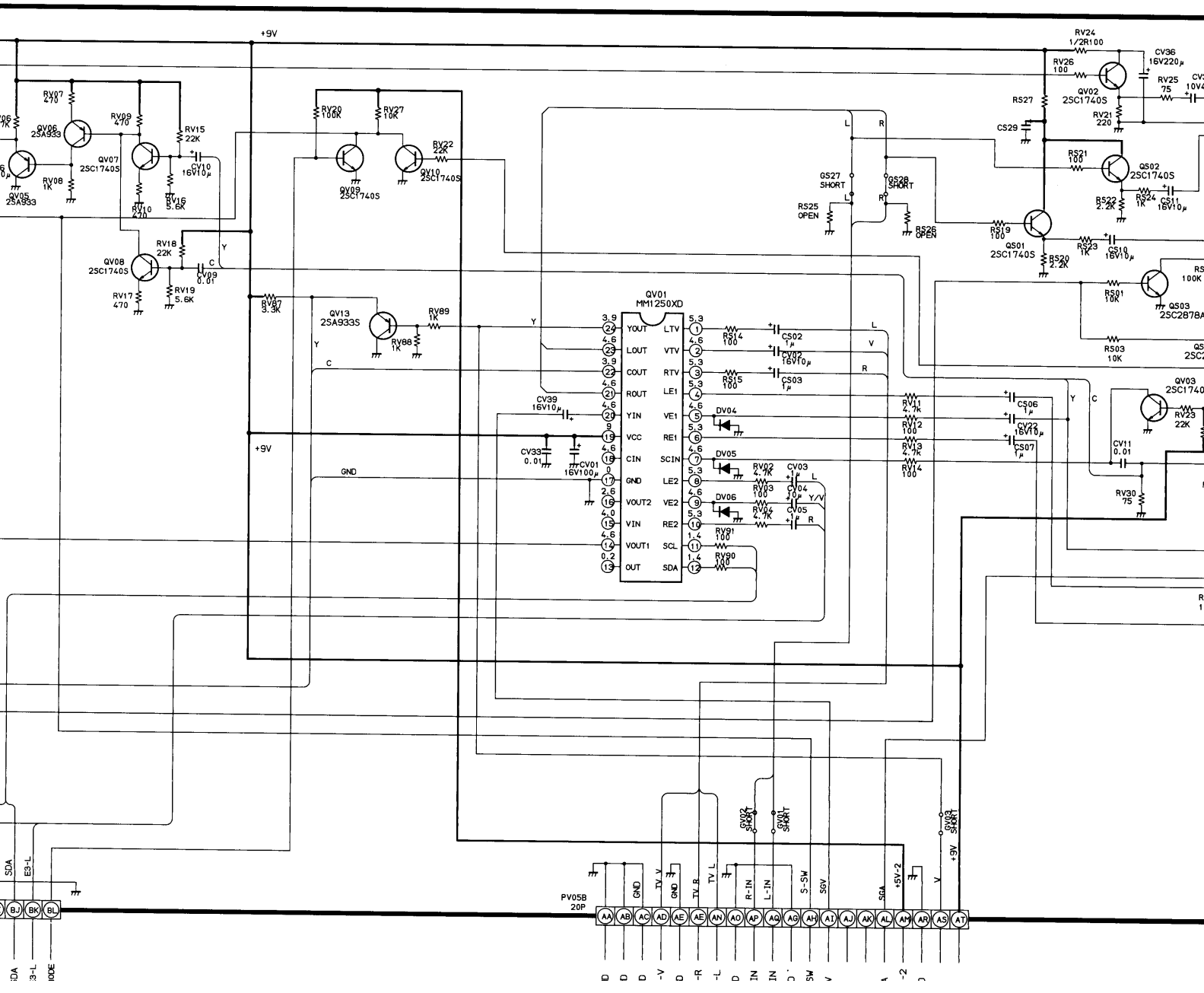
1. Voltages read with VTVM from point shown to chassis ground, line voltage 220 volts, colour bar signal. Voltages reading may vary ±20%.
2. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
3. Waveforms are taken using a standard colour bar signal.
4. Make sure that CONTRAST and COLOUR controls are in mid position and BRIGHTNESS control is almost in maximum position. Set other controls for best picture.

NOTES:

1. D.C. resistance value of a
   gram. These are measured
2. The circuits are subject to
3. ● : Solder links.

3 4 5 6

3207



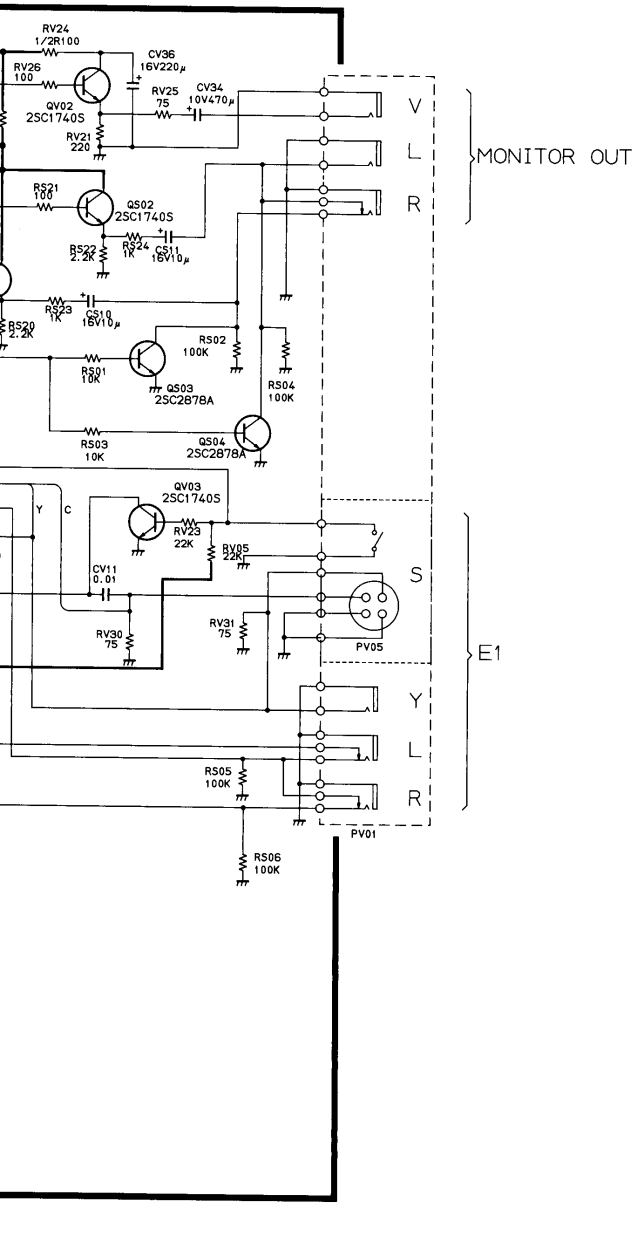
EXPRESSION

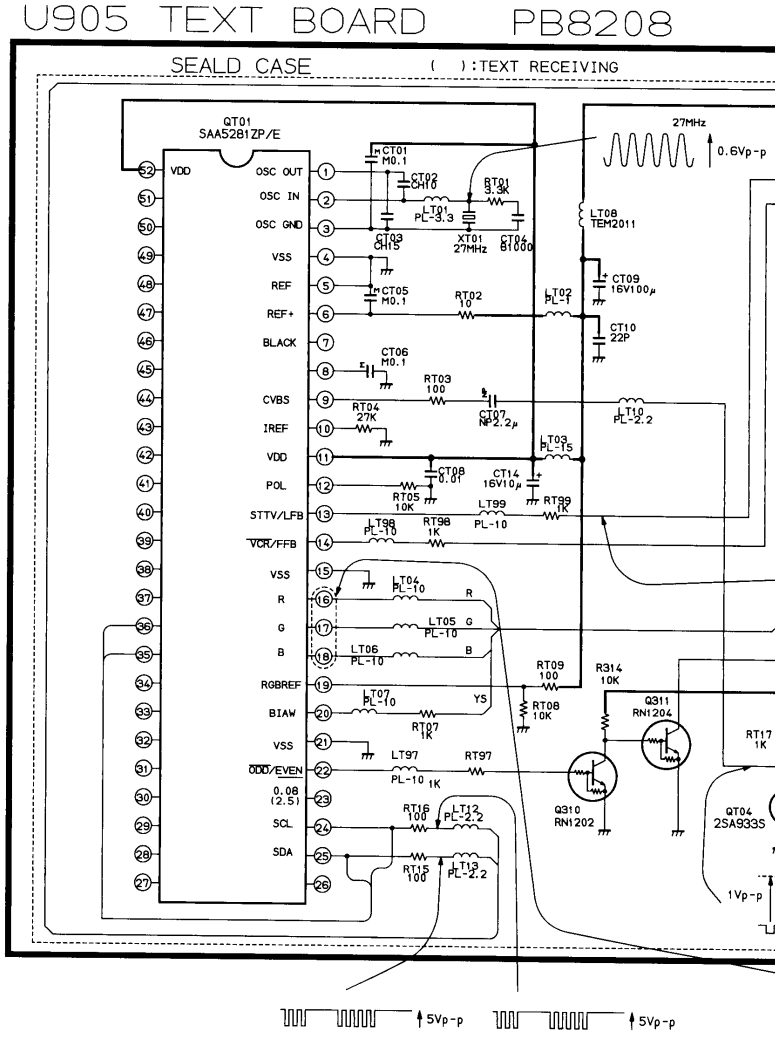
VALUE OF RESISTOR, CAPACITOR and INDUCTO

1. Resistance is shown in ohm, k=1,000, M=1,000,000
2. Unless other wise noted in schematic, all capacitor v
   sed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor va
   sed in μH, and the values less than 1 in H.

resistance value of a principal transformer is shown in this schematic dia-
These are measured for separated from the circuit.
rcuits are subject to change without notice.
Solder links.

7 8 9 10

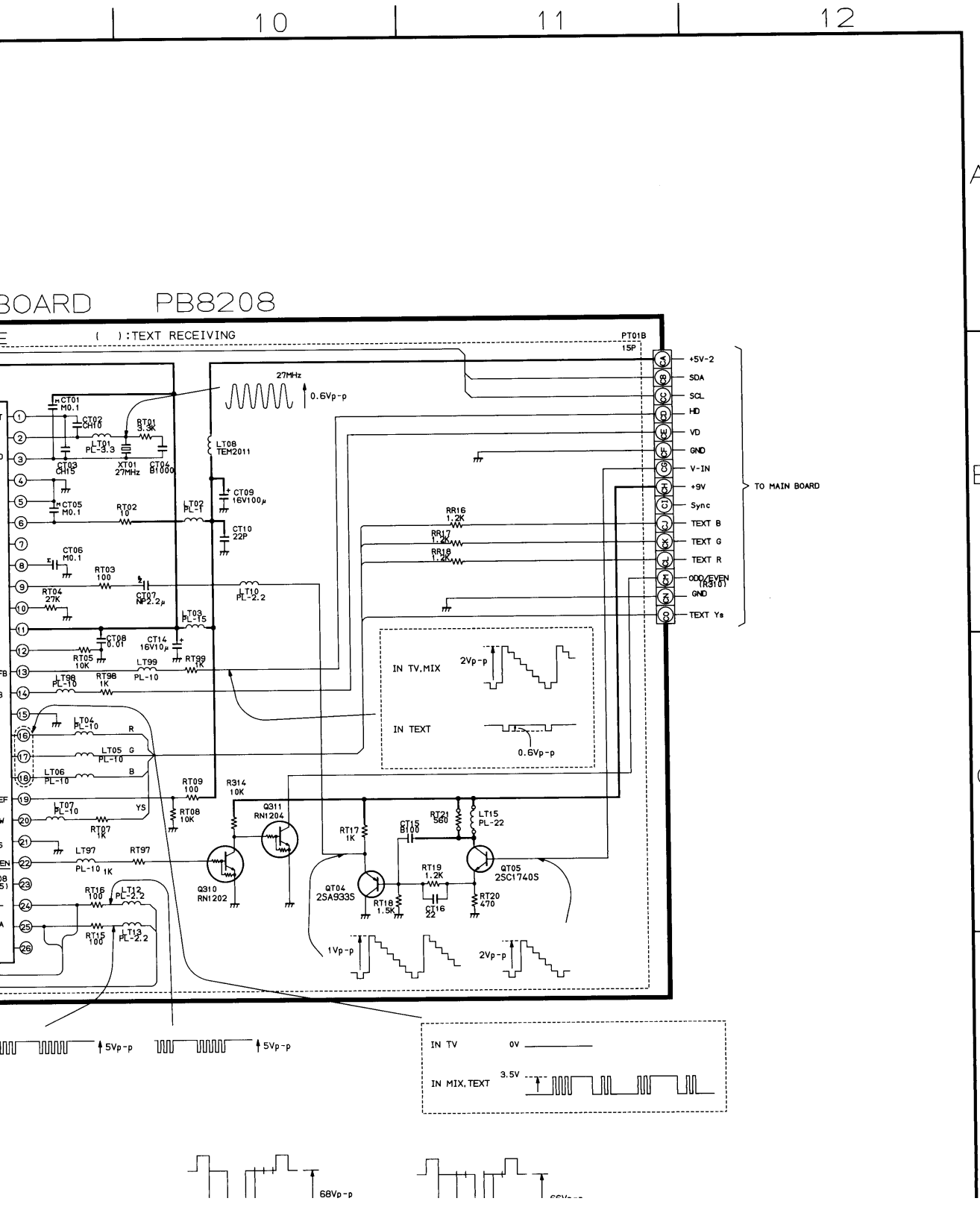


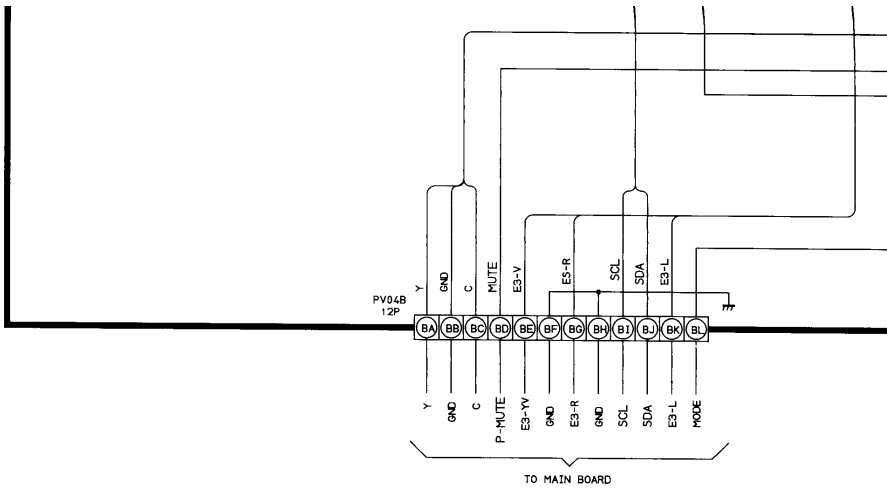


SION

F RESISTOR, CAPACITOR and INDUCTOR

ce is shown in ohm, k=1,000, M=1,000,000
ther wise noted in schematic, all capacitor values less than 1 are expres-
F and the values more than 1 in pF.
therwise noted in schematic, all inductor values more than 1 are expres-
H, and the values less than 1 in H.





DIFFERENCE TABLE

MODEL PB NO. JOB NO.	21G5DE PB8202 LJ109	21G5SXC PB8204 LJ107	21G5SXH PB8203 LJ108
C220	50V0.1μ	KETSU	KETSU
C221	50V0.1μ	KETSU	KETSU
C222	50V0.1μ	KETSU	KETSU
CB20	KETSU	50V0.0018MF	50V0.0018MF
G501	1/6W10K	50V1μ	50V1μ
H002	MVCS45	MVCS45B	MVCS45
TEXT BLK	USING	NOT USING	NOT USING
Q501	TB1229BN	TB1226BN	TB1226BN
QA01	M37222M6-082	M37222M6-083	M37222M6-083
RR22	KETSU	SHORT	SHORT
RR23	1/6W100	KETSU	KETSU
RR24	1/6W100	KETSU	KETSU
RR25	1/6W100	KETSU	KETSU

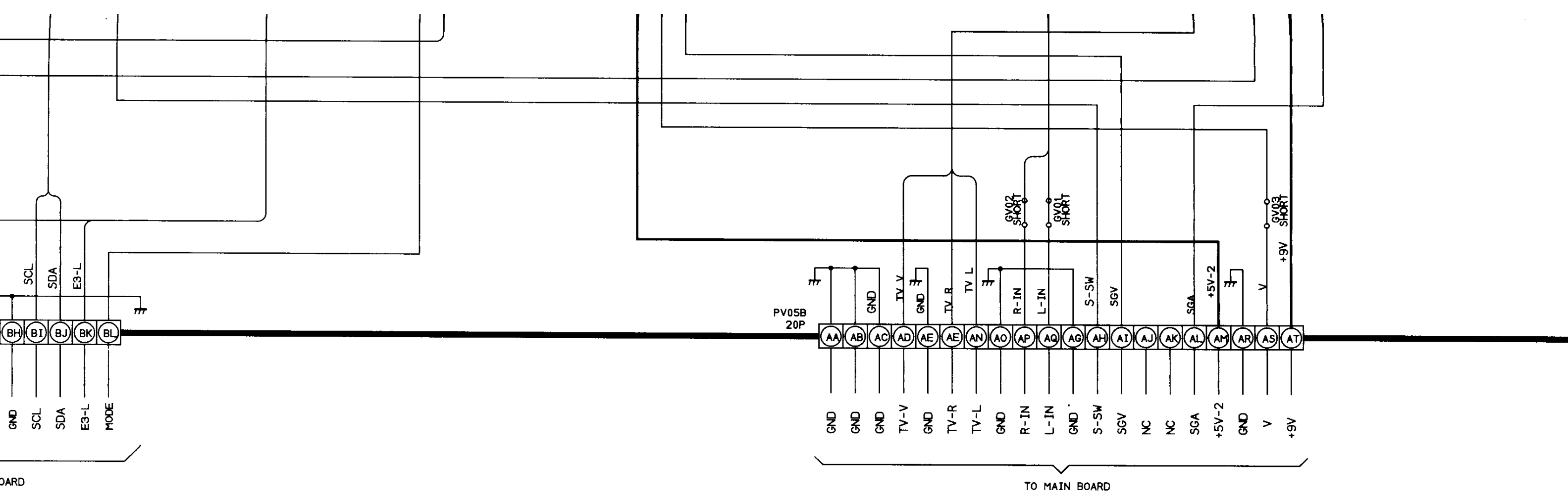
TENTATIVE
LOCATION FOR
21G5DE IS ACTUAL

	21G5DE	PROVISION FOR BILINGUAL
GJ40	SHORT	OPEN
GJ41	SHORT	OPEN
GJ42	OPEN	SHORT
GJ43	OPEN	SHORT
GJ44	OPEN	SHORT

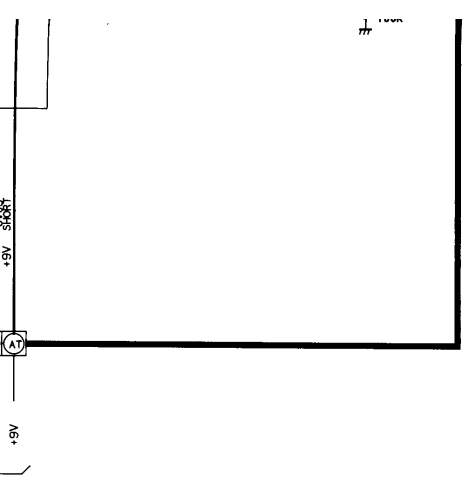
	21G5DE	PROVISION FOR EMC (TENTATIVE)
R449	OPEN	1FR1K
L446	OPEN	TLN2132
JP184	SHORT	OPEN
JP185	SHORT	OPEN
C643	OPEN	0.01
C644	OPEN	0.01
JP181	OPEN	SHORT
C623	OPEN	0.01
C624	OPEN	0.01
JP182	OPEN	SHORT
JP183	OPEN	SHORT
C109	OPEN	0.01
C198	OPEN	0.01
C380	OPEN	1000PF
C381	OPEN	1000PF
R698	SHORT	1/6W1K
R699	SHORT	1/6W1K
C698	OPEN	1000PF
C699	OPEN	1000PF
C480	OPEN	0.01
L210	SHORT	TEM2011
L211	SHORT	TEM2011
L212	SHORT	TEM2011
L213	SHORT	PL-100

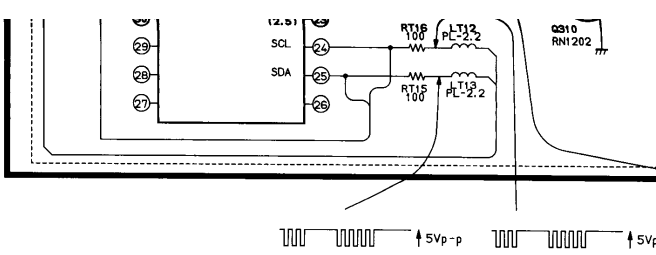
D
E
F
G
H

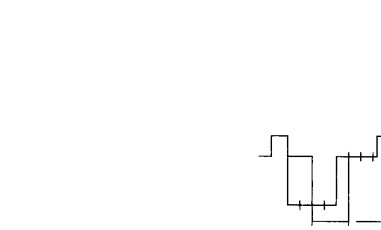
1
2
3


SCL
SDA
E3-L
BH BI BJ BK BL
GND SCL SDA E3-L MODE
OARD
GV02 SHORT
GV01 SHORT
GV03 SHORT
+9V
GND
TV V
GND
TV R
TV L
R-IN
L-IN
S-SW
SGV
SGA
+5V-2
V
PV05B
20P
AA AB AC AD AE AE AN AO AP AQ AG AH AI AJ AK AL AM AR AS AT
GND GND GND TV-V GND TV-R TV-L GND R-IN L-IN GND S-SW SGV NC NC SGA +5V-2 GND V +9V
TO MAIN BOARD

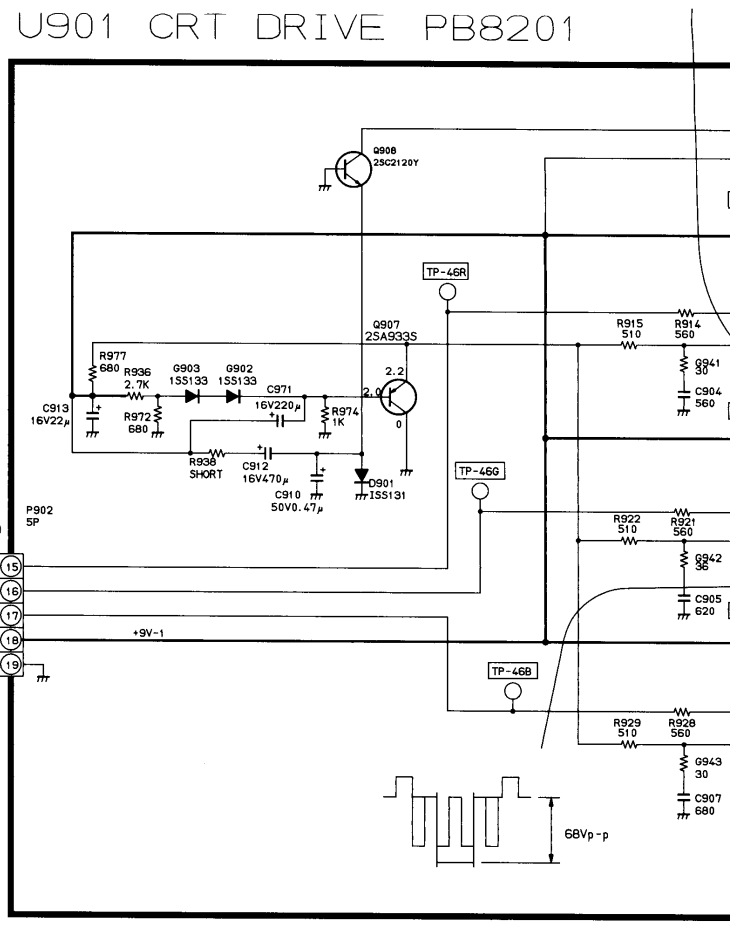
3 4 5 6

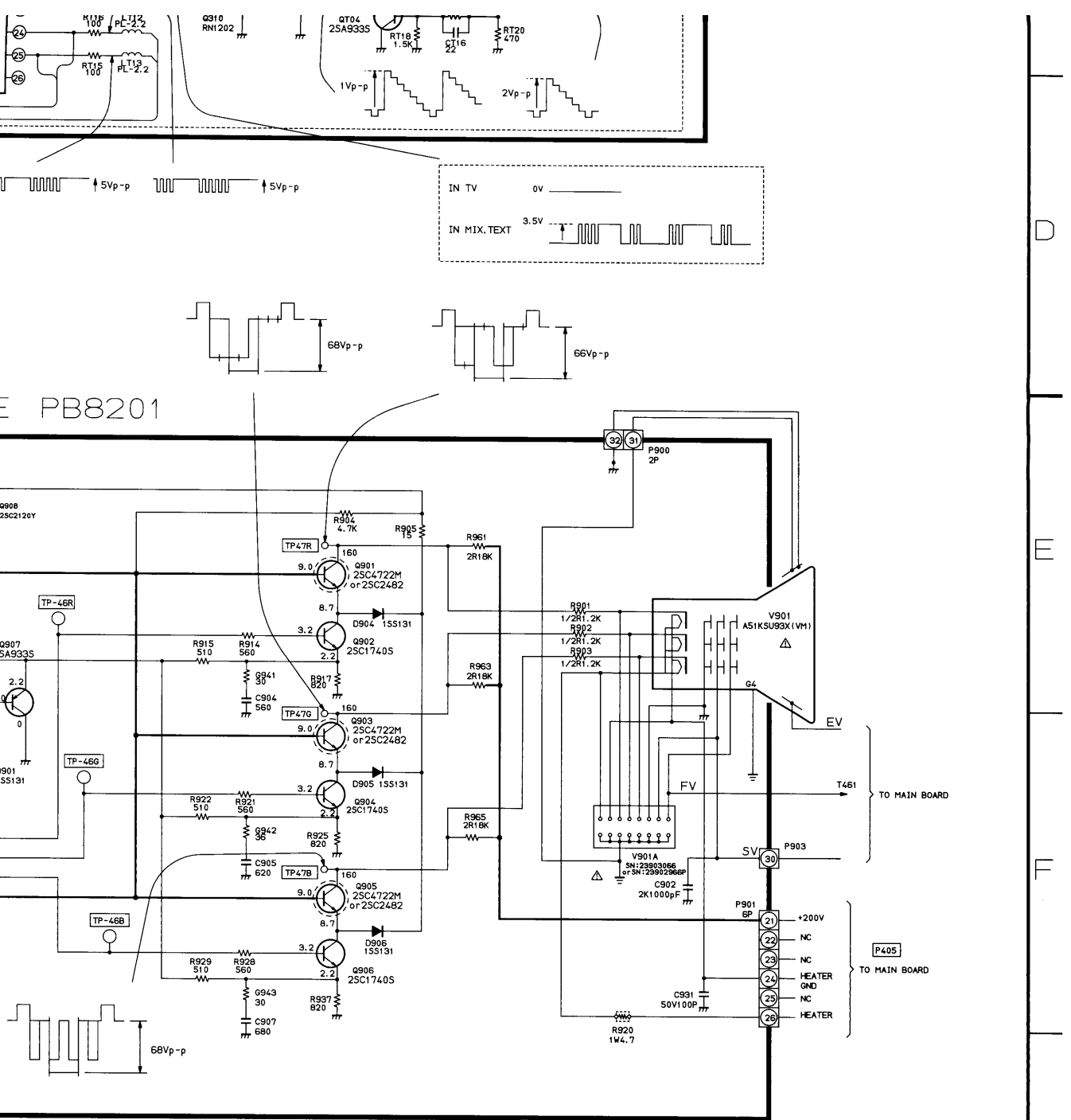






U901 CRT DRIVE PB8201





21G5DE 2/2
PK2714

SCHEMATIC DIAGRAM MODEL : 21G5DE / 21G5SXH (2/2)

060-9801

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 page 3. Do not degrade the safety of the receiver through improper servicing.

OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltages read with VTVM from point shown to chassis ground, line voltage 220 volts, colour bar signal. Voltages reading may vary ±20%.
2. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
3. Waveforms are taken using a standard colour bar signal.
4. Make sure that CONTRAST and COLOUR controls are in mid position and BRIGHTNESS control is almost in maximum position. Set other controls for best picture.

NOTES:

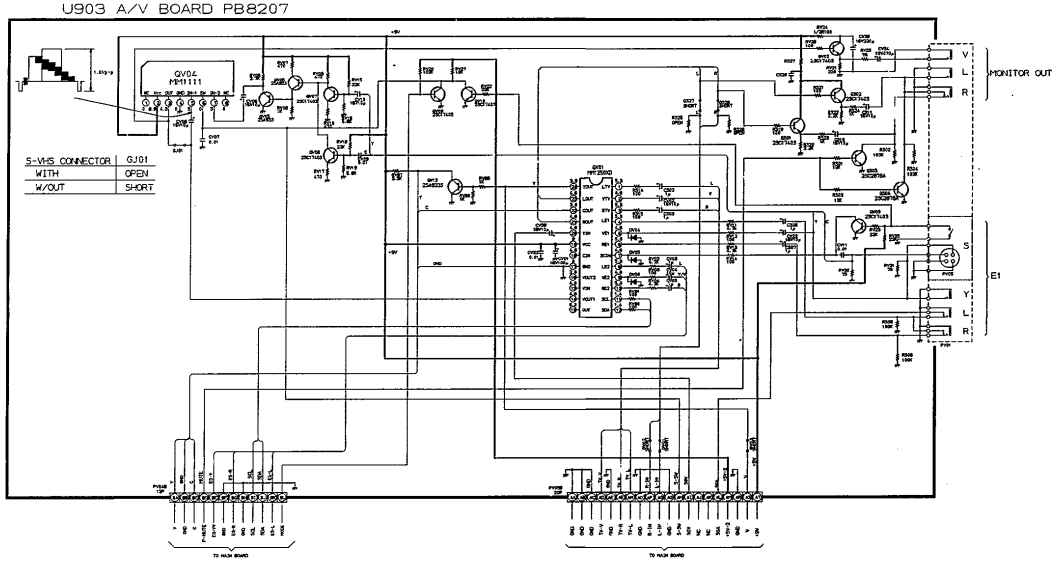
1. D.C. resistance value of a principal transformer is shown in this schematic diagram. These are measured for separated from the circuit.
2. The circuits are subject to change without notice.
3. ⏚ : Solder links.

EXPRESSION

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

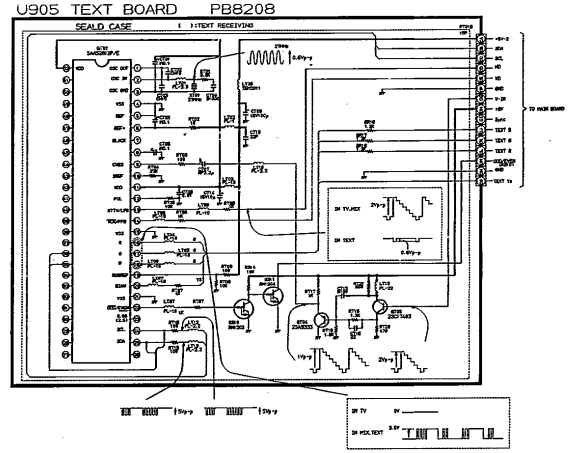
1. Resistance is shown in ohm, k=1,000, M=1,000,000
2. Unless other wise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.

U903 A/V BOARD PB8207

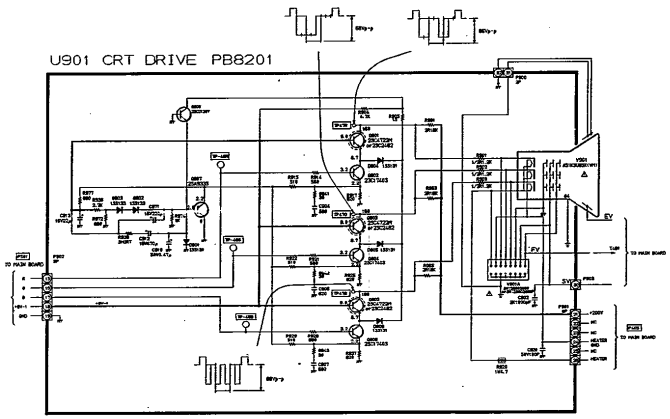


S-VHS CONNECTOR	GJ01
WITH	OPEN
W/OUT	SHORT

U905 TEXT BOARD PB8208



U901 CRT DRIVE PB8201



DIFFERENCE TABLE

MODEL	21G5DE	21G5SXC	21G5SXH
PCB NO.	PB8207	PB8207	PB8207
C005	50V/0.1μ	KE/B	KE/B
C021	50V/0.1μ	KE/B	KE/B
C022	50V/0.1μ	KE/B	KE/B
C820	KE/B	50V/0.033MF	50V/0.033MF
D01	1.5SK136	50V/1μ	50V/1μ
H003	#WIRE	#WIRE	#WIRE
TEXT BLK	USING	NOT USING	NOT USING
IC01	TB1226N	TB1226N	TB1226N
CA01	#B7200B-MBT	#B7200B-MBT	#B7200B-MBT
RF22	KE/B	SHORT	SHORT
RF23	1.5SK136	KE/B	KE/B
RF24	1.5SK133	KE/B	KE/B
RF25	1.5SK133	KE/B	KE/B

TENTATIVE
LOCATION FOR
21G5DE IS ACTUAL

	21G5DE	PROVISION FOR SVC
R448	SHORT	OPEN
R449	SHORT	OPEN
R450	SHORT	OPEN
R451	SHORT	OPEN
R452	SHORT	OPEN
R453	OPEN	SHORT
R454	OPEN	SHORT

	21G5DE	PROVISION FOR SVC (TENTATIVE)
R448	OPEN	1K
R449	OPEN	1K
JP105	SHORT	OPEN
JP106	SHORT	OPEN
C803	OPEN	0.01
C804	OPEN	0.01
JP102	OPEN	SHORT
JP103	OPEN	SHORT
JP104	OPEN	SHORT
C802	OPEN	0.01
C805	OPEN	0.01
C806	OPEN	0.01
C807	OPEN	0.01
C808	OPEN	0.01
C809	OPEN	0.01
C810	OPEN	0.01
C811	OPEN	0.01
C812	OPEN	1500PF
C813	OPEN	1500PF
R808	SHORT	1.8KHz
R809	SHORT	1.8KHz
R810	SHORT	1.8KHz
C814	OPEN	1500PF
C815	OPEN	1500PF
L813	SHORT	TBF0811
L814	SHORT	TBF0811
L815	SHORT	TBF0811
L816	SHORT	TBF0811

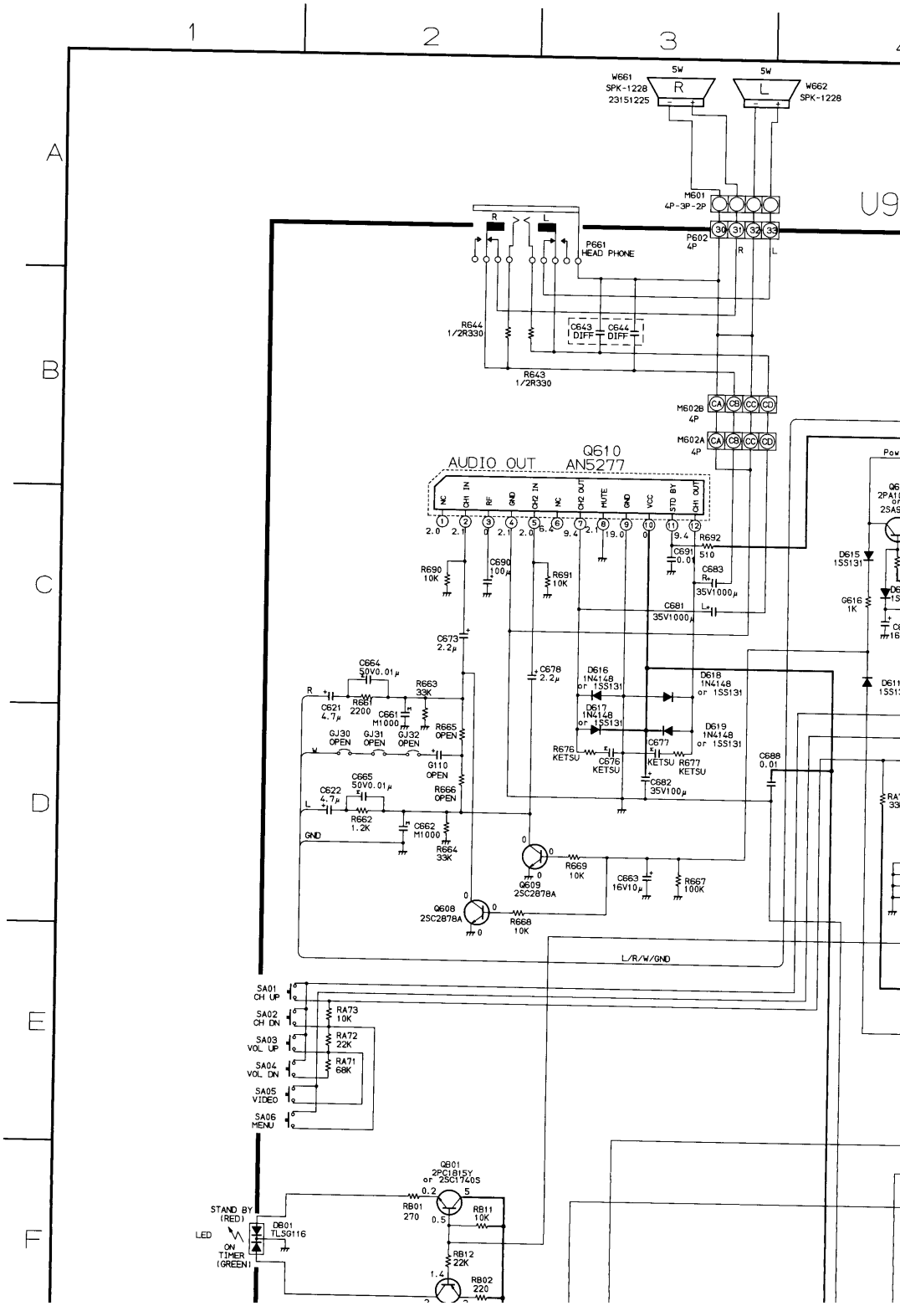
SCHEMATIC DIAGRAM MODEL : 21G5DE / 21G5SXH (1/2)

060-9801

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 page 3. Do not degrade the safety of the receiver through improper servicing.

OBSE

1. Volt
   volt
2. All v
3. Wav
4. Mak
   BRI
   pict



(1/2)

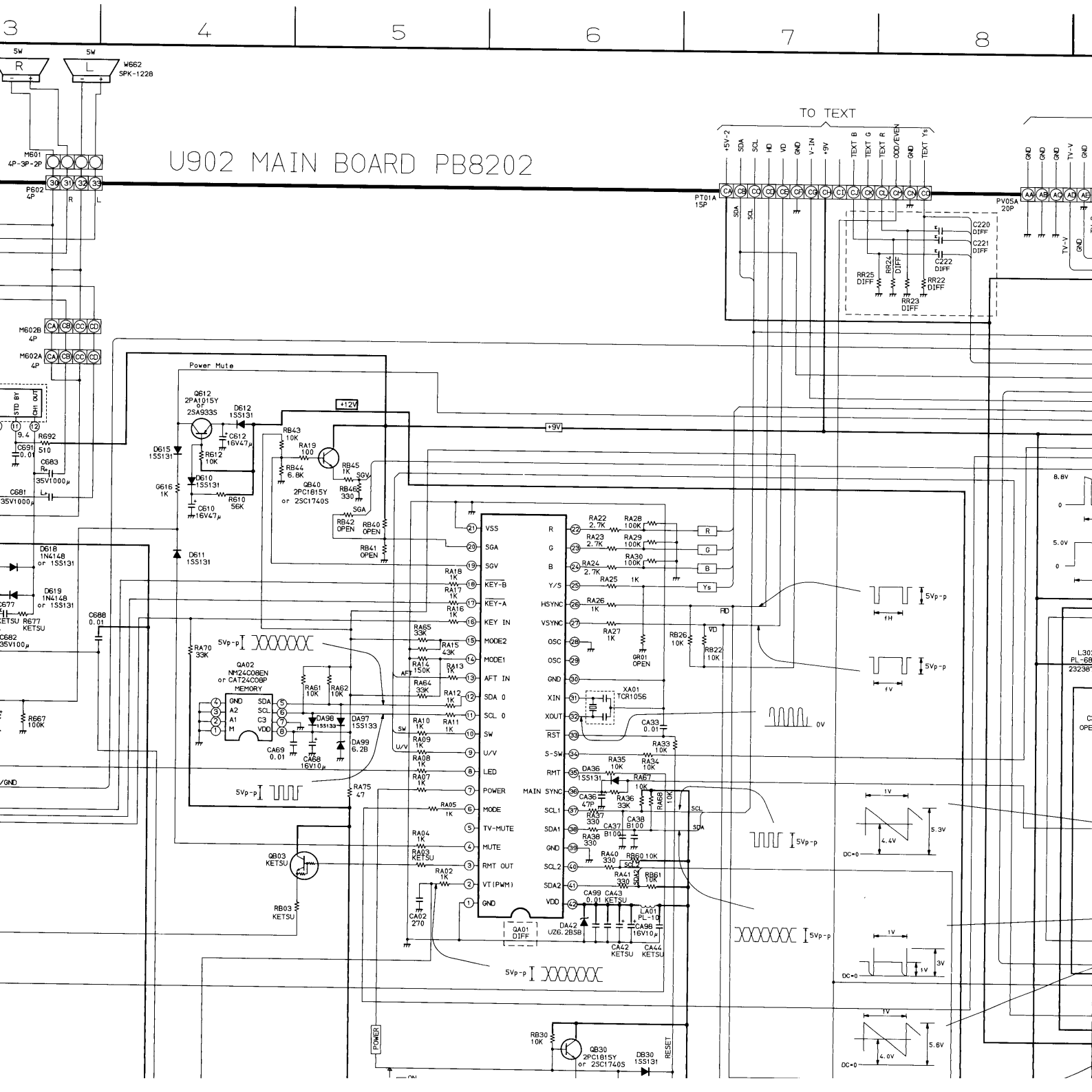
OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltages read with VTVM from point shown to chassis ground, line voltage 220 volts, colour bar signal. Voltages reading may vary ±20%.
2. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
3. Waveforms are taken using a standard colour bar signal.
4. Make sure that CONTRAST and COLOUR controls are in mid position and BRIGHTNESS control is almost in maximum position. Set other controls for best picture.

NOTES:

1. D.C. resistance value
   gram. These are meas
2. The circuits are subjec
3. ● : Solder links.

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tical to
cal
n page



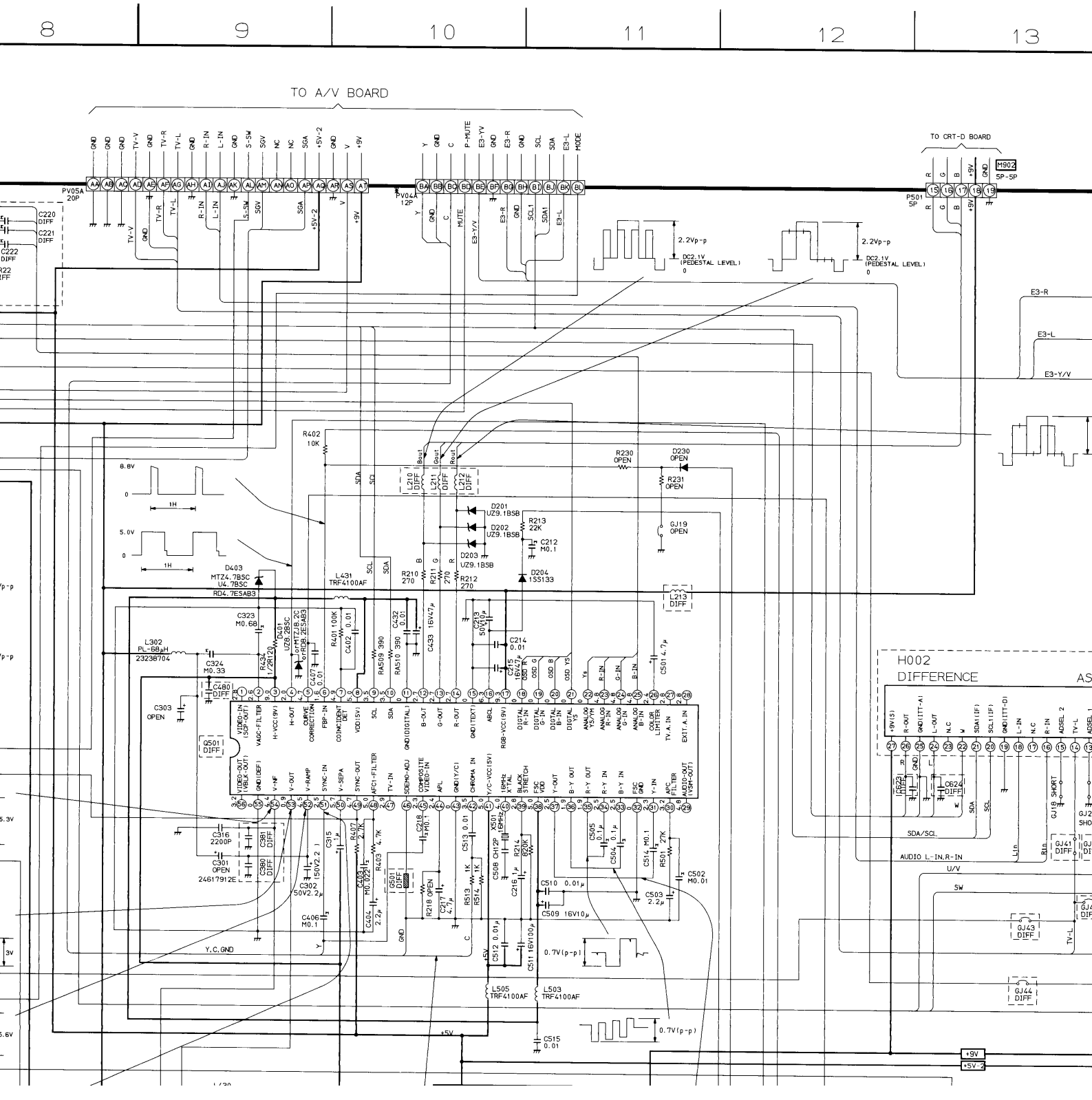
EXPRESSION

VALUE OF RESISTOR, CAPACITOR and IND

1. Resistance is shown in ohm, k=1,000, M=1,000
2. Unless other wise noted in schematic, all capa sed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all induc sed in μH, and the values less than 1 in H.

OTES:

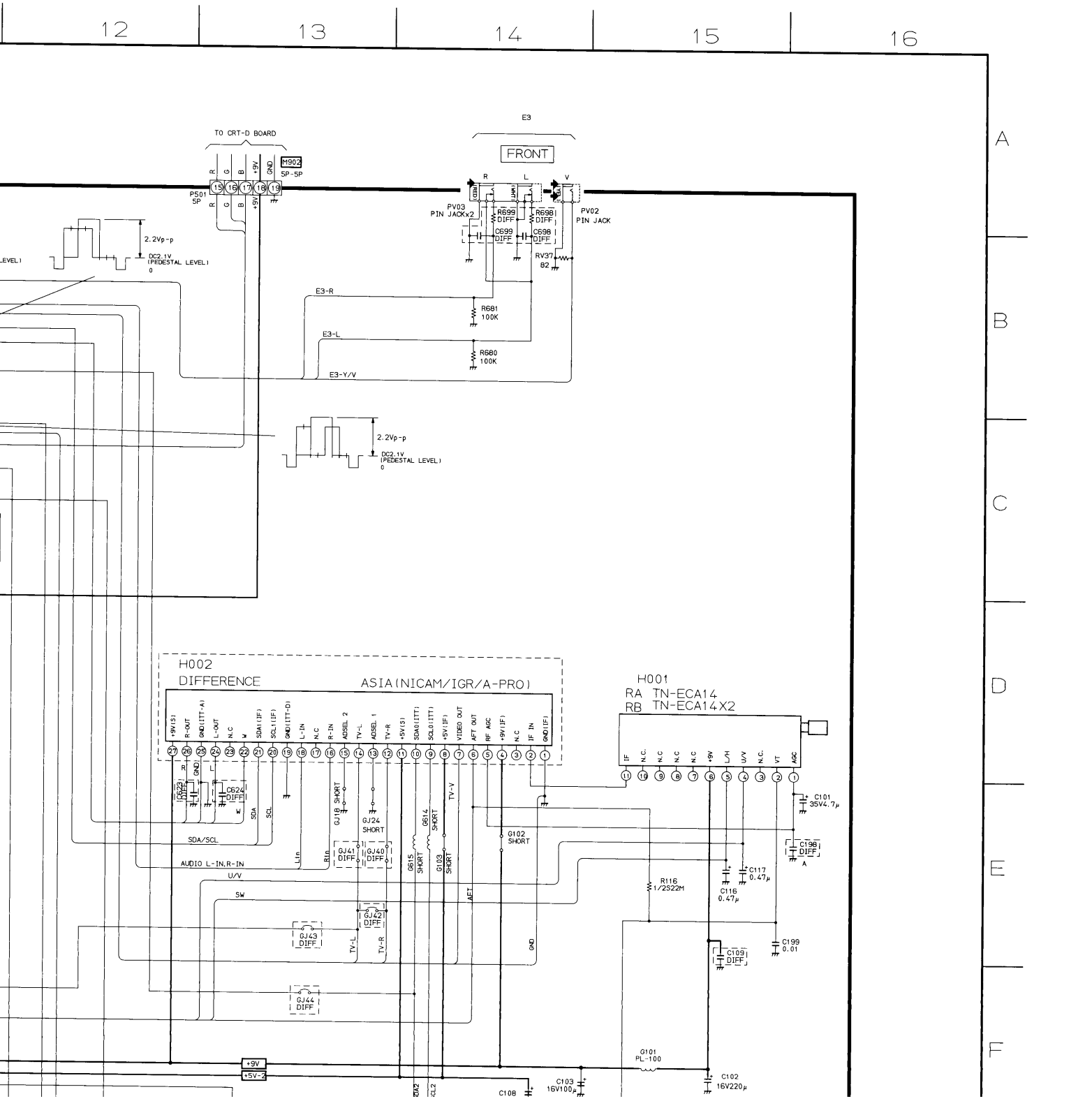
D.C. resistance value of a principal transformer is shown in this schematic diagram. These are measured for separated from the circuit.
The circuits are subject to change without notice.
: Solder links.

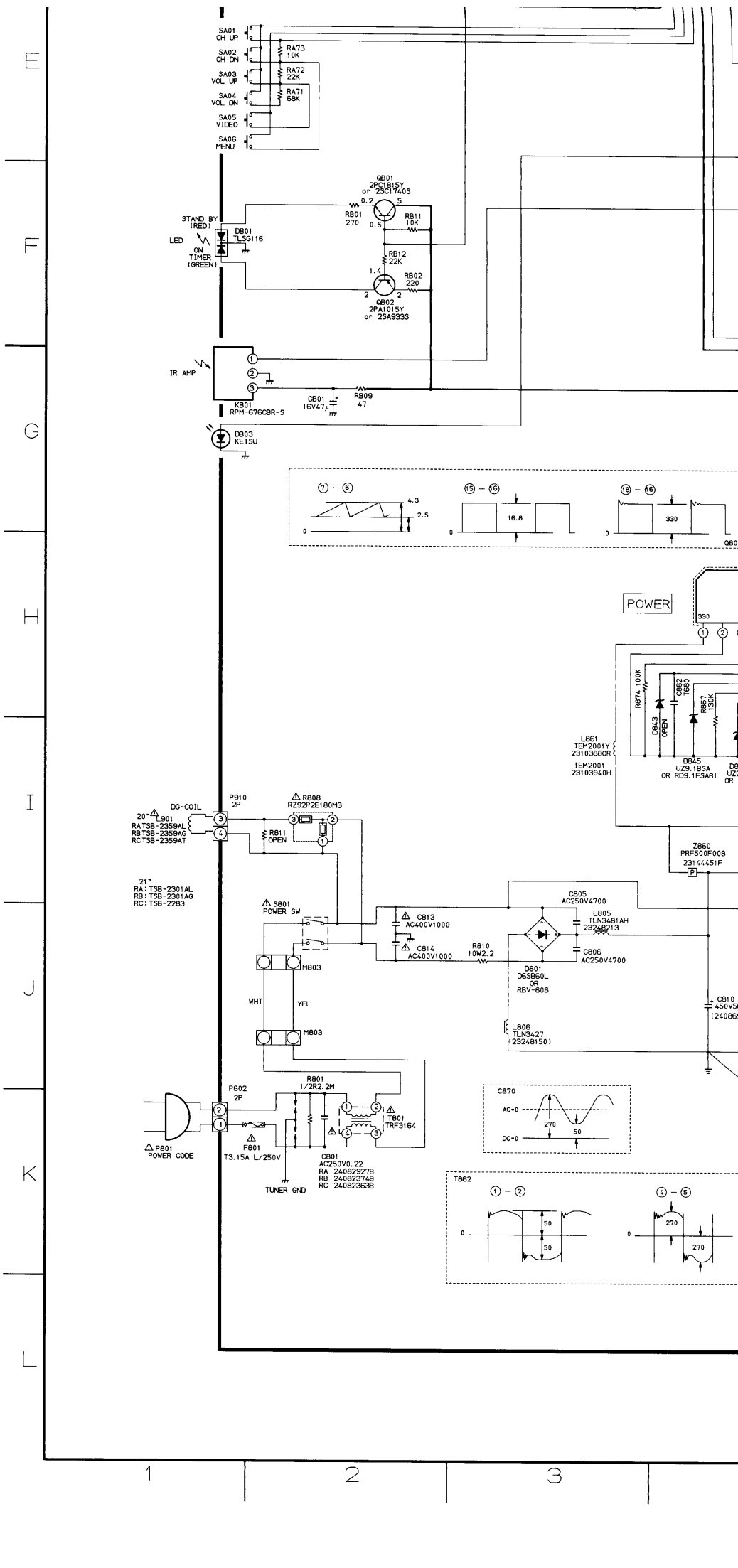


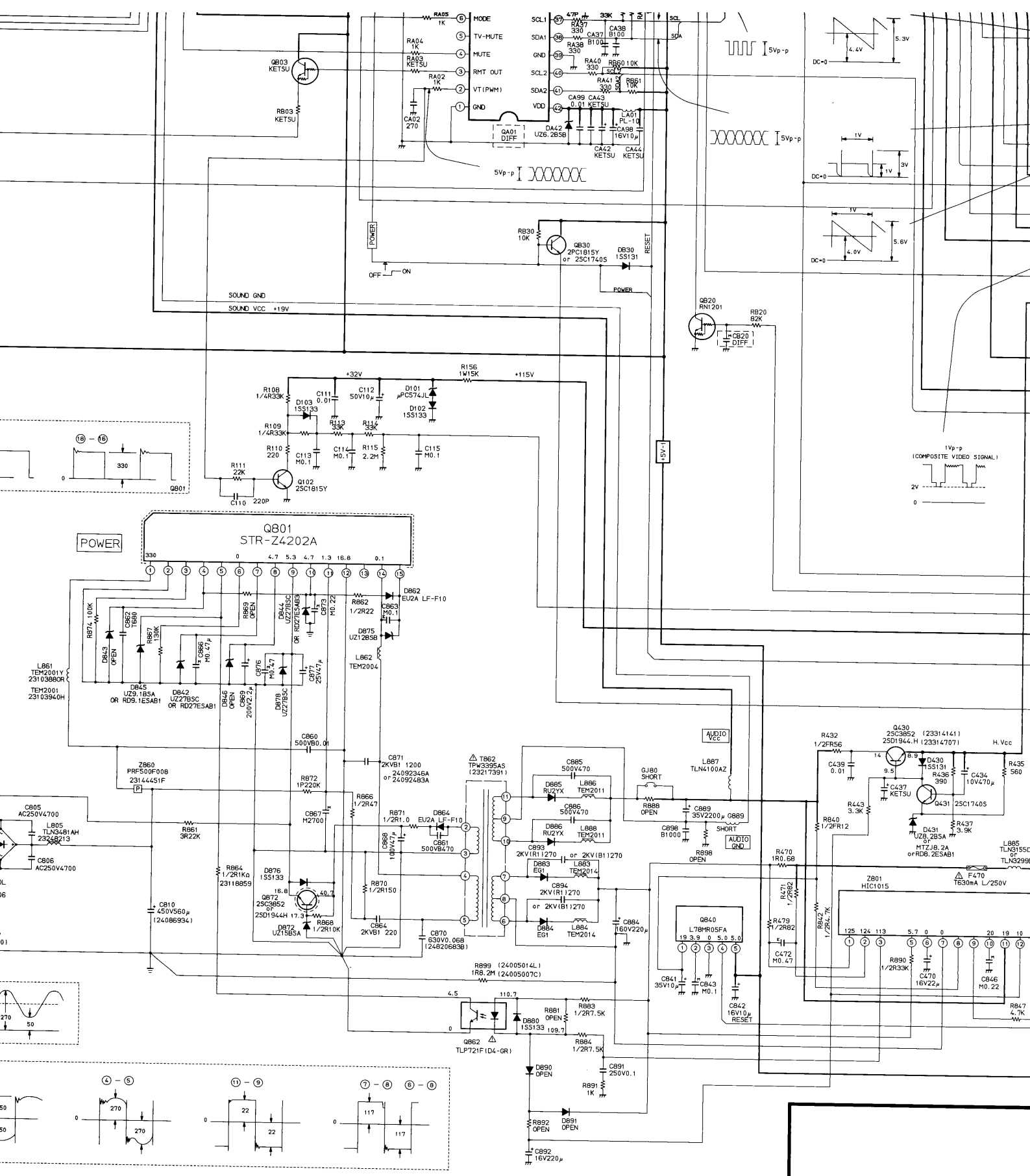
EXPRESSION

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

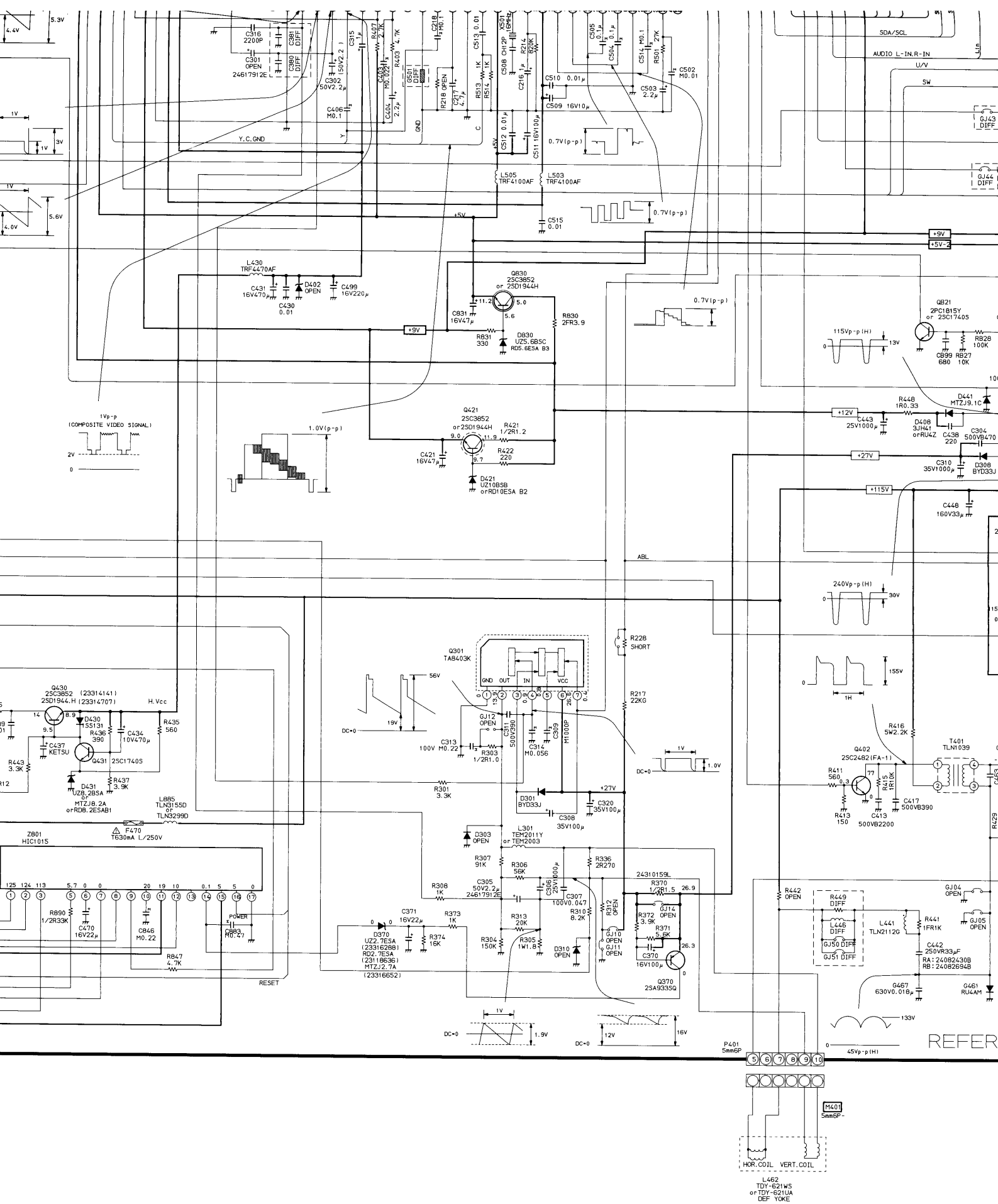
1. Resistance is shown in ohm, k=1,000, M=1,000,000
2. Unless other wise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.

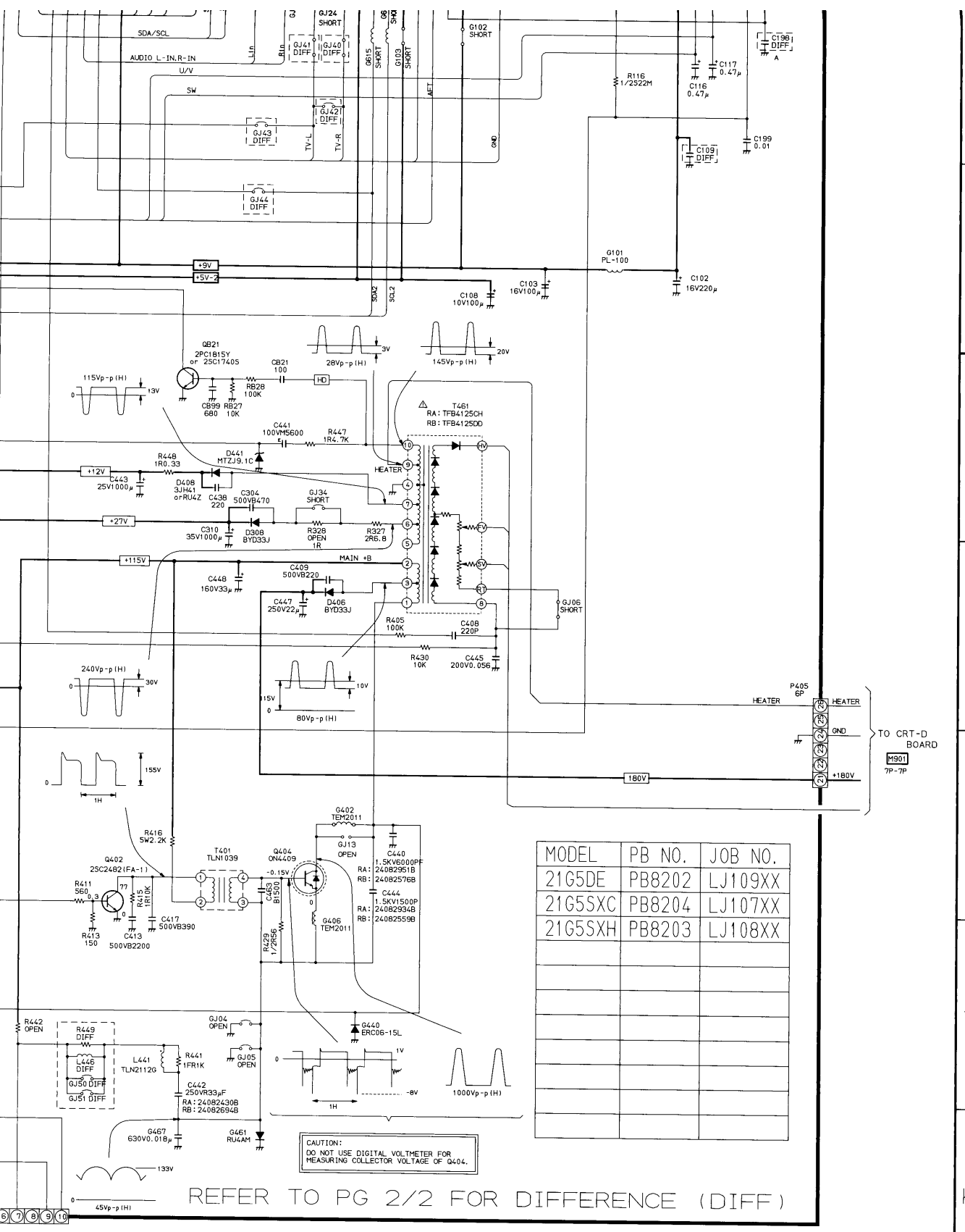



SA01 CH UP
SA02 CH DN
SA03 VOL UP
SA04 VOL DN
SA05 VIDEO
SA06 MENU
RA73 10K
RA72 22K
RA71 68K
QB01 2PC1815Y or 2SC1740S
RB01 270
RB11 10K
RB12 22K
RB02 220
QB02 2PA1015Y or 2SA933S
STAND BY (RED)
LED
ON TIMER (GREEN)
DB01 TLSG116
IR AMP
KB01 RPM-676CBR-S
CB01 16V47μ
RB09 47
DB03 KETSU
⑦ – ⑤
4.3
2.5
⑮ – ⑯
16.8
⑱ – ⑯
330
POWER
330
R874 100K
C862 T660
R867 130K
D843 OPEN
L861 TEM2001Y 23103880R
TEM2001 23103940H
D845 UZ9.1BSA OR RD9.1ESAB1
DG-COIL
P910 2P
RB08 RZ92P2E180M3
20" L901 RATSB-2359AL RBTSB-2359AG RCTSB-2359AT
RB11 OPEN
21" RA:TSB-2301AL RB:TSB-2301AG RC:TSB-2283
Z860 PRF500F008 23144451F
S801 POWER SW
C813 AC400V1000
C814 AC400V1000
C805 AC250V4700
L805 TLN3481AH 23248213
R810 10W2.2
C806 AC250V4700
D801 D6SB60L OR RBV-606
M803
WHT
YEL
M803
L806 TLN3427 (23248150)
C810 450V5
P802 2P
R801 1/2R2.2M
T801 TRF3164
P801 POWER CODE
F801 T3.15A L/250V
C801 AC250V0.22 RA 24082927B RB 24082374B RC 24082363B
TUNER GND
C870
AC+0
270
50
DC-0
T862
① – ②
50
50
④ – ⑤
270
270


Q801
STR-Z4202A
POWER
MODE
TV-MUTE
MUTE
RMT OUT
VT(PWM)
GND
SCL1
SDA1
SCL2
SDA2
VDD
SCL
SDA
QA01 DIFF
DA42 UZ6.2BSB
LA01 PL-10
QB03 KETSU
RB03 KETSU
QB30 2PC1815Y or 2SC1740S
DB30 1SS131
RESET
POWER
OFF
ON
SOUND GND
SOUND VCC +19V
QB20 RN1201
RB20 B2K
CB20 DIFF
+32V
+115V
+5V
Q102 2SC1815Y
Q801
POWER
AUDIO Vcc
AUDIO GND
H.Vcc
Q430 2SC3852 (23314141) 2SD1944.H (23314707)
Q431 2SC1740S
Q840 L78MR05FA
Q872 2SC3852 or 2SD1944H
Q862 TLP721F(D4-GR)
Z860 PRF500F008 23144451F
Z801 HIC1015
T862 TPW3395AS (23217391)
F470 T630mA L/250V
GJ80 SHORT
SHORT
OPEN
L861 TEM2001Y 23103880R
TEM2001 23103940H
L862 TEM2004
L887 TLN4100AZ
L805 TLN3481AH 23248213
L885 TLN3155D or TLN3299D
1Vp-p (COMPOSITE VIDEO SIGNAL)
5Vp-p
DC-0
5.3V
4.4V
3V
5.6V
4.0V

3 | 4 | 5 | 6 | 7 | 8


SDA/SCL
AUDIO L-IN,R-IN
U/V
SW
Y.C.GND
+5V
+9V
+5V-2
+12V
+27V
+115V
ABL
L505 TRF4100AF
L503 TRF4100AF
L430 TRF4470AF
Q830 2SC3852 or 2SD1944H
Q421 2SC3852 or 2SD1944H
Q430 2SC3852 (23314141) 2SD1944,H (23314707)
Q431 2SC1740S
Q301 TA8403K
Q370 2SA933SQ
Q402 2SC2482(FA-1)
QB21 2PC1815Y or 2SC1740S
D830 UZ5.6BSC RD5.6ESA B3
D421 UZ10BSB orRD10ESA B2
D431 UZ8.2BSA orRD8.2ESAB1
D301 BYD33J
D308 BYD33J
D441 MTZJ9.1C
D408 3JH41 orRU4Z
D370 UZ2.7ESA (23316288) RD2.7ESA (23118636) MTZJ2.7A (23316652)
Z801 HIC1015
F470 T630mA L/250V
L885 TLN3155D or TLN3299D
L301 TEM2011Y or TEM2003
T401 TLN1039
L441 TLN2112G
L446 DIFF
GJ50 DIFF
GJ51 DIFF
P401 5mm6P
M401 5mm6P
HOR.COIL VERT.COIL
L462 TDY-621WS orTDY-621UA DEF YOKE
RESET
POWER
1Vp-p (COMPOSITE VIDEO SIGNAL)
115Vp-p(H)
240Vp-p(H)
45Vp-p(H)
0.7V(p-p)
1.0V(p-p)
R228 SHORT
R217 22KG
R416 5W2.2K
R442 OPEN
R449 DIFF
R441 1FR1K
C442 250VR33μF RA:24082430B RB:24082694B
C448 160V33μ
C443 25V1000μ
C310 35V1000μ
C308 35V100μ
C320 35V100μ
C417 500VB390
C313 100V M0.22
C314 M0.056
C309 M1000P
C311 500V390
C305 50V2.2μ 24617912E
C307 100V0.047
C370 16V100μ
C371 16V22μ
C470 16V22μ
C846 M0.22
C883 M0.47
C847 4.7K
C899 680
C438 220
C304 500VB470
C413 500VB2200
C467 630V0.018μ
C461 RU4AM
RB28 100K
RB27 10K
R890 1/2R33K
R443 3.3K
R437 3.9K
R435 560
R436 390
R303 1/2R1.0
R301 3.3K
R307 91K
R306 56K
R308 1K
R313 20K
R304 150K
R305 1W1.8
R310 8.2K
R336 2R270
R312 OPEN
R372 3.9K
R371 5.6K
R373 1K
R374 16K
R847 4.7K
R411 560
R415 1R10K
R413 150
R429
GJ04 OPEN
GJ05 OPEN
GJ10 OPEN
GJ11 OPEN
GJ12 OPEN
GJ14 OPEN
REFER



MODEL	PB NO.	JOB NO.
21G5DE	PB8202	LJ109XX
21G5SXC	PB8204	LJ107XX
21G5SXH	PB8203	LJ108XX

21G5DE 1/2
PK2713

SPECIFICATIONS

Television system and channel coverage (Aerial input) ● available – not available

SYSTEM	CHANNEL		21G5DE	21G5SXH
PAL B/G	CCIR	VHF 2-12, UHF 21-69, CATV*1	●	●
PAL D/K	CHINA	VHF 1-12, UHF 13-57, CATV*2	●	●
PAL I	UK	UHF 21-69	●	●
SECAM B/G	CCIR	VHF 2-12, UHF 21-69, CATV*1	–	●
SECAM D/K	OIRT	VHF 1-12, UHF 21-69, CATV*3	–	●
NTSC M	US	VHF 2-13, UHF 14-69, CATV*4	●	–
NTSC 4.43	–	5.5/6.0/6.5MHz	●	●
NTSC 3.58	–	5.5/6.0/6.5MHz	●	●
PAL 60Hz	–	5.5/6.0/6.5MHz	●	●
NTSC 3.58 50Hz	–	4.5MHz	●	●
		*1 X~Z+2, S1~S41	*2 Z-1~Z-38	
		*3 X1~X19	*4 A-6~A-1, A~W, AA~BBB	

Colour system (Video input)

PAL	50/60Hz	●	●
SECAM	50Hz	–	●
3.58NTSC	50/60Hz	●	●
4.43NTSC	50/60Hz	●	●

Power consumption (W) (at 220V AC, 50Hz)	75W
Sound output (W)	10W × 2speakers

Rated voltage: 110-240V AC 50/60Hz
Terminals: Input: S-Video, Video, Audio L/MONO, Audio R
Monitor output: Video, Audio L/MONO, Audio R
Head phone output: ø3.5 mm (mini jack stereo type)
Speaker: 6×12cm (2)
Picture tube Type 21 (54cm) Overall picture tube measured diagonally
(51cm) Viewable picture tube measured diagonally
90° deflection

Dimensions: 630 (W) × 465 (H) × 457 (D) mm
Mass: 20.0kg
Supplied accessories: Remote controller (1)
Batteries size AA (R6) (2)
Telescopic Aerial (1)
Aerial Adaptor (1)

Design and specifications are subject to change without notice.

TOSHIBA CORPORATION
1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-01, JAPAN