TOSHIBA

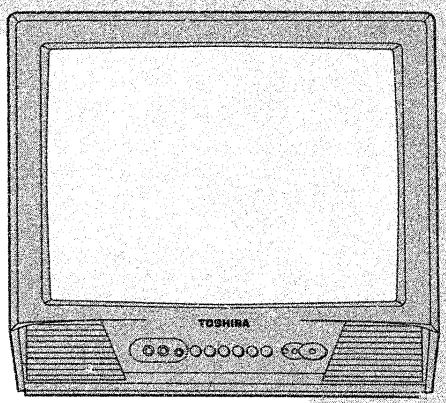
FILE NO. 060-9714

SERVICE MANUAL

COLOUR TELEVISION

S7E Chassis

2178XR, 2170RE



PRINTED iN JAPAN. Nov., 1997 (So)

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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 Ⓐ kV at zero beam current (minimum brightness) under a Ⓒ V AC power source. The high voltage must not, under any circumstances, exceed Ⓑ kV.

   Refer to table-1 for high voltage Ⓐ, Ⓑ & AC voltage Ⓒ (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.

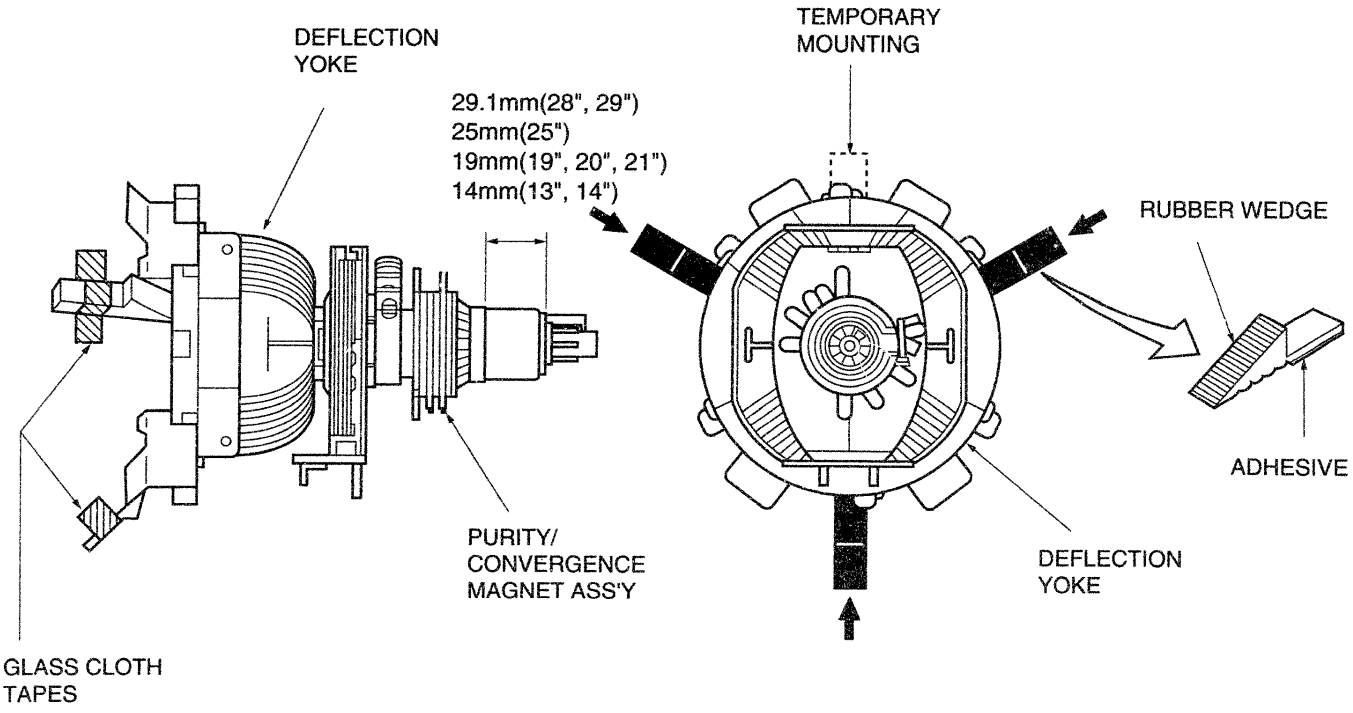


Figure 1.

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.

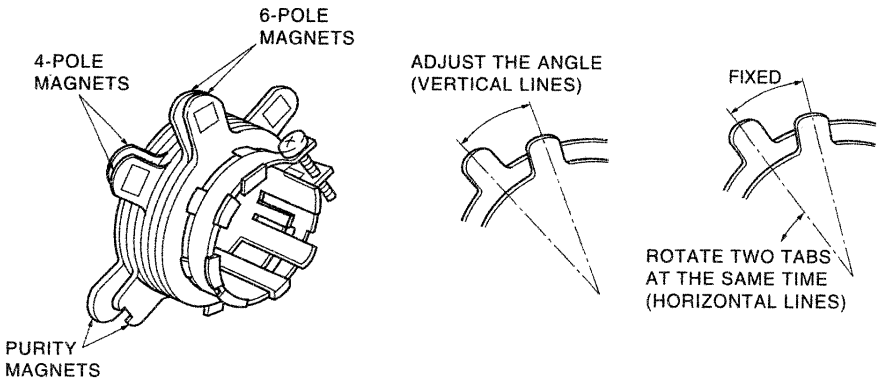


Figure 2.

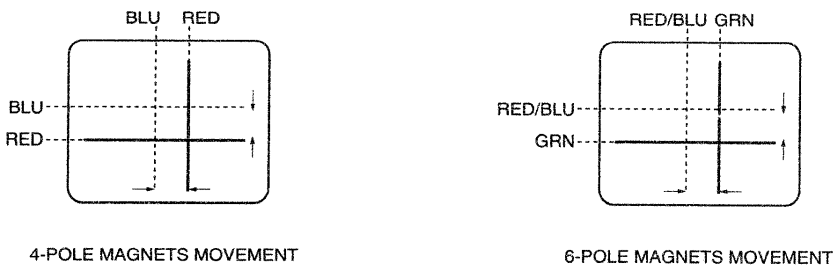


Figure 3. Dot Movement Pattern

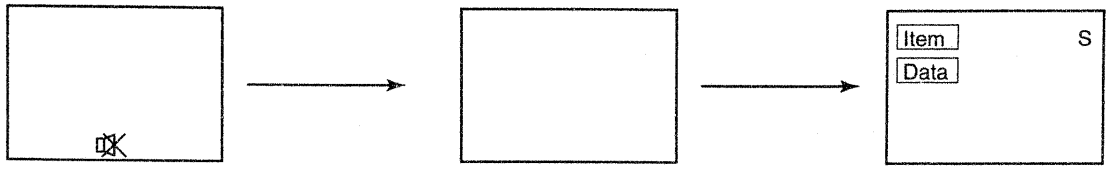
SERVICE MODE

1. ENTERING TO SERVICE MODE

1) Press 🔇 button once on Remote Control.

2) Press 🔇 button again to keep pressing.

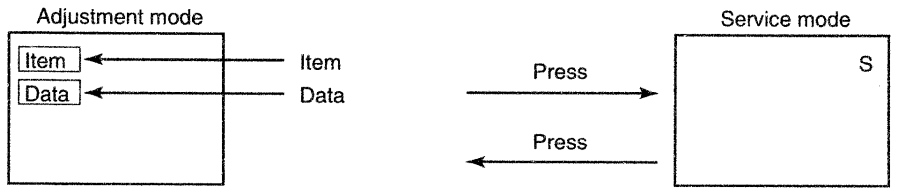
3) While pressing the 🔇 button, press MENU button on TV set.



(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– – – – 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 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.

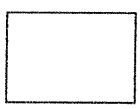
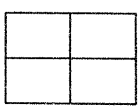
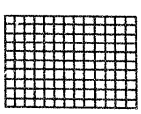
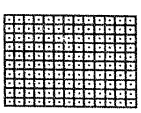
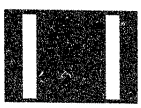
1. Enter the service mode, then select any register item.
2. Press and hold the CALL button on the Remote, then press the CHANNEL ▲ button on the TV. The initialization of QA02 has been complated.
3. Check the picture carefully. If necessary, adjust any adjustment item above. Perform "Auto search Memory"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

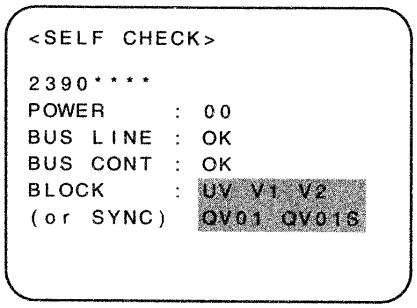
Signal off ⟶ NTSC signals (14 patterns)
↑ ⟵ PAL signals (14 patterns) ⟵ ┘

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 (→①1)
V2 : VIDEO 2 input mode (→②2)

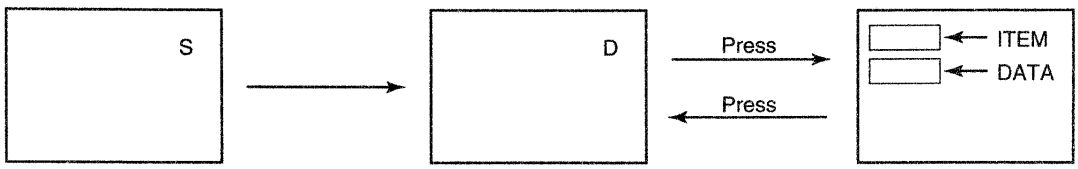
NOTE: Component which controls character display on screen is QT01 (TELETEXT IC.). If this display function fails to operate due to damage in QT01, self diagnosis procedure is as follows.
(1) In case that power indicator is blinking with interval of 0.5 seconds; it means protecting circuit (Current limiter)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



(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

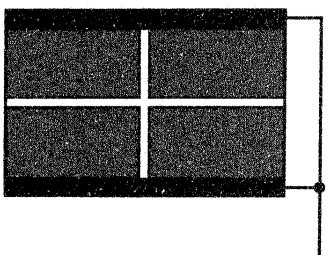
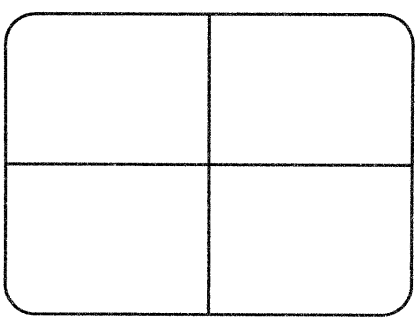
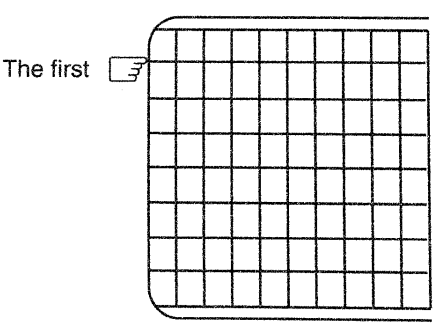
Every pressing of CHANNEL ▼ button in the design mode changes the adjustment items in the order of table-3.
(▲ button for reverse order)

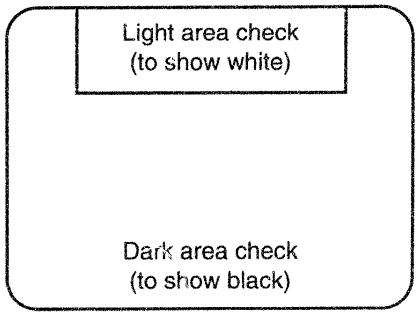
Refer to table-3 for data of design mode.
(See SETTING & ADJUSTING DATA on page 19)

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 S7E series (Reference factory adjustments)

Item. [AFT.f0]
Name. AFT.f0 SETTING. IF.OUT pin (H001) 1000pF load. (IF out Round open) Input signal. SIGNAL : CW F=37.95M 95dB (μ V) (75 Ω load) Measurement place. TP-13 Adjustment method. Adjust L161 at the point that have critical change of voltage. Making standard. STANDERD : 2.5V±0.5V NOTE : The place which detecter high and low.
Item. [RAGC]
Name. RF AGC DELAY SETTING. IF OUT pin (H001) 1000pF load. (IF out Round open) Input signal. CW F=37.95M 95dB (μ V) (75 Ω load) Measurement place. TP-15 Adjustment method. Adjust the sub address [RAGC] Making standard. 4.0V±2V
Item. [SCNT] NO ADJUSTMENT
Name. SUB-CONTRUST SETTING. Input signal. Measurement place. Adjustment method. Making standard.
Item. [BRTC]
Name. SUB-BRIGHT CENTER SETTING. Set user control setting to STANDERD 1 Input signal. SUB-BRIGHT SIGNAL Measurement place. On picture Adjustment method. It is black step of the (*sub-bright*) signal and adjust the number. Making standard. 4±1.5 bars *Note : Adjust at last

Item. [COLP] NO ADJUSTMENT

Name. SUB-COLOR CENTER (PAL)

SETTING.

Input signal.

Measurement place.

Adjustment method.

Making standard.

Item. [TNTC]

Name. SUB-TINT CENTER (For M-NTSC MODEL)

SETTING. CHROMA ADJUSTMENT MODE

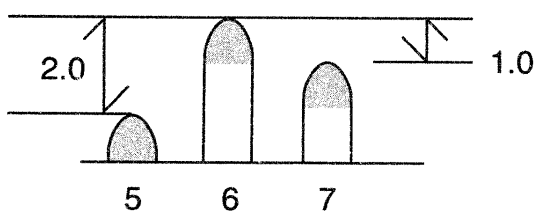
Input signal. SUB-BRIGHT SIGNAL (NTSC)

Measurement place. Q501 #20 (B OUT)

Adjustment method. The 5th position to the 6th level of B-Y signal and the 7th level difference should regulate to 2:1.

Making standard. –5.0° ±5°

Note : Adjust before [COLC]



NO ADJUSTMENT

Item. [COLC]

Name. SUB-COLOR CENTER (NTSC/PAL)

SETTING. CHROMA ADJUSTMENT MODE

Input signal. SUB-BRIGHT SIGNAL (NTSC) For M-NTSC MODEL

SUB-BRIGHT SIGNAL (PAL) For OTHER MODEL

Measurement place. Q501 #20 (B OUT)

Adjustment method. Adjust the amplitude of B-Y.

Making standard. 1.35 ±0.2V(p-p)

Item. [RCUT], [GCUT], [BCUT], [GDRV], [BDRV], [SCREEN VR]

Name. CUT OFF/DRIVE ADJUST

SETTING. [RCUT], [GCUT], [BCUT] each data set = 20H

[GDRV], [BDRV] each data set = 40H

Set to White line mode

Input signal. White signal

Measurement place. On picture.

Adjustment method.

		EG.DEPT STD CA-100			
		light	dark	light	dark
	X	271	271	299	299
	Y	276	281	302	302
		(Except XR MODEL)		(XR MODEL)	

Raise screen VR gradually and stop in the place where the line of either of R or G or B shines slightly. Decide the position of screen VR there.

Raise the CUT-OFF data other than the line which shines by first gradually shine point.

Stop in the place which shines in most white. Make clear white line mode.

Adjust it repeatedly for both the shade part and discernment to become a correct numerical value by using proofread CA100.

Making standard.

103cd/m^2 11500K +0.0075uv 17cd/m^2 10500K +0.0105uv (Except XR MODEL)

103cd/m^2 8750K –0.0020uv 17cd/m^2 8750K –0.0020uv (XR MODEL)

FOR SECAM MODEL ONLY

Item. [BELL] NO ADJUSTMENT
Name. BELL FILTER SETTING. Input signal. Measurement place. Adjustment method. Making standard.
Item. [SRY]
Name. SECAM R-Y BLACK LEVEL. SETTING Input signal. SECAM COLOR BAR. Measurement place. Q501 #18 (R-out) Adjustment method. Adjust [SRY] the level of the monochrome signal part must be a match to the level of horizontal blanking signal. (Adjust this item after adjust [COLS]) Making standard. 0±40mV (p-p)
Item. [SBY]
Name. SECAM B-Y BLACK LEVEL. SETTING. Input signal. SECAM COLOR BAR. Measurement place. Q501 #20 (B-out) Adjustment method. Adjust [SBY] the level of the monochrome signal part must be a mutch to the level of horizontal blanking signal. (Adjust this item after adjust [COLS]) Making standard. 0±40mV (p-p)
Item. [COLS]
Name. SUB-COLOR CENTER (SECAM). SETTING. CHROMA ADJUSTMENT MODE Input signal. SECAM COLOR BAR. Measurement place. Q501 #20 (B OUT) Adjustment method. Adjust the amplitude of B-Y. (Mute the picture in adjustment) Making standard. 1.75±0.2V (0-p)

Item. [VERT POSITION]
SETTING. CONTRAST=MAX. BRIGHT=CENTER COLOR=CENTER Input signal. WG Philips Pattern (Do not use French SECAM). Measurement place. On Picture Adjustment method. Adjust [VPOS] upper and lower position in 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.)
Item. [V-HEIGHT]
SETTING. CONTRAST=MAX. BRIGHT=CENTER COLOR=CENTER Input signal. WG Philips Pattern (Do not use French SECAM). Measurement place. On Picture Adjustment method. Adjust the sub address [HIT] of Philips pattern may hide frag of the upper and lower sides in exactly.
Item. [HORIZONTAL POSITION]
SETTING. CONTRAST=MAX. BRIGHT=CENTER COLOR=CENTER Input signal. WG Philips Pattern (Do not use French SECAM). Measurement place. On Picture Adjustment method. Adjust the sub address [HPOS] of Philips pattern to center. (Minimize D-C in the adjustment magnetic field on CRT.)

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 Ⓑ kV.

Refer to table-1 for high voltage Ⓑ.
(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】

		2170RE	2178XR
HIGH VOLTAGE AT ZERO BEAM:	Ⓐ	28.3 kV	28.3kV
MAX HIGH VOLTAGE:	Ⓑ	29.0 kV	29.0kV
AC VOLTAGE :	Ⓒ	110–240 V	220–240 V

Table-1

【SERVICE MODE】

ADJUSTING ITEMS AND DATAS IN THE SERVICE MODE:

Item	Adjustments	Preset data	Reference data
RCUT	R CUTOFF	20H	←
GCUT	G CUTOFF	20H	←
BCUT	B CUTOFF	20H	←
GDRV	G DRIVE	40H	←
BDRV	B DRIVE	40H	←
CNTX	SUB CONTRAST MAX	3FH	←
BRTC	SUB BRIGHT CEN	40H	←
COLC	SUB COLOR CEN NTSC	40H	←
TNTC	SUB TINT CEN	40H	3CH
COLP	SUB COLOR CEN PAL	00H	←
COLS	SUB COLOR CEN SECAM	40H	←
SCNT	Y-SUB CONTRAST	08H	05H
HPOS	50Hz HORIZONTAL POSITION	11H	←
VPOS	VERTICAL POSITION	03H	←
HIT	HIT	20H	←
VLIN	V-LINEARITY	08H	←
VSC	V-S CORRECTION	04H	←
SBY	SECAM B-Y	08H	←
SRY	SECAM R-Y	08H	←
RAGC	RF AGC	30H	←
PWR	CURR LIMIT	00H	←
BUS	BUS LINE	00H	←
MEM	MEMORY CHECK	00H	←

This item may require adjustments by models after initialization, when QA02 is replaced.

Table-2

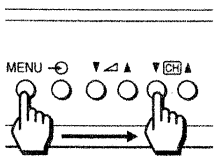
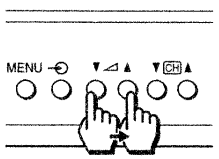
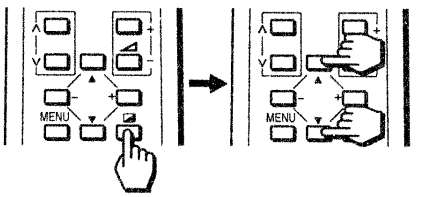
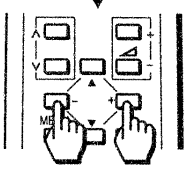
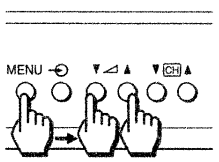
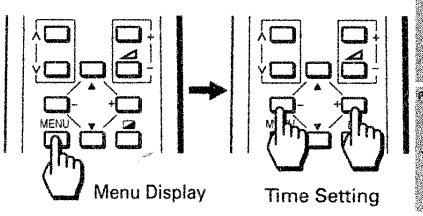
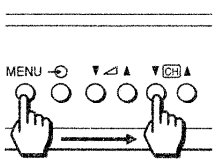
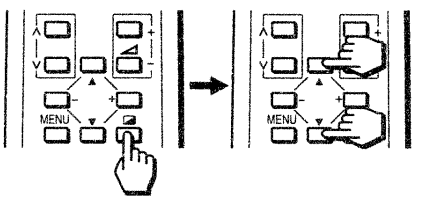
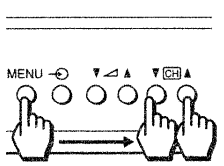
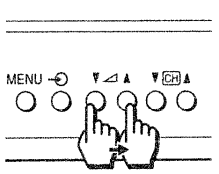
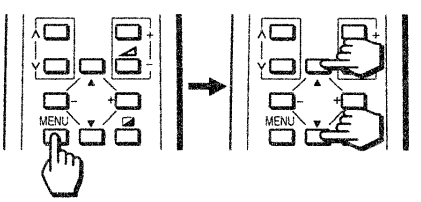
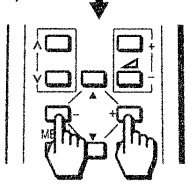
【 DESIGN MODE 】

ADJUSTING ITEMS AND DATAS IN THE DESIGN MODE:

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

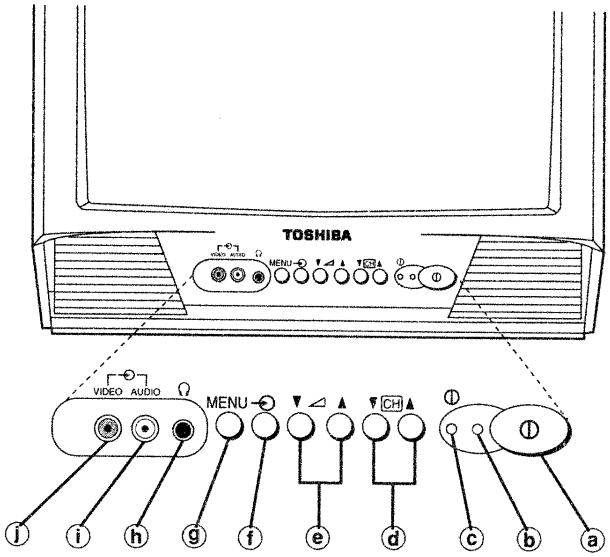
Table-3

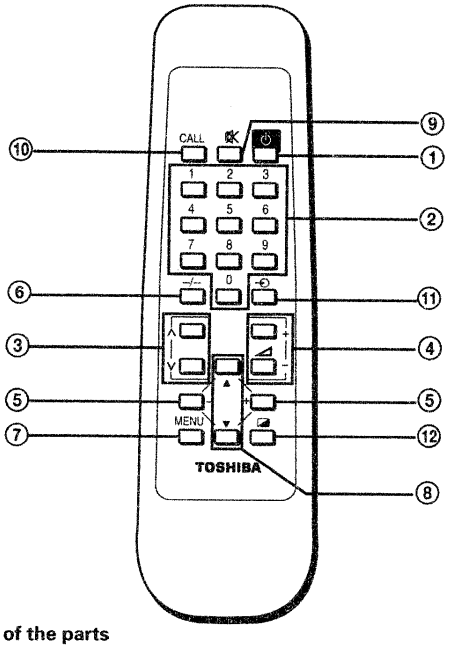
MENU FUNCTION

TV set	Remote Controller	Display	Display No.
 Menu Display & Item select ↓  ADJUST	 Menu Display → Item Select ↓  SELECT ADJUST ON/OFF	PICTURE CONTRAST ▶ BRIGHTNESS COLOR TINT SHARPNESS B/B ON ↓ ex. BRIGHTNESS 50	D1 D2
 Menu Display & Time Setting	 Menu Display Time Setting	FUNCTION ▶ TIMER OFF 00:00	D3
 Menu Display & Language selection	 Menu Display Language Selection	LANGUAGE ENGLISH 中文 MELAYU	D4 This screen is not displayed by the 2178XR, 2170TM and 2170TMJ.
 Menu Display & Item select ↓  SET UP Operations	 Menu Display → Item Select ↓  SET UP Operations	SET UP ▶COLOR AUTO SOUND ASM [+] >>> [-][+] POSITION P00 [+] SKIP OFF SET UP ▶MFT [-][+] AFT ON	D5 : 2170RE, 2170TM and 2170TMJ do not show this item. D6

OPERATION

This manual explains the main operations with the remote controller. For details on how to carry out the same operations with the buttons on the TV, see MENU FUNCTION at the left page.





Names of the parts

TV SET			Remote Controller		
ⓐ	⏻	Main power on/off	①	⏻	Power on/standby
ⓑ		Infrared sensor	②	0~9	Direct select
ⓒ	⏻	Power indicator	③	∨ / ∧	Position down/up
ⓓ	▼ CH ▲	Channel select	④	◿–/+	Volume down/up
ⓔ	▼◿▲	Volume down/up	⑤	–/+	Level down/up
ⓕ	⊖	TV/VIDEO select	⑥	-/--	Digit select
ⓖ	MENU	Menu open	⑦	MENU	Menu open
ⓗ	∩	Earphone jack	⑧	▼/▲	Menu select
ⓘ	⊖AUDIO	AUDIO input terminal	⑨	🔇	Sound mute
ⓙ	⊖VIDEO	VIDEO input terminal	⑩	CALL	On-screen on/off
			⑪	⊖	TV/VIDEO select
			⑫	◪	Picture control

Note of ⓘ ⓙ

This is convenient when hooking up video cameras or game equipment. However audio and video interference may occur if other equipment is connected to the ⊖IN terminal on the back so please remove them from this terminal.

Getting Started

• Switch on the power.

Press ⓐ (⏻) to switch on the main power.

ⓒ (⏻) lights up red and the power comes on.

■ If no picture at all is shown, the set is in Standby mode. Face the remote controller towards ⓑ, than press ① (⏻). If the remote controller is not at hand, you can switch on the power by pressing ⓓ or ⓔ or ⓕ. To select your channel at the same time that you switch on the power, press any of the keys at ② (0~9).

• Selecting the channel

Press ③ (∨ / ∧) to select the channel you want.
Press ④ (◿–/+) to adjust the volume.

■ When you can not view the channel you want
■ When the color or sound is strange

Position number ⟶ 1

• Channel Preset

Technical Term
Channel: The number or abbreviation of the broadcast station frequency in each country (CH12, TCS etc.)
Position: The number on your TV where channels are stored (0-59). Displayed on the upper right of the screen

Auto search memory (ASM)

All the channels that can be received are preset automatically.

1 Select the position for starting ASM, ② or ③.
2 Set the correct broadcast system for your region. Press ⑦ repeatedly to call up the SET UP menu [D5]. And set COLOR to AUTO and select the SOUND according to the table below by ⑧ and ⑤.
3 Select ASM, then press ⑤ (+) to start the ASM. Return to the start position. This completes the procedure.

Note.
Sound setting function is not provided to 2170RE, 2170TM and 2170TMJ.

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]

■ Having the same number for the Channel and the Position makes channel selection easier. Use Manual search (>>>) and Skip function for this setting.

Example Presetting Channel 12 to Position 12

Method 1 — **Manual Search**

1 Select Position 12.
Press ③ repeatedly until 12 is displayed.
Or, press ⑥ once or twice to display – – on the screen.
Press 1 and 2 at ② in that order.

2 Press ⑦ several times to display the D5 screen.
Press ⑧ and select ">>>". Press ⑤ to search. Pressing "–" searches lower frequency channel; pressing "+" searches higher frequency channels.

3 When Channel 12 is found, press ⑧ to select " ◈ ". Press "+" ⑤ to complete the presetting.

Method 2 — **Store Position**

1 Press ② or ③ to find the position preset for Channel 12.

2 When Channel 12 is selected, press ⑦ several times to display the D5 screen. Press ⑧ and select POSITION. Press ⑤ and set to P12. Pressing "–" displays a smaller number; pressing "+" displays a larger number.

3 When Position 12 is found, press ⑧ to select " ◈ ". Press "+" ⑤ to complete the presetting.

Skip function
If you set SKIP ON for unnecessary position numbers, when you select channels with ③, that position is skipped.

Example Skipping Position 13

1 Select Position 13 in the same manner as you selected 12 above. The instructions are the same as for 12 above.

2 Press ⑦ several times to display the D5 screen. Press ⑧ and select SKIP. Press ⑤ to switch from OFF to ON. This completes the setting.

Note • When SKIP is on, "*"is added to the left of the position number. Example: *13
Select position 13 with ⑥ and ② to confirm "*"mark.
• If you want to restore a skipped position number, select the skippied position number with ⑥ and ② buttons and Switch from ON to OFF on step 2 above.

■ Under some reception conditions, tuning slightly lower or slightly higher improves the picture. In that case, adjust Manual fine tuning.

Manual fine tuning (MFT)
Press ⑦ several times to display the D6 screen.
Press ⑧ and select MFT. Press ⑤ to start fine tuning. Pressing "–" fine tunes to a lower frequency; pressing "+" fine tunes to a higher frequency.

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

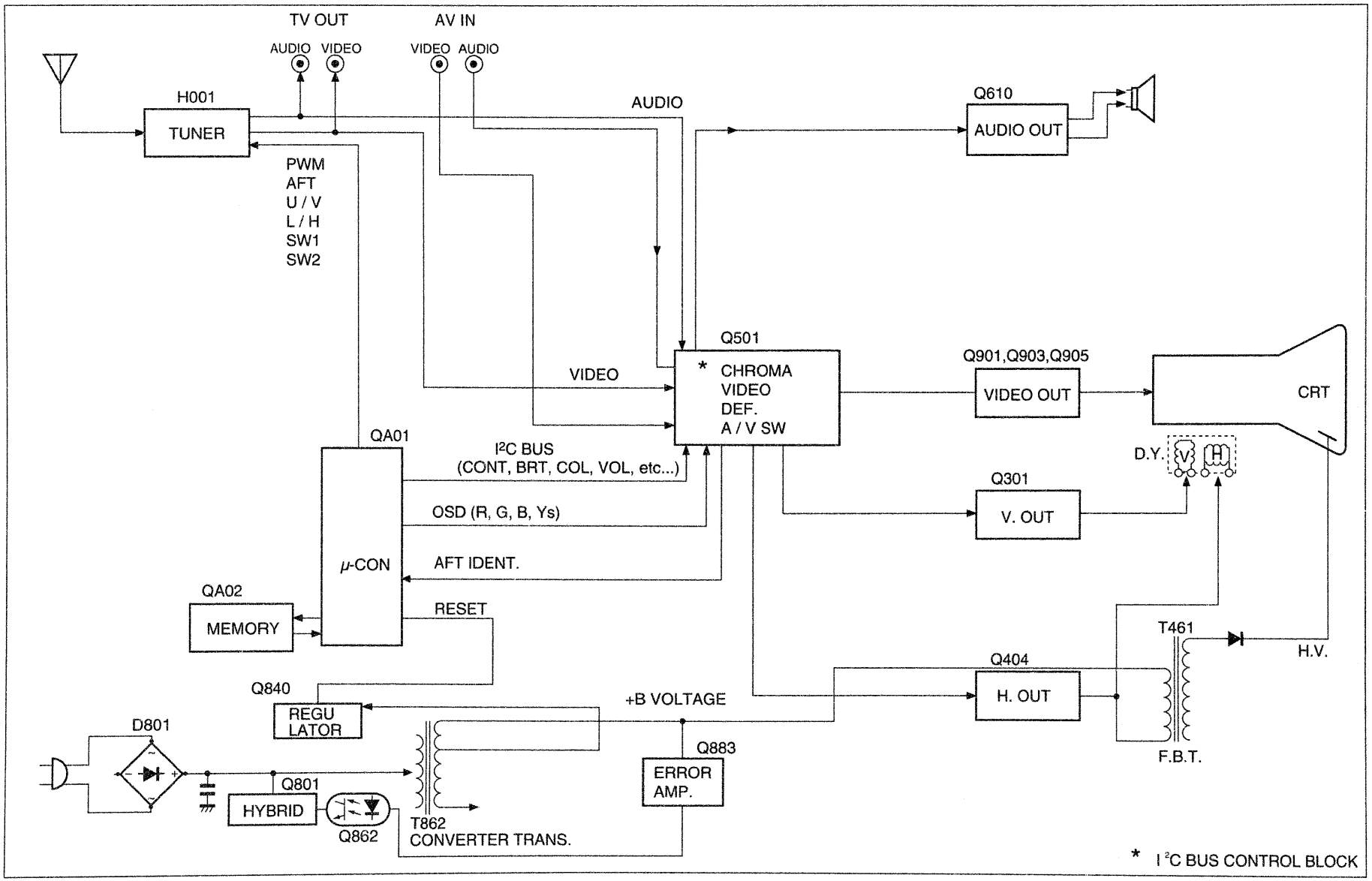
Auto fine tuning (AFT)
Press ⑦ several times to display the D6 screen.
Press ⑧ and select AFT. Press ⑤ to switch to ON. This completes the setting.

Notes • When you operate MFT, AFT is switched off automatically. If you switch on AFT after fine tuning with MFT, MFT may be released.
• AFT can be set for each position. When it is set off, ■ is added to the left of the Position number displayed at the right of the screen. Example: (■12)

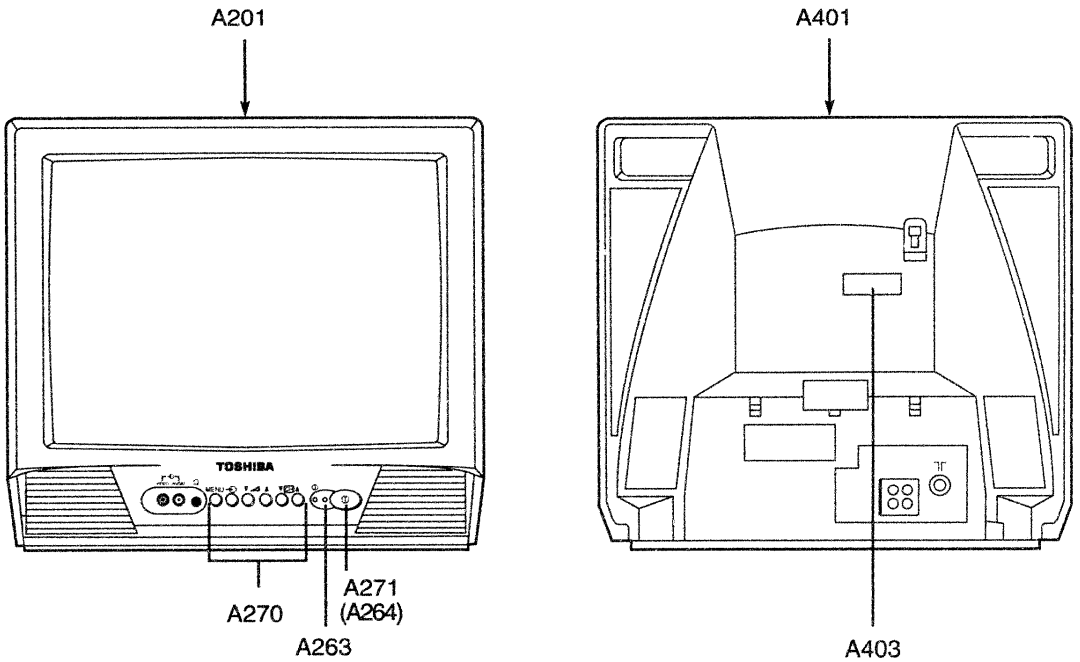
About the other menu items

1 →M←	Adjusts the picture quality selection menu on screen. M (memory) 1, 2, 3
2 CONTRAST	Adjusts the picture contrast in the Memory mode; weaker ⇔ stronger.
3 BRIGHTNESS	Adjusts the picture brightness in the Memory mode; darker ⇔ lighter.
4 COLOR	Adjusts the colour intensity in the Memory mode; paler ⇔ deeper.
5 TINT	Adjusts the tint; purplish ⇔ greenish (This effect is provided for NTSC mode only.)
6 SHARPNESS	Adjust the sharpness; softer ⇔ sharper.
7 BLUE BLACK (B/B)	Turns the screen to blue when no signal is being received.
8 TIMER (OFF TIMER)	Turns the TV off automatically after the preset time.

CIRCUIT BLOCK DIAGRAM



CABINET REPLACEMENT PARTS LIST



Location No.	Part No.	Description
A201	23510312	Front Cover (2178XR)
A201	23510258	Front Cover (2170RE)
A263	23430401	Filter, Remote
A264	23836867	Spring, Coil
A270	23444980	Button, 6-Key
A271	23444979	Button, Power
⚠A401	23427299	Back Cover (2178XR)
⚠A401	23427256	Back Cover (2170RE)
A403	23560781	Label, Model No. 2178XR
A403	23560768	Label, Model No. 2170RE

CHASSIS 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.*

Models : 2178XR, 2170RE

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	24794101	EL, 100μF, ±20%, 16V
C102	24794221	EL, 220μF, ±20%, 16V
C103	24797478	EL, 0.47μF, ±20%, 50V
C104	24797478	EL, 0.47μF, ±20%, 50V
C105	24232103	CD, 0.01μF, +80%, −20%
C106	24796479	EL, 4.7μF, ±20%, 35V
C108	24538474	PF, 0.47μF
C110	24474221	CD, 220pF, ±10%
C111	24232103	CD, 0.01μF, +80%, −20%
C112	24797100	EL, 10μF, ±20%, 50V
C113	24590104	PF, 0.1μF
C114	24590104	PF, 0.1μF
C115	24590104	PF, 0.1μF
C116	24590104	PF, 0.1μF
C117	24232103	CD, 0.01μF, +80%, −20%
C118	24474102	CD, 1000pF, ±10%
C120	24473470	CD, 47pF
C121	24473470	CD, 47pF
C122	24232103	CD, 0.01μF, +80%, −20%
C123	24232103	CD, 0.01μF, +80%, −20%
C129	24474102	CD, 1000pF, ±10%
C161	24797478	EL, 0.47μF, ±20%, 50V
C162	24212332	CD, 3300pF, ±10%
C166	24232103	CD, 0.01μF, +80%, −20%
C167	24763101	EL, 100μF, ±20%, 16V
C168	24794100	EL, 10μF, ±20%, 16V
C169	24232103	CD, 0.01μF, +80%, −20%
C170	24232103	CD, 0.01μF, +80%, −20%
C180	24797010	EL, 1μF, ±20%, 50V
C181	24232103	CD, 0.01μF, +80%, −20%
C182	24763101	EL, 100μF, ±20%, 16V
C212	24797478	EL, 0.47μF, ±20%, 50V
C213	24085958	EL, 1.0μF, ±20%, 50V, Non-Polar
C216	24797478	EL, 0.47μF, ±20%, 50V
C221	24473100	CD, 10pF
C222	24473100	CD, 10pF
C223	24473100	CD, 10pF
C224	24797100	EL, 10μF, ±20%, 50V
C225	24590104	PF, 0.1μF

Location No.	Part No.	Description
C226	24590104	PF, 0.1μF
C301	24617915	EL, 1μF, ±10%, 50V
C303	24212152	CD, 1500pF, ±10%
C305	24617915	EL, 1μF, ±10%, 50V
C306	24073043	EL, 2200μF, ±20%, 16V
C307	24693473	PF, 0.047μF, 100V
C308	24668101	EL, 100μF, ±20%, 35V
C309	24591102	PF, 1000pF
C310	24796102	EL, 1000μF, ±20%, 35V
C311	24214681	CD, 680pF, ±10%, 500V
C313	24082057	PF, 0.22μF, 100V
C314	24591563	PF, 0.056μF
C317	24214471	CD, 470pF, ±10%, 500V
C320	24668101	EL, 100μF, ±20%, 35V
C323	24538474	PF, 0.47μF
C370	24794101	EL, 100μF, ±20%, 16V
C371	24794220	EL, 22μF, ±20%, 16V
C403	24590472	PF, 4700pF
C404	24797478	EL, 0.47μF, ±20%, 50V
C408	24590183	PF, 0.018μF
C409	24212221	CD, 220pF, ±10%
C410	24693472	PF, 4700pF, 100V
C417	24214102	CD, 1000pF, ±10%, 500V
C420	24666220	EL, 22μF, ±20%, 16V
C421	24666470	EL, 47μF, ±20%, 16V
C430	24232103	CD, 0.01μF, +80%, −20%
C431	24794102	EL, 1000μF, ±20%, 16V
C432	24232103	CD, 0.01μF, +80%, −20%
C433	24073015	EL, 47μF, ±20%, 50V
C435	24797479	EL, 4.7μF, ±20%, 50V
C439	24232103	CD, 0.01μF, +80%, −20%
C440	24082951	PF, 6000pF, ±3%, 1500V
C442	24082430	PF, 0.33μF, 250V
C444	24082934	PF, 1500pF, ±3%, 1500V
C445	24828563	PF, 0.056μF, 200V
C446	24679220	EL, 22μF, ±20%, 250V
C448	24640908	EL, 33μF, ±20%, 160V
C449	24666101	EL, 100μF, ±20%, 16V
C463	24212152	CD, 1500pF, ±10%
C467	24082095	PF, 0.018μF, ±3%, 630V
C470	24794220	EL, 22μF, ±20%, 16V

Location No.	Part No.	Description
C472	24538474	PF, 0.47μF
C511	24797478	EL, 0.47μF, ±20%, 50V (2178XR)
C511	24591104	PF, 0.1μF (2170RE)
C512	24590104	PF, 0.1μF (2178XR)
C513	24590104	PF, 0.1μF (2178XR)
C516	24232103	CD, 0.01μF, +80%, -20%
C517	24797101	EL, 100μF, ±20%, 50V
C521	24590104	PF, 0.1μF
C522	24590104	PF, 0.1μF
C523	24590104	PF, 0.1μF
C524	24797101	EL, 100μF, ±20%, 50V
C525	24232103	CD, 0.01μF, +80%, -20%
C526	24590222	PF, 2200pF
C527	24353100	CD, 10pF, ±0.25pF
C528	24206228	EL, 0.22μF, 50V
C561	24590333	PF, 0.033μF (2178XR)
C562	24763101	EL, 100μF, ±20%, 16V (2178XR)
C563	24436101	CD, 100pF (2178XR)
C564	24085958	EL, 1.0μF, ±20%, 50V, Non-Polar (2178XR)
C565	24763101	EL, 100μF, ±20%, 16V (2178XR)
C566	24232103	CD, 0.01μF, +80%, -20% (2178XR)
C567	24797010	EL, 1μF, ±20%, 50V (2178XR)
C568	24794100	EL, 10μF, ±20%, 16V (2178XR)
C569	24232103	CD, 0.01μF, +80%, -20% (2178XR)
C570	24232103	CD, 0.01μF, +80%, -20% (2178XR)
C606	24797229	EL, 2.2μF, ±20%, 50V
C607	24667221	EL, 220μF, ±20%, 25V
C608	24797229	EL, 2.2μF, ±20%, 50V
C609	24591472	PF, 4700pF
C610	24667220	EL, 22μF, ±20%, 25V
C611	24591104	PF, 0.1μF
C612	24794470	EL, 47μF, ±20%, 16V
C613	24795471	EL, 470μF, ±20%, 25V
C614	24797478	EL, 0.47μF, ±20%, 50V
C615	24794220	EL, 22μF, ±20%, 16V
C621	24591152	PF, 1500pF
C623	24794220	EL, 22μF, ±20%, 16V
⚠C801	24082374	PF, 0.22μF, AC250V (2178XR)
⚠C801	24082373	PF, 0.1μF, ±20%, AC250V (2170RE)
C805	24092281	CD, 4700pF, ±20%, AC250V
C806	24092281	CD, 4700pF, ±20%, AC250V
C810	24086936	EL, 270μF, ±20%, 450V
⚠C813	24092555	CD, 1000pF, ±10%, AC250V
⚠C814	24092555	CD, 1000pF, ±10%, AC250V
C819	24538474	PF, 0.47μF
C832	24666470	EL, 47μF, ±20%, 16V
C841	24667100	EL, 10μF, ±20%, 25V
C842	24666100	EL, 10μF, ±20%, 16V
C843	24590104	PF, 0.1μF
C846	24538224	PF, 0.22μF
C860	24214102	CD, 1000pF, ±10%, 500V
C862	24082857	PF, 680pF, ±2%
C863	24538104	PF, 0.1μF
C864	24092335	CD, 150pF, ±10%, 2kV
C866	24669478	EL, 0.47μF, ±20%, 50V
C867	24591332	PF, 3300pF

Location No.	Part No.	Description
C868	24669470	EL, 47μF, ±20%, 50V
C869	24678229	EL, 2.2μF, ±20%, 200V
C870	24820473	PF, 0.047μF, 630V
C871	24092345	CD, 1000pF, ±10%, 2kV
C873	24538224	PF, 0.22μF
C877	24667470	EL, 47μF, ±20%, 25V
C884	24640018	EL, 220μF, ±20%, 160V
C885	24214471	CD, 470pF, ±10%, 500V
C889	24667471	EL, 470μF, ±20%, 25V
C891	24082229	PF, 0.1μF, ±10%, 250V
C893	24092338	CD, 270pF, ±10%, 2kV
C894	24092338	CD, 270pF, ±10%, 2kV
C897	24212471	CD, 470pF, ±10%
C898	24567224	PF, 0.22μF
C899	24212271	CD, 270pF, ±10%
C902	24092345	CD, 1000pF, ±10%, 2kV
C904	24436471	CD, 470pF
C905	24436391	CD, 390pF
C907	24436561	CD, 560pF
C910	24669478	EL, 0.47μF, ±20%, 50V
C912	24763471	EL, 470μF, ±20%, 16V
C913	24794100	EL, 10μF, ±20%, 16V
C971	24794470	EL, 47μF, ±20%, 16V
CA10	24474331	CD, 330pF, ±10%
CA22	24473100	CD, 10pF
CA23	24473100	CD, 10pF
CA24	24473100	CD, 10pF
CA25	24473100	CD, 10pF
CA33	24232103	CD, 0.01μF, +80%, -20%
CA36	24474101	CD, 100pF, ±10%
CA37	24474101	CD, 100pF, ±10%
CA38	24474101	CD, 100pF, ±10%
CA42	24794100	EL, 10μF, ±20%, 16V
CA43	24590104	PF, 0.1μF
CA68	24794100	EL, 10μF, ±20%, 16V
CA69	24232103	CD, 0.01μF, +80%, -20%
CB01	24794470	EL, 47μF, ±20%, 16V
CB20	24436101	CD, 100pF
CB21	24212221	CD, 220pF, ±10%
CS02	24794100	EL, 10μF, ±20%, 16V
CS05	24794100	EL, 10μF, ±20%, 16V
CS08	24797229	EL, 2.2μF, ±20%, 50V
CV10	24793471	EL, 470μF, ±20%, 10V

RESISTORS

R101	24366682	CF, 6800 ohm
R102	24366121	CF, 120 ohm
R103	24366122	CF, 1200 ohm
R104	24366360	CF, 36 ohm
R105	24366681	CF, 680 ohm
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
R117	24366221	CF, 220 ohm
R118	24366153	CF, 15k ohm
R119	24366563	CF, 56k ohm
R120	24366101	CF, 100 ohm
R121	24366101	CF, 100 ohm (2178XR)
R123	24366471	CF, 470 ohm

Location No.	Part No.	Description
R124	24366471	CF, 470 ohm (2178XR)
R126	24366101	CF, 100 ohm
R127	24366162	CF, 1600 ohm
R128	24366181	CF, 180 ohm (2178XR)
R128	24366221	CF, 220 ohm (2170RE)
R129	24366181	CF, 180 ohm (2178XR)
R132	24366101	CF, 100 ohm
R134	24366331	CF, 330 ohm
R135	24366102	CF, 1k ohm
R136	24366103	CF, 10k ohm
R137	24366103	CF, 10k ohm
R138	24366103	CF, 10k ohm
R139	24366562	CF, 5600 ohm
R140	24366221	CF, 220 ohm
R144	24366152	CF, 1500 ohm
R147	24366153	CF, 15k ohm
R148	24366221	CF, 220 ohm
R156	24553153	OMF, 15k ohm, 1W
R167	24366151	CF, 150 ohm
R170	24366151	CF, 150 ohm
R183	24366103	CF, 10k ohm
R190	24366101	CF, 100 ohm
R191	24366222	CF, 2200 ohm
R209	24366222	CF, 2200 ohm
R210	24366222	CF, 2200 ohm
R211	24366561	CF, 560 ohm
R212	24366102	CF, 1k ohm
R216	24366824	CF, 820k ohm
R218	24366104	CF, 100k ohm
R227	24366223	CF, 22k ohm
R228	24366271	CF, 270 ohm
R229	24366271	CF, 270 ohm
R230	24366271	CF, 270 ohm
R301	24366102	CF, 1k ohm
R304	24366243	CF, 24k ohm
R305	24322189	MF, 1.8 ohm, 1W
R306	24366153	CF, 15k ohm
R307	24366684	CF, 680k ohm
R308	24366102	CF, 1k ohm
R310	24552822	OMF, 8200 ohm, 1/2W
R312	24552272	OMF, 2700 ohm, 1/2W
R313	24366153	CF, 15k ohm
R333	24339569	MF, 5.6 ohm, 2W
R336	24383331	OMF, 330 ohm, 2W
R370	24310189	MF, 1.8 ohm, 1/2W
R371	24366562	CF, 5600 ohm
R372	24366392	CF, 3900 ohm
R373	24366102	CF, 1k ohm
R374	24366163	CF, 16k ohm
R402	24366102	CF, 1k ohm
R403	24366123	CF, 12k ohm
R405	24366104	CF, 100k ohm
R407	24366103	CF, 10k ohm
R408	24366472	CF, 4700 ohm
R410	24366181	CF, 180 ohm
R411	24366561	CF, 560 ohm
R412	24366560	CF, 56 ohm
R416	24019325	OMF, 2200 ohm, 5W
R421	24366391	CF, 390 ohm
R430	24366103	CF, 10k ohm
R432	24531120	FR, 12 ohm, 1/2W
R433	24366472	CF, 4700 ohm
R434	24552121	OMF, 120 ohm, 1/2W
R435	24366182	CF, 1800 ohm

Location No.	Part No.	Description
R441	24532102	FR, 1k ohm, 1W
R447	24553472	OMF, 4700 ohm, 1W
R448	24338278	OMF, 0.27 ohm, 1W
R470	24338688	MF, 0.68 ohm, 1W
R471	24552301	OMF, 300 ohm, 1/2W
R473	24366153	CF, 15k ohm
R474	24376393	CF, 39k ohm, 1/2W
R479	24552820	OMF, 82 ohm, 1/2W
R523	24366303	CF, 30k ohm
R526	24366821	CF, 820 ohm
R527	24366821	CF, 820 ohm
R528	24366821	CF, 820 ohm
R565	24366622	CF, 6200 ohm
R566	24366912	CF, 9100 ohm
R568	24366473	CF, 47k ohm (2178XR)
R603	24366162	CF, 1600 ohm
R604	24366562	CF, 5600 ohm
R605	24366339	CF, 3.3 ohm
R606	24366393	CF, 39k ohm
R607	24366332	CF, 3300 ohm
R608	24366104	CF, 100k ohm
R612	24366103	CF, 10k ohm
R621	24366222	CF, 2200 ohm
R622	24366101	CF, 100 ohm
R663	24552221	OMF, 220 ohm, 1/2W
⚠R801	24009954	Metal-Glazed Resistor, 2.2M ohm, 1/2W
⚠R808	24019340	PTC Thermistor, 18 ohm, 290V
R810	24569229	Cement, 2.2 ohm, 10W
R816	24366471	CF, 470 ohm
R817	24366331	CF, 330 ohm
R818	24366561	CF, 560 ohm
R819	24366102	CF, 1k ohm
R830	24546569	FR, 5.6 ohm, 1/2W
R831	24366471	CF, 470 ohm
R840	24531120	FR, 12 ohm, 1/2W
R841	24366752	CF, 7500 ohm
R846	24366332	CF, 3300 ohm
R848	24366470	CF, 47 ohm
R860	24383123	OMF, 12k ohm, 2W
R861	24383123	OMF, 12k ohm, 2W
R862	24552220	OMF, 22 ohm, 1/2W
R864	24552102	OMF, 1k ohm, 1/2W
R866	24552390	OMF, 39 ohm, 1/2W
R868	24366103	CF, 10k ohm
R870	24381201	OMF, 200 ohm, 1/2W
R871	24310109	MF, 1.0 ohm, 1/2W
R881	24366472	CF, 4700 ohm
R883	24552752	OMF, 7500 ohm, 1/2W
R884	24552752	OMF, 7500 ohm, 1/2W
R888	24546228	FR, 0.22 ohm, 1/2W
R891	24366102	CF, 1k ohm
⚠R899	24005014	MF, 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	24366101	CF, 100 ohm
R915	24366471	CF, 470 ohm
R917	24366102	CF, 1k ohm
R920	24000568	FR, 4.7 ohm, 1W
R921	24366101	CF, 100 ohm

Location No.	Part No.	Description
R922	24366471	CF, 470 ohm
R925	24366102	CF, 1k ohm
R928	24366101	CF, 100 ohm
R929	24366471	CF, 470 ohm
R931	24366229	CF, 2.2 ohm
R936	24366272	CF, 2700 ohm
R937	24366102	CF, 1k ohm
R938	24552560	OMF, 56 ohm, 1/2W
R960	24383183	OMF, 18k ohm, 2W
R961	24554183	OMF, 18k ohm, 2W
R963	24383183	OMF, 18k ohm, 2W
R972	24366102	CF, 1k ohm
R974	24366102	CF, 1k ohm
R977	24366681	CF, 680 ohm
RA02	24366102	CF, 1k ohm
RA03	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
RA13	24366102	CF, 1k ohm
RA14	24366153	CF, 15k ohm (2178XR)
RA15	24366103	CF, 10k ohm (2178XR)
RA15	24366752	CF, 7500 ohm (2170RE)
RA16	24366102	CF, 1k ohm
RA17	24366102	CF, 1k ohm
RA18	24366102	CF, 1k ohm
RA19	24366221	CF, 220 ohm
RA21	24366821	CF, 820 ohm
RA22	24366682	CF, 6800 ohm
RA23	24366682	CF, 6800 ohm
RA24	24366682	CF, 6800 ohm
RA25	24366222	CF, 2200 ohm
RA26	24366102	CF, 1k ohm
RA27	24366102	CF, 1k ohm
RA31	24366101	CF, 100 ohm
RA32	24366101	CF, 100 ohm
RA33	24366471	CF, 470 ohm
RA35	24366102	CF, 1k ohm
RA36	24366223	CF, 22k ohm
RA37	24366331	CF, 330 ohm
RA38	24366331	CF, 330 ohm
RA40	24366102	CF, 1k ohm
RA41	24366102	CF, 1k ohm
RA60	24366103	CF, 10k ohm
RA61	24366103	CF, 10k ohm
RA62	24366103	CF, 10k ohm
RA64	24366333	CF, 33k ohm
RA65	24366333	CF, 33k ohm (2170RE)
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
RA74	24366103	CF, 10k ohm (2178XR)
RA75	24366103	CF, 10k ohm (2178XR)
RA76	24366102	CF, 1k ohm
RB01	24366271	CF, 270 ohm
RB03	24366101	CF, 100 ohm
RB09	24366470	CF, 47 ohm
RB11	24366103	CF, 10k ohm

Location No.	Part No.	Description
RB20	24366823	CF, 82k ohm
RB22	24366103	CF, 10k ohm
RB26	24366472	CF, 4700 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	24366221	CF, 220 ohm
RB60	24366103	CF, 10k ohm (2178XR)
RB61	24366103	CF, 10k ohm (2178XR)
RS02	24366471	CF, 470 ohm
RS03	24366103	CF, 10k ohm
RS05	24366223	CF, 22k ohm
RS06	24366102	CF, 1k ohm
RV01	24366750	CF, 75 ohm
RV02	24366101	CF, 100 ohm
RV11	24366750	CF, 75 ohm
RV12	24366391	CF, 390 ohm
RV13	24366101	CF, 100 ohm

COILS & TRANSFORMERS

L101	23221803	Coil, Choke, TLN3040D
L102	23238560	Coil, Peaking, TRF4R68AJ
L103	23289568	Coil, Peaking, TRF4R56AF
L106	23289829	Coil, Peaking, TRF48R2AF (2178XR)
L106	23289120	Coil, Peaking, TRF4120AF (2170RE)
L107	23289829	Coil, Peaking, TRF48R2AF (2178XR)
L110	23289180	Coil, Peaking, TRF4180AF
L161	23262287	Coil, IF, TRF1239AV
L162	23289680	Coil, Peaking, TRF4680AF
L183	23289680	Coil, Peaking, TRF4680AF
L301	23103859	Coil (Ferrite Bead), TEM2011
L430	23289470	Coil, Peaking, TRF4470AF
L441	23233071	Coil, Linearity, TLN2112G
L462	23231056	Deflection Yoke, TDY-621WS
L499	23238713	Coil, Peaking, TRF4120AJ
L511	23289100	Coil, Peaking, TRF4100AF
L525	23289100	Coil, Peaking, TRF4100AF
L561	23289100	Coil, Peaking, TRF4100AF (2178XR)
L562	23289100	Coil, Peaking, TRF4100AF (2178XR)
L805	23248150	Coil, Choke, TLN3427
L806	23248150	Coil, Choke, TLN3427
L861	23103859	Coil (Ferrite Bead), TEM2011
L862	23103937	Coil (Ferrite Bead), TEM2004
L883	23103859	Coil (Ferrite Bead), TEM2011
L884	23103859	Coil (Ferrite Bead), TEM2011
L885	23221722	Coil, Choke, TLN3142D
L886	23103859	Coil (Ferrite Bead), TEM2011
L887	23280016	Coil, Peaking, TRF4100AZ
⚠L901	23200316	Coil, Degaussing, TSB-2301AL
LA01	23289100	Coil, Peaking, TRF4100AF
LB01	23262682	Coil, IF, TRF1147T
T401	23224983	Transformer, Horiz. Drive, TLN1039
⚠T461	23236481	Transformer, Flyback, TFB4125CH
⚠T801	23211702	Line, Filter, TRF3221AM (2178XR)

Location No.	Part No.	Description
⚠T801	23211696	Line, Filter, TRF3216AK (2170RE)
T802	23211696	Line, Filter, TRF3216AK (2170RE)
⚠T862	23217276	Transformer, Converter, TPW3319AE (2178XR)

SEMICONDUCTORS

Q101	A6708871	Transistor, 2SC388ATM
Q102	23114528	Transistor, 2SC1740S-Q
Q105	23114528	Transistor, 2SC1740S-Q
Q106	23114528	Transistor, 2SC1740S-Q (2178XR)
Q108	23114530	Transistor, 2SA933S-Q
Q109	23114528	Transistor, 2SC1740S-Q
Q110	B0470522	IC, TC4052BP (2178XR)
Q111	23114528	Transistor, 2SC1740S-Q
Q112	23114528	Transistor, 2SC1740S-Q
Q209	23114528	Transistor, 2SC1740S-Q
Q210	23114530	Transistor, 2SA933S-Q
Q301	B0377890	IC, TA8403K
Q370	23114530	Transistor, 2SA933S-Q
Q402	A6330069	Transistor, 2SC2482 FA-1
Q404	23314375	Transistor, ON4409(508D)
Q421	23314141	Transistor, 2SC3852
Q430	23314141	Transistor, 2SC3852
Q432	23114455	Transistor, DTC124E-S
Q470	A6547250	Transistor, 2SA1320
Q560	23906090	IC, TA1275Z (2178XR)
Q610	23119668	IC, TDA2611A
Q611	A6342206	Transistor, 2SC2878-A(TE
Q612	23114530	Transistor, 2SA933S-Q
Q620	A6010040	Transistor, RN2004
Q621	23114528	Transistor, 2SC1740S-Q
Q801	23906039	IC, STR-Z2154B
Q817	23114528	Transistor, 2SC1740S-Q
Q818	A6012010	Transistor, RN2201
Q819	23114528	Transistor, 2SC1740S-Q
Q830	23314141	Transistor, 2SC3852
Q840	23318299	IC, L78MR05
Q843	A6002050	Transistor, RN1205
Q846	A6360200	Transistor, 2SC3333
⚠Q862	A8645166	Photo Coupler, TLP721F(D4-G
Q872	23314141	Transistor, 2SC3852
Q883	A6907752	IC, S1854 FA-1
Q901	A6330059	Transistor, 2SC2482(C)
Q903	A6330059	Transistor, 2SC2482(C)
Q905	A6330059	Transistor, 2SC2482(C)
Q907	23114530	Transistor, 2SA933S-Q
Q908	A6321265	Transistor, 2SC2120-Y(TE)
QA01	23906238	IC, TMP87CK38N-3505
QA02	23904665	IC, NM24C04EN
QB01	23114528	Transistor, 2SC1740S-Q
QB03	A6002050	Transistor, RN1205
QB09	23114528	Transistor, 2SC1740S-Q
QB10	23114528	Transistor, 2SC1740S-Q
QB20	23114457	Transistor, DTC143ES
QB21	23114528	Transistor, 2SC1740S-Q
QB30	23114528	Transistor, 2SC1740S-Q
QB40	23114528	Transistor, 2SC1740S-Q
QB60	23114528	Transistor, 2SC1740S-Q (2178XR)
QB61	23114528	Transistor, 2SC1740S-Q (2178XR)

Location No.	Part No.	Description
QS01	A6342206	Transistor, 2SC2878-A(TE
QV10	23114530	Transistor, 2SA933S-Q
D101	23115922	Diode, Zener, μPC574J(M)
D102	23118859	Diode, 1SS133
D103	23118859	Diode, 1SS133
D110	23118859	Diode, 1SS133
D111	23316315	Diode, Zener, UZ6.8BSB
D201	23316326	Diode, Zener, UZ10BSA
D224	23118859	Diode, 1SS133
D301	23118479	Diode, BYD33J
D302	23118479	Diode, BYD33J
D370	23316294	Diode, Zener, UZ3.6BSA
D403	23316304	Diode, Zener, UZ4.7BSC
D406	23118479	Diode, BYD33J
D408	23118479	Diode, BYD33J
D421	23316327	Diode, Zener, UZ10BSB
D431	23316327	Diode, Zener, UZ10BSB
D433	23118859	Diode, 1SS133
D440	23316254	Diode, ERC06-15
D441	23316309	Diode, Zener, UZ5.6BSB
D444	23118338	Diode, RU4AM
D470	23316333	Diode, Zener, UZ12BSB
D498	23118859	Diode, 1SS133
D499	23118859	Diode, 1SS133
D610	23118859	Diode, 1SS133
D612	23118859	Diode, 1SS133
D620	23118859	Diode, 1SS133
D621	23118859	Diode, 1SS133
D622	23118859	Diode, 1SS133
D801	23118173	Diode, RBV-406M-LFA
D818	23316337	Diode, Zener, UZ13BSC
D830	23316306	Diode, Zener, UZ5.1BSB
D846	23316312	Diode, Zener, UZ6.2BSB
D862	23118094	Diode, EU2A
D864	23118094	Diode, EU2A
D872	23316346	Diode, Zener, UZ18BSC
D875	23316333	Diode, Zener, UZ12BSB
D876	23118859	Diode, 1SS133
D877	23316323	Diode, Zener, UZ9.1BSA
D878	23316360	Diode, Zener, UZ27BSC
D881	23118859	Diode, 1SS133
D883	23316813	Diode, EG1
D884	23316813	Diode, EG1
D885	23316813	Diode, EG1
D901	23118859	Diode, 1SS133
D904	23118859	Diode, 1SS133
D905	23118859	Diode, 1SS133
D906	23118859	Diode, 1SS133
DA42	23316312	Diode, Zener, UZ6.2BSB
DB01	23358501	Diode (LED), SCL003URC5F
DB03	23358522	LED, SIR-56SB3F
DB30	23118859	Diode, 1SS133
DS01	23118859	Diode, 1SS133

MISCELLANEOUS

B405	23451788	Holder, Power Cord
E912	23848729	Rubber Wedge
⚠F470	23144827	Fuse, 0.63A
F470A	23165433	Holder, Fuse
⚠F801	23144834	Fuse, 3.15A
F801A	23165433	Holder, Fuse
G218	24366182	CF, 1800 ohm
G303	24310109	OMF, 1.0 ohm, 1/2W
G410	23103859	Coil (Ferrite Bead), TEM2011

Location No.	Part No.	Description
G883	23118859	Diode, 1SS133
G902	23118859	Diode, 1SS133
G903	23118859	Diode, 1SS133
GA02	24366470	CF, 47 ohm
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
P661	23365728	Jack, Earphone
⚠P801	23372024	Power Cord
PV01	23365814	Jack, Phono
PV02	23365729	Jack, Phono
⚠S801	23344394	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
⚠V901A	23902966	Socket, CRT
V901M	23102409	Magnet, P/C, MAG-1070
W661	23151225	Speaker, SPK-1228, 60x90mm, 8 ohm
W662	23151225	Speaker, SPK-1228, 60x90mm, 8 ohm
X501	23153979	Crystal, 4.43MHz
XA01	23153436	Ceramic Resonator, EF0EC8004
Z101	23303188	Ceramic Trap, TCF1113
Z102	23303191	Ceramic Trap, TCF1116 (2178XR)
Z105	23107855	Ceramic Filter, 5.5MHz, TCF1031
Z106	23303071	Ceramic Filter, 6.0MHz, TCF1088 (2178XR)
Z107	23303072	Ceramic Filter, 6.5MHz, TCF1089 (2178XR)
Z130	23303176	Filter, SAW, 38MHz, OFWK2964M
ZP05	23144541	Protector, 3.15A

PC BOARD ASSEMBLIES

* U902A		Main Board, PB7767-1 (2178XR)
* U902A		Main Board, PB7733-1 (2170RE)
* U902B		CRT Drive Board, PB7767-2 (2178XR)
* U902B		CRT Drive Board, PB7733-2 (2170RE)

PICTURE TUBE

⚠V901	23312470	Pictre Tube, A51KSU93X(VM)

TUNER

H001	23321269	Tuner, ECA14

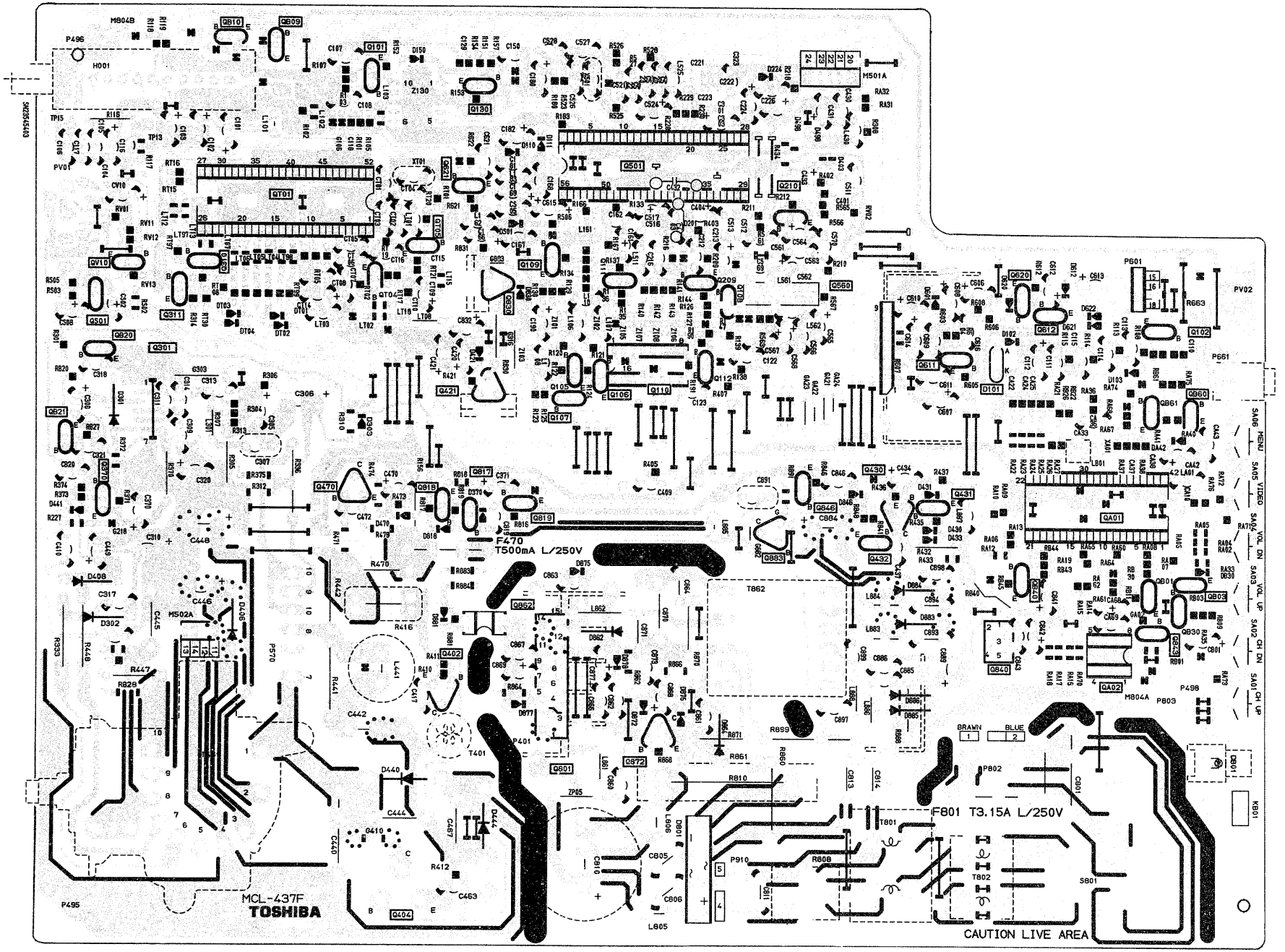
ACCESSORIES

K902	23306237	Remote Hand Unit, CT-9922
Y101	23563072	Owner's Manual, English, 2178XR/2170RE

Location No.	Part No.	Description

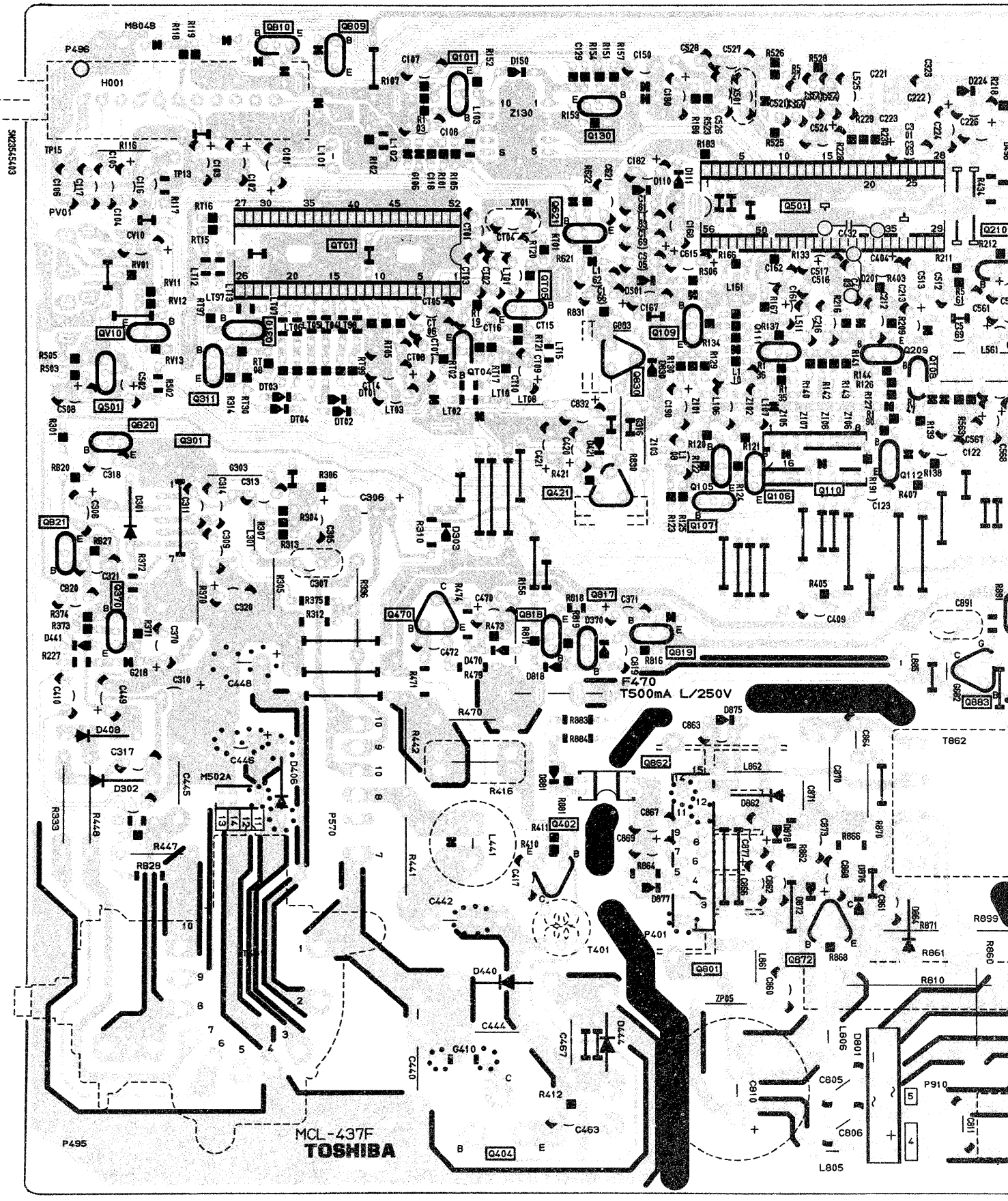
MAIN BOARD PB7767-1 (2178XR) PB7733-1 (2170RE)

BOTTOM (FOIL) SIDE



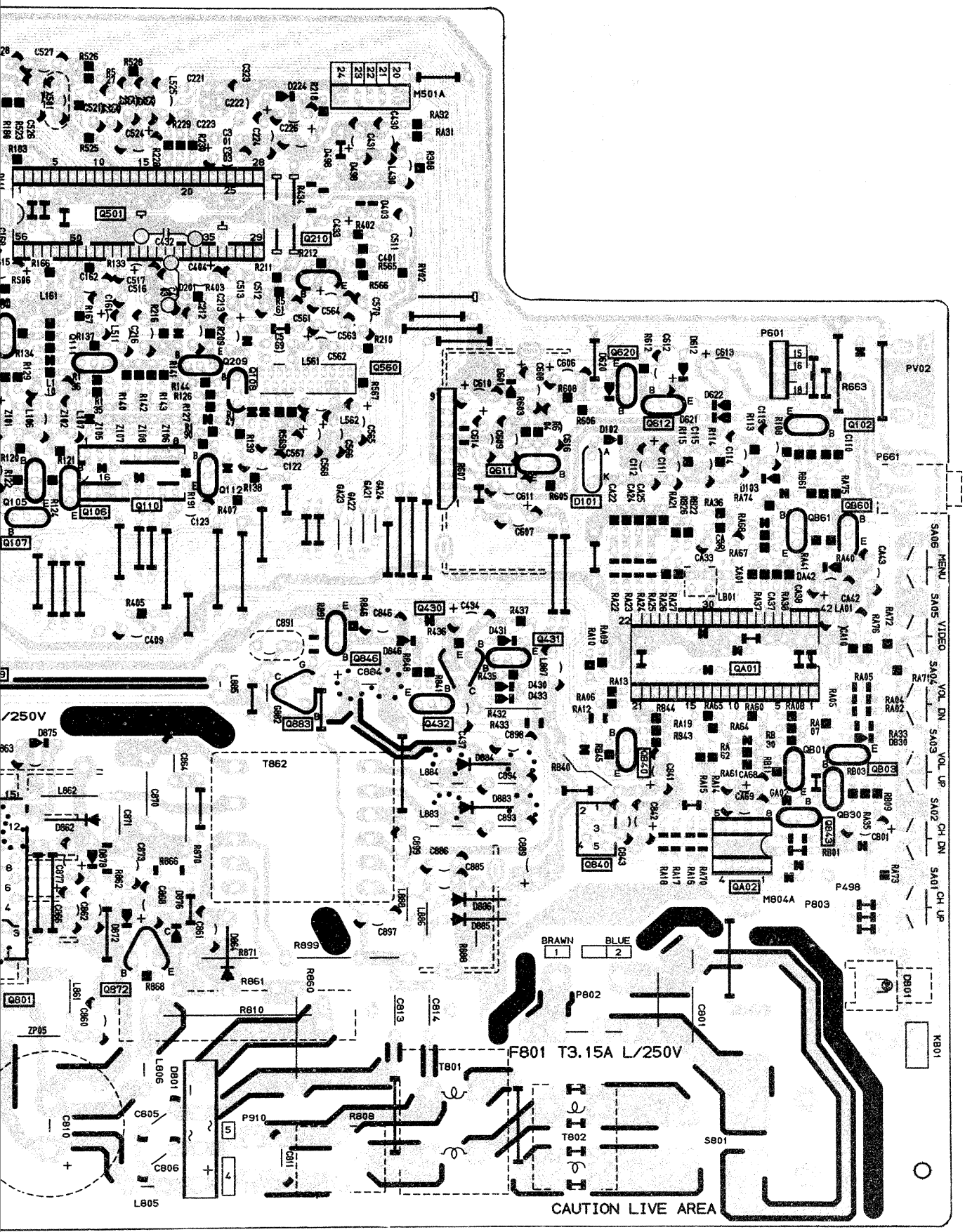
MAIN BOARD PB7767-1 (2178)
PB7733-1 (2170F

BOTTOM (FOIL) SIDE



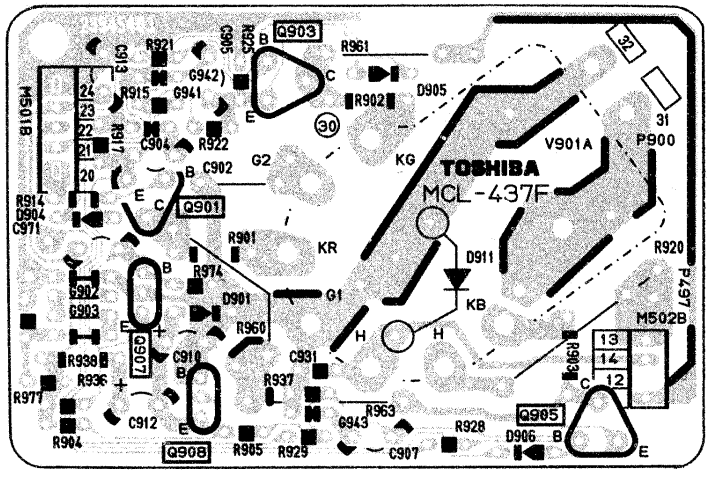
BOARD PB7767-1 (2178XR)
PB7733-1 (2170RE)

BOTTOM (FOIL) SIDE



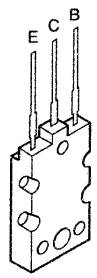
CRT-D BOARD PB7767-2 (2178XR) PB7733-2 (2170RE)

BOTTOM (FOIL) SIDE

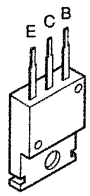


TERMINAL VIEW OF TRANSISTORS

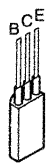
① 2SD2253
(old)
2SC5243



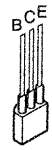
② 2SC3852
2SD1763A
2SC1569
2SC4544
2SA1788
2SA1306
2SA1186A



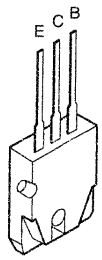
③ 2SC752GTM
2SC2482
2SC2655
2SC4721P



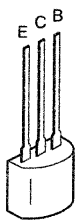
④ 2SC752
2SA562TM
2SA1015
2SC1815
2SC2878
2SC1740S
2SC2120
2SA9335



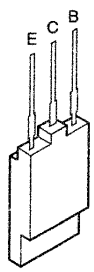
⑤ 2SA1788



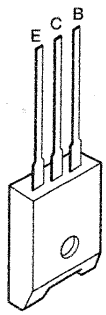
⑥ RN2203
RN2201
RN2004
RN1203
RN1204
RN2204
RN1205
RN1202
RN1201



⑦ 2SD1554
2SD2253
2SD1556
2SC5143



⑧ ON4409



SCHEMATIC DIAGRAM MODEL : 2178XR / 2170RE (1/2)

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.

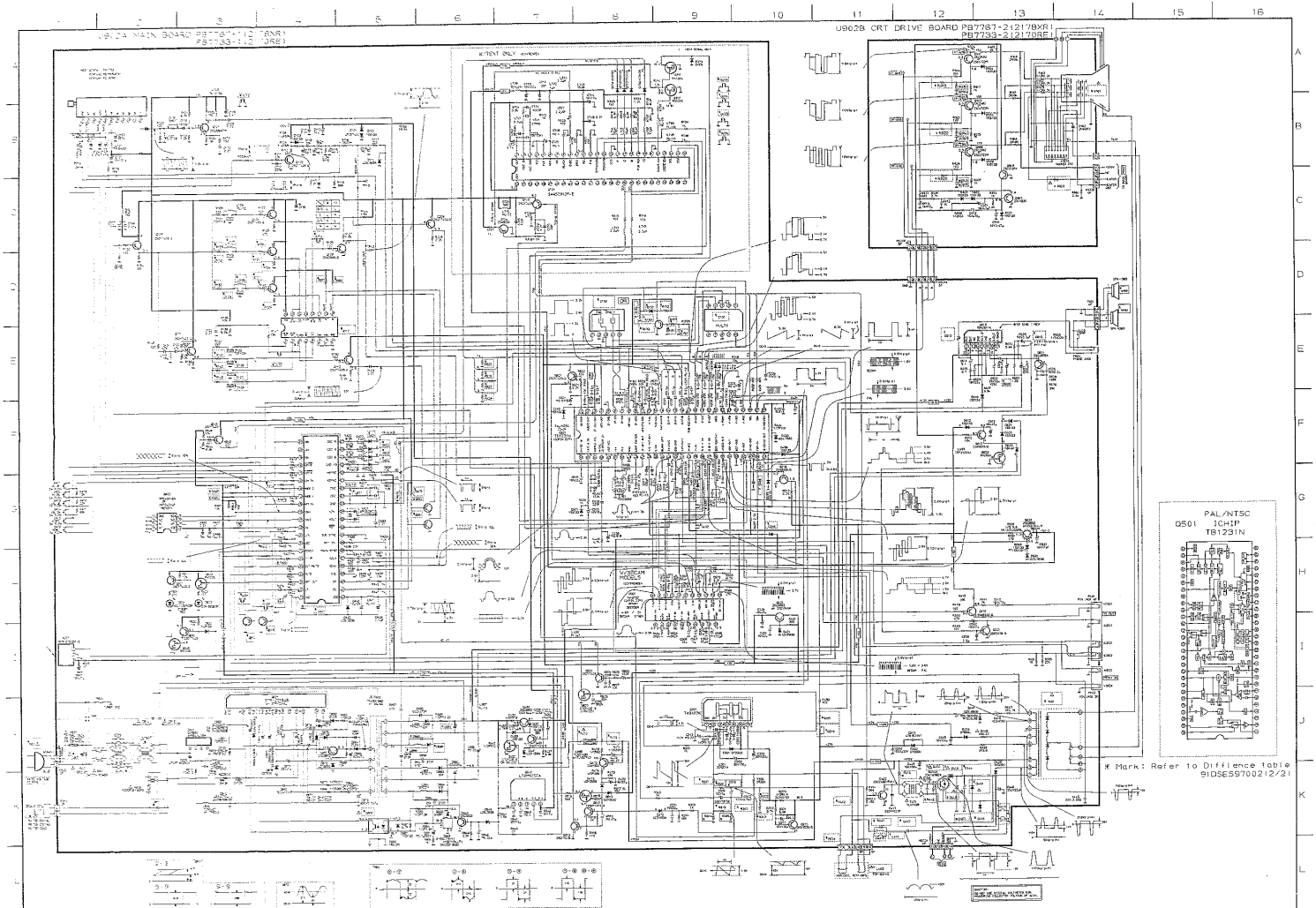
NOTES:

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

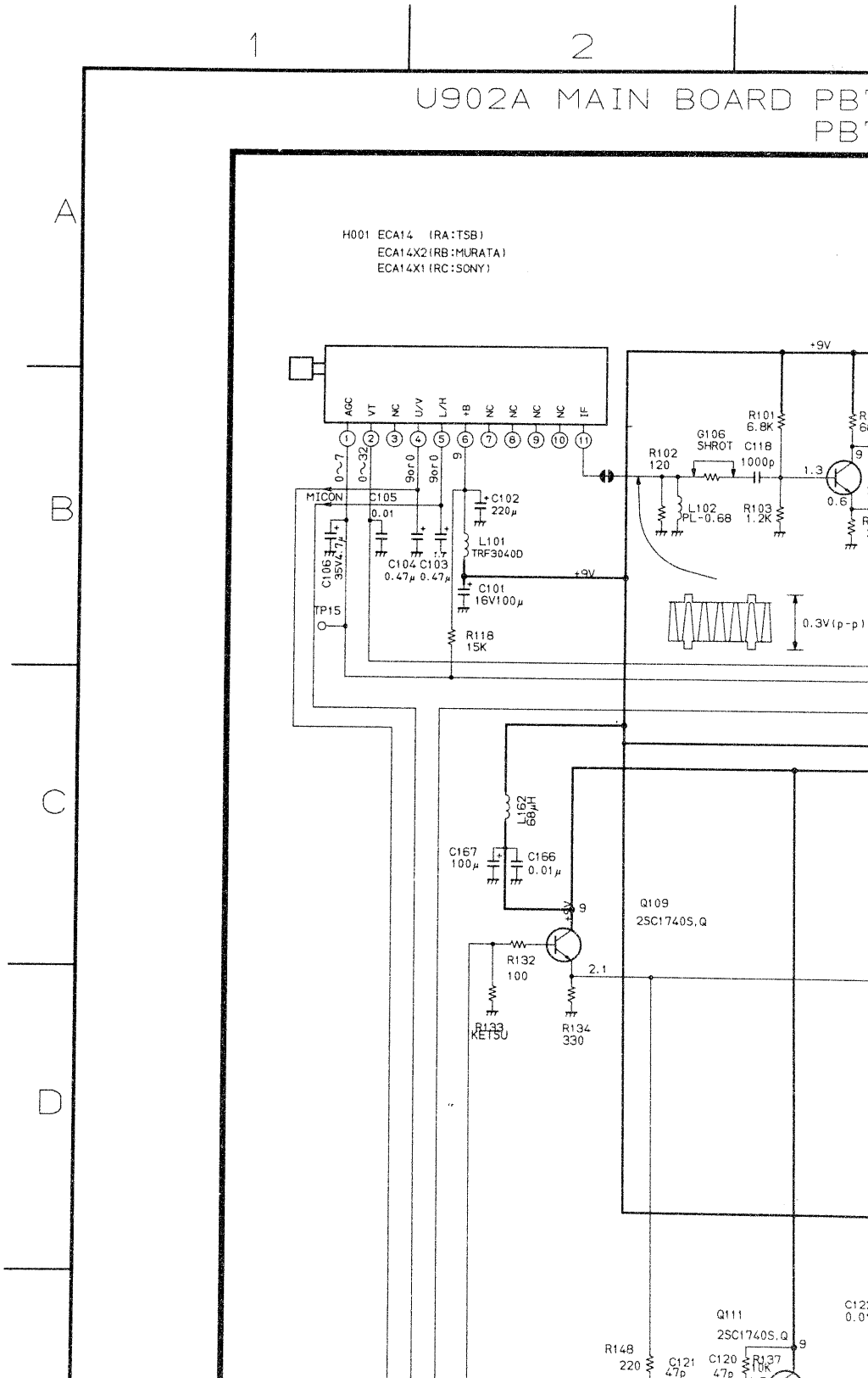
VALUE OF RESISTOR, CAPACITOR and INDUCTOR

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.



SCHEMATIC DIAGRAM MODEL : 2178XR / 2170RE

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



70RE (1/2)

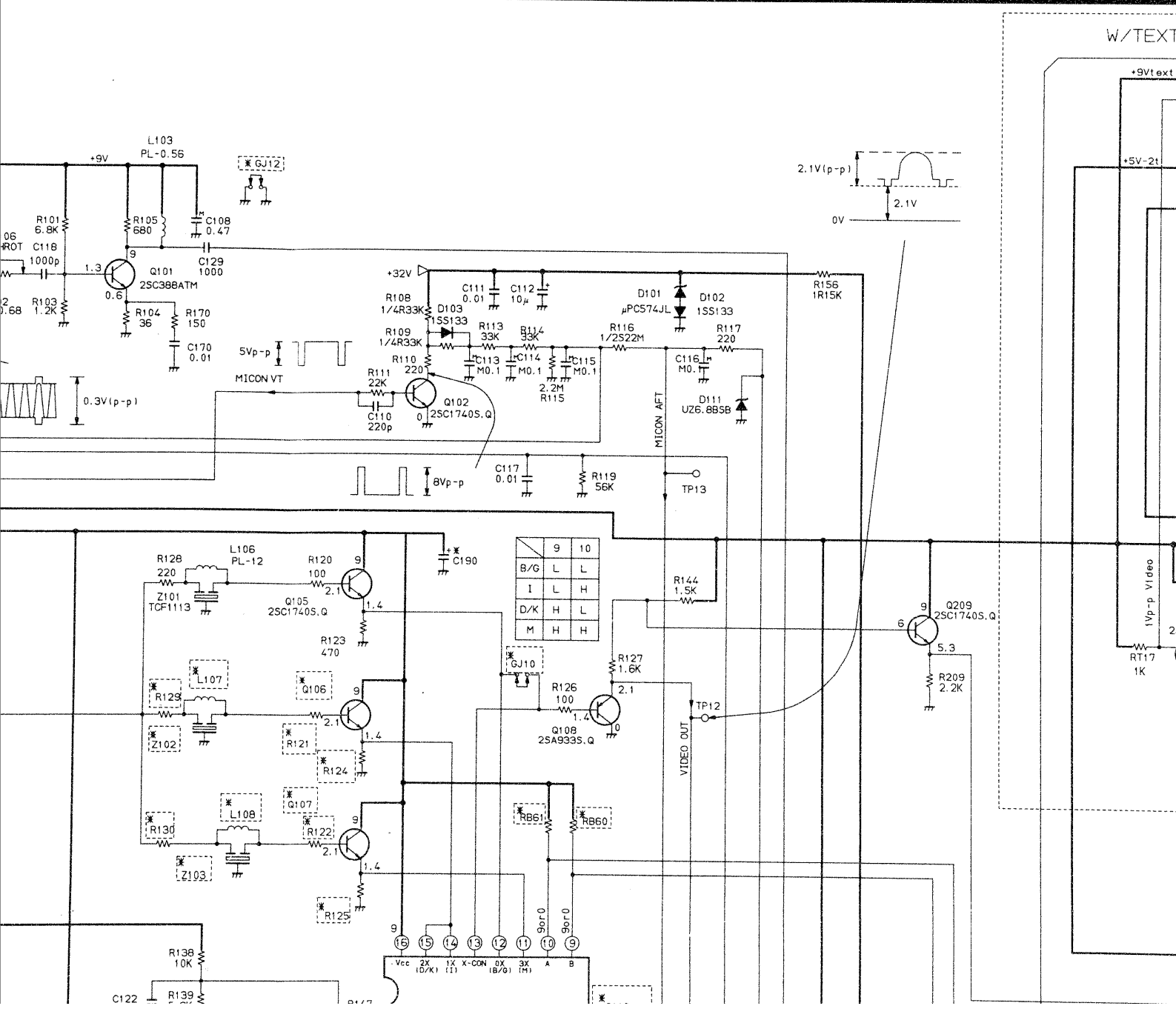
designate com-
ith types identical to
is to be identical
TY NOTICE on page

OBSERVATION OF VOLTAGES AND WAVEFORMS

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

3 4 5 6

DARD PB7767-1 (2178XR)
PB7733-1 (2170RE)



	9	10
B/G	L	L
I	L	H
D/K	H	L
M	H	H

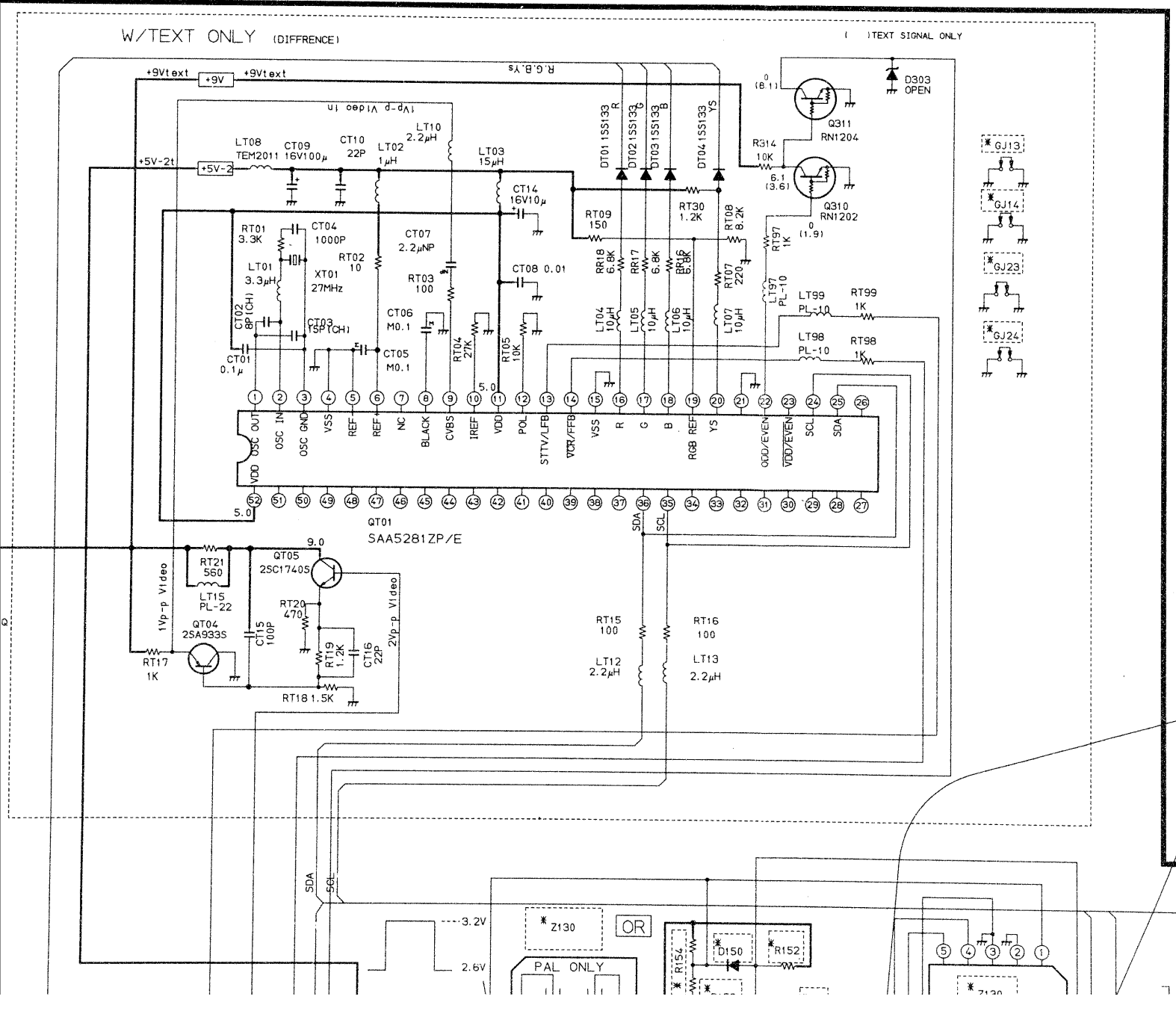
round, line voltage 220
%.
nd a low capacity probe.

e in mid position and
t other controls for best

NOTES:

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

6 7 8 9



EXPRESSION

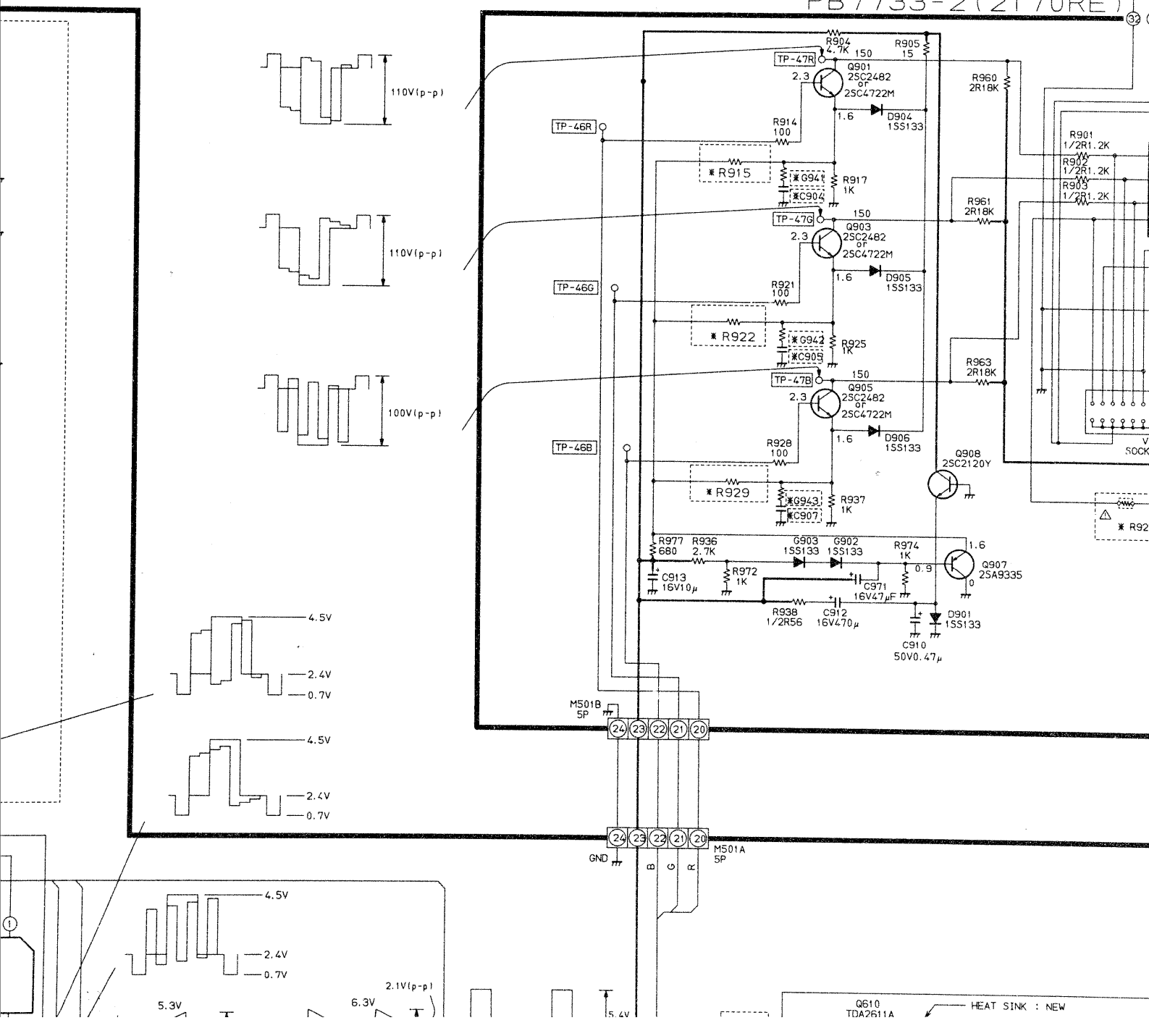
VALUE OF RESISTOR, CAPACITOR and INDUCT

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

her is shown in this schematic dia-
the circuit.
ce.

10 11 12 13

U902B CRT DRIVE BOARD PB7767-2(2178XR)
PB7733-2(2170RE)

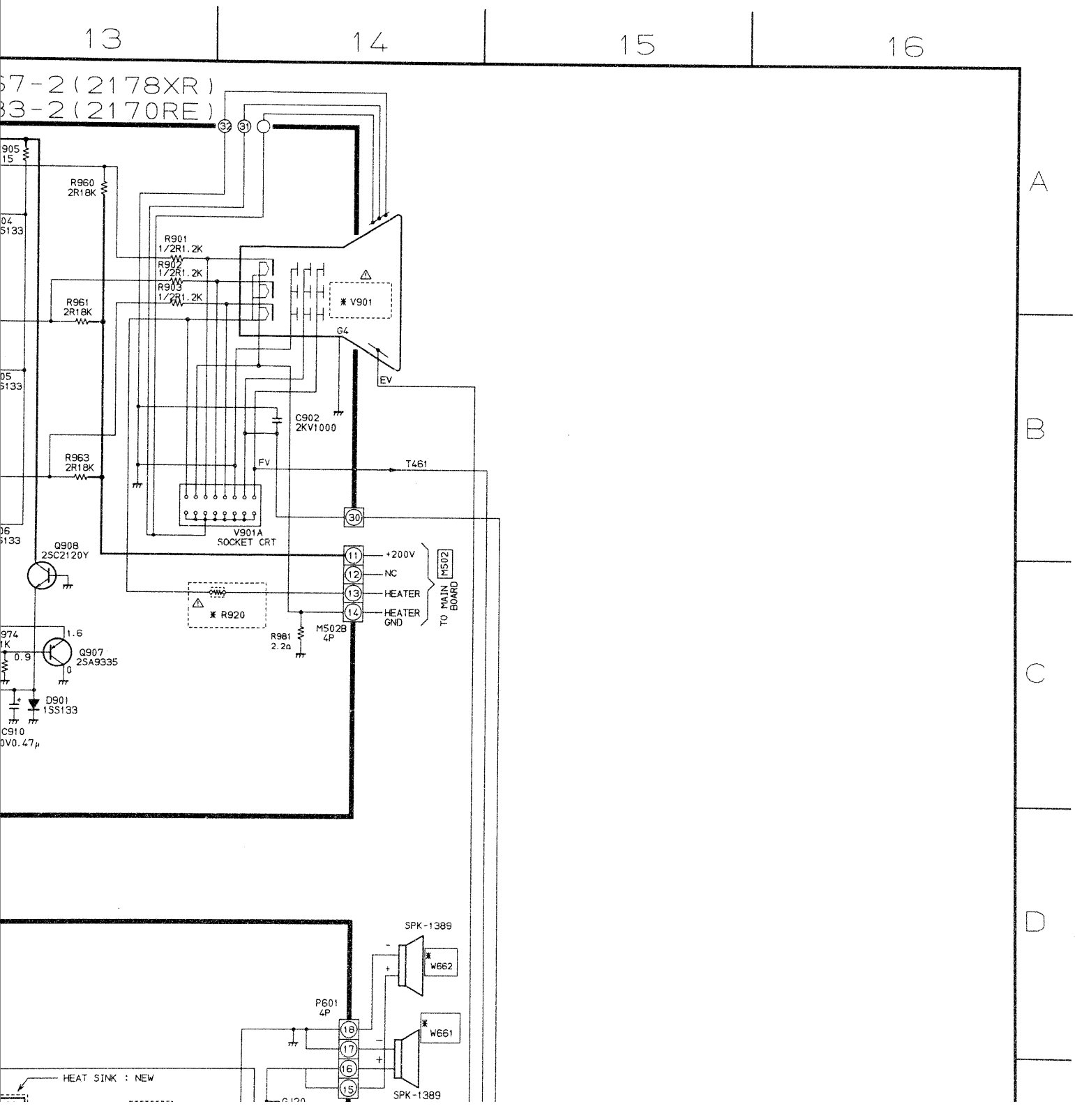


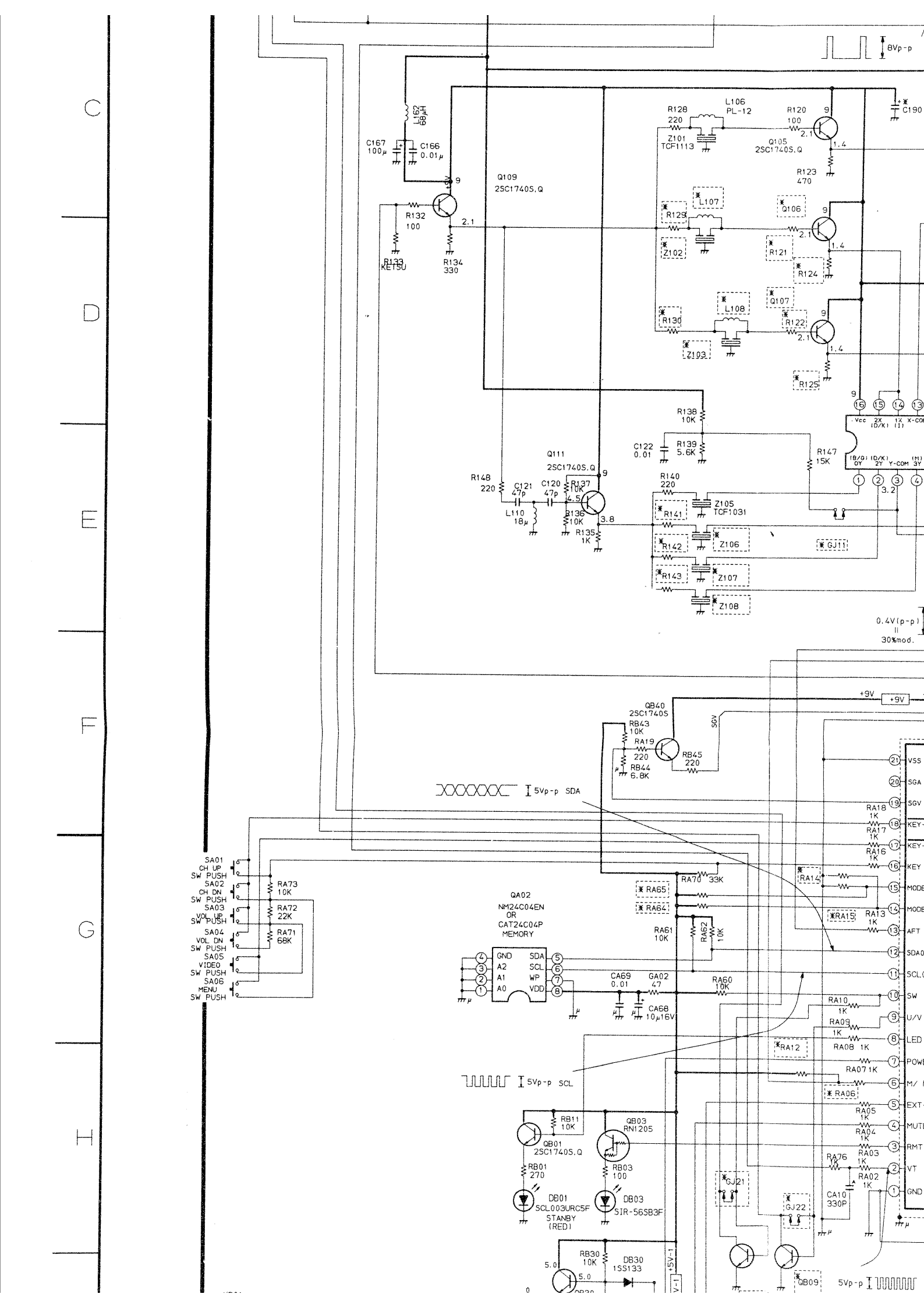
ACITOR and INDUCTOR

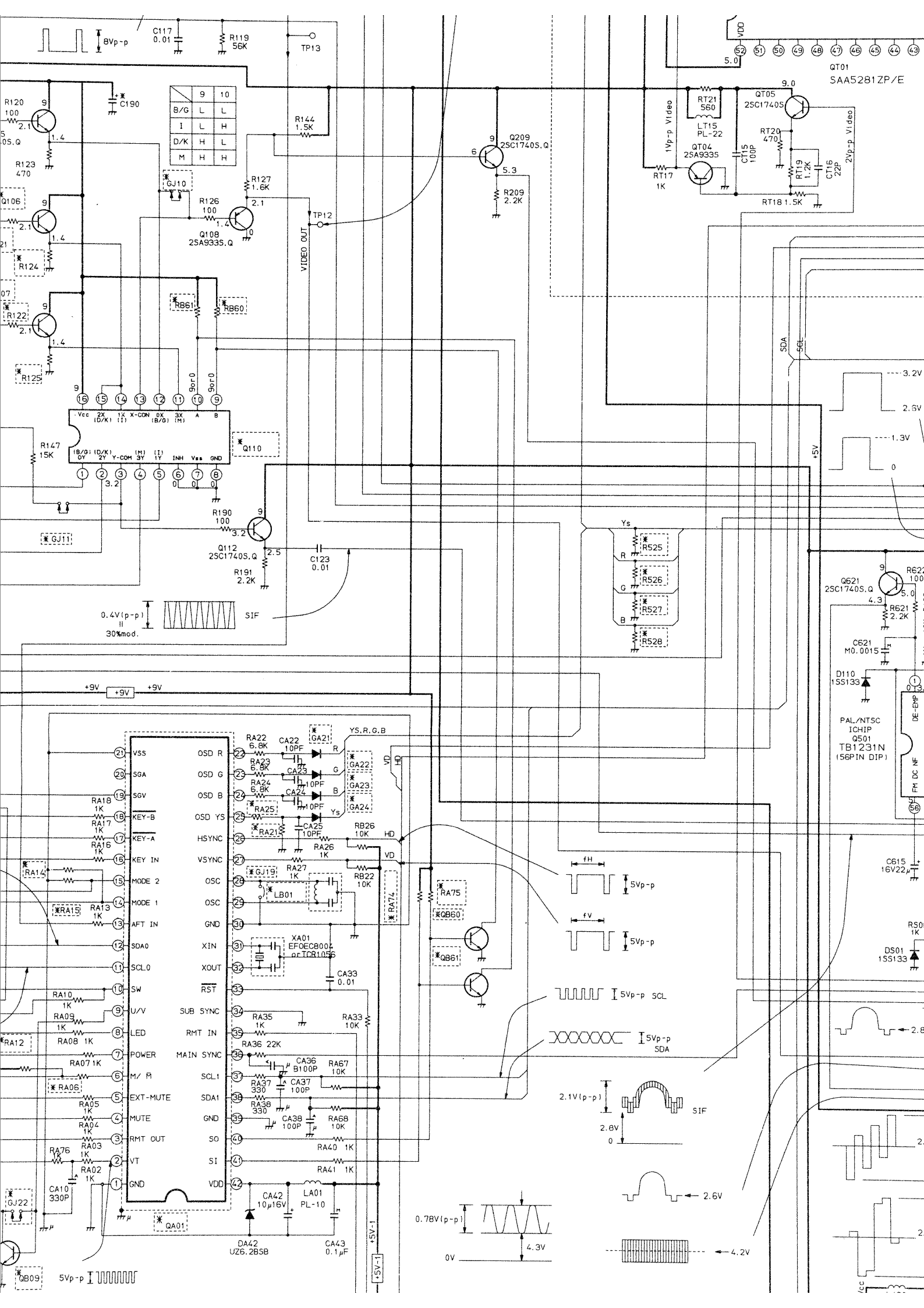
k=1,000, M=1,000,000

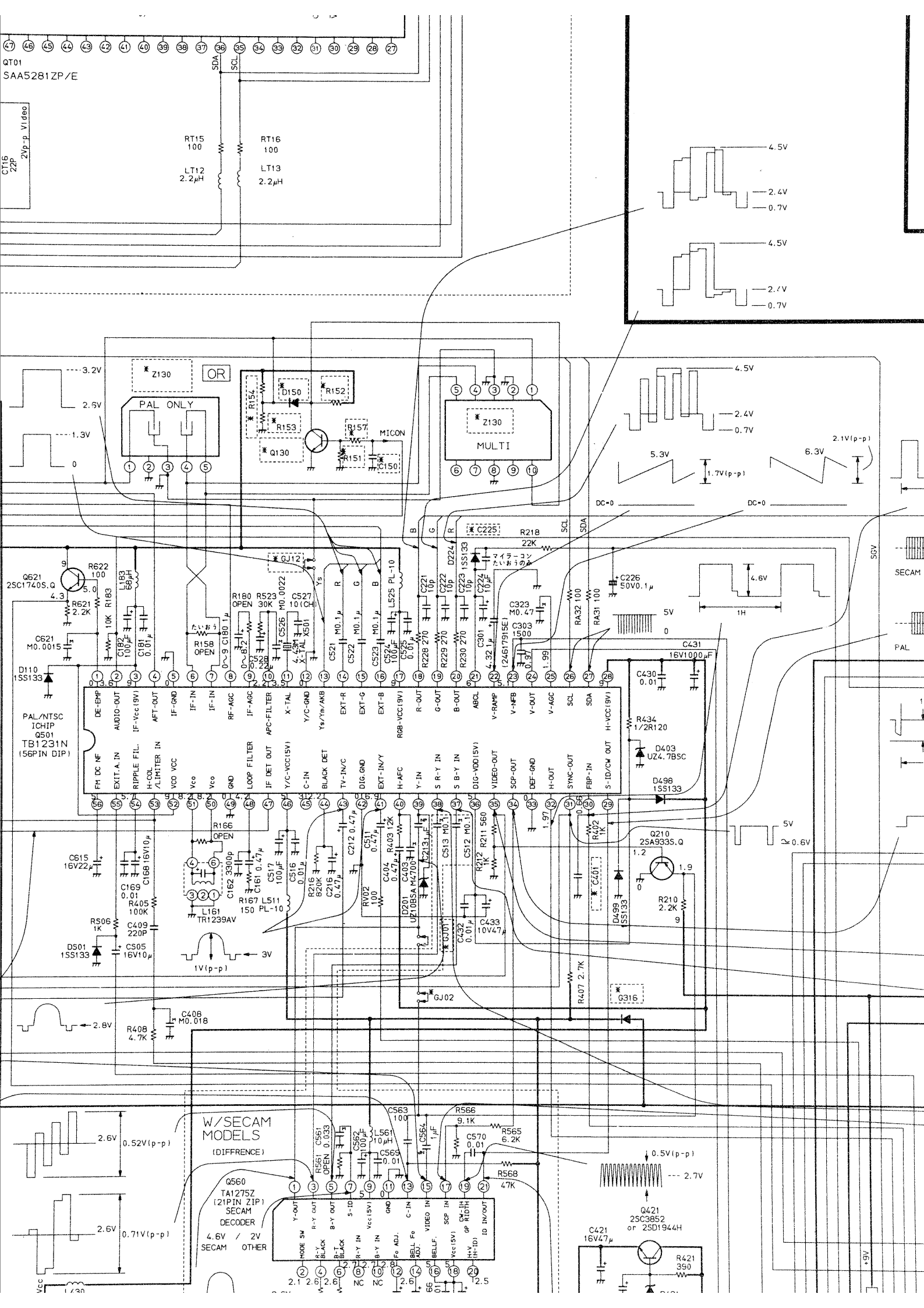
schematic, all capacitor values less than 1 are expres-
re than 1 in pF.

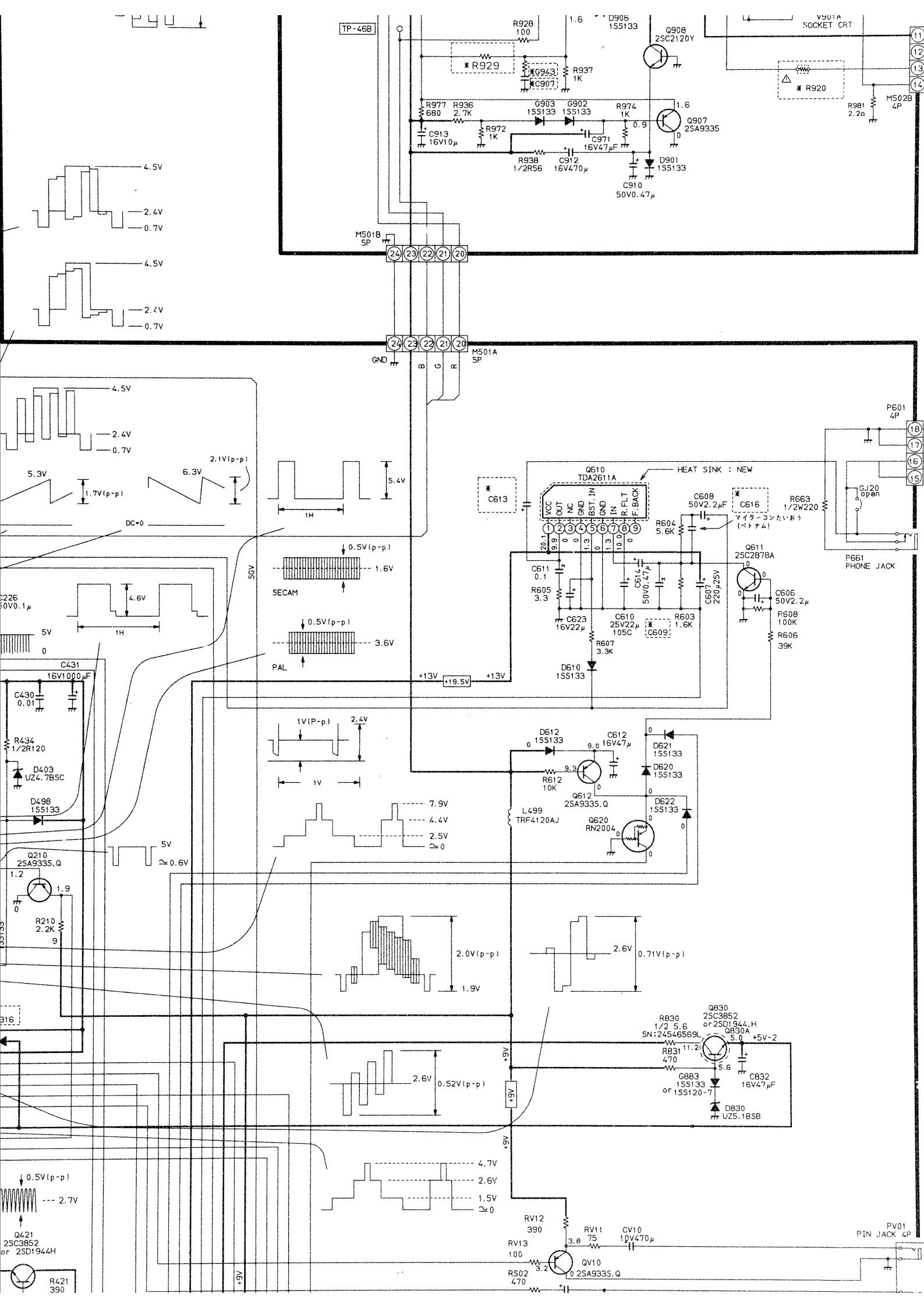
chematic, all inductor values more than 1 are expres-
s than 1 in H.




8Vp-p
L106
PL-12
R128
220
Z101
TCF1113
R120
100
Q105
2SC1740S,Q
C190
R123
470
L107
R129
Z102
Q106
R121
R124
L108
R130
Z103
Q107
R122
R125
C167
100μ
C166
0.01μ
L162
68μH
Q109
2SC1740S,Q
R132
100
R133
KE15U
R134
330
R138
10K
C122
0.01
R139
5.6K
R147
15K
Q111
2SC1740S,Q
R148
220
C121
47p
C120
47p
R137
10K
L110
18μ
R136
10K
R135
1K
R140
220
R141
Z105
TCF1031
R142
Z106
R143
Z107
Z108
GJ11
0.4V(p-p)
30%mod.
+9V
QB40
2SC1740S
RB43
10K
RA19
220
RB44
6.8K
RB45
220
SGV
5Vp-p SDA
SA01
CH UP
SW PUSH
SA02
CH DN
SW PUSH
SA03
VOL UP
SW PUSH
SA04
VOL DN
SW PUSH
SA05
VIDEO
SW PUSH
SA06
MENU
SW PUSH
RA73
10K
RA72
22K
RA71
68K
QA02
NM24C04EN
OR
CAT24C04P
MEMORY
GND
A2
A1
A0
SDA
SCL
WP
VDD
CA69
0.01
GA02
47
CA68
10μ16V
RA70
33K
RA65
RA64
RA61
10K
RA62
10K
RA60
10K
RA14
RA15
RA13
1K
RA10
1K
RA09
1K
RA08
1K
RA12
RA07
1K
RA06
RA05
1K
RA04
1K
RA03
1K
RA76
RA02
1K
CA10
330P
GJ21
GJ22
5Vp-p SCL
QB01
2SC1740S,Q
RB11
10K
QB03
RN1205
RB01
270
RB03
100
DB01
SCL003URC5F
STANBY
(RED)
DB03
SIR-56SB3F
RB30
10K
DB30
1SS133
+5V-1
QB09
5Vp-p
VSS
SGA
SGV
KEY-
KEY-
KEY
MODE
MODE
AFT
SDA
SCL
SW
U/V
LED
POWE
M/
EXT-
MUTE
RMT
VT
GND


8Vp-p
C117 0.01
R119 56K
TP13
R120 100
C190
R123 470
R124
R122
R125
R144 1.5K
R127 1.6K
R126 100
Q108 2SA933S.Q
TP12
VIDEO OUT
GJ10
RB61
RB60
Q209 2SC1740S.Q
R209 2.2K
VDD
QT01 SAA5281ZP/E
QT05 2SC1740S
QT04 2SA933S
RT21 560
LT15 PL-22
RT20 470
RT19 1.2K
RT17 1K
RT18 1.5K
CT15 100P
CT16 22P
1Vp-p Video
2Vp-p Video
SDA
SCL
3.2V
2.6V
1.3V
0
+5V
Q110
R147 15K
R190 100
Q112 2SC1740S.Q
R191 2.2K
C123 0.01
GJ11
0.4V(p-p) 30%mod.
SIF
Ys
R525
R526
R527
R528
Q621 2SC1740S.Q
R621 2.2K
C621 M0.0015
D110 1SS133
PAL/NTSC ICHIP Q501 TB1231N (56PIN DIP)
DE-EMP
FM DC NF
C615 16V22μ
DS01 1SS133
+9V
VSS
SGA
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
RMT OUT
VT
GND
OSC
XIN
XOUT
RST
SUB SYNC
RMT IN
MAIN SYNC
SCL1
SDA1
SO
SI
VDD
OSD R
OSD G
OSD B
OSD YS
HSYNC
VSYNC
YS.R.G.B
VD
HD
fH
fV
5Vp-p
5Vp-p SCL
5Vp-p SDA
XA01 EFOEC8004 or TCR10S5
LB01
QA01
QB09
QB60
QB61
DA42 UZ6.2BSB
LA01 PL-10
CA42 10μ16V
CA43 0.1μF
CA10 330P
CA33 0.01
CA36 B100P
CA37 100P
CA38 100P
RA67 10K
RA68 10K
RA40 1K
RA41 1K
RA35 1K
RA33 10K
RA36 22K
RA37 330
RA38 330
RB26 10K
RB22 10K
RA26 1K
RA27 1K
RA74
RA75
2.1V(p-p)
2.8V
0
SIF
2.6V
4.2V
0.78V(p-p)
4.3V
0V


QT01
SAA5281ZP/E
SDA
SCL
RT15 100
RT16 100
LT12 2.2μH
LT13 2.2μH
CT16 22P
2Vp-p Video
4.5V
2.4V
0.7V
2.7V
Z130
OR
PAL ONLY
3.2V
2.6V
1.3V
0
D150
R152
R154
R153
Q130
R157
R151
MICON
C150
MULTI
5.3V
1.7V(p-p)
6.3V
2.1V(p-p)
DC=0
R218 22K
C225
C226 50V0.1μ
C323 M0.47
C303 1500
C431 16V1000μF
C430 0.01
R434 1/2R120
D403 UZ4.7BSC
D498 1SS133
Q621 2SC1740S.Q
R622 100
R621 2.2K
C621 M0.0015
D110 1SS133
PAL/NTSC ICHIP Q501 TB1231N (56PIN DIP)
DE-EMP
AUDIO-OUT
IF-Vcc(9V)
AFT-OUT
IF-GND
IF-IN
RF-AGC
IF-AGC
APC-FILTER
X-TAL
Y/C-GND
Ys/Ym/AKB
EXT-R
EXT-G
EXT-B
RGB-VCC(9V)
R-OUT
G-OUT
B-OUT
ABCL
V-RAMP
V-NFB
V-OUT
V-AGC
SCL
SDA
H-VCC(9V)
FM DC NF
EXIT.A.IN
RIPPLE FIL.
H-COL /LIMITER IN
VCO VCC
Vco
GND
LOOP FILTER
IF DET OUT
Y/C-VCC(5V)
C-IN
BLACK DET
TV-IN/C
DIG.GND
EXT-IN/Y
H-AFC
Y-IN
S R-Y IN
S B-Y IN
DIG-VDD(5V)
VIDEO-OUT
SCP-OUT
DEF-GND
H-OUT
SYNC-OUT
FBP-IN
S-ID/CW OUT
Q210 2SA933S.Q
R210 2.2K
D499 1SS133
R402 1K
R407 2.7K
G316
GJ02
R166 OPEN
L161 TR1239AV
R167 L511 150 PL-10
C615 16V22μ
C168 16V10μ
C169 0.01
R405 100K
RS06 1K
C409 220P
DS01 1SS133
C505 16V10μ
C408 M0.018
R408 4.7K
2.8V
3V
1V(p-p)
W/SECAM MODELS
(DIFFRENCE)
2.6V
0.52V(p-p)
0.71V(p-p)
Q560 TA1275Z (21PIN ZIP) SECAM DECODER
4.6V / 2V
SECAM OTHER
Y-OUT
R-Y OUT
B-Y OUT
S-ID
Vcc(5V)
GND
C-IN
VIDEO IN
SCP IN
CW-IN
GP RIDTH
IO IN/OUT
MODE SW
R-Y BLACK
B-Y BLACK
R-Y IN
B-Y IN
Fo ADJ.
BELL Fo ADJ.
BELLF.
Vcc(5V)
H+V (H-ID)
C563 100
R566 9.1K
R565 6.2K
C570 0.01
R568 47K
C561 0.033
R561 OPEN
C562 100μF
L561 10μH
C564 1μF
C569 0.01
0.5V(p-p)
2.7V
Q421 2SC3852 or 2SD1944H
C421 16V47μ
R421 390
+9V
SECAM
PAL
5V
0.6V
4.6V
1H
SGV


TP-46B
R928 100
D905 1SS133
Q908 2SC2120Y
R929
G943
C907
R937 1K
V901A SOCKET CRT
R920
M502B 4P
R981 2.2Ω
R977 680
R936 2.7K
G903 1SS133
G902 1SS133
R974 1K
Q907 2SA9335
C913 16V10μ
R972 1K
C971 16V47μF
R938 1/2R56
C912 16V470μ
D901 1SS133
C910 50V0.47μ
M501B 5P
M501A 5P
GND
B
G
R
4.5V
2.4V
0.7V
5.3V
1.7V(p-p)
6.3V
2.1V(p-p)
5.4V
1H
DC=0
0.5V(p-p)
1.6V
SECAM
3.6V
PAL
SGV
4.6V
5V
0
C431 16V1000μF
C430 0.01
R434 1/2R120
D403 UZ4.7BSC
D498 1SS133
Q210 2SA933S,Q
R210 2.2K
C613
Q610 TDA2611A
HEAT SINK : NEW
VCC OUT NC GND BST. IN GND IN R.FLT F.BACK
C608 50V2.2μF
C616
マイラーコンたいおう (ベトナム)
R604 5.6K
R663 1/2W220
GJ20 open
P601 4P
P661 PHONE JACK
Q611 2SC2878A
C611 0.1
R605 3.3
C614 50V0.47μ
C607 220μ25V
C606 50V2.2μ
R608 100K
R606 39K
C623 16V22μ
C610 25V22μ 105C
C609
R603 1.6K
R607 3.3K
D610 1SS133
+13V
+19.5V
1V(P-p)
2.4V
1V
D612 1SS133
C612 16V47μ
R612 10K
Q612 2SA933S,Q
D621 1SS133
D620 1SS133
D622 1SS133
L499 TRF4120AJ
Q620 RN2004
7.9V
4.4V
2.5V
≅0
5V
≅0.6V
2.0V(p-p)
1.9V
2.6V
0.71V(p-p)
Q830 2SC3852 or 2SD1944,H
R830 1/2 5.6 SN:24546569L
Q830A
R831 470
G883 1SS133 or 1SS120-7
C832 16V47μF
D830 UZ5.1BSB
+9V
2.6V
0.52V(p-p)
4.7V
2.6V
1.5V
≅0
0.5V(p-p)
2.7V
Q421 2SC3852 or 2SD1944H
R421 390
RV12 390
RV11 75
CV10 10V470μ
RV13 100
R502 470
QV10 2SA933S,Q
PV01 PIN JACK 4P

V501A
SOCKET CRT

(11) +200V
(12) NC
(13) HEATER
(14) HEATER GND
M502 TO MAIN BOARD

⚠ * R920
R981 2.2Ω
M502B 4P

Q907 2SA9335

SPK-1389
* W662
* W661
SPK-1389

P601 4P
(18)
(17)
(16)
(15)

HEAT SINK : NEW

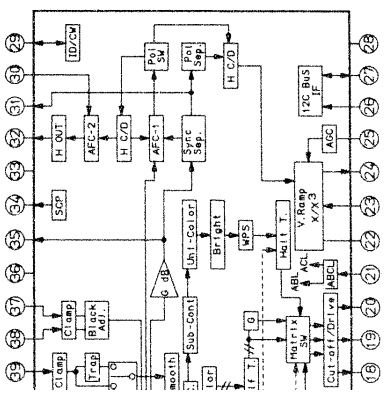
C608 50V2.2μF
* C616
マイラーコンたいおう (ベトナム)
R663 1/2W220
GJ20 open
P661 PHONE JACK

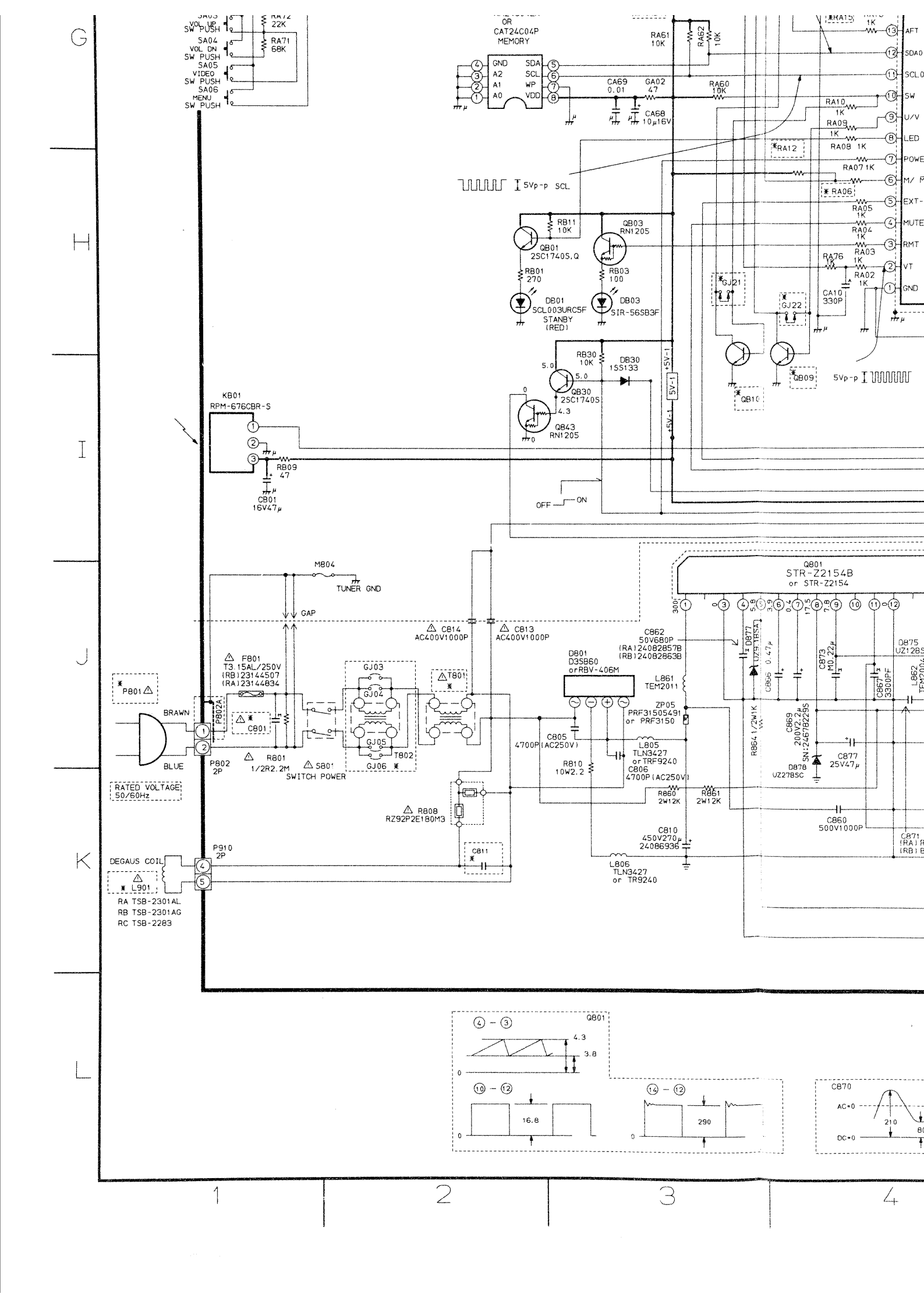
Q611 2SC2878A
C606 50V2.2μ
C607 220μ25V
R608 100K
R606 39K

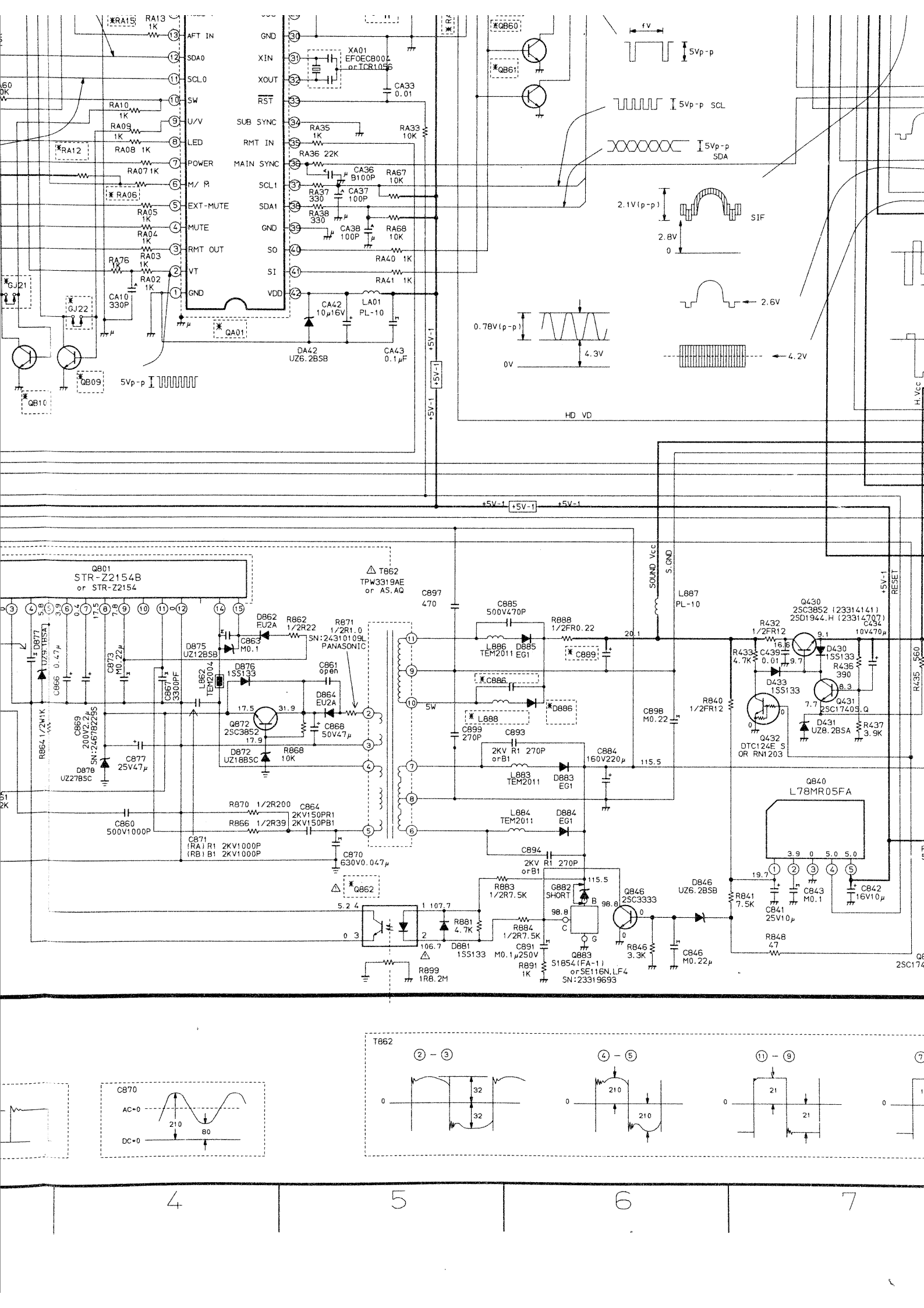
Q830 2SC3852 or 2SD1944,H
Q830A
5.0 +5V-2
5.6
C832 16V47μF
D830 UZ5.1BSB

PV01 PIN JACK 4P
VIDEO
TV OUT

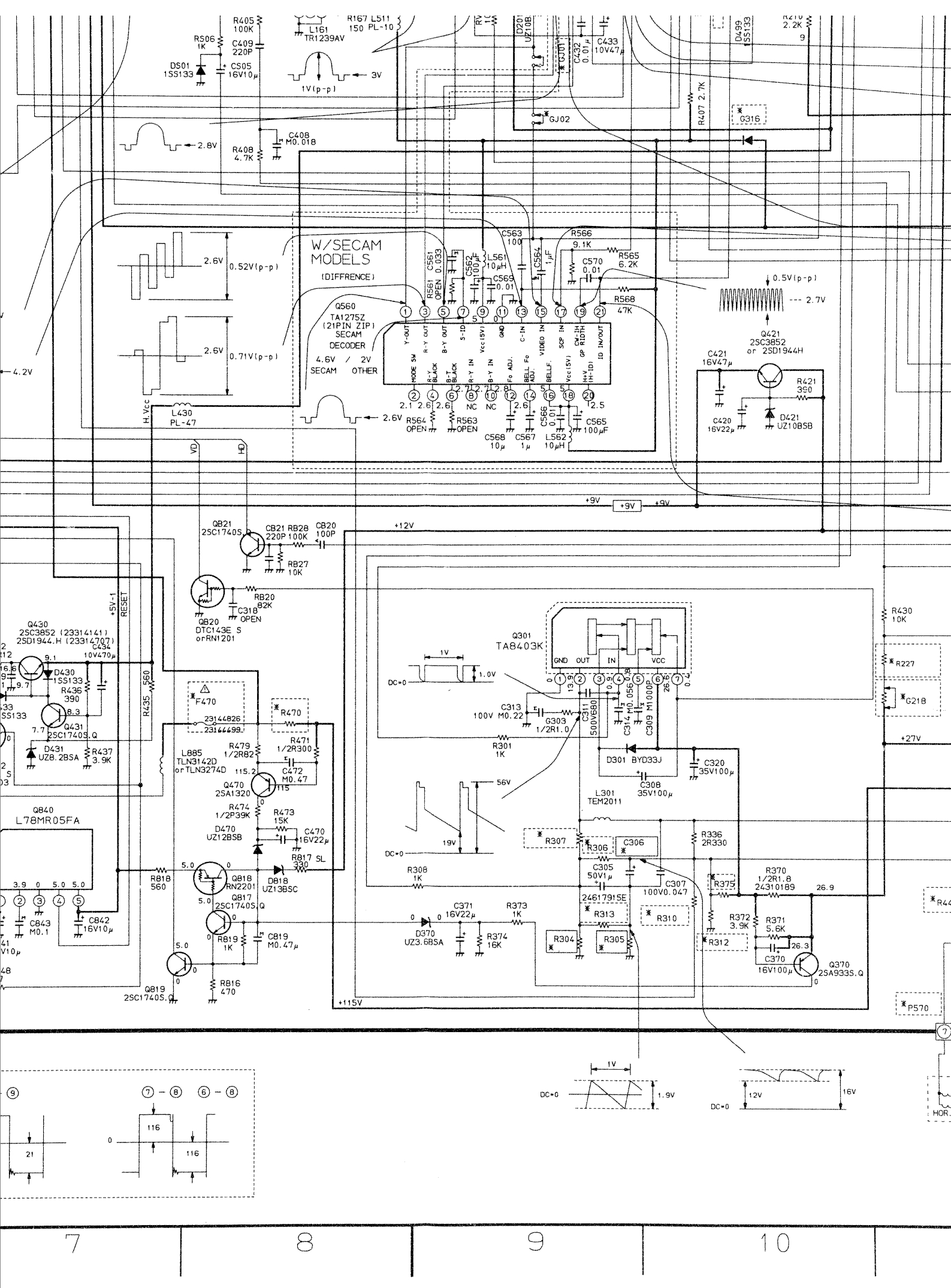
PAL/NTSC
Q501 ICHIP
TB1231N



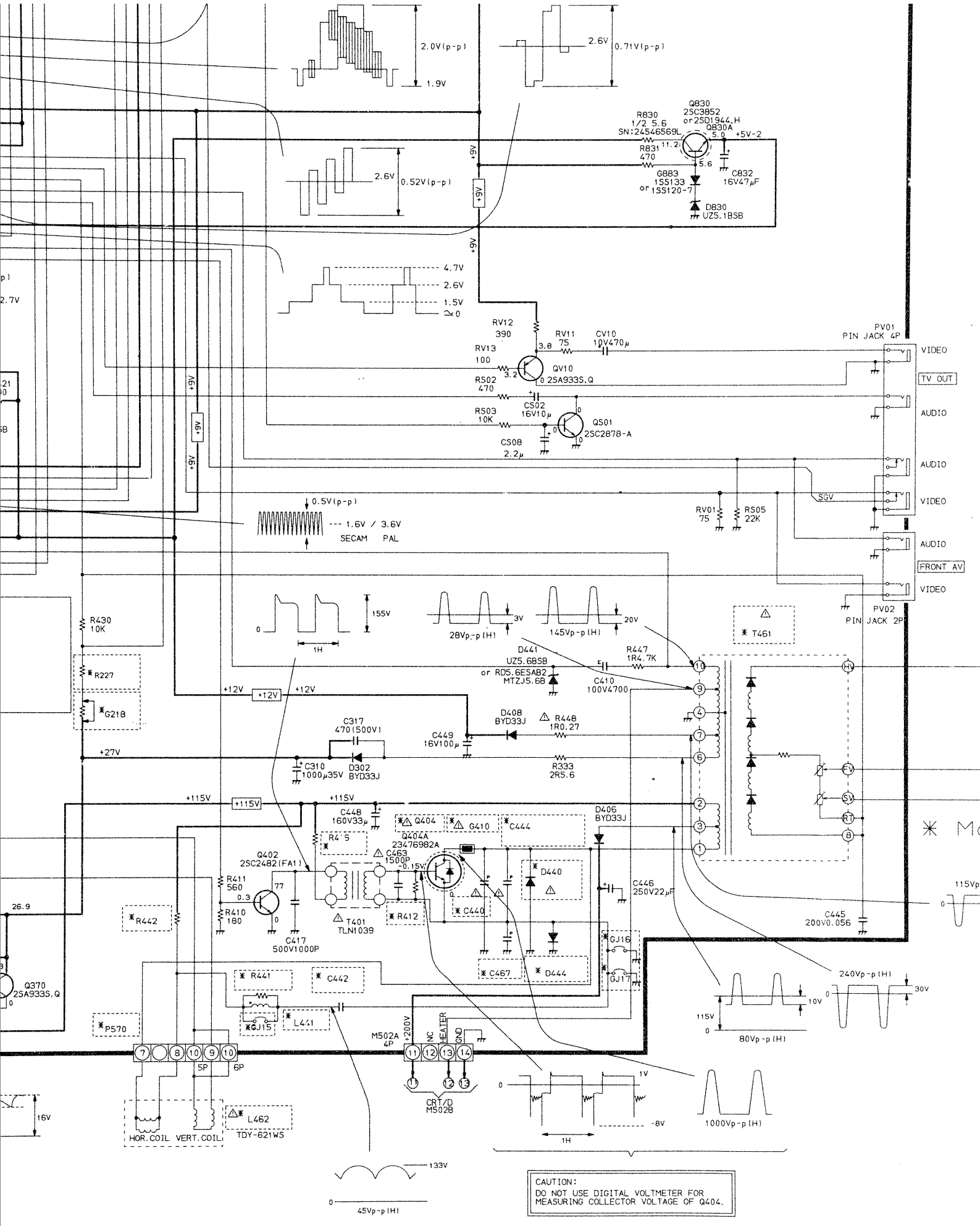

SA03 VOL UP SW PUSH
SA04 VOL DN SW PUSH
SA05 VIDEO SW PUSH
SA06 MENU SW PUSH
RA72 22K
RA71 68K
OR CAT24C04P MEMORY
GND SDA SCL A2 A1 WP A0 VDD
RA61 10K
RA62 10K
RA60 10K
CA69 0.01
GA02 47
CA68 10µ16V
5Vp-p SCL
RB11 10K
QB03 RN1205
QB01 2SC1740S,Q
RB01 270
RB03 100
DB01 SCL003URC5F STANBY (RED)
DB03 SIR-56SB3F
RB30 10K
DB30 1SS133
QB30 2SC1740S
Q843 RN1205
+5V-1
5Vp-p
QB09
QB10
GJ21
GJ22
CA10 330P
RA10 1K
RA09 1K
RA08 1K
RA12
RA07 1K
RA06
RA05 1K
RA04 1K
RA03 1K
RA76
RA02 1K
AFT
SDA
SCL
SW
U/V
LED
POWE
M/
EXT-
MUTE
RMT
VT
GND
KB01 RPM-676CBR-S
RB09 47
CB01 16V47µ
OFF
ON
M804
TUNER GND
GAP
C814 AC400V1000P
C813 AC400V1000P
F801 T3.15AL/250V (RB)23144507 (RA)23144834
P801
BRAWN
BLUE
P802A
P802 2P
C801
R801 1/2R2.2M
S801 SWITCH POWER
RATED VOLTAGE 50/60Hz
GJ03
GJ04
GJ05
GJ06
T802
T801
R808 RZ92P2E180M3
C811
P910 2P
DEGAUS COIL
L901
RA TSB-2301AL
RB TSB-2301AG
RC TSB-2283
Q801 STR-Z2154B or STR-Z2154
C862 50V680P (RA)24082857B (RB)24082863B
D801 D3SB60 orRBV-406M
L861 TEM2011
ZP05 PRF31505491 or PRF3150
C805 4700P(AC250V)
L805 TLN3427 orTRF9240
C806 4700P(AC250V)
R810 10W2.2
R860 2W12K
R861 2W12K
C810 450V270µ 24086936
L806 TLN3427 or TR9240
D877 UZ29.1BSA
C856 0.47µ
C873 M0.22µ
D875 UZ12BS
C867 3300PF
L862 TEM2011
R864 1/2W1K
C869 200V2.2µ
SN:246782295
D878 UZ27BSC
C877 25V47µ
C860 500V1000P
C871 (RA) (RB)
Q801
4.3
3.8
16.8
290
C870
AC=0
DC=0
210

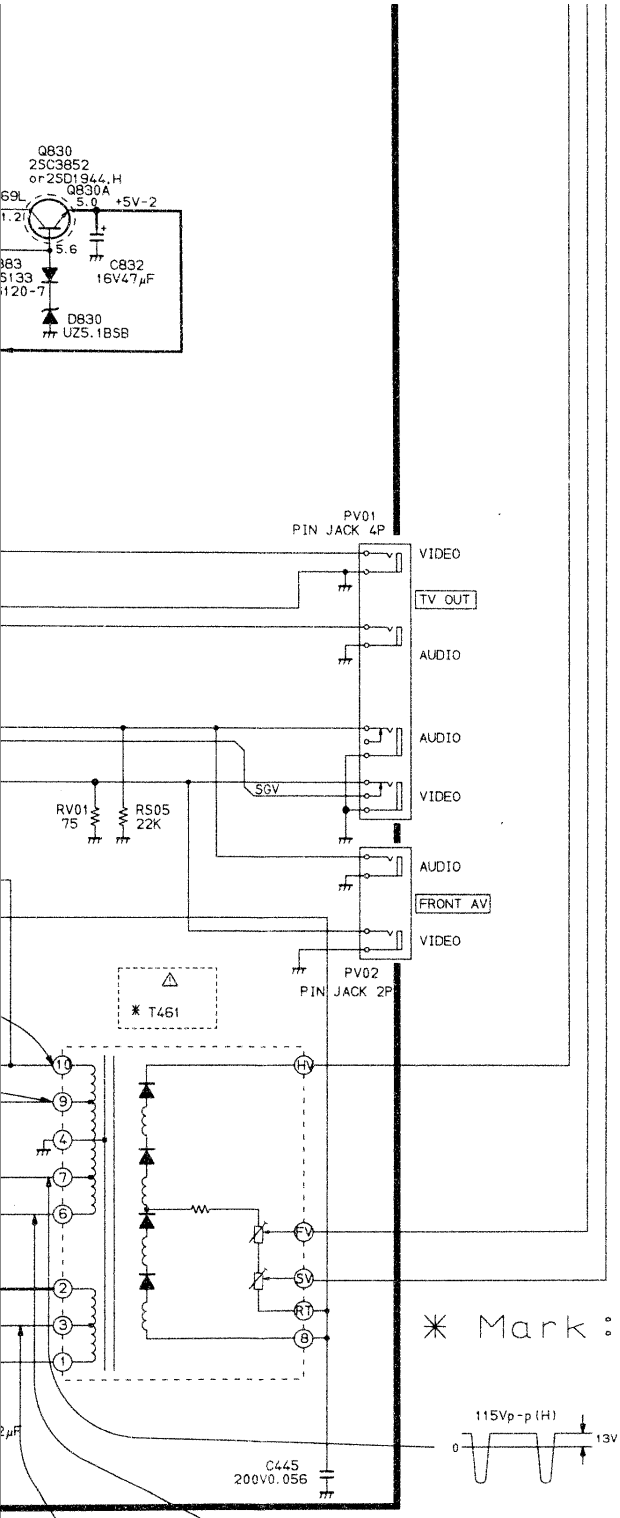

RA15
RA13 1K
AFT IN
SDA0
SCL0
SW
U/V
LED
POWER
M/ M
EXT-MUTE
MUTE
RMT OUT
VT
GND
GND
XIN
XOUT
RST
SUB SYNC
RMT IN
MAIN SYNC
SCL1
SDA1
GND
SO
SI
VDD
XA01 EFOEC8004 or TCR1056
CA33 0.01
RA10 1K
RA09 1K
RA08 1K
RA07 1K
RA06
RA05 1K
RA04 1K
RA03 1K
RA02 1K
RA76 1K
RA12
RA35 1K
RA33 10K
RA36 22K
CA36 B100P
RA67 10K
RA37 330
CA37 100P
RA38 330
CA38 100P
RA68 10K
RA40 1K
RA41 1K
CA10 330P
GJ21
GJ22
QA01
CA42 10μ16V
LA01 PL-10
DA42 UZ6.2BSB
CA43 0.1μF
+5V-1
QB09
QB10
5Vp-p
QB60
QB61
fV
5Vp-p
5Vp-p SCL
5Vp-p SDA
2.1V(p-p)
SIF
2.8V
0
2.6V
0.78V(p-p)
4.3V
0V
4.2V
HD VD
H.Vcc
Q801
STR-Z2154B
or STR-Z2154
T862
TPW3319AE
or AS.AQ
C897 470
C885 500V470P
R888 1/2FR0.22
L886 TEM2011
D885 EG1
C889
C886
L888
D886
C899 270P
C893 2KV R1 270P orB1
C884 160V220μ
L883 TEM2011
D883 EG1
L884 TEM2011
D884 EG1
C894 2KV R1 270P orB1
L887 PL-10
SOUND Vcc
S.GND
RESET
Q430 2SC3852(23314141) 2SD1944.H(23314707)
R432 1/2FR12
C434 10V470μ
R433 4.7K
C439 0.01
D430 1SS133
R436 390
D433 1SS133
Q431 2SC1740S.Q
D431 UZ8.2BSA
R437 3.9K
Q432 DTC124E_S OR RN1203
R435 560
R840 1/2FR12
C898 M0.22
D863 M0.1
D875 UZ12BSB
D876 1SS133
D862 EU2A
R862 1/2R22
R871 1/2R1.0 SN:24310109L PANASONIC
C861 open
D864 EU2A
L862 TEM2004
C867 330PF
C873 M0.22μ
C866 0.47μ
D877 UZ5.1BSA
C869 200V2.2μ SN:24678229S
R864 1/2W1K
D878 UZ27BSC
C877 25V47μ
C868 50V47μ
Q872 2SC3852
D872 UZ18BSC
R868 10K
C860 500V1000P
C871 (RA) R1 2KV1000P (RB) B1 2KV1000P
R870 1/2R200
C864 2KV150PR1 2KV150PB1
R866 1/2R39
C870 630V0.047μ
Q862
R883 1/2R7.5K
G882 SHORT
Q846 2SC3333
D846 UZ6.2BSB
R841 7.5K
C841 25V10μ
C843 M0.1
C842 16V10μ
R848 47
R884 1/2R7.5K
C891 M0.1μ250V
R891 1K
Q883 S1854(FA-1) or5E116N,LF4 SN:23319693
R881 4.7K
D881 1SS133
R899 1R8.2M
C846 M0.22μ
Q840 L78MR05FA
C870
AC-0
DC-0
T862
② - ③
④ - ⑤
⑪ - ⑨

4 5 6 7


W/SECAM MODELS
(DIFFRENCE)
Q560 TA1275Z (21PIN ZIP) SECAM DECODER
4.6V / 2V SECAM OTHER
Q301 TA8403K
GND OUT IN VCC
Q421 2SC3852 or 2SD1944H
Q430 2SC3852 (23314141) 2SD1944.H (23314707)
Q431 2SC1740S.Q
Q840 L78MR05FA
Q470 2SA1320
Q817 2SC1740S.Q
Q818 RN2201
Q819 2SC1740S.Q
QB21 2SC1740S
QB20 DTC143E S or RN1201
Q370 2SA933S.Q
L301 TEM2011
L885 TLN3142D or TLN3274D
L430 PL-47
L161 TR1239AV
L511 PL-10
D301 BYD33J
D370 UZ3.6BSA
D421 UZ10BSB
D430 1SS133
D431 UZ8.2BSA
D470 UZ12BSB
D818 UZ13BSC
DS01 1SS133
F470
R301 1K
R307
R306
C306
C307 100V0.047
C308 35V100μ
C309 M1000P
C310 M0.056
C311 500V680
C313 100V M0.22
C320 35V100μ
C371 16V22μ
C420 16V22μ
C421 16V47μ
C562 100μF
C563 100
C565 100μF
C566 0.01
C567 1μ
C568 10μ
C569 0.01
C570 0.01
L561 10μH
L562 10μH
R561 OPEN
R562 OPEN
R563 OPEN
R564 OPEN
R565 6.2K
R566 9.1K
R567 2.7K
R568 47K
+9V
+12V
+115V
+27V
+5V-1
RESET
H.Vcc
VD
HD
0.5V(p-p) --- 2.7V
0.52V(p-p)
0.71V(p-p)
1V(p-p)
3V
2.8V
2.6V
4.2V
1.0V
1.9V
56V
19V
12V
16V

7	8	9	10

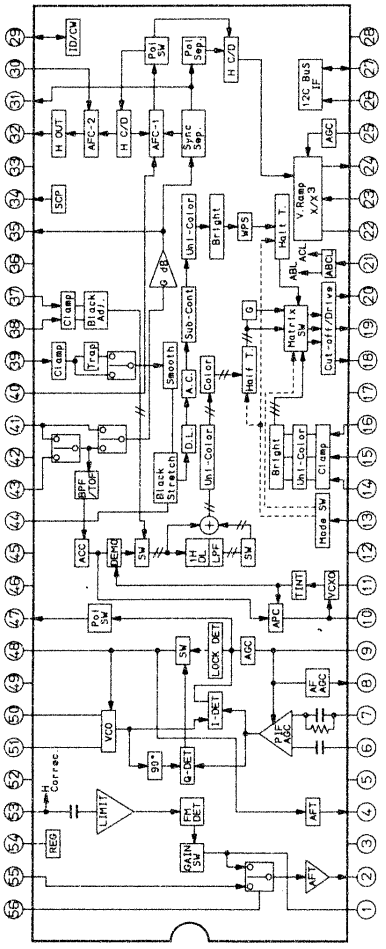

2.0V(p-p)
1.9V
2.6V
0.71V(p-p)
Q830
2SC3852
or 2SD1944,H
R830
1/2 5.6
SN:24546569L
Q830A
5.0
+5V-2
R831
470
11.2
5.6
G883
1SS133
or 1SS120-7
C832
16V47μF
D830
UZ5.1BSB
2.6V
0.52V(p-p)
+9V
4.7V
2.6V
1.5V
≃0
RV12
390
RV11
75
CV10
10V470μ
RV13
100
3.8
3.2
QV10
2SA933S,Q
RS02
470
CS02
16V10μ
RS03
10K
QS01
2SC2878-A
CS08
2.2μ
PV01
PIN JACK 4P
VIDEO
TV OUT
AUDIO
AUDIO
SGV
VIDEO
AUDIO
FRONT AV
VIDEO
PV02
PIN JACK 2P
0.5V(p-p)
--- 1.6V / 3.6V
SECAM PAL
RV01
75
RS05
22K
R430
10K
R227
G218
155V
1H
28Vp-p(H)
3V
145Vp-p(H)
20V
T461
D441
UZ5.6BSB
or RD5.6ESAB2
MTZJ5.6B
R447
1R4.7K
C410
100V4700
+12V
+12V
+12V
C317
470(500V)
D408
BYD33J
R448
1R0.27
C449
16V100μ
+27V
C310
1000μ35V
D302
BYD33J
R333
2R5.6
+115V
+115V
+115V
C448
160V33μ
Q404
G410
C444
Q404A
23476982A
D406
BYD33J
R4 5
Q402
2SC2482(FA1)
C463
1500P
-0.15V
D440
R411
560
0.3
77
R410
180
R442
R412
C440
T401
TLN1039
C417
500V1000P
C446
250V22μ
C445
200V0.056
115Vp
GJ16
GJ17
C467
D444
R441
C442
GJ15
L441
P570
M502A
4P
+200V
NC
HEATER
GND
5P
6P
CRT/D
M502B
240Vp-p(H)
30V
10V
115V
80Vp-p(H)
1V
-8V
1H
1000Vp-p(H)
16V
L462
TDY-621WS
HOR.COIL
VERT.COIL
133V
45Vp-p(H)
Q370
2SA933S,Q
26.9
CAUTION:
DO NOT USE DIGITAL VOLTMETER FOR
MEASURING COLLECTOR VOLTAGE OF Q404.



PAL/NTSC

Q501 ICHIP

TB1231N



✳ Mark: Refer to Difflence table

91DSES97002(2/2)

ETER FOR
AGE OF Q404.

G H I J K L

13 14 15 16

TG1-H(A1) S7E CHASSIS DIFFRENCE LIST

91DSES97015 (※) MARK DIFFRENCE LIST

LOC.NO.	1477TH(LJ053 1477TMJ(LJ954)	2170XHE(LJ064)	2170XNH(LJ075)	2178XR(LJ085)	2170RE
PWB/P UNIT NO.	PB7330	PB7528	PB7563	PB7767	PB7733
C150	OPEN	OPEN	OPEN	OPEN	OPEN
C151	OPEN	OPEN	OPEN	OPEN	OPEN
C010	SHORT	OPEN	OPEN	OPEN	OPEN
C011	SHORT	OPEN	OPEN	OPEN	OPEN
L107	OPEN	12μ	12μ	OPEN	OPEN
L108	OPEN	OPEN	OPEN	OPEN	OPEN
Q105	OPEN	2SC1740S-Q	2SC1740S-Q	2SC1740S-Q	OPEN
Q107	OPEN	OPEN	OPEN	OPEN	OPEN
Q110	OPEN	TC4052BP	TC4052BP	TC4052BP	OPEN
Q120	OPEN	OPEN	OPEN	OPEN	OPEN
R121	OPEN	1/6W 100	1/6W 100	1/6W 100	OPEN
R122	OPEN	OPEN	OPEN	OPEN	OPEN
R125	OPEN	OPEN	OPEN	OPEN	OPEN
R129	OPEN	1/6W 220	1/6W 220	1/6W 220	OPEN
R130	OPEN	OPEN	OPEN	OPEN	OPEN
R131	OPEN	1/6W 470	1/6W 470	1/6W 470	OPEN
R132	OPEN	1/6W 470	1/6W 470	1/6W 470	OPEN
R133	OPEN	OPEN	OPEN	OPEN	OPEN
R151	OPEN	OPEN	OPEN	OPEN	OPEN
R152	OPEN	OPEN	OPEN	OPEN	OPEN
R153	OPEN	OPEN	OPEN	OPEN	OPEN
R154	OPEN	OPEN	OPEN	OPEN	OPEN
R157	OPEN	OPEN	OPEN	OPEN	OPEN
R412	OPEN	OPEN	OPEN	OPEN	OPEN
R475	OPEN	1/6W10K	1/6W10K	1/6W10K	OPEN
R476	OPEN	1/6W10K	1/6W10K	1/6W10K	OPEN
Z102	OPEN	TCF102B	TCF102B	TCF102B	OPEN
Z103	OPEN	OPEN	OPEN	OPEN	OPEN
Z106	OPEN	TCF108B	TCF108B	TCF108B	OPEN
Z107	OPEN	TCF108B	TCF108B	TCF108B	OPEN
Z108	OPEN	OPEN	OPEN	OPEN	OPEN
Z130	OPEN	DFWK2864M	DFWK2864M	DFWK2864M	DFWK2864M
RE26	OPEN	1/6W 470	1/6W 470	1/6W 470	1/6W 470
GJ12	SHORT	SHORT	SHORT	SHORT	SHORT
GJ13	OPEN	OPEN	OPEN	OPEN	OPEN
GJ14	OPEN	OPEN	OPEN	OPEN	OPEN
RA06	OPEN	OPEN	OPEN	OPEN	OPEN
QB80	OPEN	2SC1740S-Q	2SC1740S-Q	2SC1740S-Q	OPEN
QB81	OPEN	2SC1740S-Q	2SC1740S-Q	2SC1740S-Q	OPEN
RB80	OPEN	1/6W10K	1/6W10K	1/6W10K	OPEN
RB81	OPEN	1/6W10K	1/6W10K	1/6W10K	OPEN
TEXT BLK	OPEN	OPEN	OPEN	OPEN	OPEN
RA21	1/6W820Y	1/6W820Y	1/6W820Y	1/6W820Y	1/6W820Y
C180	OPEN	OPEN	OPEN	OPEN	OPEN
C179	OPEN	OPEN	SHORT	OPEN	OPEN
G018	SHORT	SHORT	SHORT	SHORT	SHORT
G941	SHORT	SHORT	SHORT	SHORT	SHORT
G942	SHORT	SHORT	SHORT	SHORT	SHORT
G943	SHORT	SHORT	SHORT	SHORT	SHORT
G701	OPEN	OPEN	SHORT	OPEN	OPEN
R227	1/6W30K	1/6W22K	1/6W22K	1/6W22K	1/6W22K
R915	1/6W680	1/6W470	1/6W470	1/6W470	1/6W470
R922	1/6W680	1/6W470	1/6W470	1/6W470	1/6W470
R923	1/6W680	1/6W470	1/6W470	1/6W470	1/6W470
RA29	1/6W2.2K	1/6W2.2K	1/6W2.2K	1/6W2.2K	1/6W2.2K
GA21	SHORT	SHORT	SHORT	SHORT	SHORT
GA22	SHORT	SHORT	SHORT	SHORT	SHORT
GA23	SHORT	SHORT	SHORT	SHORT	SHORT
GA24	SHORT	SHORT	SHORT	SHORT	SHORT
R525	OPEN	OPEN	OPEN	OPEN	OPEN
R528	1/6W820	1/6W820	1/6W820	1/6W820	1/6W820
R529	1/6W820	1/6W820	1/6W820	1/6W820	1/6W820
R538	1/6W820	1/6W820	1/6W820	1/6W820	1/6W820
C904	330	470PF	470PF	470PF	470PF
C905	330	390PF	390PF	390PF	390PF
C907	470	560PF	560PF	560PF	560PF
SECAM BLK	USED	USED	NOT USED	USED	USED
G440(R1)	1.25KV4700	1.5KV6800PF(RA1)	1.5KV6800PF(RA)	1.5KV6800PF(RA)	1.5KV6800PF(RA)
G440(R2)	1.25KV4700	1.5KV6800PF(RB1)	1.5KV6800PF(RB)	1.5KV6800PF(RB)	1.5KV6800PF(RB)
G440(RS1)	1.25KV1800	NONE	NONE	NONE	NONE
G442(R1)	250V0.33μF	250V0.33μF(RA)	250V0.33μF(RA)	250V0.33μF(RA)	250V0.33μF(RA)
G442(R2)	250V0.33	250V0.33μF(RB)	250V0.33μF(RB)	250V0.33μF(RB)	250V0.33μF(RB)
G442(RS)	250V0.47	NONE	NONE	NONE	NONE
G443(RS1)	250V0.47	1500V1500PF	1500V1500PF	1500V1500PF	1500V1500PF
G444	OPEN	1500V1500PF	1500V1500PF	1500V1500PF	1500V1500PF
G667	OPEN	630V0.018μ	630V0.018μ	630V0.018μ	630V0.018μ
G440	OPEN	ERQ6B-15L	ERQ6B-15L	ERQ6B-15L	ERQ6B-15L
D444	OPEN	RU4AMLF-L1	RU2AMLF-L1	RU2AMLF-L1	RU4AMLF-L1
D779	1S2076A	1S30mA	1S30mA	1S30mA	1S30mA
Q670	TEH2011	TEH2011	TEH2011	TEH2011	TEH2011
G713	SHORT	OPEN	OPEN	OPEN	OPEN
G715	SHORT	OPEN	OPEN	OPEN	OPEN
G717	SHORT	OPEN	OPEN	OPEN	OPEN
L441	OPEN	TLN2112G	TLN2112G	TLN2112G	TLN2112G
D402	2SD1552FA,E	ON4409	ON4409	ON4409	ON4409
R308(R1)	1/2W516	1/6W15K	1/6W15K	1/6W15K	1/6W15K
R308(R2)	1/2W47K	NONE	NONE	NONE	NONE
R306(RG)	1/2W47K	NONE	NONE	NONE	NONE
R307(R1)	1/2W360K	1/6W680K	1/6W680K	1/6W680K	1/6W680K
R307(R2)	1/2W390K	NONE	NONE	NONE	NONE
R307(R3)	1/2W390K	NONE	NONE	NONE	NONE
R310	OPEN	OPEN	OPEN	OPEN	OPEN
R312(R1)	1/2W2.2K	1/2W2.7K	1/2W2.7K	1/2W2.7K	1/2W2.7K
R312(R2)	OPEN	NONE	NONE	NONE	NONE
R312(R3)	OPEN	NONE	NONE	NONE	NONE
R313(R1)	1/6W130K	1/6W15K	1/6W15K	1/6W15K	1/6W15K
R313(R2)	1/6W680	NONE	NONE	NONE	NONE
R313(R3)	1/6W91K	NONE	NONE	NONE	NONE
R273	OPEN	OPEN	OPEN	OPEN	OPEN
R412	OPEN	1/6W56	1/6W56	1/6W56	1/6W56
R416	5W2.0	5W2.2K	5W2.2K	5W2.2K	5W2.2K
R421	OPEN	1FR1K	1FR1K	1FR1K	1FR1K
R422	2R330	OPEN	OPEN	OPEN	1FR1.5
R209	1R0.75	1R0.68	1R0.68	1R0.68	1R0.68
R920	1FR4.7	1FR4.7	1FR4.7	1FR4.7	1FR4.7
C218	OPEN	OPEN	OPEN	OPEN	OPEN
C401	OPEN	OPEN	OPEN	OPEN	OPEN
PS01	6P PLUG	6P PLUG	6P PLUG	6P PLUG	6P PLUG
C2061RA1	16V1000μ	16V2200μ	16V2200μ	16V2200μ	16V2200μ
C2061RB1	25V1000μ	NONE	NONE	NONE	NONE
C2061R3	16V1000μ	NONE	NONE	NONE	NONE
L402(R1)	TOY2128	TOY821W5	TOY821W5	TOY821W5	TOY821W5
L402(R2)	TOY3145	NONE	NONE	NONE	NONE
L402(R3)	TOY3145Z	NONE	NONE	NONE	NONE
L901(RA)	TSB2390AL	TSB2301AL	TSB2301AL	TSB2301AL	TSB2301AL
L901(RB)	TSB2360AT	TSB2301AG	TSB2301AG	TSB2301AG	TSB2301AG
L901(RC)	TSB2360AG	TSB2283	TSB2283	TSB2283	TSB2283
TZ01(RA)	TPB5123CV	TPB5123CU	TPB5123CH		
TZ01(RB)	TPB5123CS	TPB5123CO	TPB5123CD		
V901(RB1)	A34JF090X(YW)	A51K5U93X(YW)	A51K5U93X(YW)	A51K5U93X(YW)	A51K5U93X(YW)
V901(R2)	A34JW72X	NONE	NONE		
V901(R3)	A34JL59X	NONE	NONE		
V901(RA1)	HA01079	HA01079	HA01079		
V901(R2)	HA01052	HA01054	HA01054		
V601(RG)	HA01070	NONE	NONE		
T601(RA)	TRF3216AG	TRF3216AK	TRF3222AQ	TRF3221AH	TRF3216AK
T601(RB)	TRF3214B	NONE	NONE	NONE	NONE
G903-G906	SHORT	OPEN	SHORT	SHORT	SHORT
C501	AC250V0.1	AC250V0.1	AC250V0.22	AC250V0.22	AC250V0.22
T652	NONE	TRF3216AK	NONE	NONE	NONE
C611	OPEN	OPEN	OPEN	OPEN	OPEN
C686	50V470	OPEN	OPEN	OPEN	OPEN
C689	25V1000	25V470μ	25V470μ	25V470μ	25V470μ
C686	50	OPEN	OPEN	OPEN	OPEN
L888	TEH2011	OPEN	OPEN	OPEN	OPEN
T662(RA)	TLP721FDK-GR	TLP721FDK-GR	TLP721FDK-LF2	TLP721FDK-LF2	TLP721F(DK-GR)
T662(RB)	TLP721FDK-GR	NONE	TLP721FDK-GR	NONE	NONE
P802A	NONE	NONE	NONE	NONE	NONE
Q219	OPEN	OPEN	OPEN		
L601	TRF1427T	TRF1427T	TRF1427T		
Q121	OPEN	OPEN	OPEN		
Q222	OPEN	OPEN	OPEN		
SW01	TMP79C98N-3605	TMP79C98N-3605	TMP79C98N-3605	TMP79C98N-3605	TMP79C98N-3605
D699	2SC1740S-Q	2SC1740S-Q	2SC1740S-Q		
D610	2SC1740S-Q	2SC1740S-Q	2SC1740S-Q		
RA12	1/6W20K	1/6W10K	1/6W33K	1/6W15K	OPEN
RA15	1/6W10K	1/6W7.5K	1/6W7.5K	1/6W10K	1/6W7.5K
RA54	1/6W33K	OPEN	1/6W33K	1/6W62K	
RA55	OPEN	1/6W33K	1/6W33K	OPEN	1/6W33K
W561	SPK-1399	SPK-1228	SPK-1228	SPK-1228	SPK-1228
W562	SPK-1399	SPK-1228	SPK-1228	SPK-1228	SPK-1228
C618	1KL01	OPEN	OPEN	OPEN	OPEN
C619	25V470μ	25V470μ	25V470μ	25V470μ	25V470μ
C609	50.0047	50.0047	50.0047	50.0047	50.0047
RATED VOLTAGE	110V - 240V	110V - 240V	110V - 240V	220 - 240V	110 - 240V
LOC. NO.	1477TH,1477TMJ	2170XHE	2170XNH		

SPECIFICATIONS

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

SYSTEM	CHANNEL		2170XHE	2170XNH	2178XR	2170RE	2170TM/TMJ
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)	70
Sound output (W)	3

Rated voltage: 110-240V AC 50/60Hz
(220-240V AC 50Hz for Model 2178XR only)
Terminals: Input: Video/Audio (monaural)
TV output:Video/Audio (monaural)
Speaker: 6×9cm (2)
Picture tube Type 21 (54cm) Overall picture tube measured diagonally
(51cm) Viewable picture tube measured diagonally
90° deflection

Dimensions: 520 (W) × 482 (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.