

TOSHIBA

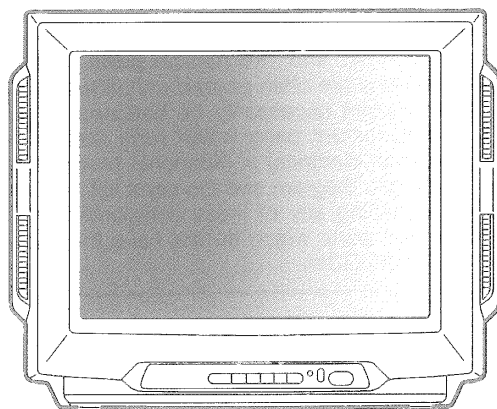
FILE NO. 040-9508

SERVICE MANUAL

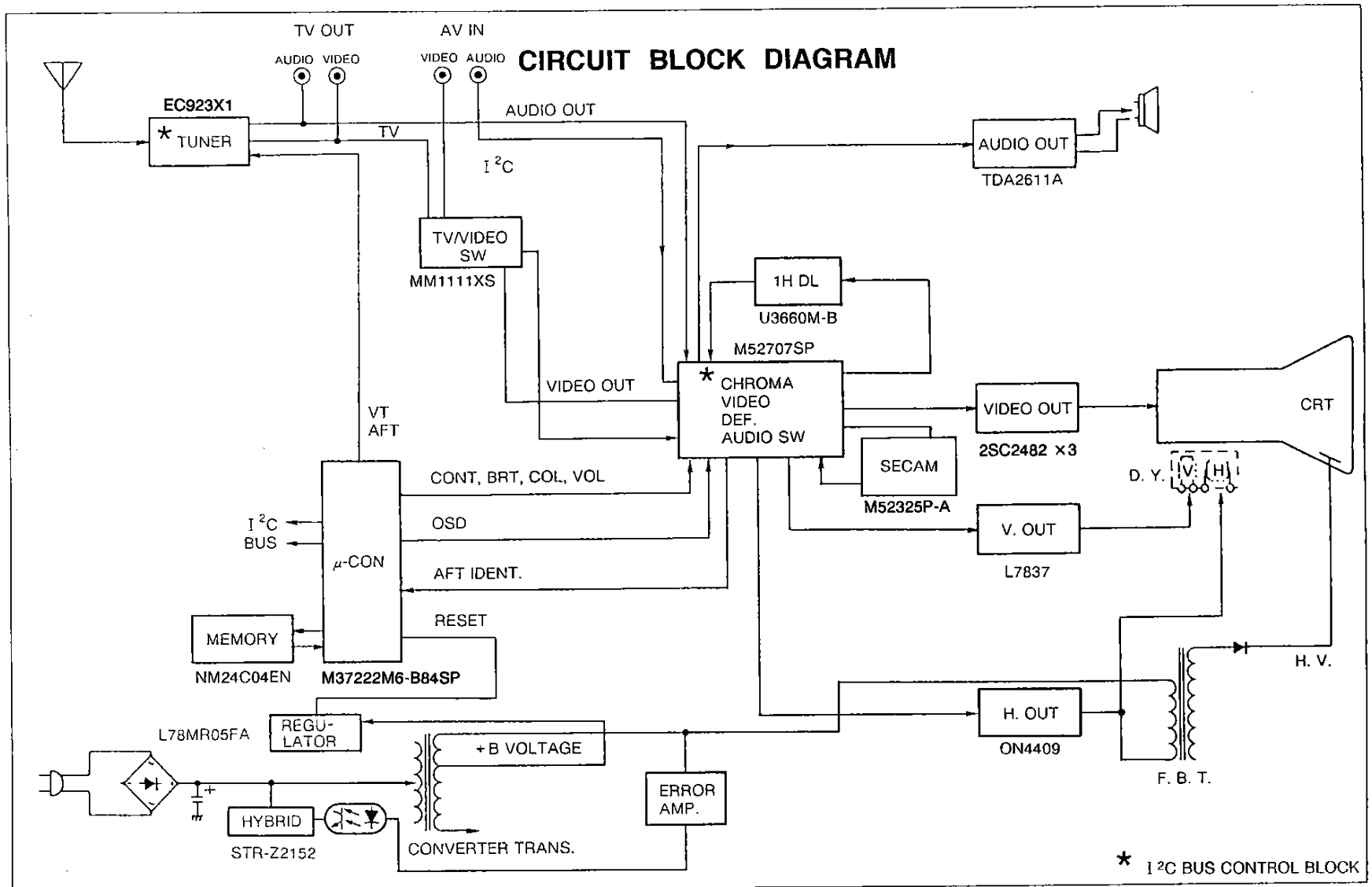
COLOUR TELEVISION

S5E Chassis

2150XS



PRINTED IN JAPAN, Aug., 1995 (S)



WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

INSTALLATION AND SERVICE ADJUSTMENTS

GENERAL INFORMATION

All adjustments are thoroughly checked and corrected when the receiver leaves the factory. Therefore the receiver should operate normally and produce proper colour and B/W pictures upon installation. However, several minor adjustments may be required depending on the particular location in which the receiver is operated.

This receiver is shipped completely in cardboard carton. Carefully draw out the receiver from the carton and remove all packing materials. Plug the power cord into a convenient 110 ~ 240 volts 50/60Hz AC two pin power outlet.

Turn the receiver ON and adjust the FINE TUNING for best picture detail with the AFC turned OFF.

Check and adjust all the customer controls such as BRIGHTNESS, CONTRAST and COLOUR Controls to obtain natural colour or B/W picture.

AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly degaussed upon installation. The degaussing coil operates for about 1 second after the power to the receiver is switched ON. If the set is moved or faced in a different direction, the power switch must be switched off at least one hour in order that the automatic degaussing circuit operates properly.

Should the chassis or parts of the cabinet become magnetized to cause poor colour purity, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube, the sides and front of the receiver and slowly withdraw the coil to a distance of about 2 m before disconnecting it from AC source. If colour shading still persists, perform the COLOUR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENTS procedures, as mentioned later.

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis.

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 will be measured below 29kV.
4. Rotate the BRIGHTNESS Control to both extremes to be sure the high voltage does not exceed the limit of 29kV under any conditions.

HEIGHT ADJUSTMENT

1. Receive the WG PHILIPS pattern, and set the contrast to max and set the colour and the brightness to center.
2. Adjust HEIGHT Control (R350) so that white blocks at top and bottom of picture are just masked.

FOCUS ADJUSTMENT

Adjust FOCUS Control on FLYBACK TRANS. (T461) for well defined scanning lines in the centre area on the screen.

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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 (See page 26.)

Note: The PURITY/CONVERGENCE MAGNET assembly and rubber wedges need mechanical positioning.
Refer to figure 2.

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. See page 24.
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 3.) 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.

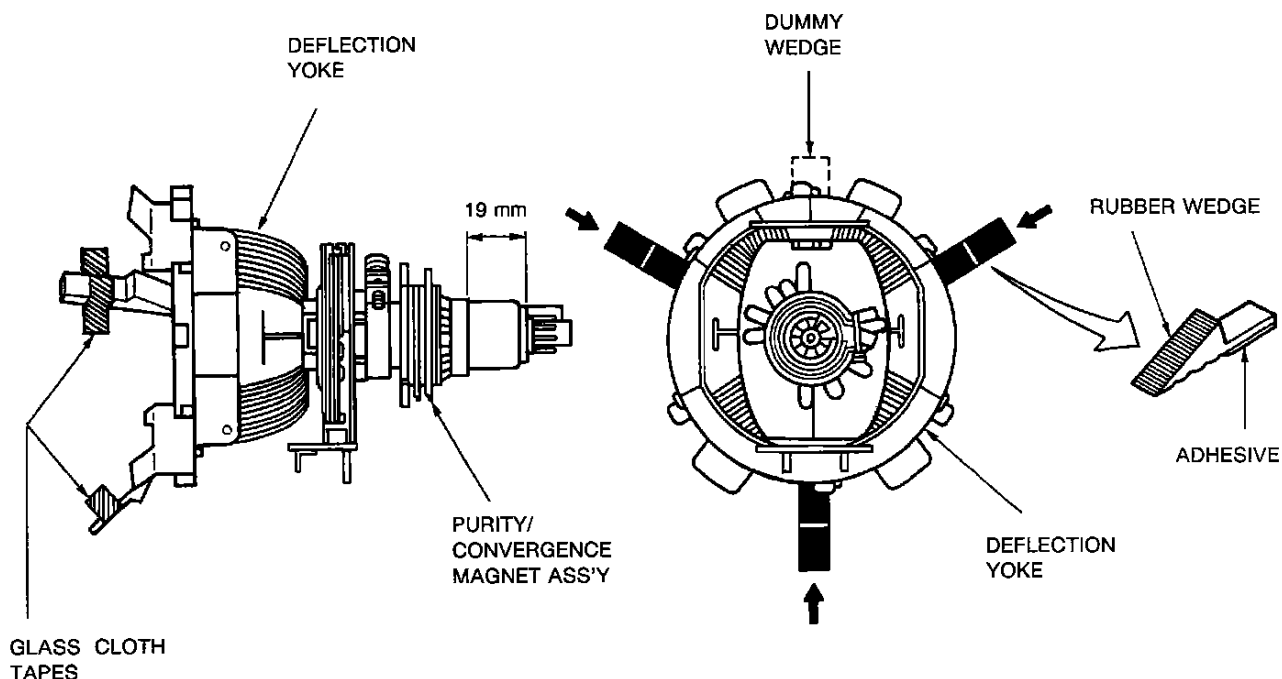


Figure 2.

CONVERGENCE ADJUSTMENTS

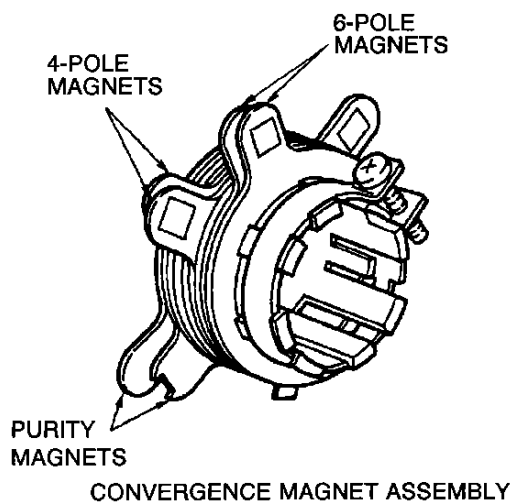
NOTE: Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

■ CENTER CONVERGENCE ADJUSTMENT

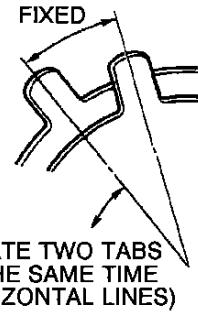
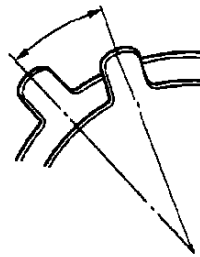
1. Use the cross-dot pattern from among the built-in test signals. See page 24.
2. Set the brightness and contrast for well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 3.) and superimpose red and blue vertical lines in the center area of the 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 2. (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 4.) 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 4.)
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 2.

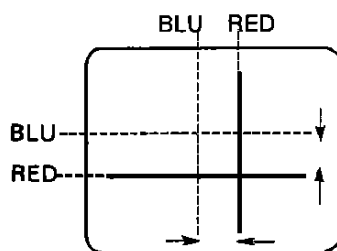


ADJUST THE ANGLE
(VERTICAL LINES)

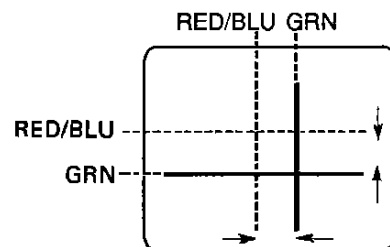


ADJUSTMENT OF MAGNETS

Figure 3.

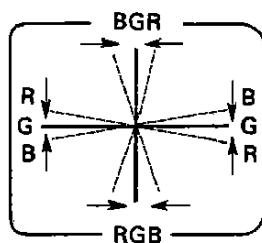


4-POLE MAGNETS MOVEMENT

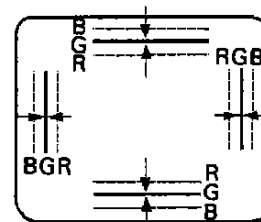


6-POLE MAGNETS MOVEMENT

Center Convergence by Convergence Magnets



INCLINE THE YOKE UP (OR DOWN)




INCLINE THE YOKE RIGHT (OR LEFT)

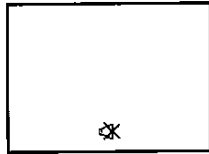
Circumference Convergence by DEF Yoke


Figure 4. Dot Movement Pattern

SERVICE MODE GENERAL INSTRUCTIONS


1. ENTERING TO SERVICE MODE

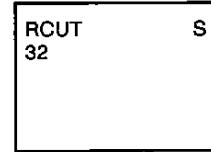
1) Press  button once on Remote Control.



2) Press  button again to keep pressing.



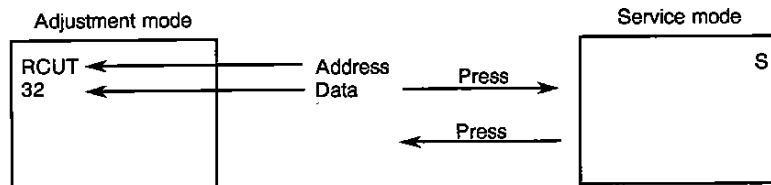
3) Keep pressing the  button, press MENU button on TV set.





(Service mode display)

2. DISPLAYING THE ADJUSTMENT MENU



Press MENU button on TV.



3. SELECTING THE ADJUSTING ITEMS

Every pressing of CHANNEL  button changes the adjustment items in the following order. ( button for reverse order.)

4. ADJUSTING THE DATA

Pressing of VOLUME  or  button will change the value of data in the range from 00 to FF. The variable range depends on the adjusting item.

5. EXIT FROM SERVICE MODE

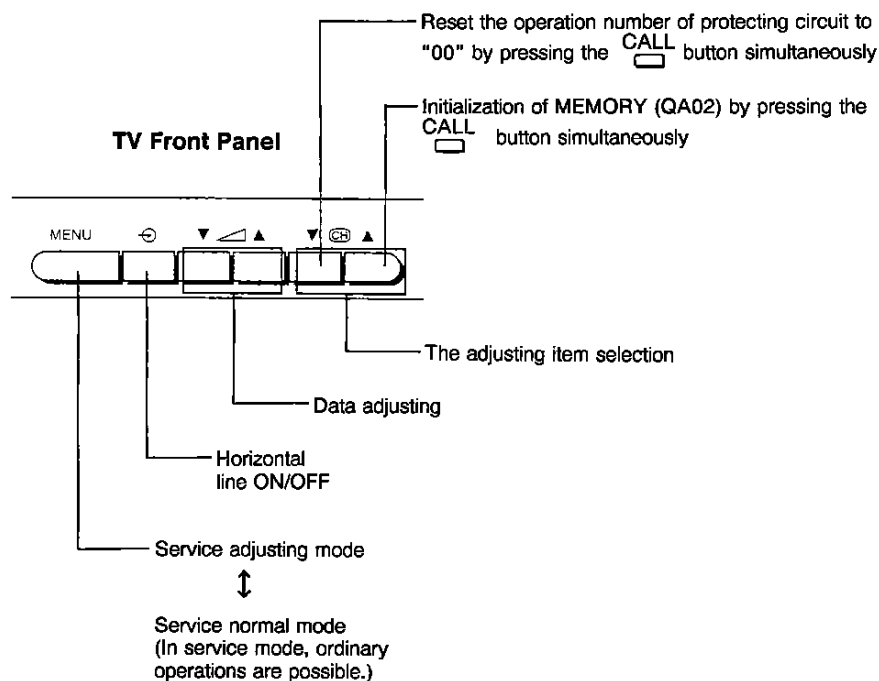
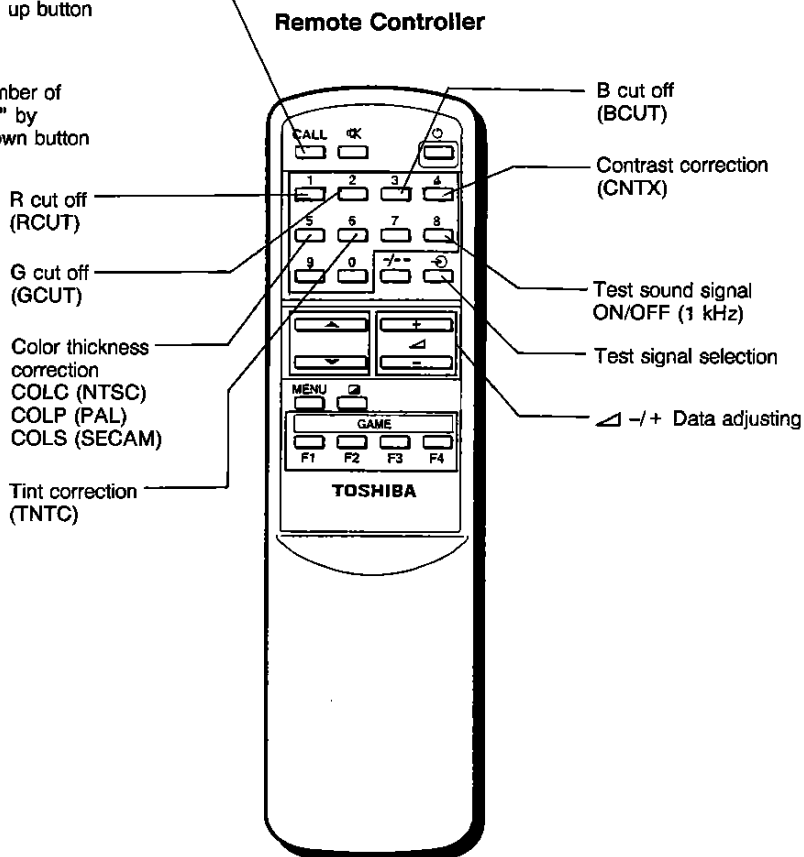
Press POWER button to turn off the TV once.

OTHER SERVICE FUNCTION

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

- ① Initialization of MEMORY (QA02) by pressing the channel up button () on the TV set simultaneously.

- ② Reset the operation number of protecting circuit to "00" by pressing the channel down button () on the TV set simultaneously.





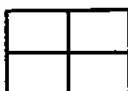
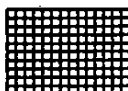
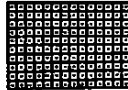

TEST SIGNAL SELECTION

Every pressing of  button changes the test patterns on screen as described below in service mode.

Signal off → NTSC signals (14 patterns)

↑ PAL signals (14 patterns) ↓

- About inside signal: The inside signal is output at video input terminal from QA01, and is not output with the pin inserted into terminal. (Single color signal can be output.)

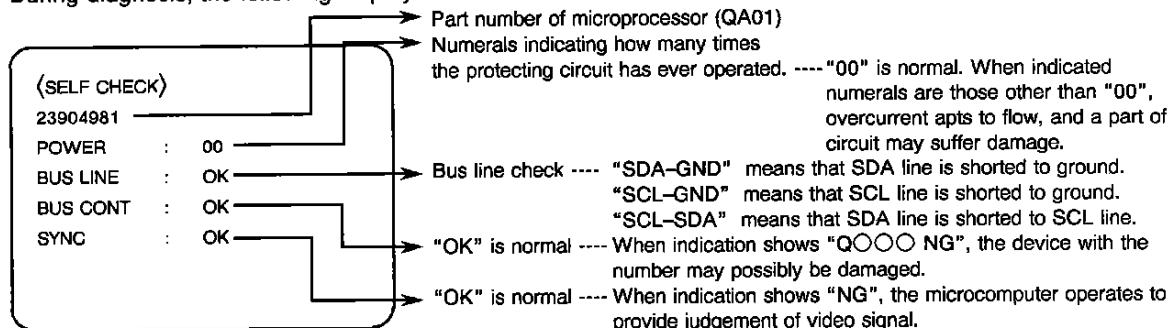
Signals	Picture	Using method
<ul style="list-style-type: none"> • Red single color • Green single color • Blue single color • Black single color • White single color 		Purity and White uniformity of CRT Red single color. . . . Stopping G and B output of Q501 Green single color. . . . Stopping R and B output of Q501 Blue single color. . . . Stopping R and G output of Q501 Black single color. . . . Making black signal of approx. 1Vp-p in QA01 White single color. . . . Making white signal of approx. 1Vp-p in QA01
<ul style="list-style-type: none"> • W/B adjustment 		White balance adjustment White part. . . . White balance adjustment/check in light area Black part. . . . White balance adjustment/check in dark area ※ Making approx. 1Vp-p signal in QA01.
<ul style="list-style-type: none"> • Black cross-bar • White cross-bar 		Picture position (horizontal, vertical and slant) in CRT adjustment ※ Making approx. 1Vp-p signal in QA01.
<ul style="list-style-type: none"> • Black cross-hatch • White cross-hatch 		Convergence and vertical amplitude adjustment ※ Making approx. 1Vp-p signal in QA01.
<ul style="list-style-type: none"> • Black cross-dot • White cross-dot 		Convergence adjustment ※ Making approx. 1Vp-p signal in QA01.
<ul style="list-style-type: none"> • H signal (Left, right, white) • H signal (Left, right, black) 		For checking (of purity drift) of white uniformity of CRT H signal (Left, right, white). . . . Check in light area H signal (Left, right, black). . . . Check in dark area The adjustment will be the best, if the time when unevenness of color in light area occurs, is a little longer than that in dark area. ※ Making approx. 1Vp-p signal in QA01.

SELF DIAGNOSTIC FUNCTION

- 1) Press "9" button on Remote Control during display of adjustment menu.

The diagnosis will begin to check if interface among IC's are executed properly.

- 2) During diagnosis, the following displays are shown.



SERVICE MODE ADJUSTMENT

ITEM	ADJUSTMENT PROCEDURE
INITIALIZATION OF QA02 (MEMORY)	<p>After replacing QA02, the following initialization is required.</p> <ol style="list-style-type: none"> 1. Call up the adjustment mode display following the steps 1 and 2 on page 21. 2. Press the RECALL and CHANNEL ▲ buttons on the Remote Control simultaneously. The initialization of QA02 has been completed. 3. Check the picture carefully. If necessary, adjust any adjustment item. Perform "AUTOMATIC SEARCH MEMORY" on page 8.
SUB-BRIGHTNESS (Address : BRTC)	<ol style="list-style-type: none"> 1. Set CONTRAST to "00", and BRIGHTNESS to "50" 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. Rotate R350 to show the belt of vertical retrace. See figure right. 5. 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. <div data-bbox="1043 602 1378 853" data-label="Image"> <p style="text-align: right;">Belt of vertical retrace</p> </div>
HORIZONTAL POSITION ADJUSTMENT (HPOS) VERTICAL POSITION ADJUSTMENT (VPOS)	<ol style="list-style-type: none"> 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. <div data-bbox="984 1070 1374 1357" data-label="Image"> </div>
VERTICAL AMPLITUDE ADJUSTMENT (HIT)	<ol style="list-style-type: none"> 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. <div data-bbox="1007 1413 1402 1704" data-label="Image"> <p style="text-align: right;">The first </p> </div>

ITEM	ADJUSTMENT PROCEDURE
<p>WHITE BALANCE ADJUSTMENT</p> <ul style="list-style-type: none"> • CUTOFF ADJUSTMENT (RCUT) (GCUT) (BCUT) • DRIVE ADJUSTMENT (GDRV) (BDRV) 	<ol style="list-style-type: none"> 1. Set Contrast to 40, and brightness to +20 by picture control. 2. Set the TV in service mode (page 21), and get the inside W/B adjusting signal with VIDEO button. (page 23) 3. Select RCUT, GCUT and BCUT with CHANNEL ▲, ▼ buttons, to set individual values to 32, and to set GDRV and BDRV to 20 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. <p>※ To correct white balance in light area, select GDRV and BDRV with CHANNEL ▲, ▼ buttons to adjust.</p> <p>※ To correct white balance in dark area, perform fine adjustment of RCUT, GCUT and BCUT.</p> <div data-bbox="986 636 1369 918"> <div data-bbox="1050 636 1305 716">Light area check (to show white)</div> <div data-bbox="1091 846 1264 909">Dark area check (to show black)</div> </div>

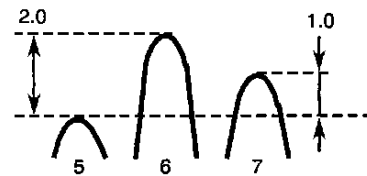
ADJUSTMENT OF VIDEO-CHROMA SYSTEM (Factory adjustment)

Model Name: S5E

Item	Name	Setting (User control)	Input signal	Measureme nt point	Adjustment procedure	Adjustment standard
Slave address 36 [BRTC]	SUB BRIGHT CENTER	Contrast: MAX Bright : CENTER Color : MIN	Sub-bright signal	Screen adjustment	1. This adjustment must be done after [BRTC], screen VR and white balance adjustments have been completed. 2. Adjust number of black collapse lines of sub-bright signal.	5 ± 1.5
Slave address 37 [COLC]	COLOR CONTROL CENTER NTSC	Contrast: MAX Bright : CENTER Color : CENTER Tint : CENTER	Sub-bright signal (3.58NTSC)	IC501 #23... (B-OUT)	1. Select slave address 37 [COLC]. 2. When [COLC] is selected, Y-signal is muted and only color signals are outputted. (This adjustment must be done after [TNTC] has been adjusted.) 3. Adjust amplitude of the upper half of the rainbow color bar output.	$1.4V(p-p) \pm 0.2V(p-p)$
Slave address 39 [COLP]	SUB COLOR PAL	Contrast: MAX Bright : CENTER Color : CENTER	PHILIPS signal (PAL)	IC501 #23... (B-OUT)	1. Select slave address 39 [COLP]. 2. When [COLP] is selected, Y-signal is muted and only color signals are outputted. (This adjustment must be done after [COLC] has been adjusted.) 3. Adjust amplitude of the upper half of the color bar output.	$1.4V(p-p) \pm 0.2V(p-p)$
Slave address 38 [TNTC]	TINT CONTROL CENTER	Contrast: MAX Bright : CENTER Color : CENTER Tint : CENTER	Sub-bright signal (3.58NTSC)	IC501 #23... (B-OUT)	1. Select slave address 38 [TNTC]. 2. When [TNTC] is selected, Y-signal is muted and only color signals are outputted. 3. Adjust it so that 6.25 of the rainbow color bar becomes max. (See Fig.-1.)	$-5.0^\circ \pm 5.0^\circ$ (Refer to the conversion table.)
RQ50 (R-Y axis) RQ51 (B-Y axis)	SECAM W/B R-Y axis B-Y axis	Contrast: MAX Bright : CENTER Color : CENTER	SECAM color bar signal	QQ01 #9 (R-Y axis) #10 (B-Y axis)	1. Coincide the level of black and white portion of color difference signal to that of H. BLK portion. 2. Adjust RQ50 for R-Y axis and adjust RQ51 for B-Y axis. 3. Repeat the above steps because RQ50 and RQ51 affect each other.	$\pm 10mV$ or less on both axis
Slave address 3A [COLS]	SUB COLOR CENTER SECAM	Contrast: MAX Bright : CENTER Color : CENTER	SECAM color bar signal	Q501 #23 (B-OUT)	1. Select slave address 3A [COLS]. 2. When [COLS] is selected, Y signal is muted, and only color signal is output. Perform this step after the adjustment of RQ50 and RQ51. 3. Adjust the peak amplitude of color bar.	$1.9V(p-p) \pm 0.2V(p-p)$

Model Name: S5E

Item	Name	Setting (User control)	Input signal	Measureme nt point	Adjustment procedure	Adjustment standard
Slave address 30 [RCUT] 31 [GCUT] 32 [BCUT] Screen VR	R cut-off G cut-off B cut-off Screen	RCUT) GCUT) 32 Hexa-decimal BCUT) GDRV) 20 Hexa-decimal BDRV) Select horizontal line mode by pressing \odot button on TV set in service mode.		Screen adjustment	1. Set the controls as shown in the left column. 2. Gradually increase the screen VR (T461) until one of R, G or B line begins to brighten slightly. 3. Determine the position of the screen VR here. 4. Adjust RCUT, GCUT and BCUT, brighten other lines until they begin to light slightly. (Adjust DATA so that the line becomes almost white.) 5. Press \odot button on TV set to escape from the horizontal line mode.	—
Slave address 30 [RCUT] 31 [GCUT] 32 [BCUT] 33 [GDRV] 34 [BDRV]	R cut-off G cut-off B cut-off G drive B drive (White balance)	Contrast: MAX Bright : CENTER Color : CENTER	Cross- hatch, etc.	Screen adjustment	1. This adjustment must be done after adjustment of the above- mentioned cut-off and screen VR's have been completed. 2. Adjust cut-off and drive DATA alternately. 3. Use a checker to adjust brightness by changing modulation factor.	HIGH LIGHT; (103cd/m ³) 7195K -0.005uv DARK; (17cd/m ³) 7695K $\pm 0uv$
Slave address F0 $\overline{\text{PID}}$	ID ref		VIDEO No input	Pin 52 of IC501	1. Connect a resistor 220k ohm across pin 52 of IC501 and GND, and connect digital voltmeter. 2. Select slave address F0 $\overline{\text{PID}}$. 3. Adjust DC voltage.	2.0V DC $\pm 0.1V$ DC
Slave address F1 $\overline{\text{TRP}}$	Chroma trap f_0 adjusting	Contrast: MAX Bright : MIN Color : MIN	4.43NTSC color bar	Pin 23 of IC501 (B-OUT)	1. Select slave address F1 $\overline{\text{TRP}}$. 2. Adjust chroma trap so that chroma level at pin 23 of IC501 becomes minimum.	Chroma level: MIN



Status of TCC 6.25
Fig.-1

MULTI BUS E2PROM ADDRESS, ADJUSTING ADDRESS TABLE

Adjusting method	Micom adjusting number	QA02 memory ADDR	Name of item	Value of initializing QA02 (Hexa-decimal)	Adjustments
F ↓ F	30	06D	RCUT	32	R CUTOFF
	31	06E	GCUT	32	G CUTOFF
	32	06F	BCUT	32	B CUTOFF
	33	070	GDRV	20	G DRIVE
	34	071	BDRV	20	B DRIVE
	35	072	CNTX	39	SUBCONTRAST MAX
	36	073	BRTC	32	SUBBRIGHT CEN
	37	074	COLC	32	SUBCOLOR CEN NTSC
	38	075	TNTC	39	SUBTINT CEN
	39	076	COLP	32	SUBCOLOR CEN PAL
	3A	077	COLS	32	SUBCOLOR CEN SECAM
	80	08F	HPOS	08	50Hz HORIZONTAL POSITION

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

CHASSIS REPLACEMENT PARTS LIST

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 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 on page 2. 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.

ABBREVIATIONS:

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 $\pm 5\%$, 50V and all resistors, $\pm 5\%$, 1/6W unless otherwise noted.)

Location No.	Part No.	Description
CAPACITORS		
C101	24797100	EL, 10 μ F, $\pm 20\%$, 50V
C102	24794101	EL, 100 μ F, $\pm 20\%$, 16V
C103	24232103	CD, 0.01 μ F, +80%, -20%
C201	24797478	EL, 0.47 μ F, $\pm 20\%$, 50V
C207	24232103	CD, 0.01 μ F, +80%, -20%
C211	24793470	EL, 47 μ F, $\pm 20\%$, 10V
C212	24794100	EL, 10 μ F, $\pm 20\%$, 16V
C214	24794101	EL, 100 μ F, $\pm 20\%$, 16V
C215	24793471	EL, 470 μ F, $\pm 20\%$, 10V
C216	24232103	CD, 0.01 μ F, +80%, -20%
C219	24794100	EL, 10 μ F, $\pm 20\%$, 16V
C220	24591104	PF, 0.1 μ F
C221	24591104	PF, 0.1 μ F
C222	24591104	PF, 0.1 μ F
C230	24794100	EL, 10 μ F, $\pm 20\%$, 16V
C301	24436561	CD, 560pF
C302	24591103	PF, 0.01 μ F
C303	24617915	EL, 1 μ F, $\pm 10\%$, 50V
C305	24617915	EL, 1 μ F, $\pm 10\%$, 50V
C306	24666332	EL, 3300 μ F, $\pm 20\%$, 16V
C307	24214472	CD, 4700pF, $\pm 10\%$, 500V
C308	24668101	EL, 100 μ F, $\pm 20\%$, 35V
C309	24434100	CD, 10pF, ± 0.5 pF, 500V
C310	24796102	EL, 1000 μ F, $\pm 20\%$, 35V
C313	24082057	PF, 0.22 μ F, 100V
C317	24214471	CD, 470pF, $\pm 10\%$, 500V
C321	24666101	EL, 100 μ F, $\pm 20\%$, 16V
C402	24591562	PF, 5600pF
C403	24232103	CD, 0.01 μ F, +80%, -20%
C404	24797010	EL, 1 μ F, $\pm 20\%$, 50V
C405	24212182	CD, 1800pF, $\pm 10\%$
C406	24085958	EL, 1.0 μ F, $\pm 20\%$, 50V, Non-Polar
C408	24794470	EL, 47 μ F, $\pm 20\%$, 16V
C409	24474221	CD, 220pF, $\pm 10\%$
C417	24214102	CD, 1000pF, $\pm 10\%$, 500V
C421	24538474	PF, 0.47 μ F
C422	24591474	PF, 0.47 μ F
C430	24232103	CD, 0.01 μ F, +80%, -20%
C431	24794102	EL, 1000 μ F, $\pm 20\%$, 16V

Location No.	Part No.	Description
△C440	24082344	PF, 6000pF, $\pm 3\%$, 1500V
△C442	24082694	PF, 0.33 μ F, 250V
C444	24082559	PF, 1500pF, $\pm 3\%$, 1500V
C445	24828563	PF, 0.056 μ F, 200V
C446	24700220	EL, 22 μ F, $\pm 20\%$, 250V
C448	24640908	EL, 33 μ F, $\pm 20\%$, 160V
C449	24666471	EL, 470 μ F, $\pm 20\%$, 16V
△C463	24212152	CD, 1500pF, $\pm 10\%$
C467	24095881	PF, 0.018 μ F, $\pm 3\%$, 630V
C470	24794220	EL, 22 μ F, $\pm 20\%$, 16V
C472	24538474	PF, 0.47 μ F
C501	24473680	CD, 68pF
C502	24473680	CD, 68pF
C503	24473680	CD, 68pF
C504	24353560	CD, 56pF
C506	24591153	PF, 0.015 μ F
C507	24353101	CD, 100pF
C510	24797010	EL, 1 μ F, $\pm 20\%$, 50V
C511	24474101	CD, 100pF, $\pm 10\%$
C512	24474101	CD, 100pF, $\pm 10\%$
C520	24436471	CD, 470pF
C530	24591473	PF, 0.047 μ F
C531	24591473	PF, 0.047 μ F
C560	24797010	EL, 1 μ F, $\pm 20\%$, 50V
C561	24212182	CD, 1800pF, $\pm 10\%$
C606	24797479	EL, 4.7 μ F, $\pm 20\%$, 50V
C607	24797100	EL, 10 μ F, $\pm 20\%$, 50V
C608	24797229	EL, 2.2 μ F, $\pm 20\%$, 50V
C609	24591103	PF, 0.01 μ F
C610	24795220	EL, 22 μ F, $\pm 20\%$, 25V
C611	24591104	PF, 0.1 μ F
C612	24794470	EL, 47 μ F, $\pm 20\%$, 16V
C613	24796221	EL, 220 μ F, $\pm 20\%$, 35V
C614	24797478	EL, 0.47 μ F, $\pm 20\%$, 50V
△C801	24082374	PF, 0.22 μ F, AC250V
C805	24092300	CD, 0.01 μ F, +80%, -20%, AC250V
C806	24092300	CD, 0.01 μ F, +80%, -20%, AC250V
C810	24086936	EL, 270 μ F, $\pm 20\%$, 450V
C813	24094655	CD, 1000pF, $\pm 20\%$, AC400V

Location No.	Part No.	Description
C814	24094655	CD, 1000pF, $\pm 20\%$, AC400V
C819	24538474	PF, 0.47 μ F
C832	24666470	EL, 47 μ F, $\pm 20\%$, 16V
C841	24667100	EL, 10 μ F, $\pm 20\%$, 25V
C842	24666100	EL, 10 μ F, $\pm 20\%$, 16V
C843	24538104	PF, 0.1 μ F
C846	24538224	PF, 0.22 μ F
C861	24214471	CD, 470pF, $\pm 10\%$, 500V
C862	24082857	PF, 680pF, $\pm 2\%$
C863	24538104	PF, 0.1 μ F
C864	24092469	CD, 100pF, $\pm 10\%$, 2kV
C866	24669100	EL, 10 μ F, $\pm 20\%$, 50V
C868	24676470	EL, 47 μ F, $\pm 20\%$, 100V
C869	24678229	EL, 2.2 μ F, $\pm 20\%$, 200V
C871	24092483	CD, 1200pF, $\pm 10\%$, 2kV
C872	24212102	CD, 1000pF, $\pm 10\%$
C873	24212102	CD, 1000pF, $\pm 10\%$
C876	24538104	PF, 0.1 μ F
C877	24667470	EL, 47 μ F, $\pm 20\%$, 25V
C884	24640018	EL, 220 μ F, $\pm 20\%$, 160V
C885	24214471	CD, 470pF, $\pm 10\%$, 500V
C889	24667471	EL, 470 μ F, $\pm 20\%$, 25V
C891	24082229	PF, 0.1 μ F, $\pm 10\%$, 250V
C893	24092338	CD, 270pF, $\pm 10\%$, 2kV
C894	24092338	CD, 270pF, $\pm 10\%$, 2kV
C898	24212102	CD, 1000pF, $\pm 10\%$
C899	24212271	CD, 270pF, $\pm 10\%$
C902	24211102	CD, 1000pF, $\pm 10\%$, 2kV
C921	24212681	CD, 680pF, $\pm 10\%$
C922	24212681	CD, 680pF, $\pm 10\%$
C923	24212681	CD, 680pF, $\pm 10\%$
C971	24763221	EL, 220 μ F, $\pm 20\%$, 16V
C972	24794100	EL, 10 μ F, $\pm 20\%$, 16V
C980	24763471	EL, 470 μ F, $\pm 20\%$, 16V
C981	24797479	EL, 4.7 μ F, $\pm 20\%$, 50V
CA10	24474331	CD, 330pF, $\pm 10\%$
CA11	24474151	CD, 150pF, $\pm 10\%$
CA33	24232103	CD, 0.01 μ F, $+80\%$, -20%
CA36	24474101	CD, 100pF, $\pm 10\%$
CA37	24474101	CD, 100pF, $\pm 10\%$
CA38	24474101	CD, 100pF, $\pm 10\%$
CA42	24794100	EL, 10 μ F, $\pm 20\%$, 16V
CA43	24232103	CD, 0.01 μ F, $+80\%$, -20%
CA68	24794100	EL, 10 μ F, $\pm 20\%$, 16V
CA69	24232103	CD, 0.01 μ F, $+80\%$, -20%
CB01	24794470	EL, 47 μ F, $\pm 20\%$, 16V
CB20	24474101	CD, 100pF, $\pm 10\%$
CP01	24538104	PF, 0.1 μ F
CP03	24538104	PF, 0.1 μ F
CP04	24538104	PF, 0.1 μ F
CP05	24232103	CD, 0.01 μ F, $+80\%$, -20%
CP06	24232103	CD, 0.01 μ F, $+80\%$, -20%
CP07	24793470	EL, 47 μ F, $\pm 20\%$, 10V
CP08	24591223	PF, 0.022 μ F
CQ01	24797470	EL, 47 μ F, $\pm 20\%$, 50V
CQ02	24538104	PF, 0.1 μ F
CQ03	24591224	PF, 0.22 μ F
CQ04	24538104	PF, 0.1 μ F
CQ05	24232103	CD, 0.01 μ F, $+80\%$, -20%
CQ06	24232103	CD, 0.01 μ F, $+80\%$, -20%
CS02	24797010	EL, 1 μ F, $\pm 20\%$, 50V
CS03	24797478	EL, 0.47 μ F, $\pm 20\%$, 50V
CS04	24797478	EL, 0.47 μ F, $\pm 20\%$, 50V
CS05	24794221	EL, 220 μ F, $\pm 20\%$, 16V

Location No.	Part No.	Description
CS06	24793471	EL, 470 μ F, $\pm 20\%$, 10V
CS07	24794101	EL, 100 μ F, $\pm 20\%$, 16V
CS08	24797479	EL, 4.7 μ F, $\pm 20\%$, 50V
CV05	24794100	EL, 10 μ F, $\pm 20\%$, 16V
CV06	24232103	CD, 0.01 μ F, $+80\%$, -20%
CV07	24591104	PF, 0.1 μ F
CV08	24794100	EL, 10 μ F, $\pm 20\%$, 16V

RESISTORS

R101	24382153	OMF, 15k ohm, 1W
R207	24366102	CF, 1k ohm
R208	24366101	CF, 100 ohm
R209	24366101	CF, 100 ohm
R211	24366103	CF, 10k ohm
R212	24366224	CF, 220k ohm-
R214	24366103	CF, 10k ohm
R215	24366153	CF, 15k ohm
R219	24366511	CF, 510k ohm
R227	24366123	CF, 12k ohm
R301	24366332	CF, 3300 ohm
R302	24366683	CF, 68k ohm
R303	24552751	OMF, 750 ohm, 1/2W
R304	24366243	CF, 24k ohm
R305	24322119	MF, 1.1 ohm, 1W
R306	24366363	CF, 36k ohm
R307	24366134	CF, 130k ohm
R309	24321109	MF, 1 ohm, 1/2W
R310	24366102	CF, 1k ohm
R311	24366432	CF, 4300 ohm
R312	24366273	CF, 27k ohm
R313	24366273	CF, 27k ohm
R320	24366473	CF, 47k ohm
R331	24545479	FR, 4.7 ohm, 1/4W
R336	24383271	OMF, 270 ohm, 2W
R350	24066602	VR, 50k ohm, 1/10W
R365	24366244	CF, 240k ohm
R400	24366155	CF, 1.5M ohm
R401	24366473	CF, 47k ohm
R402	24366622	CF, 6200 ohm
R403	24366682	CF, 6800 ohm
R404	24366123	CF, 12k ohm
R405	24366104	CF, 100k ohm
R407	24366224	CF, 220k ohm
R409	24366101	CF, 100 ohm
R410	24366151	CF, 150 ohm
R411	24366391	CF, 390 ohm
R412	24366560	CF, 56 ohm
△R416	24019321	OMF, 1500 ohm, 5W
R417	24366182	CF, 1800 ohm
R420	24366221	CF, 220 ohm
R430	24366103	CF, 10k ohm
R432	24382181	OMF, 180 ohm, 1W
R433	24366472	CF, 4700 ohm
R443	24532102	FR, 1k ohm, 1W
R447	24553472	OMF, 4700 ohm, 1W
R448	24338228	OMF, 0.27 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
R501	24366102	CF, 1k ohm
R502	24366102	CF, 1k ohm
R503	24366102	CF, 1k ohm
R504	24366271	CF, 270 ohm

Location No.	Part No.	Description
R505	24366271	CF, 270 ohm
R506	24366271	CF, 270 ohm
R507	24366332	CF, 3300 ohm
R509	24366101	CF, 100 ohm
R516	24366101	CF, 100 ohm
R517	24366101	CF, 100 ohm
R520	24366475	CF, 4.7M ohm
R522	24366475	CF, 4.7M ohm
R540	24366103	CF, 10k ohm
R560	24366221	CF, 220 ohm
R561	24366564	CF, 560k ohm
R603	24366162	CF, 1600 ohm
R604	24366562	CF, 5600 ohm
R605	24366339	CF, 3.3 ohm
R606	24366393	CF, 39k ohm
R612	24366103	CF, 10k ohm
R613	24366103	CF, 10k ohm
R614	24366181	CF, 180 ohm
R801	24009954	Metal-Glazed Resistor, 2.2M ohm, 1/2W
△ R808	24000875	PTC Thermistor, 18 ohm, ±20%, 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
R861	24383223	OMF, 22k ohm, 2W
R862	24552220	OMF, 22 ohm, 1/2W
R863	24366432	CF, 4300 ohm
R864	24366561	CF, 560 ohm
R866	24552390	OMF, 39 ohm, 1/2W
R867	24000251	MF, 62k ohm, ±1%, 1/4W
R868	24552103	OMF, 10k ohm, 1/2W
R870	24531220	FR, 22 ohm, 1/2W
R871	24310109	MF, 1.0 ohm, 1/2W
R872	24377224	CF, 220k ohm, 1W
R881	24366472	CF, 4700 ohm
R883	24552752	OMF, 7500 ohm, 1/2W
R884	24552752	OMF, 7500 ohm, 1/2W
R891	24366102	CF, 1k ohm
R898	24366222	CF, 2200 ohm
R899	24005007	Metal-Glazed Resistor, 8.2M ohm, 1W
R901	24376472	CF, 4700 ohm, 1/2W
R902	24376472	CF, 4700 ohm, 1/2W
R903	24376472	CF, 4700 ohm, 1/2W
R911	24366101	CF, 100 ohm
R912	24366101	CF, 100 ohm
R913	24366101	CF, 100 ohm
R920	24000568	FR, 4.7 ohm, 1W
R921	24366391	CF, 390 ohm
R922	24366391	CF, 390 ohm
R923	24366391	CF, 390 ohm
R931	24366152	CF, 1500 ohm
R932	24366152	CF, 1500 ohm
R933	24366152	CF, 1500 ohm
R961	24383183	OMF, 18k ohm, 2W

Location No.	Part No.	Description
R962	24383183	OMF, 18k ohm, 2W
R963	24383183	OMF, 18k ohm, 2W
R971	24366152	CF, 1500 ohm
R972	24366221	CF, 220 ohm
R973	24366122	CF, 1200 ohm
R980	24552560	OMF, 56 ohm, 1/2W
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
RA13	24366102	CF, 1k ohm
RA14	24366153	CF, 15k ohm
RA15	24366103	CF, 10k ohm
RA16	24366102	CF, 1k ohm
RA17	24366102	CF, 1k ohm
RA18	24366102	CF, 1k ohm
RA22	24366472	CF, 4700 ohm
RA23	24366472	CF, 4700 ohm
RA24	24366472	CF, 4700 ohm
RA25	24366332	CF, 3300 ohm
RA26	24366102	CF, 1k ohm
RA27	24366102	CF, 1k ohm
RA28	24366102	CF, 1k ohm
RA33	24366103	CF, 10k ohm
RA35	24366102	CF, 1k ohm
RA36	24366472	CF, 4700 ohm
RA37	24366331	CF, 330 ohm
RA38	24366331	CF, 330 ohm
RA61	24366103	CF, 10k ohm
RA62	24366103	CF, 10k ohm
RA64	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
RB01	24366271	CF, 270 ohm
RB03	24366101	CF, 100 ohm
RB09	24366470	CF, 47 ohm
RB11	24366103	CF, 10k 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
RB36	24366103	CF, 10k ohm
RB40	24366103	CF, 10k ohm
RB41	24366182	CF, 1800 ohm
RB42	24366102	CF, 1k ohm
RB43	24366222	CF, 2200 ohm
RB44	24366152	CF, 1500 ohm
RB45	24366221	CF, 220 ohm
RP02	24366105	CF, 1M ohm
RQ03	24366222	CF, 2200 ohm
RQ05	24366473	CF, 47k ohm
RQ08	24366473	CF, 47k ohm
RQ50	24066879	VR, 1k ohm, 0.3W
RQ51	24066876	VR, 10k ohm, 0.3W
RR22	24366471	CF, 470 ohm
RR23	24366471	CF, 470 ohm

Location No.	Part No.	Description
RR24	24366471	CF, 470 ohm
RS02	24366681	CF, 680 ohm
RS03	24366472	CF, 4700 ohm
RS04	24366513	CF, 51k ohm
RS06	24366513	CF, 51k ohm
RS07	24366391	CF, 390 ohm
RS08	24366750	CF, 75 ohm
RS10	24366101	CF, 100 ohm
RS11	24366564	CF, 560k ohm
RV01	24366750	CF, 75 ohm
RV05	24366102	CF, 1k ohm
RV06	24366101	CF, 100 ohm
RV07	24366104	CF, 100k ohm
RV09	24366103	CF, 10k ohm
RV10	24366561	CF, 560 ohm
RV11	24366101	CF, 100 ohm
COILS & TRANSFORMERS		
L201	23238714	Coil, Peaking, TRF4100AJ
L301	23103880	Coil (Ferrite Bead), TEM2011Y
L410	23103880	Coil (Ferrite Bead), TEM2011Y
L411	23103880	Coil (Ferrite Bead), TEM2011Y
L430	23238714	Coil, Peaking, TRF4100AJ
△L441	23233071	Coil, Linearity, TLN2112G
△L462	23231056	Deflection Yoke, TDY-621WS
L805	23261959	Coil, Choke, TRF9240
L840	23289100	Coil, Peaking, TRF4100AF
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	23221722	Coil, Choke, TLN3142D
L886	23103859	Coil (Ferrite Bead), TEM2011
L887	23222694	Coil, Width, TLN2026
△L901	23200286	Coil, Degaussing, TSB-2301AG
LA01	23289100	Coil, Peaking, TRF4100AF
LP01	23289470	Coil, Peaking, TRF4470AF
△T401	23224983	Transformer, Horiz. Drive, TLN1039
△T461	23236481	Transformer, Flyback, TFB4125CH
△T801	23211673	Line Filter, TRF3204N
△T862	23217276	Transformer, Converter, TPW3319AE
SEMICONDUCTORS		
Q301	23319459	IC, LA7837
Q203	23114530	Transistor, 2SA933S-Q
Q303	A6002040	Transistor, RN1204
Q402	A6330069	Transistor, 2SC2482 FA-1
△Q404	23314375	Transistor, ON4409(508D)
Q421	B0372900	IC, TA78009AP
Q430	A6333346	Transistor, 2SC2655-Y(C)
Q432	A6002030	Transistor, RN1203
Q470	A6547250	Transistor, 2SA1320
Q501	23904952	IC, M52707SP
Q610	23119668	IC, TDA2611A
Q611	A6342206	Transistor, 2SC2878-A(TE
Q612	23114530	Transistor, 2SA933S-Q
Q620	A6010040	Transistor, RN2004
△Q801	23904956	IC, STR-Z2152,L
Q817	23114528	Transistor, 2SC1740S-Q
Q818	A6012010	Transistor, RN2201
Q819	23114528	Transistor, 2SC1740S-Q

Location No.	Part No.	Description
Q830	23314141	Transistor, 2SC3852
Q840	23318299	IC, L78MR05
Q843	A6002050	Transistor, RN1205
Q846	A6360200	Transistor, 2SC3333
△Q862	A8643108	Photo Coupler, TLP621(GR-LF
Q872	23314141	Transistor, 2SC3852
Q883	A6907752	IC, S1854 FA-1
Q901	A6330059	Transistor, 2SC2482(C)
Q902	A6330059	Transistor, 2SC2482(C)
Q903	A6330059	Transistor, 2SC2482(C)
Q971	23114530	Transistor, 2SA933S-Q
Q980	A6330059	Transistor, 2SC2482(C)
QA01	23905246	IC, M37222M6-B84
QA02	23904665	IC, NM24C04EN
QB01	23114528	Transistor, 2SC1740S-Q
QB03	A6002050	Transistor, RN1205
QB20	A6002010	Transistor, RN1201
QB21	23114528	Transistor, 2SC1740S-Q
QB30	23114528	Transistor, 2SC1740S-Q
QB40	23114528	Transistor, 2SC1740S-Q
QP01	23904954	IC, U3660M-B
QQ01	23905127	IC, M52325P-A
QS01	A6342206	Transistor, 2SC2878-A(TE
QS02	23114530	Transistor, 2SA933S-Q
QV04	23904943	IC, MM1111XS
QV05	23114528	Transistor, 2SC1740S-Q
QV10	23114528	Transistor, 2SC1740S-Q
D101	23115922	Diode, Zener, μ PC574J(M)
D201	23118859	Diode, 1SS133
D230	23316309	Diode, Zener, UZ5.6BSB
D301	23118479	Diode, BYD33J
D302	23118479	Diode, BYD33J
D303	23316794	Diode, SC570A
D304	23118859	Diode, 1SS133
D306	23316323	Diode, Zener, UZ9.1BSA
D309	23316326	Diode, Zener, UZ10BSA
D401	23316321	Diode, Zener, UZ8.2BSB
D402	23316333	Diode, Zener, UZ12BSB
D406	23118479	Diode, BYD33J
D408	23118479	Diode, BYD33J
D430	23115537	Diode, 1SS131
D431	23316326	Diode, Zener, UZ10BSA
D440	23316254	Diode, ERC06-15
D441	23316312	Diode, Zener, UZ6.2BSB
D444	23118338	Diode, RU4AM
D470	23316333	Diode, Zener, UZ12BSB
D612	23118859	Diode, 1SS133
D620	23118859	Diode, 1SS133
D621	23118859	Diode, 1SS133
D622	23118859	Diode, 1SS133
D801	23316391	Diode, D3SB60, 4109
D818	23316337	Diode, Zener, UZ13BSC
D830	23316310	Diode, Zener, UZ5.6BSC
D846	23316312	Diode, Zener, UZ6.2BSB
D862	23118094	Diode, EU2A
D864	23118094	Diode, EU2A
D872	23316345	Diode, Zener, UZ18BSB
D875	23316345	Diode, Zener, UZ18BSB
D876	23118859	Diode, 1SS133
D881	23118859	Diode, 1SS133
D883	23316813	Diode, EG1
D884	23316813	Diode, EG1
D885	23118060	Diode, AL01Z
D898	23118859	Diode, 1SS133

Location No.	Part No.	Description
D980	23118859	Diode, 1SS133
D981	23316554	Diode, 1SS146
D982	23316554	Diode, 1SS146
D983	23316554	Diode, 1SS146
DA19	23316672	Diode, Zener, MTZJ5.6B
DB01	23358501	Diode (LED), SCL003URC5F
DB03	23358522	LED, SIR-56SB3F
DB30	23118859	Diode, 1SS133
DQ20	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
G218	24366153	CF, 15k ohm
G302	23289100	Coil, Peaking, TRF4100AF
G520	23238704	Coil, Peaking, TRF4680AJ
GV04	24366102	CF, 1k 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
△P801	23372011	Power Cord
P910	23164725	Plug, 2P
PV01	23365814	Jack, Phono
△S801	23344382	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	23351085	Speaker, SPK-1357
W662	23351085	Speaker, SPK-1357
X401	23153423	Ceramic Resonator, 503KHz, TCR1073
X501	23153427	Crystal, 3.58MHz
X502	23153410	Crystal, 4.43MHz
XA01	23153325	Ceramic Resonator, 8.00M, TCR1056
△ZP03	23144778	Fuse, 1.0A
△ZP04	23144451	Protector, PRF5000, 125V, 5A
△ZP05	23144451	Protector, PRF5000, 125V, 5A
PC BOARD ASSEMBLIES		
* U902A	23704393	Main Board, PB5674-1
* U902B	23704394	CRT Drive Board, PB5674-2
PICTURE TUBE		
△V901	A5549139	Picture Tube, A51KSU93X(VM)
TUNER		
H001	23321199	Tuner, EC923X1

Location No.	Part No.	Description
ACCESSORIES		
K902	23306085	Remote Hand Unit, CT-9782
AT03	23305735	Battery Cover
Y101	23562438	Owner's Manual, English/Russian, 2150XS

TERMINAL VIEW OF TRANSISTOR, etc.

① 2SA1015
2SC388ATM
2SC1815
2SA562TM
2SC1959
2SC1627
2SC2878
2SC2482
2SA1300
2SC752GTM



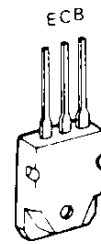
② 2SC2120
2SC2230
2SC2655



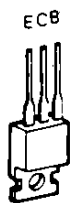
③ RN1203
RN1204
RN1205
RN1206
RN2201



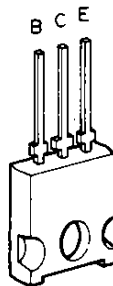
④ 2SA1265N



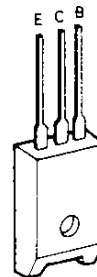
⑤ 2SD553
2SC1569
2SC2383
2SC3148
2SA1012



⑥ 2SC3619



⑦ ON4409



SPECIFICATIONS

Input Power Rating:	70 watts, AC 110 ~ 240 volts, 50/60 Hz				
Aerial Input Impedance:	75 ohm unbalanced type for VHF, UHF and CATV				
Television System and Channels:	System	Channel	VHF	UHF	CATV
	PAL B/G	CCIR	2 ~ 12	21 ~ 69	X ~ Z + 2, S1 ~ S41
	PAL D/K	CHINA	1 ~ 12	13 ~ 57	Z-1 ~ Z-35
	PAL I	UK	-	21 ~ 69	-
	SECAM B/G	CCIR	2 ~ 12	21 ~ 69	X ~ Z + 2, S1 ~ S41
	SECAM D/K	OIRT	1 ~ 12	21 ~ 69	X-1 ~ X-19
	4.43NTSC	5.5/6.0/6.5MHz (Special RF signal)			
	PAL 60Hz	5.5/6.0/6.5MHz (Special RF signal)			
Colour System:	PAL / SECAM / 4.43 NTSC / 3.58 NTSC / 60 Hz PAL / 50 Hz 3.58 NTSC				
Intermediate Frequencies:	Picture I-F carrier frequency 38.0 MHz, 33.5 MHz-M				
	Sound I-F carrier frequency 32.5 MHz-B/G				
	32.0 MHz-I, 31.5 MHz-D/K				
Picture Tube:	21 inches, 50.8 cm (measured on diagonal of viewable picture area), 90° deflection				
Sound Output:	3 watts x 1				
Speakers:	77 mm round 2 pc				
Aux. Terminals:	AUDIO/VIDEO INPUT socket, TV OUTPUT socket				
Dimensions:	Height 475 mm				
	Width 579 mm				
	Depth 469 mm				
Mass:	20.5 kg				
Features:	OFF-timer, No signal off, Blue back screen, VIDEO and AUDIO input terminals, TV output terminals				

Specifications are subject to change without notice.



040-9508

SCHEMATIC DIAGRAM MODEL: 2150XS

CAUTION: The international hazard symbols "E" 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 original. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 2. 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 120%.
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.

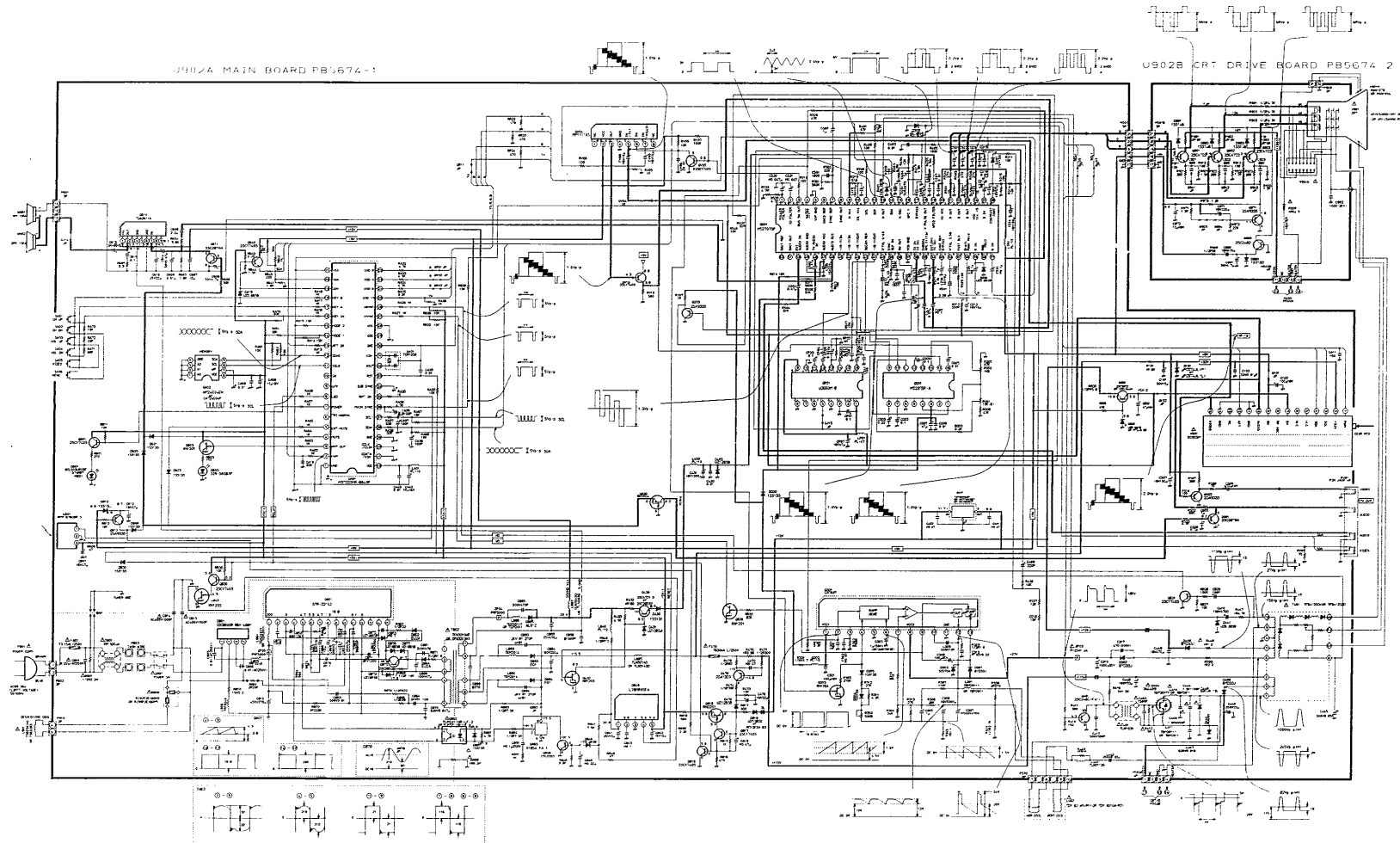
NOTES:

1. D.C. resistance value of a principal transformer is shown in this schematic diagram. These are measured for unenergized 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 value noted in schematic, all capacitor values less than 1 are expressed in pF and the values more than 1 in μ F.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μ H, and the values less than 1 in nH.



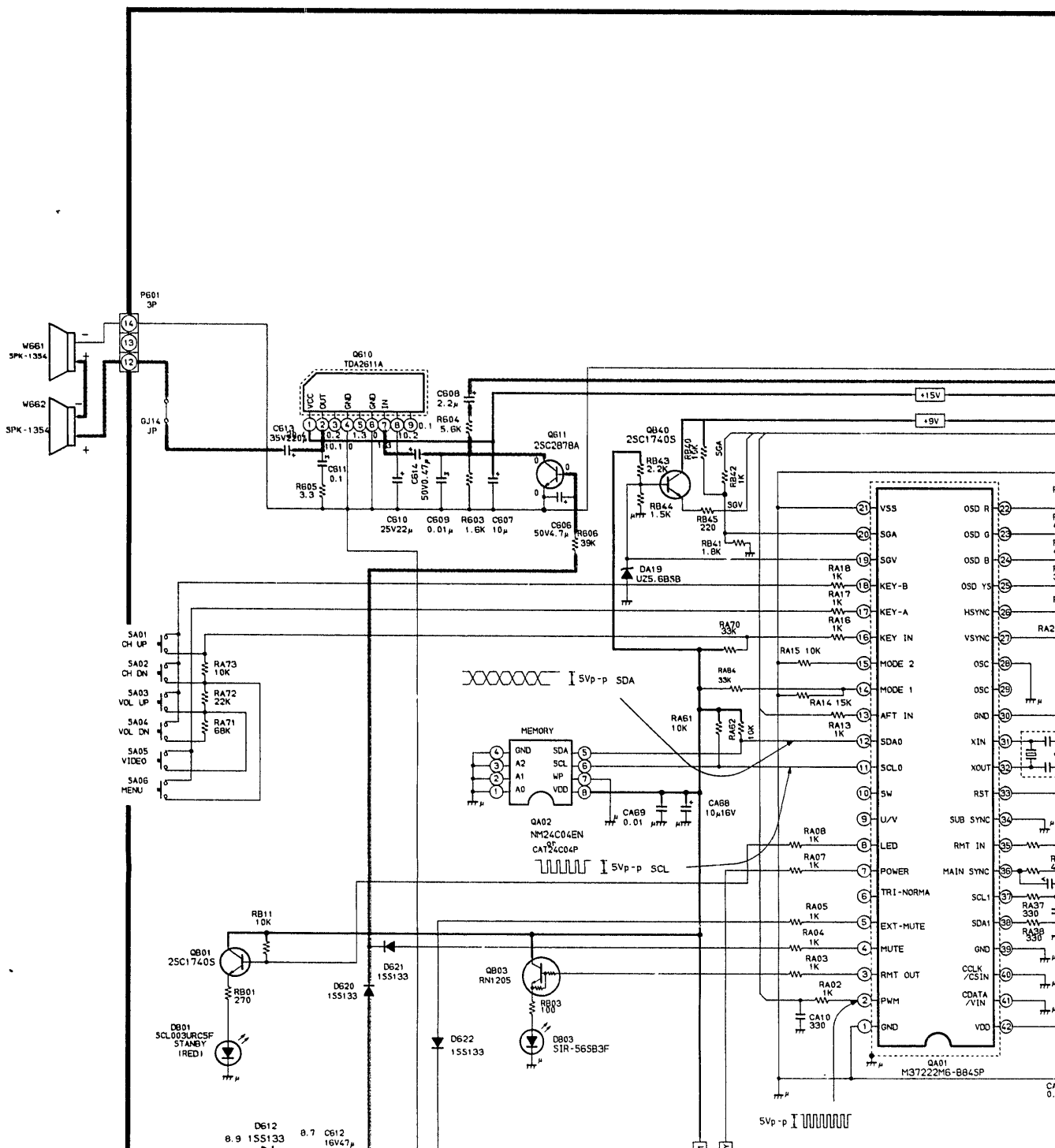
040-9508

SCHEMATIC DIAGRAM

MODEL: 2150XS


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 2. Do not degrade the safety of the receiver through improper servicing.

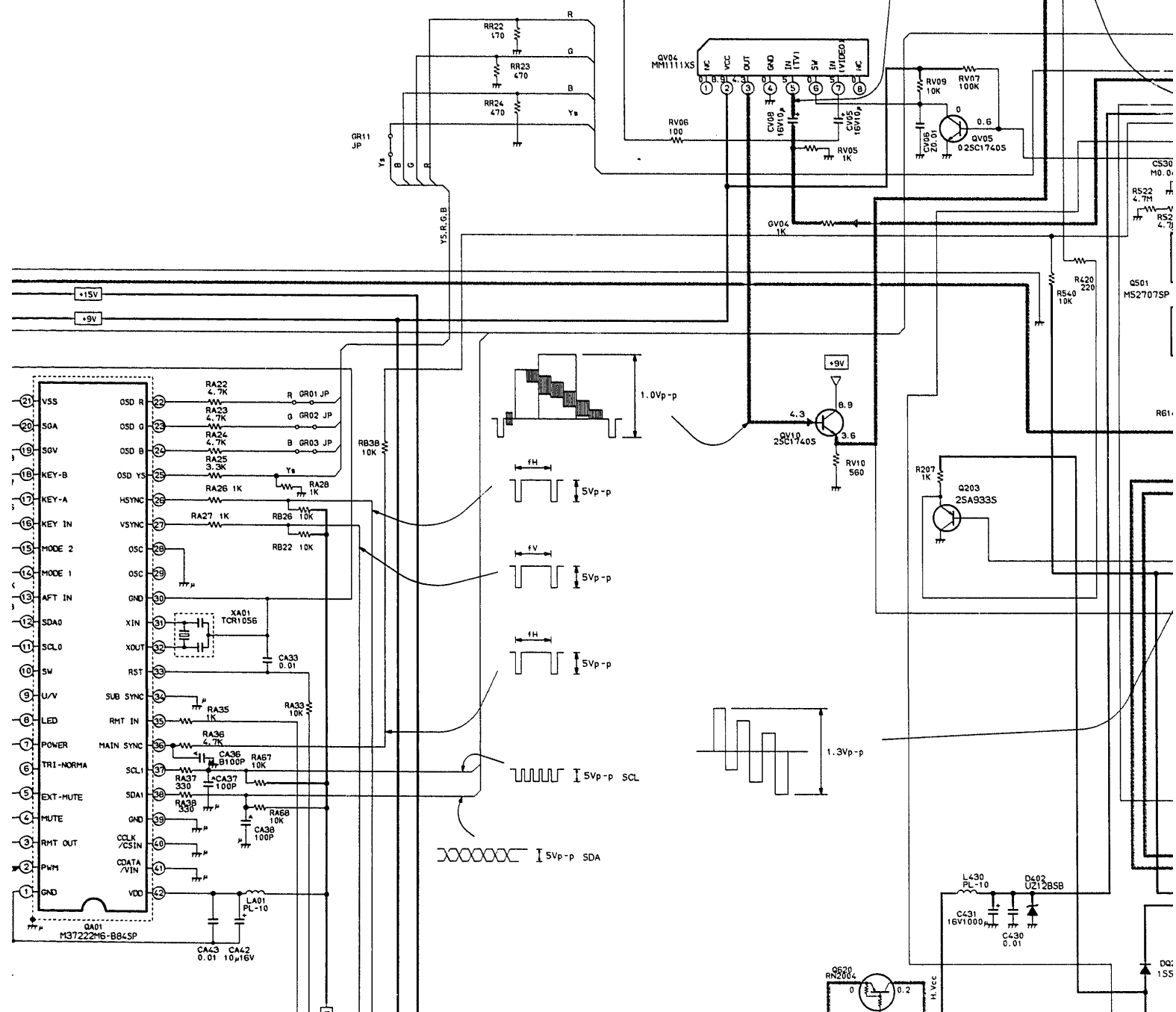
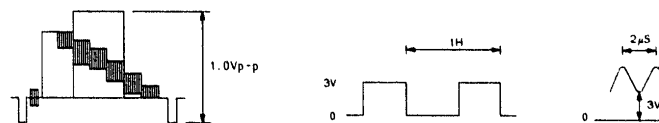
U902A MAIN BOARD PB5674-1



35674 - 1

NOTES:

1. D.C. resist gram. The
2. The circuit
3.  : Solc



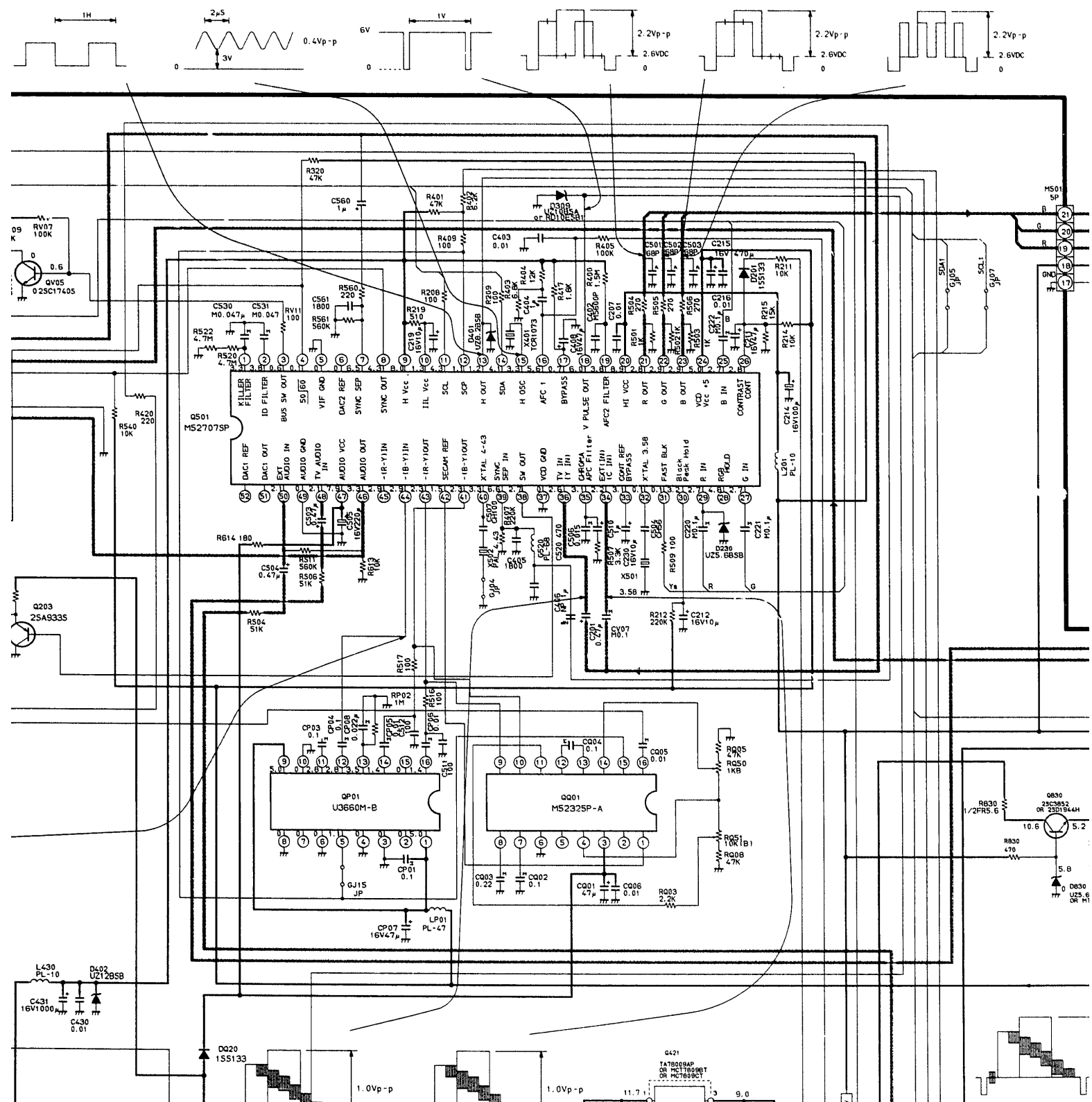
EXPRESSION

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.

VALUE OF RESISTOR, CAPAC

1. Resistance is shown in ohm, k=
2. Unless other wise noted in sche sed in μF and the values more tl
3. Unless otherwise noted in sche sed in μH , and the values less th



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.

