TOSHIBA

FILE NO. 020-200103

SERVICE MANUAL

COLOR TELEVISION

N1N Chassis

27AF61, 27AF41

(TAC0115) *(TAC0116)*

PUBLISHED IN JAPAN, May., 2001 (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 (A) kV at zero beam current (minimum brightness) under a 120V AC power source. The high voltage must not, under any circumstances, exceed (B) kV.

   Refer to table-1 for high voltage (A), (B).
   (See SETTING & ADJUSTING DATA on page 17)

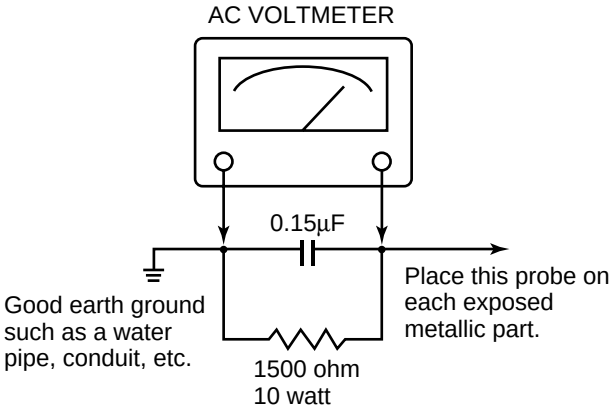
   Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure in this manual. It is recommended that the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. This receiver is equipped with a Fail Safe (FS) circuit which prevents the receiver from producing an excessively high voltage even if the B+ voltage increases abnormally. Each time the receiver is serviced, the FS circuit must be checked to determine that the circuit is properly functioning, following the FS CIRCUIT CHECK procedure in this manual.
3. 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.
4. 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; non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.
4. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, screwheads, metal overlays, control shafts etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a 120V AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner:

   Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 µF, AC type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and 0.15 µF capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.3 volts rms. This corresponds to 0.2 milliamp. AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



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 (FOR 13”, 14”, 19”, 20”)

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

1. Color Purity
2. Convergence
3. White Balance

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

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

COLOR PURITY ADJUSTMENT

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

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

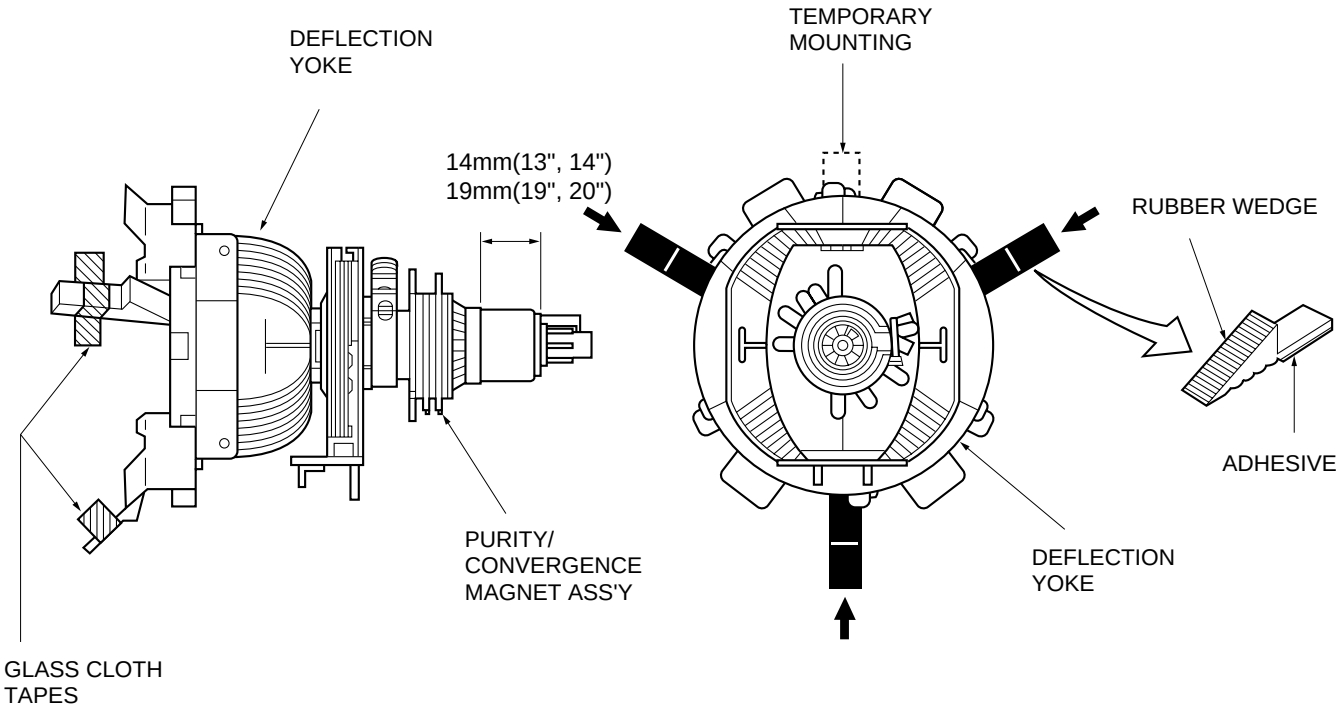


Figure 1.

CONVERGENCE ADJUSTMENTS

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

■ CENTER CONVERGENCE ADJUSTMENT

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

■ CIRCUMFERENCE CONVERGENCE ADJUSTMENT

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

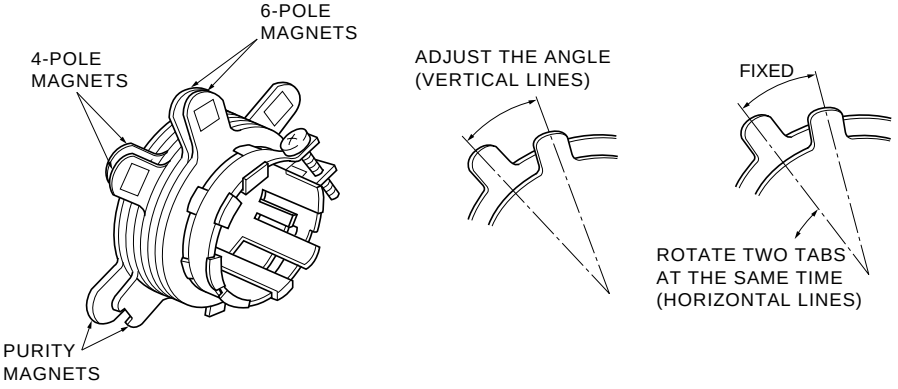
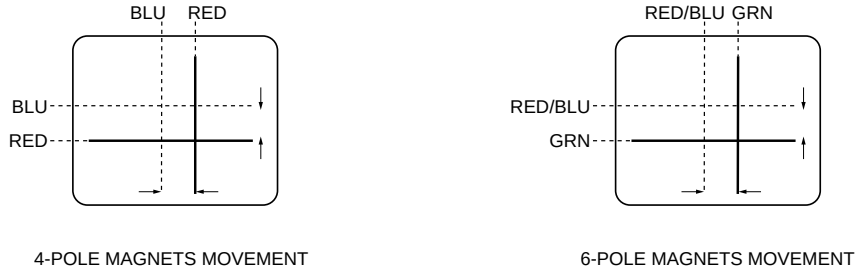


Figure 2.



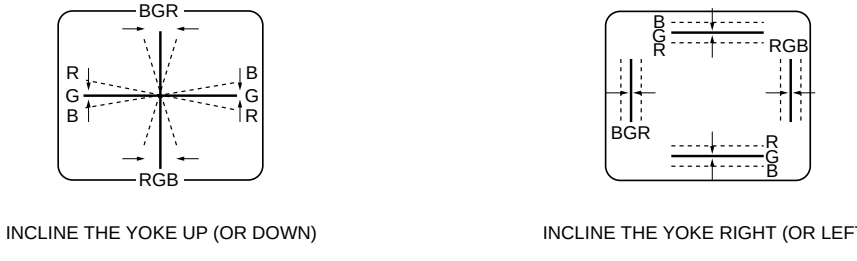


Figure 3. Dot Movement Pattern

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

(FOR 35", 36")

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

1. Color Purity
2. Convergence
3. White Balance

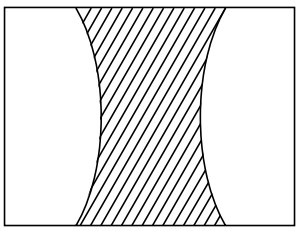
Note: The PURITY/CONVERGENCE MAGNET assembly and rubber wedges need mechanical positioning. Refer to figure 1.
Mounting position of the purity magnet assembly should fit to same position as old one because slightly difference to the position depend on a kind of tube.

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

COLOR PURITY ADJUSTMENT

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

1. Evenly degauss the entire screen.
2. Set the CONTRAST and BRIGHTNESS Controls to the maximum.
3. Display built-in green raster using the TEST SIGNAL SELECTION function.
4. Loosen the clamp screw holding the deflection yoke (and remove the Rubber Wedges).
5. Slide the yoke forward or backward to provide vertical green belt (zone) in the picture screen.
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, center the raster vertically by adjusting the magnet as shown below.



Green Belt

7. Move the yoke slowly 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.
9. Put four wedges into the space between the picture tube and the yoke to hold the yoke in the adjusted position. (See figure 2.)
   Do not tilt the yoke by excessive insertion of the wedge.
10. Remove cover paper of wedge and stick wedges on the tube to fix the yoke in the adjusted position.
    Fix the wedges with glass cloth tapes.

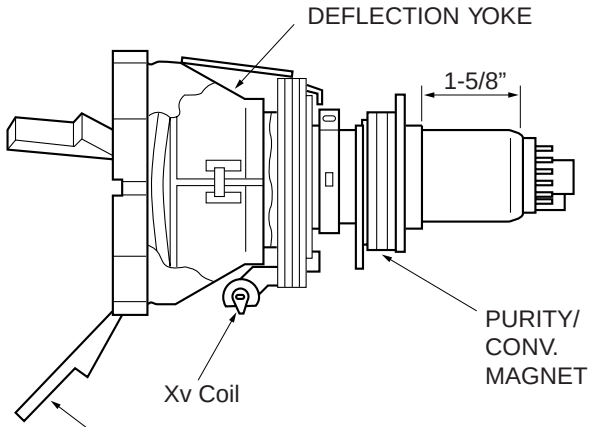


Figure 1.

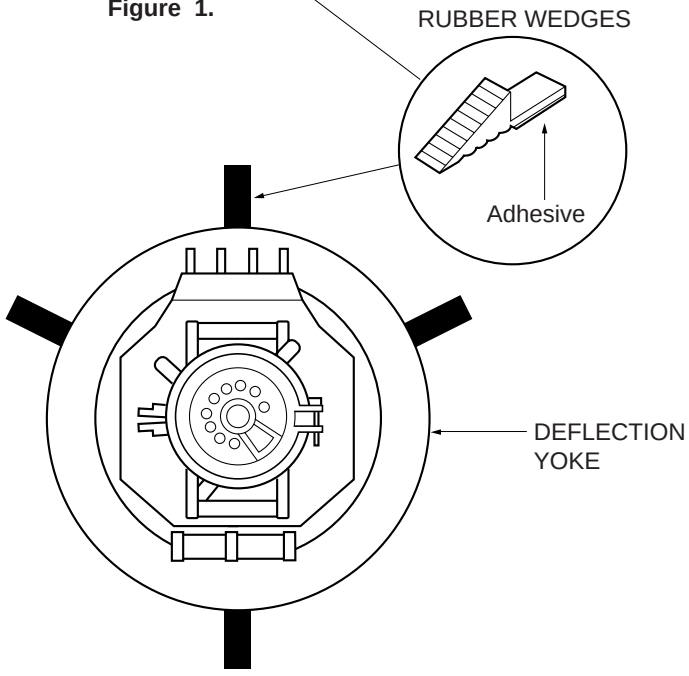


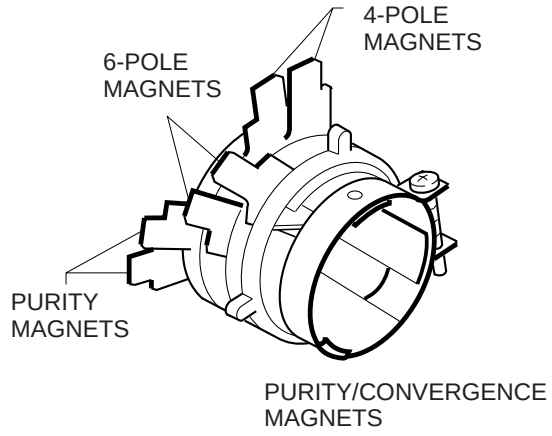
Figure 2.

CONVERGENCE ADJUSTMENTS

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

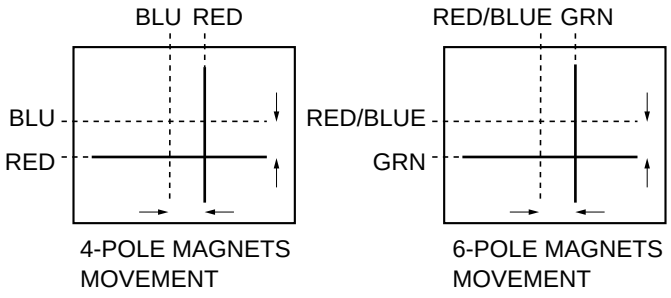
■ **CENTER CONVERGENCE ADJUSTMENT**

1. Display built-in cross-dot pattern using the TEST SIGNAL SELECTION function.
2. Adjust the BRIGHTNESS and CONTRAST Controls for well defined pattern.
3. Loosen the tightening ring and 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. (See figure 4.)
4. Turn the both tabs at the same time keeping the constant angle to superimpose red and blue horizontal lines at the centre of the screen. (See figure 4.)
5. Adjust two tabs of 6-Pole Magnets to superimpose red/blue line with 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 interact and make dot movement complex.
7. After completing the "CENTER CONVERGENCE ADJUSTMENT" tighten the tightening ring to fix the magnets.



ADJUSTMENT OF MAGNETS

Figure 3.



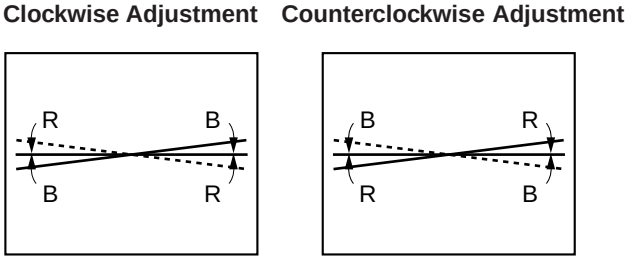
Center Convergence by Convergence Magnets

Figure 4.

■ **Xv COIL ADJUSTMENT**

Adjust the Xv coil (on the deflection yoke) to correct misconvergence at both sides on screen.

Use a hexagonal tip stick (plastic) to adjust the core of coil.

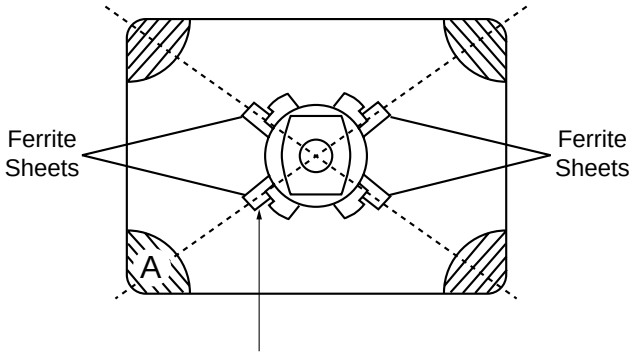


X_V Cross Pattern View

■ **SCREEN-CORNER CONVERGENCE**

When the misconvergence is still evident on corners even though the above adjustment is done, use the ferrite sheet (Part No. 23993622) to correct misconvergence.

1. Put ferrite sheets into the space under the yoke. Decide such position that misconvergence becomes minimum, watching picture screen. (See figure below.)
2. Remove cover paper of ferrite sheet to stick it in the place on the tube. Put adhesive tapes on ferrite sheets to fix.



SERVICE MODE

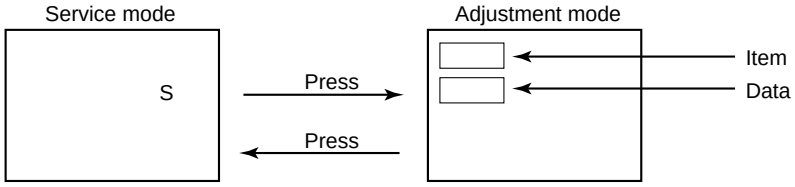
1. ENTERING TO SERVICE MODE

1) Press MUTE button once on Remote Control.
2) Press MUTE button again to keep pressing.
3) While pressing the MUTE 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:	TV (ANT)/VIDEO button (on TV)
Test signal selection :	TV (ANT)/VIDEO 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) :	RECALL+Channel button on TV (▲)
Initialization of the self diagnostic data:	RECALL+Channel button on TV (▼)

“RCUT” selection :	1 button
“GCUT” selection :	2 button
“BCUT” selection :	3 button
“SCNT” selection :	4 button
“COLC” selection :	5 button
“TNTC” selection :	6 button
Self diagnostic display ON/OFF :	9 button

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 17)

5. ADJUSTING THE DATA

1) Pressing of VOLUME ▲ or ▼ 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

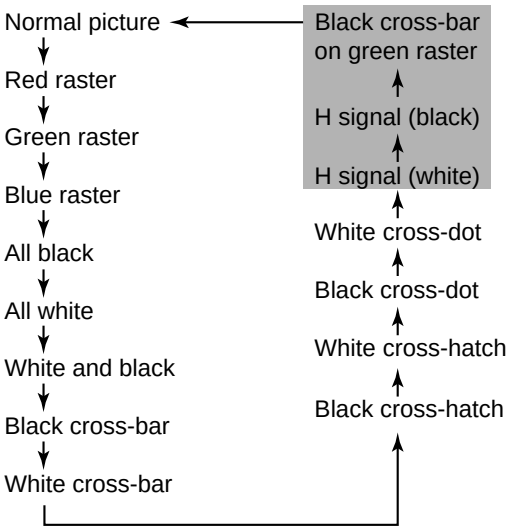
After replacing QA02, the following initialization is required.

1. Enter the service mode, then select any register item.
2. Press and hold the RECALL 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 “Programming Channel Memory” on the owner’s manual.

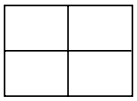
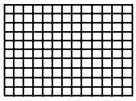
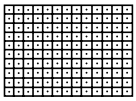
CAUTION: Never attempt to initialize the data unless QA02 has been replaced.

7. TEST SIGNAL SELECTION

1) Every pressing of TV/VIDEO button on the Remote Control in the Service mode, changes the built-in test patterns on screen in the following order.



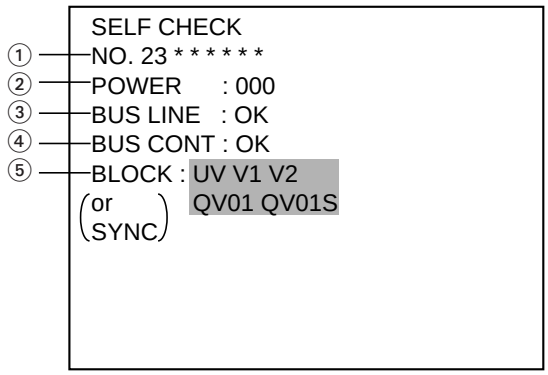
Note: If the video cable is connected to the VIDEO1 INPUT jack, the built-in pattern signals are not displayed.

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

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

8. SELF DIAGNOSTIC FUNCTION

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



① Part number of microprocessor (QA01)
② Operation number of protection circuit (current limiter) . . . . “000” is normal.
③ BUS line check
- “OK” ..... Normal
- “NG” ..... SCL-GND or SAD-GND short circuit

④ BUS line ACK (acknowledge) check
- “OK” ..... Normal

Display of Location Number . . . . NG
(Display example)
“QA02 NG”, “H001 NG”, “Q501 NG” etc.

Note: The indication of failure place is only one place though failure places are plural. When repair of a failure place finishes, the next failure place is indicated. (The order of priority of indication is left side.)

⑤ Sync. signal check
- Green display ..... Normal
- Cyan display ..... No check
- Red display ..... NG

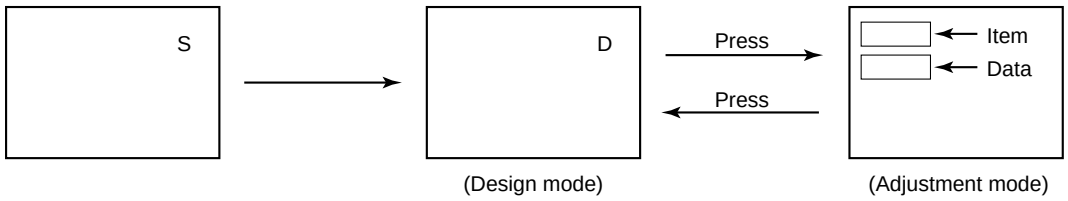
UV ..... TV mode
V1 ..... VIDEO 1 mode
V2 ..... VIDEO 2 mode

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

DESIGN MODE

1. ENTERING TO DESIGN MODE

1) Select the Service mode. 2) While pressing RECALL button on Remote and press MENU button on TV. 3) Press MENU button on TV.



When QA02 is initialized, items “OPT0” and “OPT1” and "OPT2" 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” and "OPT2".

2. SELECTING THE ADJUSTING ITEMS

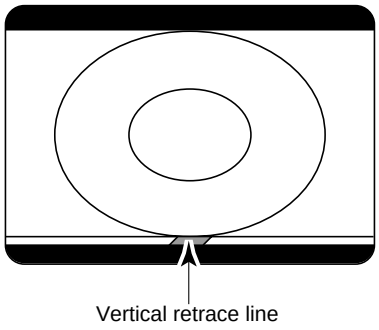
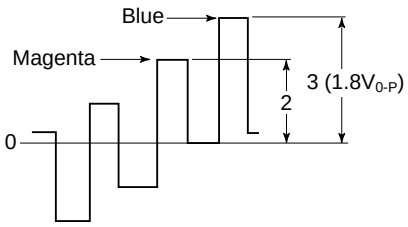
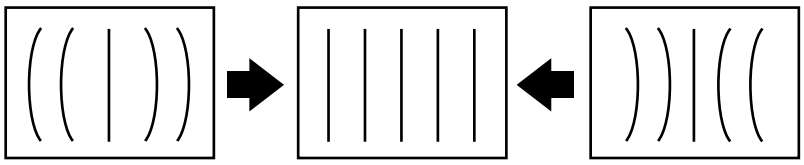
Every pressing of CHANNEL ▼ button in the design mode changes the adjustment items in the order of table-3.
(▲ button for reverse order)

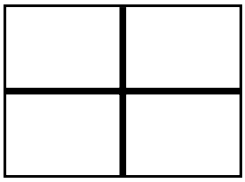
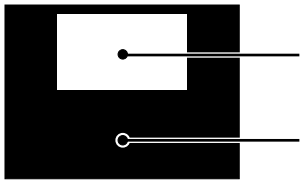
Refer to table-3 for data of design mode.
(See SETTING & ADJUSTING DATA on page 17)

3. ADJUSTING THE DATA

Pressing of VOLUME ▲ or ▼ button will change the value of data.

ELECTRICAL ADJUSTMENT

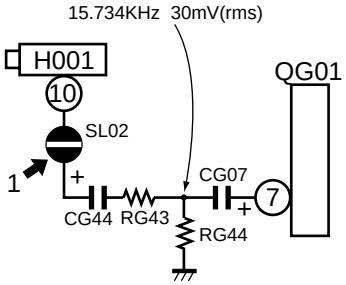
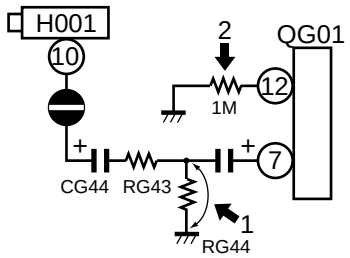
ITEM	ADJUSTMENT PROCEDURE
FOCUS VR ADJ	1. Enter the service mode, then select any register item. 2. Press the TV/VIDEO button on the Remote until the black cross-bar pattern appears on the screen. 3. Adjust the FOCUS control (on T461) for well defined scanning lines on the picture screen.
SUB-BRIGHTNESS (BRTC)	1. Constrict the picture height until the vertical retrace line appears adjusting the HEIGHT control on the MAIN board. 2. Adjust the CONTRAST to the minimum and BRIGHTNESS to the center. 3. Enter the service mode, then select "**BRTC**" register. 4. Adjust the data value so the belt of vertical retrace line just disappear. 5. Adjust the CONTRAST for the desired contrast. 6. Adjust the HEIGHT control. 
SUB-COLOR (COLC) SUB-TINT (TNTC)	1. Receive color-bar signal from color-bar generator. 2. Press the RESET button. 3. Connect oscilloscope to base of Q906 on CRT-D board. 4. Enter the service mode, then select "**COLC**". 5. Adjust the SUB-COLOR by pressing the VOLUME ▲ or ▼ button to achieve about $1V_{0\text{-}p}$ of blue bar. 6. Select "**TNTC**" register. 7. Adjust the data value to obtain the blue bar to magenta bar ratio of 3:2 as shown. 8. Select "**COLC**" register. 9. Adjust the data value to achieve $1.8V_{0\text{-}p}$ of blue bar on scope. 10. Check the picture with off-air signal. 
WIDTH (WID)	1. Call up the adjustment mode display, then select the item **WID**. 2. Press the VOLUME ▲ or ▼ button to get the picture so the left and right edges of raster begins to lack. 3. Press the VOLUME ▲ or ▼ button to advance the data by 7 steps. Note : Check the horizontal picture position is correct.
E-W PARABOLA (DPC)	1. Call up the adjustment mode display, then select the item **DPC**. 2. Press the TV/VIDEO button on Remote until the cross-hatch pattern appears on the screen. 3. Press the VOLUME ▲ or ▼ button to make vertical lines straight as shown below. 

<table>
<tr><th>ITEM</th><th>ADJUSTMENT PROCEDURE</th></tr>
<tr><td>HORIZONTAL POSITION
(HPOS)
VERTICAL POSITION
(VPOS)</td><td>1. Call up the adjustment mode display, then select the item HPOS or VPOS.
2. Press the TV/VIDEO button on Remote until the white cross-bar or black cross-bar pattern appears on the screen.
3. Adjust the HORIZONTAL and VERTICAL position alternately by pressing the VOLUME ▲ or ▼ button for proper picture position.
4. Check the picture with off-air signal.
  </td></tr>
<tr><td>HEIGHT
(HIT)</td><td>1. Call up the adjustment mode display, then select the item HIT.
2. Press the VOLUME ▲ or ▼ button to get the picture so the top of raster begins to lack.
3. Press the VOLUME ▲ button to advance the data by 9 steps.
Note : Check the vertical picture position is correct.</td></tr>
<tr><td>WHITE BALANCE
(RCUT)
(GCUT)
(BCUT)
(GDRV)
(BDRV)</td><td>1. Adjust the CONTRAST control to the center, and BRIGHTNESS control to the maximum.
2. Call up the adjustment mode display, and press the TV/VIDEO button on Remote until the white and black pattern appears on the screen.
3. Adjust the following item with the CHANNEL ▲/▼ and VOLUME ▲/▼ buttons.
RCUT ⟶ Data : 40H
GCUT ⟶ Data : 40H
BCUT ⟶ Data : 40H
GDRV ⟶ Data : 40H
BDRV ⟶ Data : 40H
4. Press the TV/VIDEO button on TV to display a single horizontal line on the screen.
5. Turn the SCREEN control (FBT) fully counterclockwise and gradually rotate clockwise until the first horizontal line appears slightly on the screen.
6. Press the TV/VIDEO button to display the normal picture.
7. Adjust the remaining two “?CUT” items (CHANNEL ▲/▼ → TV/VIDEO → VOLUME ▲/▼ in order) to obtain the slightly lighted horizontal line in the same levels of three (red, green, blue) colors. The line should be white if the adjustments are proper.
 
Bright area
Adjust "GDRV" or "BDRV" to be white.
Dark area
Fine adjust "RCUT", "GCUT" or "BCUT" to be black.</td></tr>
<tr><td>PIP SUB-BRIGHTNESS
(PBOF)</td><td rowspan="3">Adjust to match the PIP screen to the brightness, white balance and tint of the main picture.</td></tr>
<tr><td>PIP WHITE BALANCE
(PGOF, PROF)</td></tr>
<tr><td>PIP SUB-TINT
(PHUE)</td></tr>
</table>

MTS ADJUSTMENT (FOR N1N CHASSIS)

No.	ITEM	INPUT SIGNAL	ADJUSTMENT PROCEDURE
1	STEREO VCO (STVC)	• No signal	1. Display item **STVC**, and connect pin 9 of H002 to ground. 2. Connect frequency counter to pin 12 of H002. 3. Change data by Volume ▲/▼ buttons so that the reading of counter becomes value as close as 4fH (62.936kHz).
2	SAP VCO (SAVC)	• 78.670kHz 147mVrms → pin 9 of H002 • Monaural signal → ANT	1. Display item SAVC. 2. Change data by Volume ▲/▼ buttons so that the data becomes in the center of range for STA7=0 and STA8=1. SAVC 88H STA7:0 STA8:1
3	STEREO FILTER (STRF)	• 9.4kHz 600mVrm → pin 9 of H002 Monaural signal → ANT	1. Display item **STRF** on screen. 2. Change data by Volume ▲/▼ buttons so that the data becomes in the center of range for STA3=1. STRF 16H STA3:1
4	SAP FILTER (SAPF)	• 88kHz 110mVrms → pin 9 of H002 • Monaural signal → ANT	1. Display item **SAPF**. 2. Change data by Volume ▲/▼ buttons so that the data becomes in the center of range for STA4=1. SAPF 98H STA4:1
5	ATTENUATOR (ATT)	• 1kHz 30% mod. → ANT terminal	1. Connect rms meter to pin 12 of H002. 2. Display item **ATT** on screen. 3. Change data by Volume ▲/▼ buttons so that output at pin 12 of H002 becomes value as close as 130mVrms.
6	STEREO SEPARATION (WBAN)	• STEREO 300Hz R-channel only → ANT	1. Select “STEREO” mode from the MTS function in the Audio menu. 2. Display item **WBAN** on screen. 3. Connect oscilloscope to pin 14 of H002. 4. Change data by Volume ▲/▼ buttons so that 300Hz element on scope becomes minimum.
	(SPEC)	• STEREO 3kHz R-channel only → ANT	5. Display item **SPEC** on screen. 6. Change data by Volume ▲/▼ buttons so that 3kHz element on scope becomes minimum.

MTS ADJUSTMENT (FOR N0ES CHASSIS)

No.	ITEM	INPUT SIGNAL	ADJUSTMENT PROCEDURE
1	ATTENUATOR (ATT)	• 1kHz 30% mod. → ANT terminal	1. Connect rms meter to pin 34 of QG01. 2. Display item **ATT** on screen. 3. Change data by VOLUME ▲/▼ buttons so that the reading of meter becomes value as close as 137mVrms.
2	STEREO VCO (STVC)	• No signal	1. Short circuit RG44 with a jumper wire. 2. Display item **STVC** on screen. 3. Connect frequency counter to pin 34 of QG01. 4. Change data by VOLUME ▲/▼ buttons so that the reading of counter becomes value as close as 15.73kHz.
3	STEREO FILTER (STRF)	• 15.734kHz 30mV(rms) 	1. Unsolder the solder link SL02. 2. Display item **STRF** on screen. 3. Connect oscilloscope to pin 34 of QG01. 4. Change data by VOLUME ▲/▼ button to minimize AC output level on scope. 5. Resolder SL02.
4	STEREO SEPARATION (WBAN)	• STEREO 300Hz R-channel only → ANT	1. Display item **WBAN** on screen. 2. Connect oscilloscope to pin 35 of QG01. 3. Change data by VOLUME ▲/▼ buttons so that 300Hz element on scope becomes minimum.
	(SPEC)	• STEREO 3kHz R-channel only → ANT	4. Display item **SPEC** on screen. 5. Change data by Volume ▲/▼ buttons so that 3kHz element on scope becomes minimum.
5	SAP VCO (SAVC)	• No signal 	1. Shortcircuit RG44 with a short jumper. 2. Connect 1Mohm resistor between pin 12 of QG01 and ground. 3. Display item **SAVC** on screen. 4. Connect frequency counter to pin 34 of QG01. 5. Change data by VOLUME ▲/▼ buttons so that the reading of counter becomes value as close as 78.67kHz. 6. Remove the short jumper and 1M ohm resistor.

CIRCUIT CHECKS

HIGH VOLTAGE CHECK

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

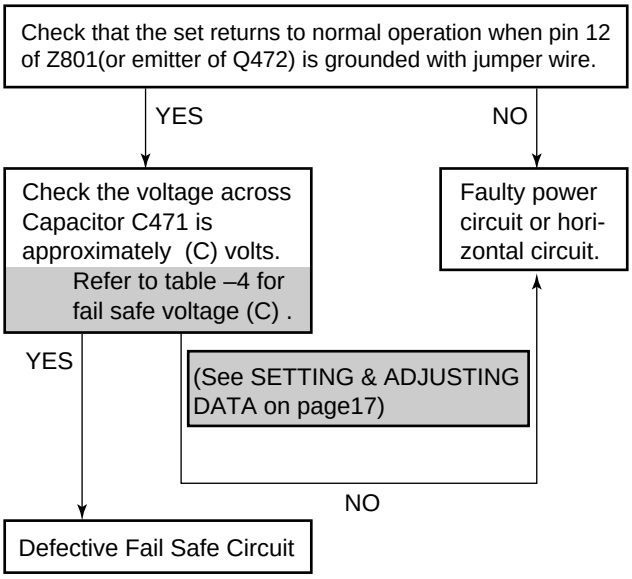
1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage must be measured below (B) kV.
   Refer to table-1 for high voltage (B).
   (See SETTING & ADJUSTING DATA on page 17)
4. Vary the BRIGHTNESS control to both extremes to be sure the high voltage does not exceed the limit under any conditions.

FS CIRCUIT CHECK

The Fail Safe (FS) circuit check is indispensable for the final check in servicing. Checking should be done following the steps below.

1. Turn the receiver on and press the RESET button.
2. Temporarily short TP-(R) and TP-(X) with a jumper wire. Raster and sound will disappear.
3. The receiver must remain in this state even after removing the jumper wire. This is the evidence that the FS circuit is functioning properly.
4. To obtain a picture again, temporarily turn the receiver off and allow the FS circuit more than 5 seconds to reset. Then turn the power switch on to produce a normal picture.

Troubleshooting Guide for Fail Safe Circuit



CHAPTER 2 SPECIFIC INFORMATIONS

SETTING & ADJUSTING DATA

【SAFETY INSTRUCTIONS】

		27"
HIGH VOLTAGE AT ZERO BEAM:	(A)	28.3kV
MAX HIGH VOLTAGE:	(B)	29.7kV

Table-1

【SERVICE MODE】

ADJUSTING ITEMS AND DATAS IN THE SERVICE MODE:

Item	Name of adjustment	Preset	Data
RCUT	R CUTOFF	40H	←
GCUT	G CUTOFF	40H	←
BCUT	B CUTOFF	40H	←
GDRV	G DRIVE	40H	←
BDRV	B DRIVE	40H	←
SCNT	SUB-CONTRAST	08H	←
BRTC	SUB-BRIGHT	40H	←
COLC	SUB-COLOR	40H	←
TNTC	SUB-TINT	40H	←
SAVC	SAP VCO	88H	←
ATT	ATTENUATOR	08H	←
SAPF	SAP FILTER	88H	←
STVC	STEREO VCO	1CH	←
STRF	STEREO FILTER	16H	←
SPEC	SPECTRAL	30H	←
WBAN	STEREO SEPARATION	22H	←
HPOS	HORIZ. POSITION	16H	←
VPOS	VERT. POSITION	03H	←

Item	Name of adjustment	Preset	Data
HIT	HEIGHT	1EH	←
LIN	V-LINEARITY	06H	06H
VSC	V-S CORRECTION	04H	02H
VPS	V-SHIFT	1BH	←
VCP	V-COMPENSATION	03H	←
WID	PICTURE WIDTH	18H	18H
DPC	E-W PARABOLA (DPC)	0AH	0AH
CNR	E-W CORNER	07H	07H
TRAP	TRAPEZIUM	09H	09H
HCP	H-COMPENSATION	00H	←
VFC	V-F CORRECTION	0FH	←
PCOL	PIP COLOR	0FH	←
PHUE	PIP TINT	11H	←
DAC	DAC	03H	←
PGOF	PIP	36H	←
PROF	PIP	17H	←
PBOF	PIP	17H	←
RGBB	RGB BRIGHT	0BH	←

Table-2

【DESIGN MODE】

ADJUSTING ITEMS AND DATAS IN THE DESIGN MODE:

Item	Name of adjustment	Preset Data	Data	Remarks
OPT1	OPTION1	84H	84H	
OPT2	OPTION2	01H	02H	

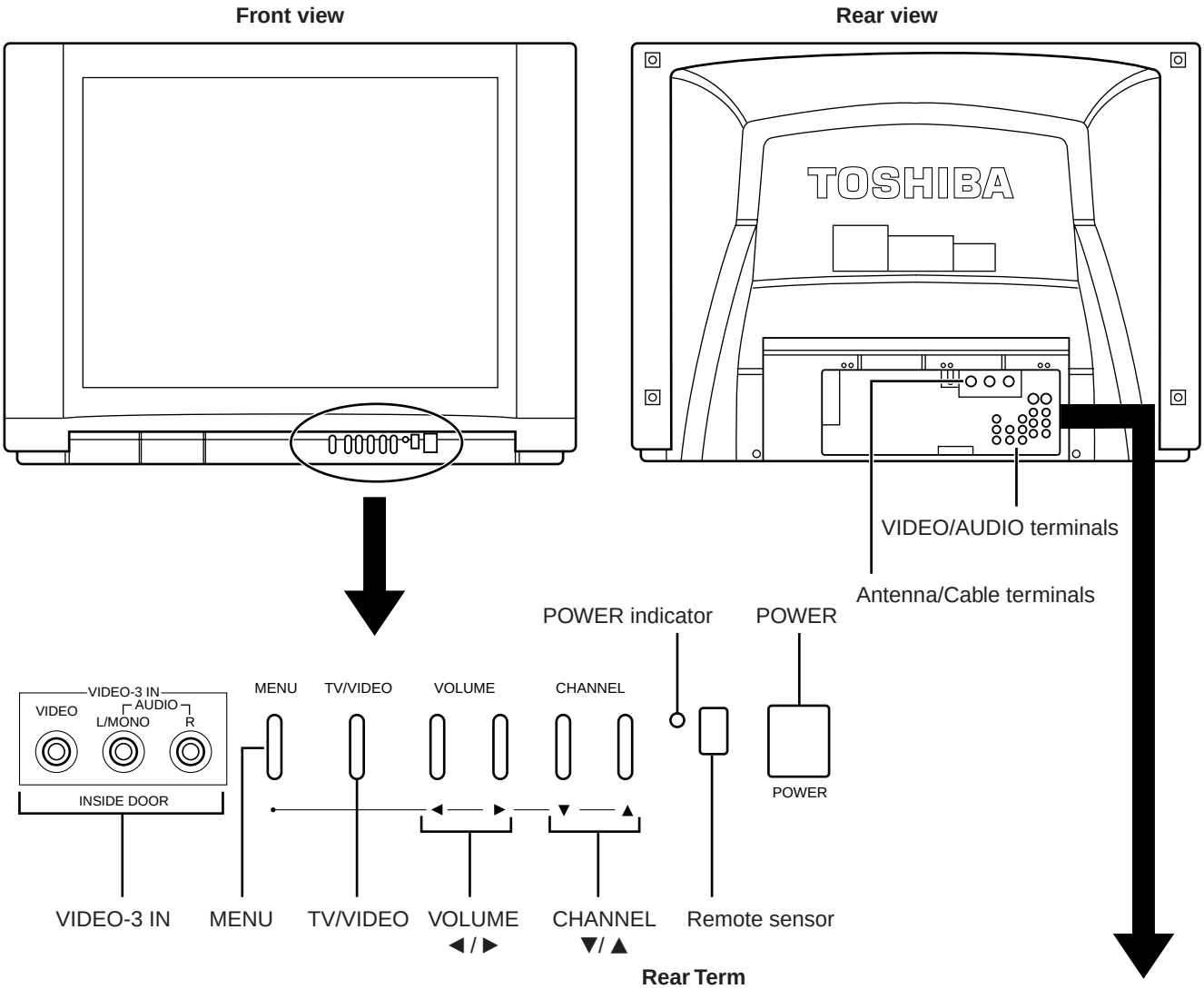
Table-3

【CIRCUIT CHECKS】

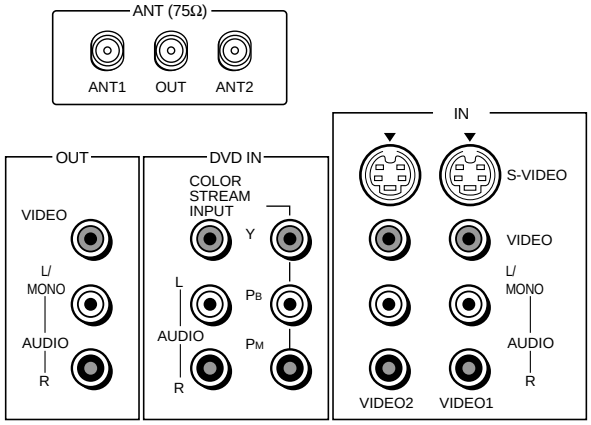
		27"
FBT DETECTION VOLTAGE	(C)	21.5 V

Table-4

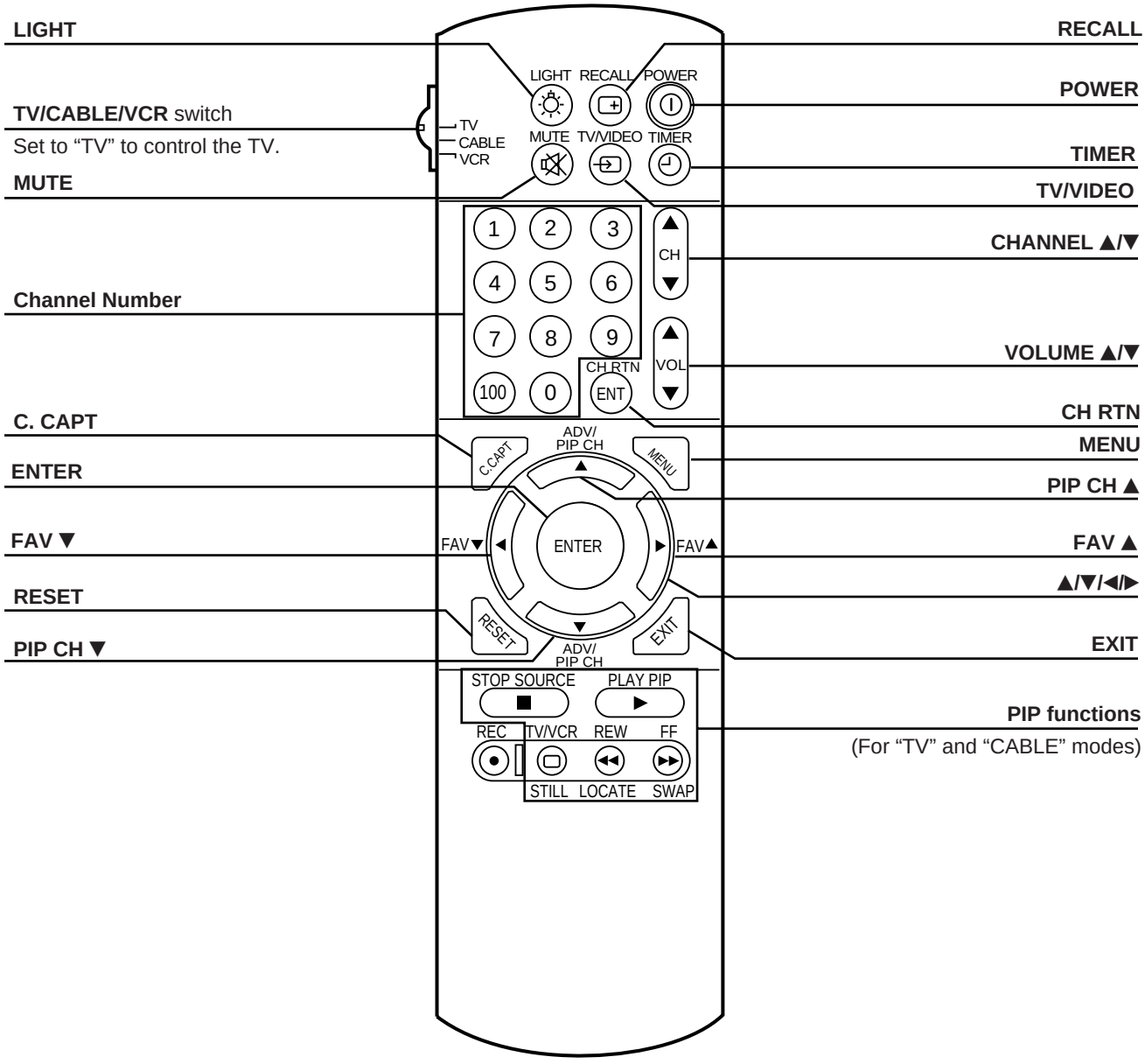
LOCATION OF CONTROLS (Representative: 27AF61)



Rear Term



Remote Control



PROGRAMMING CHANNEL MEMORY

The channel memory is the list of TV channel numbers your TV will stop on when you press the CHANNEL ▲ or ▼ button.
First, use the TV/CABLE and CH PROGRAM functions to preset all active channels in your area automatically.
If necessary, arrange the preset channels with the ADD/ERASE functions so that you can tune into only desired channels.
Note: If you utilize both ANT-1 and ANT-2 terminals for some model, perform programming channels for each input source.

TV/CABLE function

1. Press **MENU**, then press ► or ◄ until the SET UP menu appears.
2. Press ▼ (or ▲) until “TV/CABLE” is highlighted.
3. Press ► or ◄ to highlight either “TV” or “CABLE”, whichever you use.

CH PROGRAM function

1. Select “CH PROGRAM” following steps 1 and 2 above.
2. Press ► or ◄ to start channel programming.
   The TV will automatically cycle through all the TV or CABLE channels selected by the TV/CABLE function, and store active channels in the channel memory.
3. When channel programming is complete, you will see the message to the right appears.
4. Press **CHANNEL** ▲ or ▼ to make sure the channel programming has been done properly.

ADD/ERASE function

After performing the CH PROGRAM function, you can add or erase specific channels.

1. Select the channel you want to erase using the **CHANNEL** ▲ or ▼ button, or select the channel you want to add using the **Channel Number** buttons.
2. Press **MENU**, then press ► or ◄ until the SET UP menu appears.
3. Press ▼ (or ▲) until “ADD/ERASE” is highlighted.
4. Press ► or ◄ :
   To erase the channel
   Press the button until “ERASE” is highlighted.

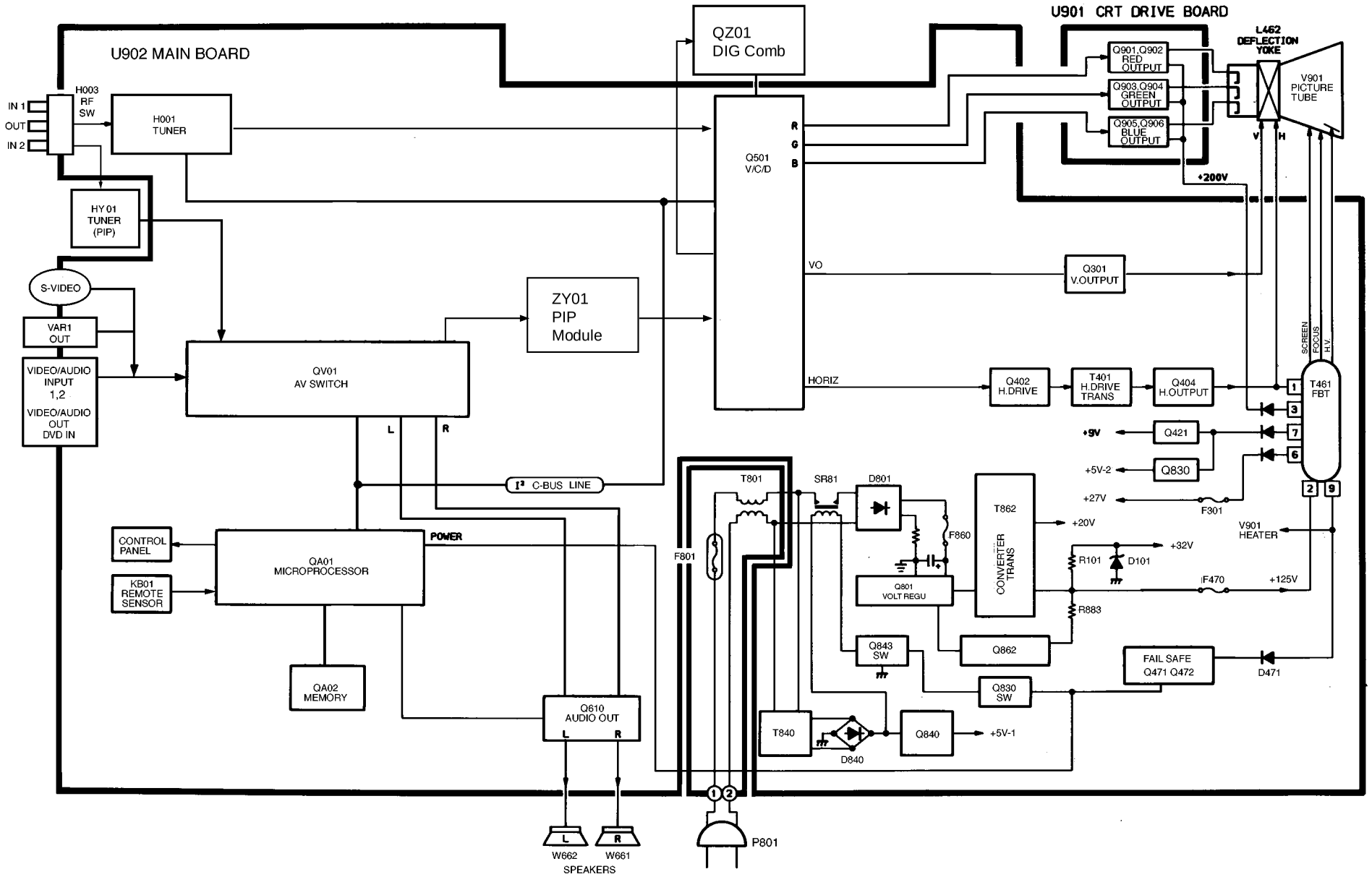
   To add the channel
   Press the button until “ADD” is highlighted.
5. Repeat steps 1 to 4 for other channels.

You have now completed the channel programming.

Note: The CHANNEL ▼/▲ buttons on the TV function as the ▼/▲ buttons while a menu is on the screen.

*Please refer to owner's manual in detil.

CIRCUIT BLOCK DIAGRAM



CHASSIS AND CABINET REPLACEMENT PARTS LIST

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

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

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

Model : 27AF61, 27AF41

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		
C102	24793221	EL, 220μF, ±20%, 10V
C105	24212102	CD, 1000pF, ±10%
C106	24797479	EL, 4.7μF, ±20%, 50V
C107	24763221	EL, 220μF, ±20%, 16V
C110	24794470	EL, 47μF, ±20%, 16V
C112	24793221	EL, 220μF, ±20%, 10V (27AF61)
C115	24212102	CD, 1000pF, ±10% (27AF61)
C117	24763221	EL, 220μF, ±20%, 16V (27AF61)
C150	24794101	EL, 100μF, ±20%, 16V (27AF61)
C201	24503041	PF, 0.1μF, 63V
C204	24797010	EL, 1μF, ±20%, 50V
C205	24794100	EL, 10μF, ±20%, 16V
C207	24436270	CD, 27pF
C208	24436270	CD, 27pF
C209	24436270	CD, 27pF
C216	24206108	EL, 0.1μF, ±20%, 50V (27AF61)
C216	24797100	EL, 10μF, ±20%, 50V (27AF41)
C220	24539474	PF, 0.47μF
C221	24232103	CD, 0.01μF, +80%, -20%
C222	24232103	CD, 0.01μF, +80%, -20%
C223	24232103	CD, 0.01μF, +80%, -20%
C224	24503041	PF, 0.1μF, 63V
C225	24503041	PF, 0.1μF, 63V
C226	24503041	PF, 0.1μF, 63V
C245	24797470	EL, 47μF, ±20%, 50V (27AF61)
C245	24206108	EL, 0.1μF, ±20%, 50V (27AF41)
C261	24503041	PF, 0.1μF, 63V
C262	24503041	PF, 0.1μF, 63V
C263	24503041	PF, 0.1μF, 63V
C300	24503041	PF, 0.1μF, 63V
C304	24693473	PF, 0.047μF, 100V
C306	24073059	EL, 3300μF, ±20%, 25V
C308	24797221	EL, 220μF, ±20%, 50V
C310	24073094	EL, 1000μF, ±20%, 50V
C312	24503037	PF, 0.047μF, 63V

Location No.	Part No.	Description
C313	24082057	PF, 0.22μF, 100V
C314	24793101	EL, 100μF, ±20%, 10V
C316	24212222	CD, 2200pF, ±10%
C317	24214471	CD, 470pF, ±10%, 500V
C318	24073041	EL, 470μF, ±20%, 16V
C319	24212102	CD, 1000pF, ±10%
C320	24669101	EL, 100μF, ±20%, 50V
C326	24503041	PF, 0.1μF, 63V
C327	24436471	CD, 470pF
C328	24591433	PF, 0.043μF
C337	24797229	EL, 2.2μF, ±20%, 50V
C352	24617915	EL, 1μF, ±10%, 50V
C360	24793221	EL, 220μF, ±20%, 10V
C361	24794101	EL, 100μF, ±20%, 16V
C366	24693154	PF, 0.15μF, 100V
C370	24668101	EL, 100μF, ±20%, 35V
C371	24668100	EL, 10μF, ±20%, 35V
C391	24666100	EL, 10μF, ±20%, 16V
C393	24666100	EL, 10μF, ±20%, 16V
C396	24082825	PF, 1800pF, ±3%, 1800V
C399	24085981	EL, 10μF, ±20%, 16V, Non-Polar
C400	24503041	PF, 0.1μF, 63V
C403	24591103	PF, 0.01μF
C404	24797010	EL, 1μF, ±20%, 50V
C407	24503041	PF, 0.1μF, 63V
C409	24763221	EL, 220μF, ±20%, 16V (27AF61)
C410	24232103	CD, 0.01μF, +80%, -20%
C413	24214821	CD, 820pF, ±10%, 500V
C415	24567273	PF, 0.027μF
C416	24678010	EL, 1μF, ±20%, 200V
C417	24214391	CD, 390pF, ±10%, 500V
C421	24794101	EL, 100μF, ±20%, 16V
C430	24232103	CD, 0.01μF, +80%, -20%
C431	24794101	EL, 100μF, ±20%, 16V
C439	24829433	PF, 0.043μF, 400V
⚠ C440	24082592	PF, 1000pF, ±3%, 1800V
C441	24082917	PF, 0.3μF, 315V
⚠ C442	24082924	PF, 0.56μF, 315V
⚠ C443	24082609	PF, 5100pF, ±3%, 1800V

Location No.	Part No.	Description
⚠C444	24082616	PF, 0.03μF, ±3%, 1800V
C445	24828563	PF, 0.056μF, 200V
C446	24679100	EL, 10μF, ±20%, 250V
C448	24640962	EL, 33μF, ±20%, 200V
C449	24666102	EL, 1000μF, ±20%, 16V
C450	24829473	PF, 0.047μF, 400V
C453	24092344	CD, 820pF, ±10%, 2kV
⚠C461	24082923	PF, 0.51μF, 315V
C463	24212152	CD, 1500pF, ±10%
C464	24640872	EL, 10μF, ±20%, 100V
C465	24212472	CD, 4700pF, ±10%
⚠C467	24820243	PF, 0.024μF, 630V
⚠C469	24820243	PF, 0.024μF, 630V
C471	24797479	EL, 4.7μF, ±20%, 50V
C473	24797479	EL, 4.7μF, ±20%, 50V
C474	24797479	EL, 4.7μF, ±20%, 50V
C476	24829273	PF, 0.027μF, 400V
C480	24747220	EL, 22μF, ±20%, 50V
C481	24503049	PF, 0.47μF, 63V
C482	24797478	EL, 0.47μF, ±20%, 50V
C499	24212102	CD, 1000pF, ±10%
C501	24436102	CD, 1000pF
C504	24591222	PF, 2200pF
C505	24353120	CD, 12pF, CH
C510	24763101	EL, 100μF, ±20%, 16V
C511	24232103	CD, 0.01μF, +80%, -20%
C512	24206228	EL, 0.22μF, ±20%, 50V
C582	24232103	CD, 0.01μF, +80%, -20%
C583	24762471	EL, 470μF, ±20%, 10V
C612	24794470	EL, 47μF, ±20%, 16V
C613	24232103	CD, 0.01μF, +80%, -20%
C661	24212102	CD, 1000pF, ±10%
C662	24212102	CD, 1000pF, ±10%
C663	24666100	EL, 10μF, ±20%, 16V
C671	24795470	EL, 47μF, ±20%, 25V
C672	24795470	EL, 47μF, ±20%, 25V
C673	24669229	EL, 2.2μF, ±20%, 50V
C674	24669229	EL, 2.2μF, ±20%, 50V
C675	24669229	EL, 2.2μF, ±20%, 50V
C676	24503041	PF, 0.1μF, 63V
C677	24503041	PF, 0.1μF, 63V
C678	24669229	EL, 2.2μF, ±20%, 50V
C679	24795470	EL, 47μF, ±20%, 25V
C681	24667102	EL, 1000μF, ±20%, 25V
C682	24668471	EL, 470μF, ±20%, 35V
C683	24667102	EL, 1000μF, ±20%, 25V
C704	24232103	CD, 0.01μF, +80%, -20%
C705	24232103	CD, 0.01μF, +80%, -20%
C707	24794101	EL, 100μF, ±20%, 16V
C713	24709100	EL, 10μF, ±20%, 200V
C714	24436101	CD, 100pF
C715	24214472	CD, 4700pF, ±10%, 500V
C716	24436101	CD, 100pF
C717	24214472	CD, 4700pF, ±10%, 500V
C718	24794470	EL, 47μF, ±20%, 16V
C719	24435560	CD, 56pF, 500V
C720	24709100	EL, 10μF, ±20%, 200V
C721	24794470	EL, 47μF, ±20%, 16V
C722	24436561	CD, 560pF
C726	24212102	CD, 1000pF, ±10%
C801	24503002	PF, 0.22μF, ±20%, AC275V
C802	24503001	PF, 0.1μF
C805	24092623	CD, 0.01μF, +80%, -20%, AC250V

Location No.	Part No.	Description
C806	24092623	CD, 0.01μF, +80%, -20%, AC250V
C808	24667221	EL, 220μF, ±20%, 25V
C810	24086057	EL, 680μF, ±20%, 200V
C811	24092597	CD, 4700pF, ±20%, AC250V
C811A	23960136	Adhesive, TSE3843-W
C812	24092597	CD, 4700pF, ±20%, AC250V
C813	24092597	CD, 4700pF, ±20%, AC250V
C815	24092597	CD, 4700pF, ±20%, AC250V
C816	24092597	CD, 4700pF, ±20%, AC250V
C817	24092339	CD, 330pF, ±10%, 2kV
C818	24082402	PF, 2200pF, ±3%, 1250V
C821	24214471	CD, 470pF, ±10%, 500V
C822	24503041	PF, 0.1μF, 63V
C823	24212471	CD, 470pF, ±10%
C829	24591681	PF, 680pF
C832	24794470	EL, 47μF, ±20%, 16V
C840	24795221	EL, 220μF, ±20%, 25V
C842	24792101	EL, 100μF, ±20%, 6.3V
C843	24797479	EL, 4.7μF, ±20%, 50V
C850	24794470	EL, 47μF, ±20%, 16V
C884	24086049	EL, 330μF, ±20%, 160V
C886	24214471	CD, 470pF, ±10%, 500V
C889	24796222	EL, 2200μF, ±20%, 35V
C891	24591223	PF, 0.022μF
C893	24092339	CD, 330pF, ±10%, 2kV
C898	24539224	PF, 0.22μF
C902	24092345	CD, 1000pF, ±10%, 2kV
C904	24436681	CD, 680pF
C905	24436681	CD, 680pF
C907	24436681	CD, 680pF
C909	24679220	EL, 22μF, ±20%, 250V
C910	24797478	EL, 0.47μF, ±20%, 50V
C911	24203100	EL, 10μF, ±20%, 16V
C912	24794471	EL, 470μF, ±20%, 16V
C913	24794100	EL, 10μF, ±20%, 16V
C914	24212103	CD, 0.01μF, ±10%
C920	24232103	CD, 0.01μF, +80%, -20%
C921	24232103	CD, 0.01μF, +80%, -20%
C930	24214101	CD, 100pF, ±10%, 500V
C970	24794470	EL, 47μF, ±20%, 16V
C971	24794470	EL, 47μF, ±20%, 16V
C972	24794470	EL, 47μF, ±20%, 16V
C3319	24591103	PF, 0.01μF
C3322	24617912	EL, 2.2μF, ±10%, 50V
C3323	24503049	PF, 0.47μF, 63V
C3325	24591203	PF, 0.02μF
C3326	24212102	CD, 1000pF, ±10%
C3327	24073041	EL, 470μF, ±20%, 16V
C3360	24763471	EL, 470μF, ±20%, 16V
C3361	24503037	PF, 0.047μF, 63V
C3440	24082395	PF, 1100pF, ±3%, 1250V
C4463	24567224	PF, 0.22μF
CA13	24436470	CD, 47pF (27AF61)
CA13	24212101	CD, 100pF, ±10% (27AF41)
CA33	24232103	CD, 0.01μF, +80%, -20%
CA36	24212101	CD, 100pF, ±10%
CA37	24212101	CD, 100pF, ±10%
CA38	24212101	CD, 100pF, ±10%
CA42	24794100	EL, 10μF, ±20%, 16V
CA43	24232103	CD, 0.01μF, +80%, -20%
CA44	24232103	CD, 0.01μF, +80%, -20%
CA68	24794100	EL, 10μF, ±20%, 16V
CA69	24232103	CD, 0.01μF, +80%, -20%

Location No.	Part No.	Description
CB01	24797470	EL, 47μF, ±20%, 50V
CB41	24763221	EL, 220μF, ±20%, 16V
CB48	24436101	CD, 100pF
CD80	24794100	EL, 10μF, ±20%, 16V
CG02	24203220	EL, 22μF, ±20%, 16V
CG03	24503041	PF, 0.1μF, 63V
CG05	24797010	EL, 1μF, ±20%, 50V
CG06	24797479	EL, 4.7μF, ±20%, 50V
CG07	24206229	EL, 2.2μF, ±20%, 50V
CG08	24591473	PF, 0.047μF
CG09	24797478	EL, 0.47μF, ±20%, 50V
CG10	24503041	PF, 0.1μF, 63V
CG12	24206108	EL, 0.1μF, ±20%, 50V
CG14	24797010	EL, 1μF, ±20%, 50V
CG16	24704106	Tantalum, 10μF, ±20%, 16V
CG17	24797010	EL, 1μF, ±20%, 50V
CG18	24797010	EL, 1μF, ±20%, 50V
CG19	24797479	EL, 4.7μF, ±20%, 50V
CG20	24797010	EL, 1μF, ±20%, 50V
CG27	24591223	PF, 0.022μF
CG28	24797229	EL, 2.2μF, ±20%, 50V
CG29	24591102	PF, 1000pF
CG30	24206108	EL, 0.1μF, ±20%, 50V
CG31	24797229	EL, 2.2μF, ±20%, 50V
CG32	24591102	PF, 1000pF
CG33	24206108	EL, 0.1μF, ±20%, 50V
CG37	24206229	EL, 2.2μF, ±20%, 50V
CG38	24206229	EL, 2.2μF, ±20%, 50V
CG42	24206010	EL, 1μF, ±20%, 50V
CG44	24203100	EL, 10μF, ±20%, 16V
CG46	24203101	EL, 100μF, ±20%, 16V
CG60	24797220	EL, 22μF, ±20%, 50V
CG61	24797220	EL, 22μF, ±20%, 50V
CG62	24797229	EL, 2.2μF, ±20%, 50V
CG63	24797010	EL, 1μF, ±20%, 50V
CG65	24232103	CD, 0.01μF, +80%, -20%
CG66	24794470	EL, 47μF, ±20%, 16V
CG67	24085981	EL, 10μF, ±20%, 16V, Non-Polar
CG68	24794100	EL, 10μF, ±20%, 16V
CG69	24797479	EL, 4.7μF, ±20%, 50V
CG70	24794100	EL, 10μF, ±20%, 16V
CG71	24794100	EL, 10μF, ±20%, 16V
CG72	24794221	EL, 220μF, ±20%, 16V
CM51	24503041	PF, 0.1μF, 63V
CM58	24503041	PF, 0.1μF, 63V
CR01	24503041	PF, 0.1μF, 63V (27AF61)
CR02	24503041	PF, 0.1μF, 63V (27AF61)
CR03	24503041	PF, 0.1μF, 63V (27AF61)
CS02	24797229	EL, 2.2μF, ±20%, 50V
CS04	24797229	EL, 2.2μF, ±20%, 50V
CS08	24797229	EL, 2.2μF, ±20%, 50V
CS10	24797229	EL, 2.2μF, ±20%, 50V
CS14	24797229	EL, 2.2μF, ±20%, 50V
CS16	24797229	EL, 2.2μF, ±20%, 50V
CS25	24797229	EL, 2.2μF, ±20%, 50V
CS26	24797229	EL, 2.2μF, ±20%, 50V
CS40	24797010	EL, 1μF, ±20%, 50V
CS42	24797010	EL, 1μF, ±20%, 50V
CS43	24436331	CD, 330pF
CS44	24436331	CD, 330pF
CS45	24436331	CD, 330pF
CS46	24436331	CD, 330pF
CS47	24436331	CD, 330pF

Location No.	Part No.	Description
CS48	24436331	CD, 330pF
CS49	24436331	CD, 330pF
CS50	24436331	CD, 330pF
CS51	24212102	CD, 1000pF, ±10%
CS52	24212102	CD, 1000pF, ±10%
CS70	24794220	EL, 22μF, ±20%, 16V
CS71	24794220	EL, 22μF, ±20%, 16V
CS115	24206010	EL, 1μF, ±20%, 50V
CS116	24206010	EL, 1μF, ±20%, 50V
CS118	24794470	EL, 47μF, ±20%, 16V
CS120	24206010	EL, 1μF, ±20%, 50V
CS625	24797479	EL, 4.7μF, ±20%, 50V
CS626	24797479	EL, 4.7μF, ±20%, 50V
CS627	24797479	EL, 4.7μF, ±20%, 50V
CS628	24797479	EL, 4.7μF, ±20%, 50V
CS630	24794101	EL, 100μF, ±20%, 16V
CV03	24206108	EL, 0.1μF, ±20%, 50V
CV05	24232103	CD, 0.01μF, +80%, -20%
CV09	24503041	PF, 0.1μF, 63V
CV13	24206108	EL, 0.1μF, ±20%, 50V
CV15	24232103	CD, 0.01μF, +80%, -20%
CV24	24591473	PF, 0.047μF
CV25	24794220	EL, 22μF, ±20%, 16V
CV27	24206108	EL, 0.1μF, ±20%, 50V
CV29	24232103	CD, 0.01μF, +80%, -20%
CV31	24503041	PF, 0.1μF, 63V
CV38	24763471	EL, 470μF, ±20%, 16V
CV39	24232103	CD, 0.01μF, +80%, -20%
CV41	24591223	PF, 0.022μF
CV45	24232103	CD, 0.01μF, +80%, -20% (27AF61)
CV46	24794101	EL, 100μF, ±20%, 16V (27AF61)
CV47	24794100	EL, 10μF, ±20%, 16V (27AF61)
CV48	24232103	CD, 0.01μF, +80%, -20% (27AF61)
CV49	24794100	EL, 10μF, ±20%, 16V (27AF61)
CV60	24763471	EL, 470μF, ±20%, 16V
CV61	24762471	EL, 470μF, ±20%, 10V
CZ03	24092743	Chip, 0.47μF, +80%, -20%, 10V
CZ05	24109103	Chip, 0.01μF, ±10%
CZ07	24092730	Chip, 0.1μF, ±10%, 16V
CZ09	24105220	Chip, 22pF
CZ10	24105100	Chip, 10pF, ±0.5pF
CZ11	24105220	Chip, 22pF
CZ12	24109103	Chip, 0.01μF, ±10%
CZ13	24109103	Chip, 0.01μF, ±10%
CZ14	24203100	EL, 10μF, ±20%, 16V
CZ17	24109103	Chip, 0.01μF, ±10%
CZ19	24105181	Chip, 180pF
CZ20	24109103	Chip, 0.01μF, ±10%
CZ21	24109122	Chip, 1200pF, ±10%
CZ22	24203100	EL, 10μF, ±20%, 16V
CZ23	24109103	Chip, 0.01μF, ±10%
CZ24	24109103	Chip, 0.01μF, ±10%
CZ25	24203100	EL, 10μF, ±20%, 16V
CZ26	24109103	Chip, 0.01μF, ±10%
CZ28	24109103	Chip, 0.01μF, ±10%
CZ29	24109103	Chip, 0.01μF, ±10%
CZ30	24203100	EL, 10μF, ±20%, 16V
CZ31	24092730	Chip, 0.1μF, ±10%, 16V
CZ32	24105150	Chip, 15pF
CZ33	24105390	Chip, 39pF

Location No.	Part No.	Description
CZ34	24105150	Chip, 15pF
CZ35	24105390	Chip, 39pF
CZ37	24203100	EL, 10μF, ±20%, 16V
CZ38	24203100	EL, 10μF, ±20%, 16V
CZ41	24105470	Chip, 47pF
CZ42	24105470	Chip, 47pF
CZ45	24105100	Chip, 10pF, ±0.5pF

RESISTORS

R101	24382223	OMF, 22k ohm, 1W
R151	24366562	CF, 5600 ohm (27AF61)
R152	24366103	CF, 10k ohm (27AF61)
R201	24366102	CF, 1k ohm
R202	24366102	CF, 1k ohm
R203	24366474	CF, 470k ohm
R205	24366101	CF, 100 ohm
R206	24366102	CF, 1k ohm
R207	24366101	CF, 100 ohm
R208	24366101	CF, 100 ohm
R209	24366101	CF, 100 ohm
R216	24366223	CF, 22k ohm
R223	24366102	CF, 1k ohm
R228	24366473	CF, 47k ohm
R238	24366473	CF, 47k ohm
R239	24366274	CF, 270k ohm
R240	24366562	CF, 5600 ohm
R241	24366682	CF, 6800 ohm (27AF41)
R245	24366103	CF, 10k ohm (27AF61)
R245	24366104	CF, 100k ohm (27AF41)
R261	24366472	CF, 4700 ohm
R262	24366102	CF, 1k ohm
R263	24366472	CF, 4700 ohm
R264	24366102	CF, 1k ohm
R265	24366472	CF, 4700 ohm
R266	24366102	CF, 1k ohm
R271	24366101	CF, 100 ohm
R272	24366222	CF, 2200 ohm
R275	24366103	CF, 10k ohm
R302	24366222	CF, 2200 ohm
R303	24321109	MF, 1 ohm, 1/2W
R305	24322688	MF, 0.68 ohm, 1W
R306	24366223	CF, 22k ohm
R309	24366753	CF, 75k ohm
R310	24366153	CF, 15k ohm
R311	24366392	CF, 3900 ohm
R312	24366153	CF, 15k ohm
R313	24366153	CF, 15k ohm
R318	24366101	CF, 100 ohm
R319	24366101	CF, 100 ohm
R320	24366101	CF, 100 ohm
R321	24366102	CF, 1k ohm
R322	24366394	CF, 390k ohm
R323	24366102	CF, 1k ohm
R326	24366474	CF, 470k ohm
R327	24339479	MF, 4.7 ohm, 2W
R328	24366684	CF, 680k ohm
R329	24366153	CF, 15k ohm
R330	24366102	CF, 1k ohm
R331	24366134	CF, 130k ohm
R336	24383271	OMF, 270 ohm, 2W
R353	24366621	CF, 620 ohm
R360	24366104	CF, 100k ohm
R361	24366473	CF, 47k ohm
R362	24366103	CF, 10k ohm

Location No.	Part No.	Description
R363	24366105	CF, 1M ohm
R364	24366103	CF, 10k ohm
R365	24366681	CF, 680 ohm
R366	24366431	CF, 430 ohm
R367	24366103	CF, 10k ohm
R368	24545479	FR, 4.7 ohm, 1/4W
R369	24366391	CF, 390 ohm
R370	24321109	MF, 1 ohm, 1/2W
R371	24366103	CF, 10k ohm
R372	24366392	CF, 3900 ohm
R373	24366102	CF, 1k ohm
R374	24366163	CF, 16k ohm
R379	24382103	OMF, 10k ohm, 1W
R389	24366472	CF, 4700 ohm
R392	24552102	OMF, 1k ohm, 1/2W
R394	24366102	CF, 1k ohm
R396	24366103	CF, 10k ohm
R397	24366103	CF, 10k ohm
R398	24366184	CF, 180k ohm
R399	24366103	CF, 10k ohm
R400	24946561	CC, 560 ohm, 1/2W
R401	24366391	CF, 390 ohm
R403	24366622	CF, 6200 ohm
R405	24382682	OMF, 6800 ohm, 1W
R406	24366104	CF, 100k ohm
R407	24366103	CF, 10k ohm
R408	24366472	CF, 4700 ohm
R409	24376153	CF, 15k ohm, 1/2W
R410	24366271	CF, 270 ohm
R411	24366561	CF, 560 ohm
R415	24553272	OMF, 2700 ohm, 1W
R416	24510562	Cement, 5600 ohm, 5W
R418	24383181	OMF, 180 ohm, 2W
R424	24546279	FR, 2.7 ohm, 1/2W (27AF41)
R425	24366561	CF, 560 ohm
R430	24366102	CF, 1k ohm
R431	24366103	CF, 10k ohm
R432	24366202	CF, 2k ohm
R433	24366102	CF, 1k ohm (27AF61)
R441	24532102	FR, 1k ohm, 1W
R443	24382513	OMF, 51k ohm, 1W
R445	24310229	OMF, 2.2 ohm, 1/2W
R448	24338478	MF, 0.47 ohm, 1W
R456	24366103	CF, 10k ohm
R462	24366561	CF, 560 ohm
R463	24322479	MF, 4.7 ohm, 1W
R472	24382270	OMF, 27 ohm, 1W
⚠R475	24366391	CF, 390 ohm
R476	24366823	CF, 82k ohm
R477	24366273	CF, 27k ohm
⚠R478	24327133	MF, 13k ohm, ±1%, 1/4W
R481	24366333	CF, 33k ohm
⚠R482	24327472	MF, 4700 ohm, ±1%, 1/4W
R485	24338568	MF, 0.56 ohm, 1W
R486	24552820	OMF, 82 ohm, 1/2W
R487	24552301	OMF, 300 ohm, 1/2W
R488	24327183	MF, 18k ohm, ±1%, 1/4W
R489	24327183	MF, 18k ohm, ±1%, 1/4W
R490	24366102	CF, 1k ohm
R493	24366102	CF, 1k ohm
R494	24366471	CF, 470 ohm
R495	24366560	CF, 56 ohm
R501	24366333	CF, 33k ohm
R502	24366101	CF, 100 ohm

Location No.	Part No.	Description
R503	24366101	CF, 100 ohm
R508	24366102	CF, 1k ohm
R509	24366102	CF, 1k ohm
R510	24366102	CF, 1k ohm
R511	24366101	CF, 100 ohm
R612	24366103	CF, 10k ohm
R613	24366222	CF, 2200 ohm
R614	24366102	CF, 1k ohm
R661	24366182	CF, 1800 ohm
R662	24366182	CF, 1800 ohm
R663	24366103	CF, 10k ohm
R664	24366103	CF, 10k ohm
R667	24366223	CF, 22k ohm
R668	24366103	CF, 10k ohm
R669	24366103	CF, 10k ohm
R674	24366153	CF, 15k ohm
R676	24366229	CF, 2.2 ohm
R677	24366229	CF, 2.2 ohm
R678	24366153	CF, 15k ohm
R702	24366122	CF, 1200 ohm
R709	24366563	CF, 56k ohm
R713	24366393	CF, 39k ohm
R714	24552121	OMF, 120 ohm, 1/2W
R715	24366563	CF, 56k ohm
R716	24366273	CF, 27k ohm
R717	24366333	CF, 33k ohm
R718	24366101	CF, 100 ohm
R719	24366392	CF, 3900 ohm
R720	24366392	CF, 3900 ohm
R722	24366102	CF, 1k ohm
R723	24366471	CF, 470 ohm
R724	24366331	CF, 330 ohm
R725	24366182	CF, 1800 ohm
R730	24552100	OMF, 10 ohm, 1/2W
R731	24552331	OMF, 330 ohm, 1/2W
R732	24366820	CF, 82 ohm
R733	24366683	CF, 68k ohm
R734	24366820	CF, 82 ohm
R735	24366683	CF, 68k ohm
R736	24366620	CF, 62 ohm
R737	24366152	CF, 1500 ohm
R738	24366102	CF, 1k ohm
R739	24366152	CF, 1500 ohm
R740	24366620	CF, 62 ohm
R741	24366279	CF, 2.7 ohm
R742	24366279	CF, 2.7 ohm
R743	24554221	OMF, 220 ohm, 2W
R744	24366122	CF, 1200 ohm
R745	24366122	CF, 1200 ohm
R808	24019477	PTC Thermistor, 1.5 ohm, AC140V
R810	24569828	Cement, 0.82 ohm, ±10%, 10W
R814	24366103	CF, 10k ohm
R815	24552472	OMF, 4700 ohm, 1/2W
R820	24004942	MF, 0.1 ohm, 1W
R821	24552101	OMF, 100 ohm, 1/2W
R823	24366152	CF, 1500 ohm
R829	24004943	MF, 0.12 ohm, 1W
R830	24548569	FR, 5.6 ohm, 2W
R831	24366561	CF, 560 ohm
R835	24552471	OMF, 470 ohm, 1/2W
R850	24322759	MF, 7.5 ohm, 1W
R851	24366561	CF, 560 ohm

Location No.	Part No.	Description
R861	24553153	OMF, 15k ohm, 1W
R883	24552102	OMF, 1k ohm, 1/2W
R884	24366471	CF, 470 ohm
R888	24321228	MF, 0.22 ohm, 1/2W
R891	24366102	CF, 1k ohm
R898	24002000	CC, 3.9M ohm, ±10%, 1/2W
R901	24376561	CF, 560 ohm, 1/2W
R902	24376561	CF, 560 ohm, 1/2W
R903	24376561	CF, 560 ohm, 1/2W
R904	24366103	CF, 10k ohm
R905	24366101	CF, 100 ohm
R912	24366102	CF, 1k ohm
R914	24366561	CF, 560 ohm
R915	24366101	CF, 100 ohm
R916	24366470	CF, 47 ohm
R917	24366471	CF, 470 ohm
R918	24366820	CF, 82 ohm
R919	24366102	CF, 1k ohm
R920	24000568	FR, 4.7 ohm, 1W
R921	24366561	CF, 560 ohm
R922	24366101	CF, 100 ohm
R923	24366391	CF, 390 ohm
R924	24366820	CF, 82 ohm
R925	24366471	CF, 470 ohm
R926	24366102	CF, 1k ohm
R928	24366561	CF, 560 ohm
R929	24366101	CF, 100 ohm
R930	24366820	CF, 82 ohm
R932	24366272	CF, 2700 ohm
R933	24366750	CF, 75 ohm
R934	24366391	CF, 390 ohm
R935	24366821	CF, 820 ohm
R936	24366750	CF, 75 ohm
R937	24366471	CF, 470 ohm
R939	24366101	CF, 100 ohm
R940	24366821	CF, 820 ohm
R942	24366392	CF, 3900 ohm
R943	24366392	CF, 3900 ohm
R944	24366392	CF, 3900 ohm
R945	24366470	CF, 47 ohm
R946	24366470	CF, 47 ohm
R947	24366103	CF, 10k ohm
R948	24366103	CF, 10k ohm
R949	24366103	CF, 10k ohm
R950	24366302	CF, 3k ohm
R951	24366682	CF, 6800 ohm
R952	24366101	CF, 100 ohm
R955	24366122	CF, 1200 ohm
R957	24366822	CF, 8200 ohm
R960	24383153	OMF, 15k ohm, 2W
R961	24383153	OMF, 15k ohm, 2W
R962	24383153	OMF, 15k ohm, 2W
R963	24383153	OMF, 15k ohm, 2W
R964	24383153	OMF, 15k ohm, 2W
R965	24383153	OMF, 15k ohm, 2W
R973	24366472	CF, 4700 ohm
R976	24366102	CF, 1k ohm
R977	24366122	CF, 1200 ohm
R978	24366102	CF, 1k ohm
R979	24366102	CF, 1k ohm
R980	24366471	CF, 470 ohm
R981	24366821	CF, 820 ohm
R982	24366103	CF, 10k ohm
R983	24366222	CF, 2200 ohm

Location No.	Part No.	Description
R984	24367152	CF, 1500 ohm, ±2%
R985	24367471	CF, 470 ohm, ±2%
R986	24367681	CF, 680 ohm, ±2%
R987	24367681	CF, 680 ohm, ±2%
R988	24367472	CF, 4700 ohm, ±2%
R989	24367472	CF, 4700 ohm, ±2%
R990	24366222	CF, 2200 ohm
R991	24367681	CF, 680 ohm, ±2%
R992	24366150	CF, 15 ohm
R993	24366471	CF, 470 ohm
R994	24366392	CF, 3900 ohm
R997	24366272	CF, 2700 ohm
R998	24366472	CF, 4700 ohm
R999	24366472	CF, 4700 ohm
R3315	24366472	CF, 4700 ohm
R3317	24366472	CF, 4700 ohm
R3323	24366274	CF, 270k ohm
R3324	24366334	CF, 330k ohm
R3328	24366202	CF, 2k ohm
R3332	24366183	CF, 18k ohm
R3361	24366102	CF, 1k ohm
R3364	24366332	CF, 3300 ohm
R3368	24366333	CF, 33k ohm
R3440	24338129	MF, 1.2 ohm, 1W
R3442	24005016	Metal-Glazed Resistor, 180k ohm, 1/2W
R3443	24005016	Metal-Glazed Resistor, 180k ohm, 1/2W
R3444	24005016	Metal-Glazed Resistor, 180k ohm, 1/2W
R3445	24005016	Metal-Glazed Resistor, 180k ohm, 1/2W
R4310	24366183	CF, 18k ohm
R4311	24366563	CF, 56k ohm
R4385	24366822	CF, 8200 ohm
R4386	24366331	CF, 330 ohm
R4460	24366102	CF, 1k ohm
R4461	24366102	CF, 1k ohm
R4462	24366133	CF, 13k ohm
R4463	24366682	CF, 6800 ohm
R4465	24366223	CF, 22k ohm
R4466	24366103	CF, 10k ohm
R4466	24366223	CF, 22k ohm
R4467	24366103	CF, 10k ohm
R4467	24366223	CF, 22k ohm
R4468	24366472	CF, 4700 ohm
R4468	24366562	CF, 5600 ohm
R4469	24366102	CF, 1k ohm
R4470	24366393	CF, 39k ohm
R4760	24366133	CF, 13k ohm
R4761	24366102	CF, 1k ohm
R4762	24366104	CF, 100k ohm
R4763	24366472	CF, 4700 ohm
R4764	24366102	CF, 1k ohm
R4765	24366221	CF, 220 ohm
R4766	24366202	CF, 2k ohm
R4767	24003984	MF, 1000 ohm, 1/4W
R4768	24366622	CF, 6200 ohm
R4769	24366102	CF, 1k ohm
RA02	24366102	CF, 1k ohm (27AF61)
RA03	24366102	CF, 1k ohm
RA04	24366102	CF, 1k ohm
RA05	24366102	CF, 1k ohm
RA06	24366102	CF, 1k ohm

Location No.	Part No.	Description
RA07	24366102	CF, 1k ohm
RA08	24366102	CF, 1k ohm
RA09	24366102	CF, 1k ohm
RA10	24366103	CF, 10k ohm (27AF61)
RA13	24366103	CF, 10k ohm
RA14	24366102	CF, 1k ohm
RA15	24366102	CF, 1k ohm
RA16	24366102	CF, 1k ohm
RA17	24366102	CF, 1k ohm
RA18	24366102	CF, 1k ohm
RA20	24366221	CF, 220 ohm
RA21	24366102	CF, 1k ohm
RA22	24366331	CF, 330 ohm
RA23	24366331	CF, 330 ohm
RA24	24366331	CF, 330 ohm
RA25	24366331	CF, 330 ohm
RA26	24366102	CF, 1k ohm
RA27	24366102	CF, 1k ohm
RA33	24366103	CF, 10k ohm
RA34	24366471	CF, 470 ohm
RA35	24366102	CF, 1k ohm
RA36	24366103	CF, 10k ohm
RA37	24366331	CF, 330 ohm
RA38	24366331	CF, 330 ohm
RA40	24366101	CF, 100 ohm
RA41	24366101	CF, 100 ohm
RA61	24366103	CF, 10k ohm
RA62	24366103	CF, 10k ohm
RA67	24366472	CF, 4700 ohm
RA68	24366472	CF, 4700 ohm
RA71	24366683	CF, 68k ohm
RA72	24366223	CF, 22k ohm
RA73	24366103	CF, 10k ohm
RA74	24366333	CF, 33k ohm
RA99	24366223	CF, 22k ohm
RA201	24366472	CF, 4700 ohm
RB01	24366271	CF, 270 ohm
RB03	24366101	CF, 100 ohm
RB09	24366470	CF, 47 ohm
RB11	24366103	CF, 10k ohm
RB21	24366472	CF, 4700 ohm (27AF61)
RB22	24366122	CF, 1200 ohm (27AF61)
RB23	24366222	CF, 2200 ohm (27AF61)
RB24	24366472	CF, 4700 ohm
RB25	24366472	CF, 4700 ohm
RB30	24366103	CF, 10k ohm
RB43	24366103	CF, 10k ohm
RB44	24366103	CF, 10k ohm
RB45	24366181	CF, 180 ohm
RB46	24366101	CF, 100 ohm
RB47	24366332	CF, 3300 ohm
RB48	24366473	CF, 47k ohm
RB49	24366332	CF, 3300 ohm
RD80	24366102	CF, 1k ohm
RD81	24366152	CF, 1500 ohm
RD82	24366103	CF, 10k ohm
RD83	24366102	CF, 1k ohm
RD85	24366103	CF, 10k ohm
RG02	24366101	CF, 100 ohm
RG03	24366101	CF, 100 ohm
RG05	24366102	CF, 1k ohm
RG08	24366394	CF, 390k ohm
RG09	24366473	CF, 47k ohm
RG14	24366332	CF, 3300 ohm

Location No.	Part No.	Description
RG15	24327153	MF, 15k ohm, ±1%, 1/4W
RG16	24366162	CF, 1600 ohm
RG17	24366472	CF, 4700 ohm
RG22	24366101	CF, 100 ohm
RG23	24366101	CF, 100 ohm
RG41	24366103	CF, 10k ohm
RG43	24366472	CF, 4700 ohm
RG44	24366222	CF, 2200 ohm
RG60	24366182	CF, 1800 ohm
RG61	24366182	CF, 1800 ohm
RG62	24366473	CF, 47k ohm
RG63	24366821	CF, 820 ohm
RG64	24366222	CF, 2200 ohm
RG66	24366562	CF, 5600 ohm
RG67	24366822	CF, 8200 ohm
RG68	24366102	CF, 1k ohm
RG69	24366564	CF, 560k ohm
RG70	24366102	CF, 1k ohm
RG71	24366473	CF, 47k ohm
RG72	24366222	CF, 2200 ohm
RJ01	24366103	CF, 10k ohm
RJ02	24366102	CF, 1k ohm
RJ04	24366102	CF, 1k ohm
RJ05	24323479	MF, 4.7 ohm, 2W
RJ06	24366103	CF, 10k ohm
RR01	24366102	CF, 1k ohm (27AF61)
RR02	24366472	CF, 4700 ohm
RR03	24366102	CF, 1k ohm (27AF61)
RR04	24366472	CF, 4700 ohm
RR05	24366102	CF, 1k ohm (27AF61)
RR06	24366472	CF, 4700 ohm
RR07	24366681	CF, 680 ohm
RR08	24366682	CF, 6800 ohm
RR93	24366472	CF, 4700 ohm
RS02	24366562	CF, 5600 ohm
RS04	24366562	CF, 5600 ohm
RS08	24366562	CF, 5600 ohm
RS10	24366562	CF, 5600 ohm
RS14	24366562	CF, 5600 ohm
RS16	24366562	CF, 5600 ohm
RS25	24366562	CF, 5600 ohm
RS26	24366562	CF, 5600 ohm
RS40	24366272	CF, 2700 ohm
RS42	24366272	CF, 2700 ohm
RS43	24366103	CF, 10k ohm
RS44	24366103	CF, 10k ohm
RS60	24366101	CF, 100 ohm
RS61	24366222	CF, 2200 ohm
RS62	24366101	CF, 100 ohm
RS63	24366222	CF, 2200 ohm
RS64	24366102	CF, 1k ohm
RS65	24366102	CF, 1k ohm
RS66	24366102	CF, 1k ohm
RS68	24366223	CF, 22k ohm
RS69	24366223	CF, 22k ohm
RS70	24366104	CF, 100k ohm
RS71	24366104	CF, 100k ohm
RS101	24366123	CF, 12k ohm
RS102	24366123	CF, 12k ohm
RS105	24366332	CF, 3300 ohm
RS107	24366473	CF, 47k ohm
RS108	24366473	CF, 47k ohm
RS109	24366103	CF, 10k ohm
RS111	24366222	CF, 2200 ohm

Location No.	Part No.	Description
RS113	24366103	CF, 10k ohm
RS115	24366222	CF, 2200 ohm
RS611	24366101	CF, 100 ohm
RS612	24366101	CF, 100 ohm
RS613	24366101	CF, 100 ohm
RS614	24366101	CF, 100 ohm
RV02	24366750	CF, 75 ohm
RV04	24366750	CF, 75 ohm
RV05	24366750	CF, 75 ohm
RV07	24366103	CF, 10k ohm
RV09	24366750	CF, 75 ohm
RV10	24366750	CF, 75 ohm
RV11	24366100	CF, 10 ohm
RV12	24366103	CF, 10k ohm
RV13	24366101	CF, 100 ohm
RV19	24366101	CF, 100 ohm
RV20	24366101	CF, 100 ohm
RV21	24366103	CF, 10k ohm
RV22	24366103	CF, 10k ohm
RV35	24366103	CF, 10k ohm
RV36	24366222	CF, 2200 ohm (27AF61)
RV36	24366103	CF, 10k ohm (27AF41)
RV60	24552101	OMF, 100 ohm, 1/2W
RV61	24366101	CF, 100 ohm
RV62	24366750	CF, 75 ohm
RV63	24366221	CF, 220 ohm
RW01	24366750	CF, 75 ohm
RW02	24366750	CF, 75 ohm
RW03	24366750	CF, 75 ohm
RY11	24366102	CF, 1k ohm
RY12	24366102	CF, 1k ohm
RZ01	24872102	Chip, 1k ohm, 1/16W
RZ02	24872102	Chip, 1k ohm, 1/16W
RZ03	24872332	Chip, 3300 ohm, 1/16W
RZ04	24872122	Chip, 1200 ohm, 1/16W
RZ05	24872471	Chip, 470 ohm, 1/16W
RZ06	24872821	Chip, 820 ohm, 1/16W
RZ08	24872122	Chip, 1200 ohm, 1/16W
RZ09	24872101	Chip, 100 ohm, 1/16W
RZ10	24872471	Chip, 470 ohm, 1/16W
RZ12	24872332	Chip, 3300 ohm, 1/16W
RZ13	24872122	Chip, 1200 ohm, 1/16W
RZ14	24872391	Chip, 390 ohm, 1/16W
RZ15	24872391	Chip, 390 ohm, 1/16W
RZ17	24872471	Chip, 470 ohm, 1/16W
RZ18	24872122	Chip, 1200 ohm, 1/16W
RZ19	24872332	Chip, 3300 ohm, 1/16W
RZ20	24872101	Chip, 100 ohm, 1/16W
RZ22	24872471	Chip, 470 ohm, 1/16W
RZ29	24872331	Chip, 330 ohm, 1/16W
RZ30	24872331	Chip, 330 ohm, 1/16W

COILS & TRANSFORMERS

L101	23289845	Coil, Peaking, TRF4680AT
L111	23289220	Coil, Peaking, TRF4220AF (27AF61)
L121	23238562	Coil, Peaking, TRF4109AJ (27AF61)
L122	23238562	Coil, Peaking, TRF4109AJ (27AF61)
L301	23103880	Coil (Ferrite Bead), TEM2011Y
L302	23237975	Coil, Peaking, TRF4101AC
L400	23238714	Coil, Peaking, TRF4100AJ
⚠L441	23233045	Coli, Linearity, TLN2083G

Location No.	Part No.	Description
L442	23248122	Coil, Choke, TLN3384D
⚠L447	23248282	Coil, Choke, TLN3458AH
⚠L461	23248179	Coil, Choke, TLN3339AD
L500	23289840	Coil, Peaking, TRF4100AT
L501	23289844	Coil, Peaking, TRF4470AT
L702	23261974	Coil, Choke, HC5-035
L704	23103859	Coil (Ferrite Bead), TEM2011
L705	23103859	Coil (Ferrite Bead), TEM2011
L805	23248227	Coil, Choke, TLN3481AD
L806	23248227	Coil, Choke, TLN3481AD
L815	23103880	Coil (Ferrite Bead), TEM2011Y
L816	23103880	Coil (Ferrite Bead), TEM2011Y
L883	23103880	Coil (Ferrite Bead), TEM2011Y
L885	23248073	Coil, Choke, TLN3299D
L886	23103880	Coil (Ferrite Bead), TEM2011Y
L902	23289101	Coil, Peaking, TRF4101AF
L903	23289101	Coil, Peaking, TRF4101AF
L904	23289101	Coil, Peaking, TRF4101AF
L905	23289390	Coil, Peaking, TRF4390AF
L906	23289390	Coil, Peaking, TRF4390AF
L907	23289390	Coil, Peaking, TRF4390AF
L908	23289100	Coil, Peaking, TRF4100AF
L910	23237991	Coil, Peaking, TRF4479AC
LA01	23289100	Coil, Peaking, TRF4100AF
LA28	23103775	Coil (Ferrite Bead), TEM2014
LV01	23289840	Coil, Peaking, TRF4100AT
LV03	23103852	Coil, Filter, TEM2028AH (27AF61)
LV04	23103852	Coil, Filter, TEM2028AH (27AF61)
LV45	23289840	Coil, Peaking, TRF4100AT (27AF61)
LV99	23103845	Coil, TEM2030AY
LZ01	23238710	Coil, Peaking, TRF4220AJ
LZ02	23238714	Coil, Peaking, TRF4100AJ
LZ03	23238714	Coil, Peaking, TRF4100AJ
LZ04	23238714	Coil, Peaking, TRF4100AJ
LZ05	23238714	Coil, Peaking, TRF4100AJ
LZ08	23238707	Coil, Peaking, TRF4390AJ
LZ11	23238710	Coil, Peaking, TRF4220AJ
LZ12	23238710	Coil, Peaking, TRF4220AJ
T400	23224364	Transformer, Focus, TLN2168AH
T401	23224367	Transformer, Horiz. Drive, TLN1098AH
⚠T461Z	23236645	Transformer, Flyback, TFB4166ZD (27AF61)
T840	23213513	Transformer, Power, TPW1459AZ

SEMICONDUCTORS

Q151	23114530	Transistor, 2SA933S-Q (27AF61)
Q152	23114528	Transistor, 2SC1740S, Q (27AF61)
Q201	23114528	Transistor, 2SC1740S, Q
Q202	A6317440	Transistor, 2SC1815-Y
Q203	A6317440	Transistor, 2SC1815-Y
Q204	A6002040	Transistor, RN1204
Q205	A6002040	Transistor, RN1204
Q300	23114528	Transistor, 2SC1740S, Q
Q301	23905610	IC, LA7846N
Q301B	72471082	Screw, BRDT2W3X10 SZN
Q302	B0385853	IC, TA1241AN
Q306	23114530	Transistor, 2SA933S-Q
Q308	23114528	Transistor, 2SC1740S, Q
Q360	23114528	Transistor, 2SC1740S, Q
Q361	23314445	Transistor, 2SC4721, Q
Q370	23114530	Transistor, 2SA933S-Q
Q390	B0350510	IC, TA75558S
Q391	23314548	Transistor, 2SC4256
Q402	A6330069	Transistor, 2CS2482 FA-1
Q403	23314444	Transistor, 2SC4721P
Q404	A6873777	Transistor, 2SD2553
Q404B	72471082	Screw, BRDT2W3X10 SZN
Q421	23314141	Transistor, 2SC3852
Q421B	23035308	Screw, BTB3X8SZN
Q462	23114530	Transistor, 2SA933S-Q
Q463	23314938	Transistor, 2SD2493(P)
Q463B	72471082	Screw, BRDT2W3X10 SZN
Q465	A6317440	Transistor, 2SC1815-Y
Q471	A6534020	Transistor, 2SA1015-O
Q472	A6317440	Transistor, 2SC1815-Y
Q480	A6532853	Transistor, 2SA949-Y(C)
Q481	A6317440	Transistor, 2SC1815-Y
Q482	A6317440	Transistor, 2SC1815-Y
Q483	A6012010	Transistor, RN2201
Q503	23114528	Transistor, 2SC1740S, Q
Q610B	70391356	Screw, BITTB3X10 SZN
Q611	A6342200	Transistor, 2CS2878-A
Q612	23314962	Transistor, KTA1266 Y
Q613	A6342200	Transistor, 2CS2878-A
Q706	A6317440	Transistor, 2SC1815-Y
Q707	23114528	Transistor, 2SC1740S, Q
Q709	23114528	Transistor, 2SC1740S, Q
Q710	23114530	Transistor, 2SA933S-Q
Q711	A6550640	Transistor, 2SA1837
Q712	A6369650	Transistor, 2SC4793
Q719	23114528	Transistor, 2SC1740S, Q
Q720	23114528	Transistor, 2SC1740S, Q
Q801B	72471082	Screw, BRDT2W3X10 SZN
Q805	A6002050	Transistor, RN1205
Q830	23314141	Transistor, 2SC3852
Q830B	23035308	Screw, BTB3X8SZN
Q840	23318299	IC, L78MR05
Q843	A6002050	Transistor, RN1205
Q850	23314707	Transistor, 2SD1944, H
Q862A	23960136	Adhesive, TSE3843-W
⚠Q883	23319692	IC, SE130N, LF4
Q901	A6368700	Transistor, 2CS4544
Q902	A6317440	Transistor, 2SC1815-Y
Q903	A6368700	Transistor, 2CS4544
Q904	A6317440	Transistor, 2SC1815-Y
Q905	A6368700	Transistor, 2CS4544
Q906	A6317440	Transistor, 2SC1815-Y
Q907	23114530	Transistor, 2SA933S-Q
Q908	A6321240	Transistor, 2SC2120-Y
Q910	A6317440	Transistor, 2SC1815-Y
Q911	23114528	Transistor, 2SC1740S, Q
Q912	23114530	Transistor, 2SA933S-Q
Q913	23114530	Transistor, 2SA933S-Q
Q914	A6317440	Transistor, 2SC1815-Y
Q920	23114528	Transistor, 2SC1740S, Q
Q921	23114528	Transistor, 2SC1740S, Q
Q922	23114528	Transistor, 2SC1740S, Q
Q923	23114528	Transistor, 2SC1740S, Q
Q924	23114528	Transistor, 2SC1740S, Q
Q925	23114528	Transistor, 2SC1740S, Q

Location No.	Part No.	Description
Q4460	A6317440	Transistor, 2SC1815-Y
Q4461	A6317440	Transistor, 2SC1815-Y
Q4462	A6317440	Transistor, 2SC1815-Y
Q4462	A6317440	Transistor, 2SC1815-Y
QA01	23000818	IC, TMP88CS38N-2C34
QA02	23905665	IC, AT24C08-10PC
QB01	A6317440	Transistor, 2SC1815-Y
QB03	A6002050	Transistor, RN1205
QB22	A6734590	Transistor, 2SC752(G)TM-Y (27AF61)
QB23	A6317440	Transistor, 2SC1815-Y
QB30	A6317440	Transistor, 2SC1815-Y
QB40	A6317440	Transistor, 2SC1815-Y
QB41	A6317440	Transistor, 2SC1815-Y
QD80	23114530	Transistor, 2SA933S-Q
QG01	23906499	IC, μPC1851BCU
QG60	23904303	IC, BA10358
QG61	23119228	IC, μPC1406HA
QJ02	23114528	Transistor, 2SC1740S, Q
QJ03	A6369650	Transistor, 2SC4793
QJ04	23114528	Transistor, 2SC1740S, Q
QS60	23314965	Transistor, KTC3198 Y
QS61	23314965	Transistor, KTC3198 Y
QS62	A6012040	Transistor, RN2204
QS63	A6342200	Transistor, 2CS2878-A
QS64	A6342200	Transistor, 2CS2878-A
QS101	23904303	IC, BA10358
QS106	23000529	IC, MM1231XD
QV01	23000369	IC, MM1495XD
QV02	23904943	IC, MM1111XS (27AF61)
QV05	A6002030	Transistor, RN1203
QV10	A6002030	Transistor, RN1203
QV11	A6734590	Transistor, 2SC752(G)TM-Y
QV60	A6317440	Transistor, 2SC1815-Y
QZ01	B0410895	IC, TC90A49P
QZ02	A6541130	Transistor, 2SA1162-Y
QZ03	A6541130	Transistor, 2SA1162-Y
QZ04	A6541130	Transistor, 2SA1162-Y
QZ05	A6335470	Transistor, 2SC2712-Y
QZ06	A6541130	Transistor, 2SA1162-Y
QZ07	A6541130	Transistor, 2SA1162-Y
QZ08	A6335470	Transistor, 2SC2712-Y
D112	23316678	Diode, Zener, MTZJ6.8B
D201	23316817	Diode, 1SS120-7
D221	23316817	Diode, 1SS120-7
D222	23316817	Diode, 1SS120-7
D223	23316817	Diode, 1SS120-7
D224	23316817	Diode, 1SS120-7
D252	23118518	Diode, Zener, RD9.1ESA B1
D253	23118518	Diode, Zener, RD9.1ESA B1
D301	23118095	Diode, ERB44-06, E
D302	23118095	Diode, ERB44-06, E
D303	23316794	Diode, SC570A
D310	23118859	Diode, 1SS133
D312	23118859	Diode, 1SS133
D314	23118859	Diode, 1SS133
D315	23118859	Diode, 1SS133
D316	23316679	Diode, Zener, MTZJ6.8C
D335	23316715	Diode, Zener, MTZJ11A
D336	23316672	Diode, Zener, MTZJ5.6B
D337	23316672	Diode, Zener, MTZJ5.6B
D338	23316655	Diode, Zener, MTZJ3.0B
D370	23316672	Diode, Zener, MTZJ5.6B
D371	23118859	Diode, 1SS133

Location No.	Part No.	Description
D390	23316651	Diode, Zener, MTZJ2.4B
D395	23316725	Diode, Zener, MTZJ15B
D404	23316254	Diode, ERC06-15L
D406	23118094	Diode, EU2A, LF-F10
D408	23118052	Diode, RU4Z LF-L1
D409	23316690	Diode, Zener, MTZJ10B
D411	23118520	Diode, Zener, RD8.2ESA B2
D421	23316665	Diode, Zener, MTZJ4.7A
D422	23316669	Diode, Zener, MTZJ5.1B
D430	23118510	Diode, Zener, RD12ESA B3
D441	23316687	Diode, Zener, MTZJ9.1B
D442	23118094	Diode, EU2A, LF-F10
D467	23118095	Diode, ERB44-06, E
D468	23316719	Diode, Zener, MTZJ12B
D471	23118095	Diode, ERB44-06, E
⚠D472	23115774	Diode, Zener, RD6.2E(4)
D473	23118859	Diode, 1SS133
D480	23316727	Diode, Zener, MTZJ16A
D611	23118859	Diode, 1SS133
D612	23118859	Diode, 1SS133
D613	23118859	Diode, 1SS133
D614	23118859	Diode, 1SS133
D704	23118859	Diode, 1SS133
D705	23118859	Diode, 1SS133
D715	23118859	Diode, 1SS133
D720	23118859	Diode, 1SS133
D721	23118859	Diode, 1SS133
D801	23357041	Diode, LN6SB60-F05
D805	23118859	Diode, 1SS133
D806	23118094	Diode, EU2A, LF-F10
D807	23118859	Diode, 1SS133
D815	23316746	Diode, Zener, MTZJ27B
D830	23316673	Diode, Zener, MTZJ5.6C
D840	23316962	Diode, S1WBA20 4101
D845	23118859	Diode, 1SS133
D850	23316673	Diode, Zener, MTZJ5.6C
D855	23118859	Diode, 1SS133
D881	23118859	Diode, 1SS133
D883	23118338	Diode, RU-4AM LF-L1
D885	23118094	Diode, EU2A, LF-F10
D901	23118859	Diode, 1SS133
D903	23118859	Diode, 1SS133
D904	23118859	Diode, 1SS133
D905	23118859	Diode, 1SS133
D906	23118859	Diode, 1SS133
D907	23118859	Diode, 1SS133
D908	23118859	Diode, 1SS133
D909	23118859	Diode, 1SS133
D910	23118859	Diode, 1SS133
D911	A7568250	Diode, 1S1834
D3440	A7568200	Diode, 1S1832
D3441	A7568200	Diode, 1S1832
D4385	23316680	Diode, Zener, MTZJ7.5A
D4386	23118859	Diode, 1SS133
DA42	23118529	Diode, Zener, RD5.6ESA B2
DB03	23358522	Diode (LED), SIR-56SB3F
DB30	23118859	Diode, 1SS133
DB45	23316817	Diode, 1SS120-7
DE50	23358564	Diode (LED), SLR-56VC3FPQ (27AF61)
DE50	23358501	Diode (LED), SCL003URC5F (27AF41)
DJ01	23316817	Diode, 1SS120-7
DJ02	23118504	Diode, Zener, RD15ESA B3

Location No.	Part No.	Description
DS106	23316660	Diode, Zener, MTZJ3.9A
DV03	23118518	Diode, Zener, RD9.1ESA B1
DV05	23118518	Diode, Zener, RD9.1ESA B1
DV13	23118518	Diode, Zener, RD9.1ESA B1
DV15	23118518	Diode, Zener, RD9.1ESA B1
DV19	23118518	Diode, Zener, RD9.1ESA B1
DV26	23316716	Diode, Zener, MTZJ11B (27AF41)
DV27	23118518	Diode, Zener, RD9.1ESA B1
DV45	23118518	Diode, Zener, RD9.1ESA B1
DV46	23316716	Diode, Zener, MTZJ11B
DV47	23316686	Diode, Zener, MTZJ9.1A
MISCELLANEOUS		
B230	23037312	Screw, BTBW 3X12 SZN
B231	23035412	Screw, BTB 4X12 SZN
B232	23035312	Screw, BTB 3X12 SZN
BB03A	23903022	Socket, 8P
BB03B	23903022	Socket, 8P
BB03C	23368627	Plug, 8P
BB04A	23902749	Socket, B-B, 6P
BB04B	23368517	Plug, B-B, 6P
F424	23144454	Fuse, 2.0A-S, 125V (27AF61)
F470	23144731	Fuse, 1.6A, 125V
F470A	23165433	Holder, Fuse
F801A	23165433	Holder, Fuse
F802A	23165433	Holder, Fuse
G060	24366470	CF, 47 ohm
G217	24366153	CF, 15k ohm (27AF61)
G217	24366333	CF, 33k ohm (27AF41)
G301	24366472	CF, 4700 ohm
G306	24366222	CF, 2200 ohm
G307	24366152	CF, 1500 ohm
G312	24366272	CF, 2700 ohm
G317	23118859	Diode, 1SS133
G3369	24366101	CF, 100 ohm
G380	24946226	CC, 22M ohm, ±10%, 1/2W
G405	24214472	CD, 4700pF, ±10%, 500V
G463	23103880	Coil (Ferrite Bead), TEM2011Y
G808	23248227	Coil, Choke, TLN3481AD
⚠G884	23316681	Diode, Zener, MTZJ7.5B
H003	23344421	RF Switch, RSU133X6 (27AF61)
H003	23364765	F Connector (27AF41)
H003A	23740989	Nut, F-Connector
KB01	23906805	Remote Sensor, PIC-TB17
P910	23164725	Plug, 2P
PV02	23365949	Jack, 5P
PV04	23365763	Jack, Phono, 3P
PZ01	23368130	Plug, 10P
PZ01A	23902213	Socket, B-B, 10P
SA01	23145430	Switch, Push, 1C1P
SA02	23145430	Switch, Push, 1C1P
SA03	23145430	Switch, Push, 1C1P
SA04	23145430	Switch, Push, 1C1P
SA05	23145430	Switch, Push, 1C1P
SA06	23145430	Switch, Push, 1C1P
SA07	23145430	Switch, Push, 1C1P
SJ01	23146958	Relay, DC12V
SR81	23146564	Relay, DC12V
SR83	23146564	Relay, DC12V
W661	23351088	Speaker, SPK-1360, 60X120mm, 8 ohm
W662	23351088	Speaker, SPK-1360, 60X120mm, 8 ohm
X401	23153721	Ceramic Resonator, 503kHz, TCR1023
X501	23153961	Crystal, 3.58MHz
XA01	23153504	Ceramic Resonator, 8.00MHz, TCR1056BM
Z401	23140203	SG-GAP, SG99B3EN
ZT01	70108925	Resonator, 4MHz, TCR1071
PC BOARD ASSEMBLIES		
* U801G	23786307	PWR/D Board, PD0154F (27AF61)
* U801G	23786542	PWR/D Board, PD0154G (27AF41)
* U801P	23786306	PWR/D Board, PD0154F (27AF61)
* U801P	23786538	PWR/D Board, PD0154A (27AF41)
* U901G	23786314	CRT/D Board, PB9973A
* U901P	23786315	CRT/D Board, PB9973A
* U902G	23786324	Signal Board, PB9966D (27AF61)
* U902G	23786549	Signal Board, PB9966F (27AF41)
* U902P	23786326	Signal Board, PB9966A (27AF61)
* U902P	23786548	Signal Board, PB9966F (27AF41)
* U905	23786166	3L Board, PB9398A
PICTURE TUBE		
⚠V901	23312921	Picture Tube, A68ERF031X013
TUNER		
HY01	23321379	Tuner, EL955LX1 (27AF61)
ACCESSORIES		
K912	23306263	Remote Hand Unit, CT-9946 (27AF61)
K912	23306359	Remote Hand Unit, CT-90037 (27AF41)
Y101	23565243	Owner's Manual, English, 27AF61
Y101	23565273	Owner's Manual, French, 27AF41
Y101F	23565244	Owner's Manual, English, 27AF61
Y101F	23565274	Owner's Manual, French, 27AF41
CABINET PARTS		
A201	23540530	Front Cover
A213	23427950	Door
A224	23445483	Button
A401	23008163	Back Cover

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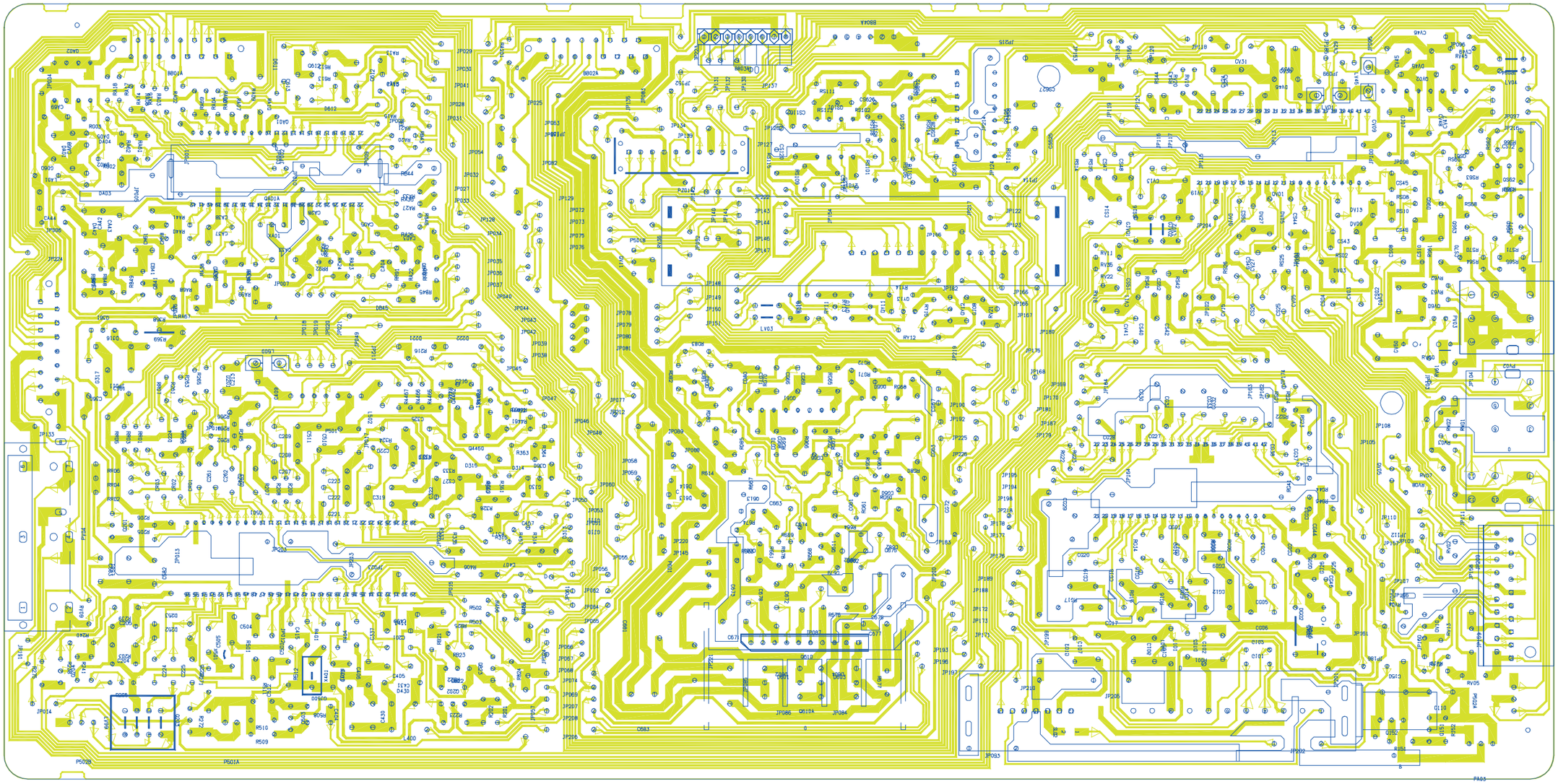
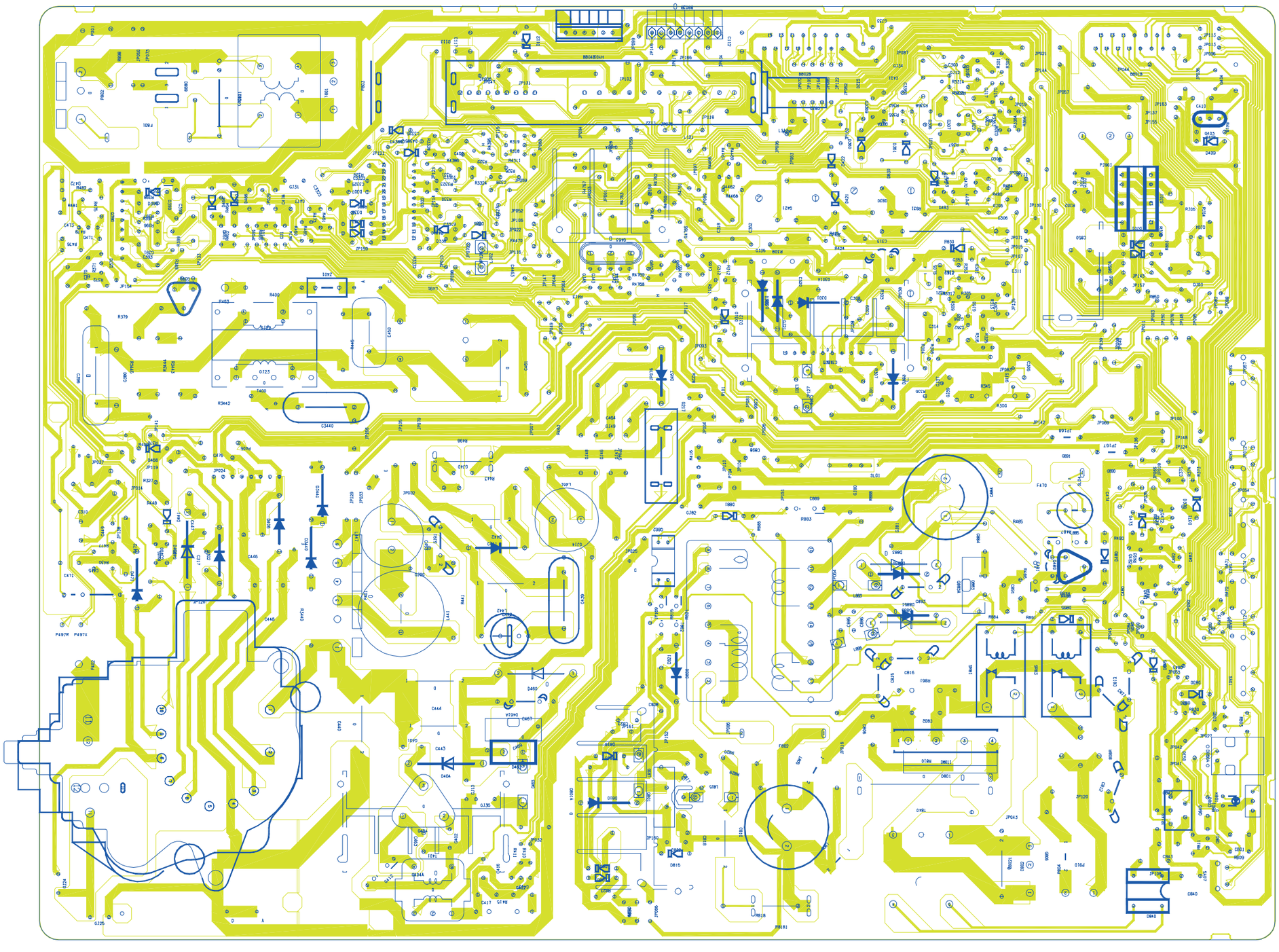
SIGNAL BOARD PB9966

BOTTOM (FOIL) SIDE



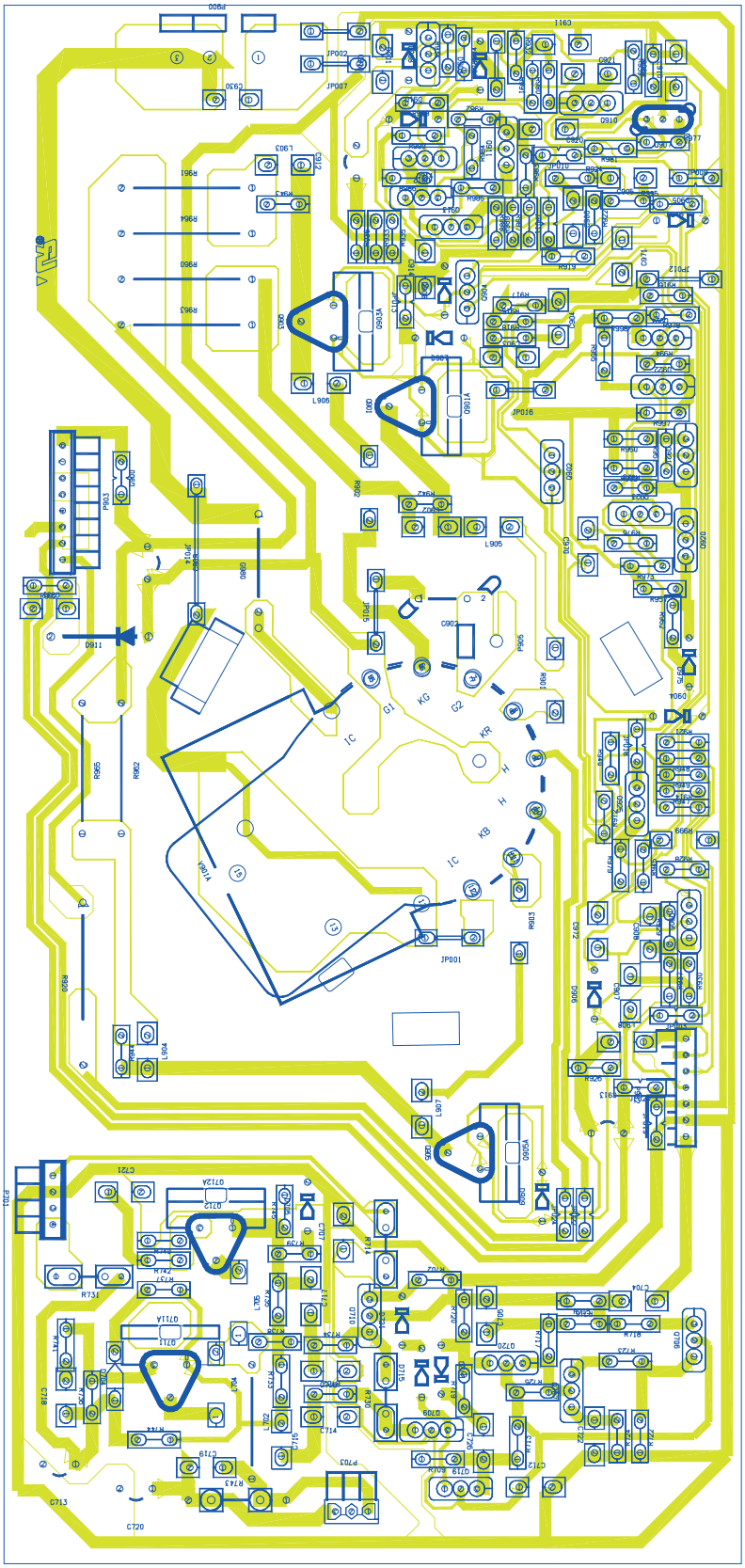
POWER/DEF BOARD PD0154

BOTTOM (FOIL) SIDE



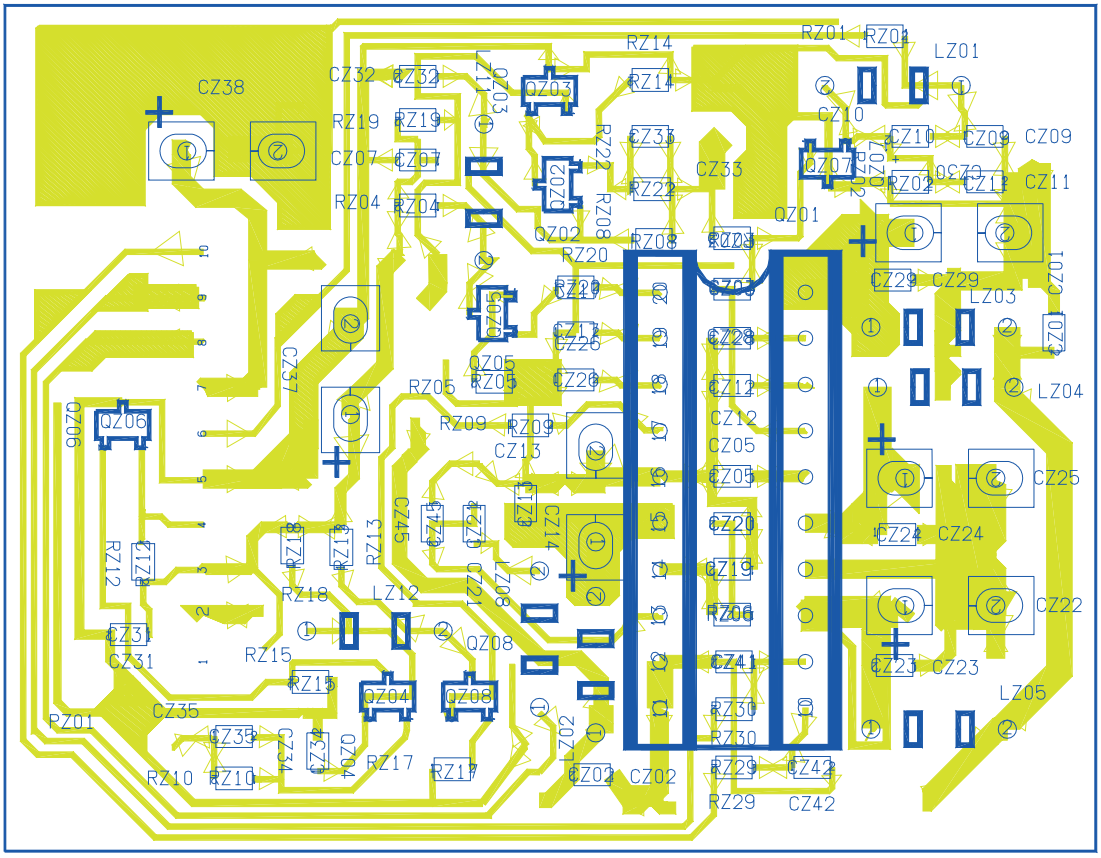
CRT DRIVE BOARD PB9973

BOTTOM (FOIL) SIDE



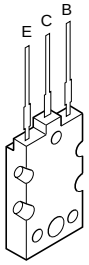
3L BOARD PB9398

BOTTOM (FOIL) SIDE

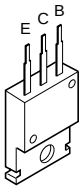


TERMINAL VIEW OF TRANSISTORS

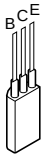
① 2SD2253
(old)
2SC5243



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



③ 2SC752GTM
2SC2482
2SC2655
2SC4721P



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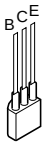
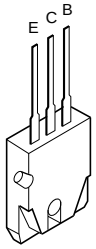
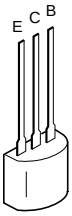
2SA1015
2SC1815
2SC2878
2SC1740S
2SC2120
2SA9335



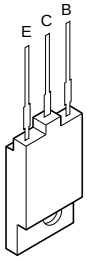
⑤ 2SA1788



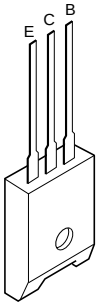
⑥ RN2203
RN2201
RN2004
RN1203
RN1204
RN2204
RN1205
RN1202
RN1201



⑦ 2SD1554
2SD2253
2SD1556
2SD2553
2SC5143



⑧ ON4409



MEMO

SPECIFICATIONS (Representative : 27AF61)	
TELEVISION SYSTEM	NTSC standard
CHANNEL COVERAGE	VHF: 2 through 13 UHF: 14 through 69 Cable TV: mid band (A-8 through A-1, A through I) super band (J through W) hyper band (AA through ZZ, AAA, BBB) ultra band (65 through 94, 100 through 125)
POWER SOURCE	120V AC, 60Hz
AUDIO POWER	5W + 5W
SPEAKER TYPE	2-3/8 x 4-3/4 inches (60 x 120 mm)
VIDEO/AUDIO TERMINALS	S-VIDEO INPUT Y: 1V (p-p), 75 ohm, negative sync. C: 0.286V (p-p) (burst signal), 75 ohm VIDEO/AUDIO INPUT VIDEO: 1V(p-p), 75 ohm, negative sync. AUDIO: 150mV(rms) (30% modulation equivalent, 47k ohm) ColorStream™ (Color Difference) VIDEO/AUDIO INPUT Y: 1V (p-p), 75 ohm Cr: 0.7V (p-p), 75 ohm Cb: 0.7V (p-p), 75 ohm AUDIO: 2V (p-p), 1 kohm
DIMENSIONS	Width 785 mm Height 584 mm Depth 499 mm
MASS	34.0 kg (Approx.)

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