TOSHIBA

FILE NO. 020-200201

SERVICE MANUAL

# COLOR TELEVISION

N2ES Chassis

# 32A32

*(TAC0245)*

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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 16)

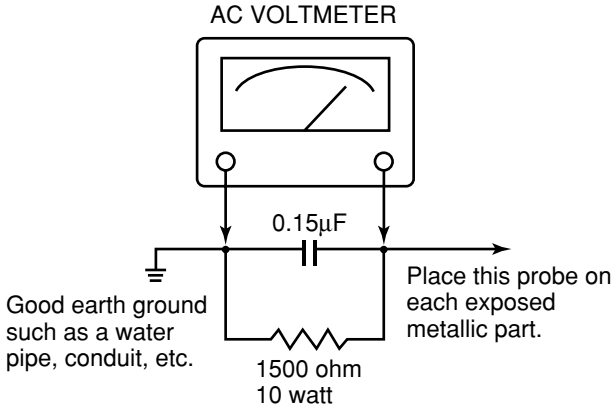
   Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure in this manual. It is recommended that the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. 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.

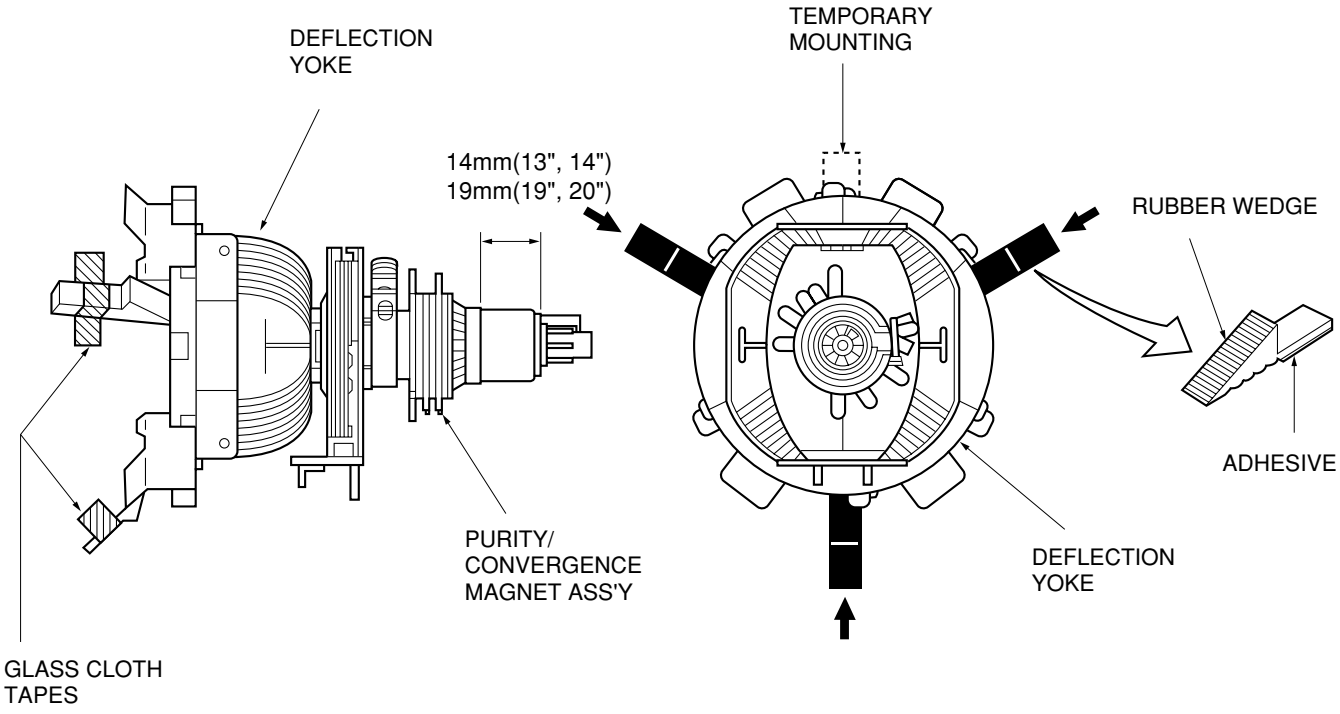



**Figure 1.**

## 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.

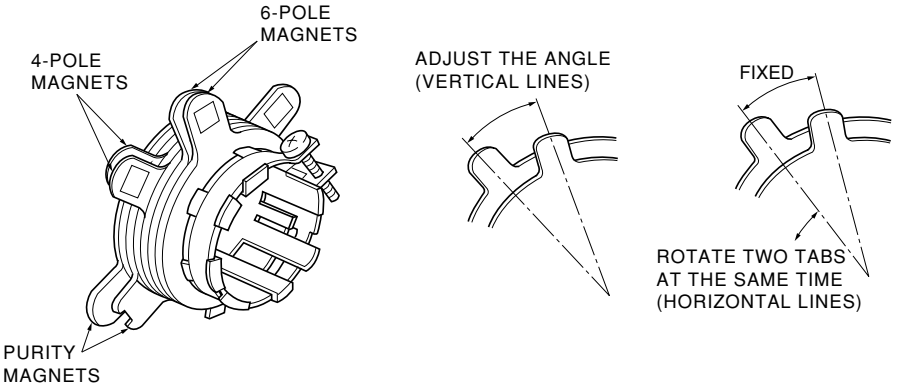



**Figure 2.**

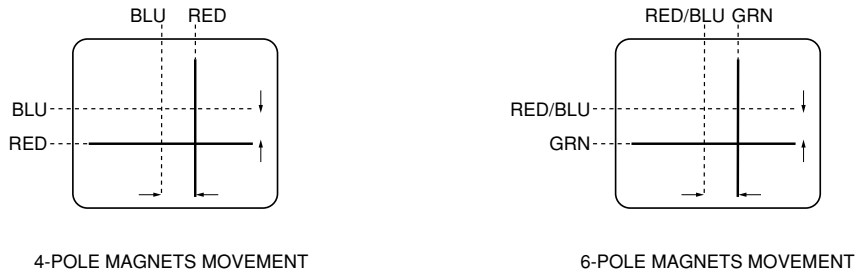




**Figure 3.** Dot Movement Pattern

**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

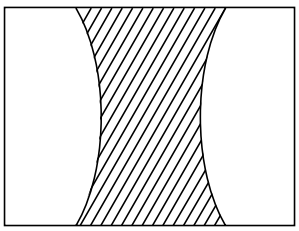
Note: The PURITY/CONVERGENCE MAGNET assembly and rubber wedges need mechanical positioning. Refer to figure 1.
Mounting position of the purity magnet assembly should fit to same position as old one because slightly difference to the position depend on a kind of tube.

***** 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 4.) 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.

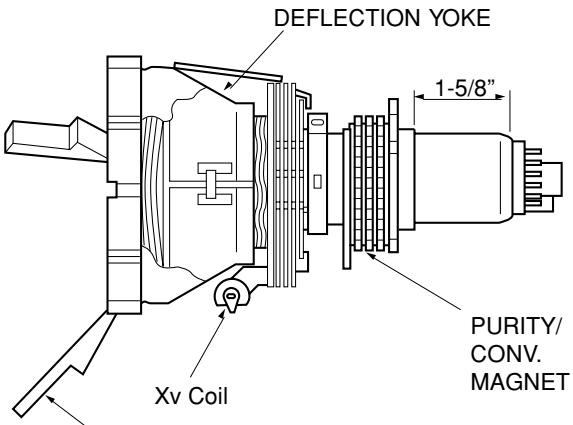



**Figure 1.**

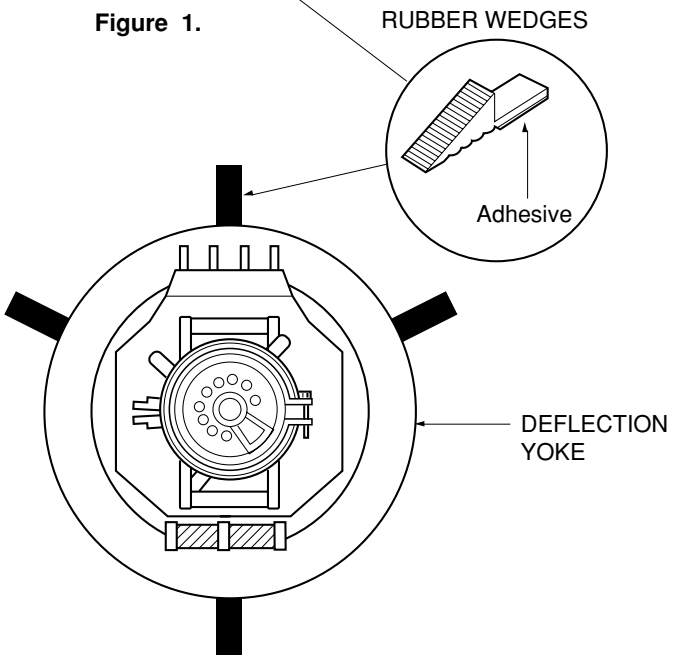


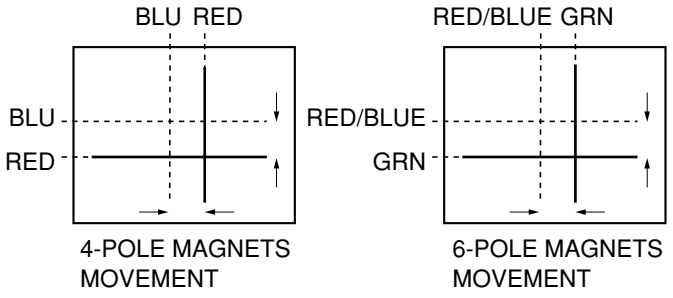

**Figure 2.**

**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 4.) and superimpose red and blue vertical lines in the center area of the picture screen. (See figure 3.)
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 3.)
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.




Center Convergence by Convergence Magnets

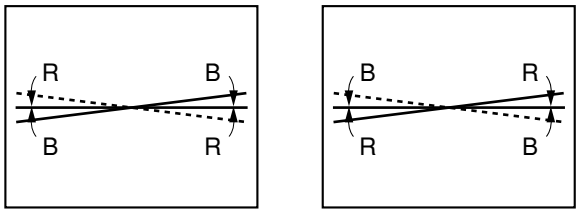
**Figure 3.**

■ **Xv COIL ADJUSTMENT**

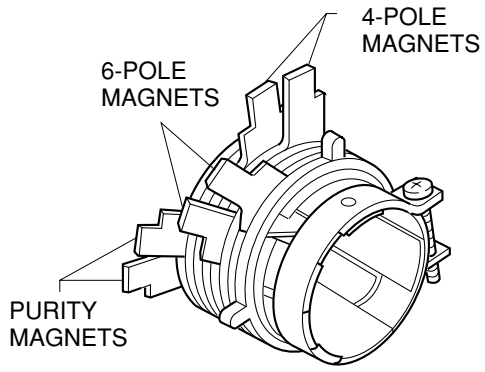
Adjust the Xv coil (on the deflection yoke) to correct misconvergence at both sides on screen.

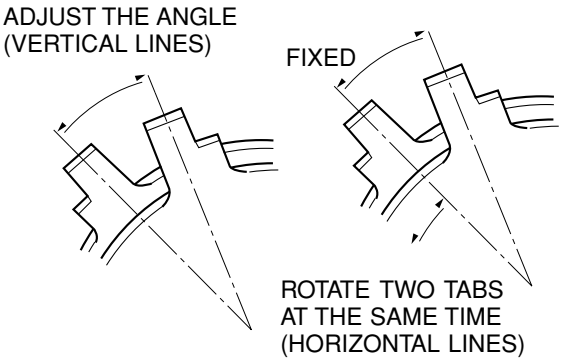
Use a hexagonal tip stick (plastic) to adjust the core of coil.

**Clockwise Adjustment** **Counterclockwise Adjustment**




**$X_V$ Cross Pattern View**



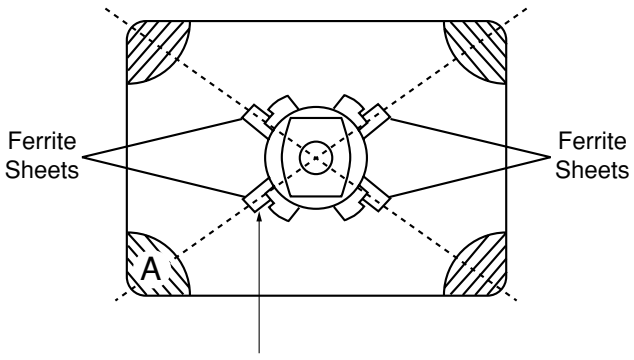

ADJUSTMENT OF MAGNETS

**Figure 4.**

■ **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

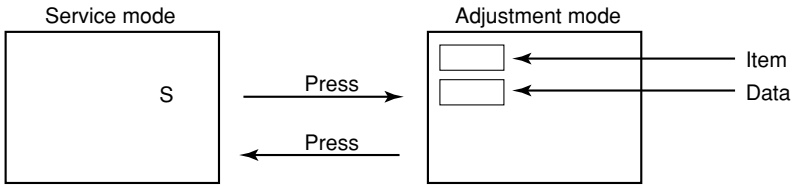
## 1. ENTERING TO SERVICE MODE

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 |
| “CNTX” selection : | 4 button |
| “COLC” selection : | 5 button |
| “TNTC” selection : | 6 button |
| Test audio signal ON/OFF (1kHz): | 8 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 16)

**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**

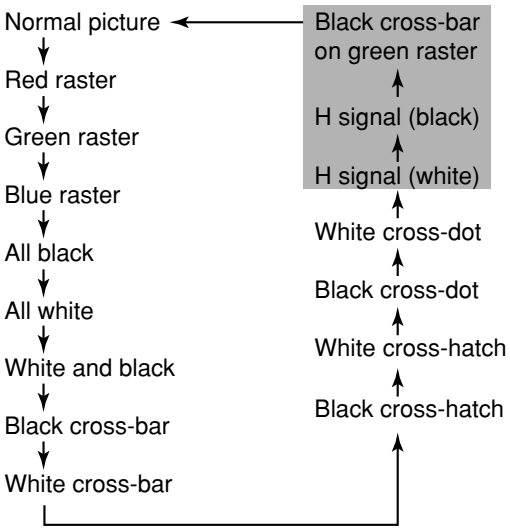
After replacing QA02, the following initialization is required.

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.

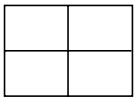
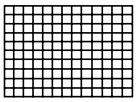
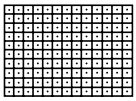
**7. TEST SIGNAL SELECTION**

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.




2) Press "8" button while any built-in test pattern to on the screen to output the 1 kHz sound. Press the button again to cut off the sound.

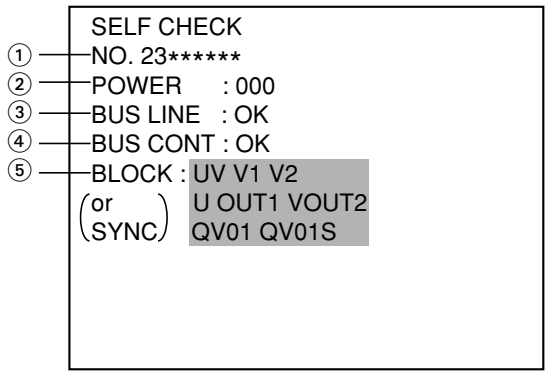
Note: If the video cable is connected to the VIDEO1 INPUT jack, the built-in pattern signals are not displayed.

| Signals | Picture |
|---|---|
| • Red raster<br>• Green raster<br>• Blue raster<br>• All Black<br>• All White |  |
| • Black & White |  |
| • Black cross-bar<br>• White cross-bar<br>• Black cross-bar on green raster |  |
| • Black cross-hatch<br>• White cross-hatch |  |
| • Black cross-dot<br>• White cross-dot |  |
| • H signal (white)<br>• 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
- “SCL-GND” or “NG” ..... SCL-GND short circuit
- “SDA-GND” or “NG” ..... SDA-GND short circuit
- “SCL-SDA” or “NG” ..... SCL-SDA 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

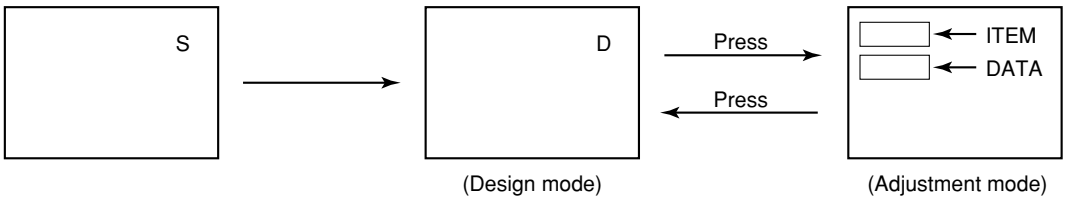
| | |
|---|---|
| UV | ..... TV mode |
| V1 | ..... VIDEO 1 mode |
| V2 | ..... VIDEO 2 mode |

***** 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” of DESIGN MODE are set to the data of the representative model of this chassis family.
Therefore, because ON-SCREEN specification remains in the state of the representative of model. This model is required to reset the data of items “OPT0” and “OPT1”.

## 2. SELECTING THE ADJUSTING ITEMS

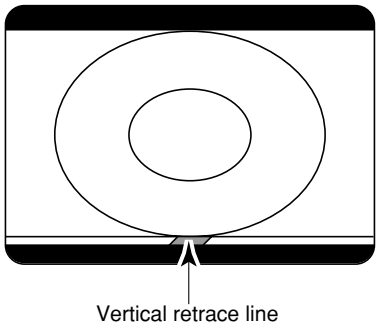
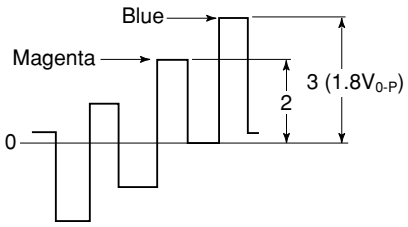
Every pressing of CHANNEL ▼ button in the design mode changes the adjustment items in the order of table-3.
(▲ button for reverse order)

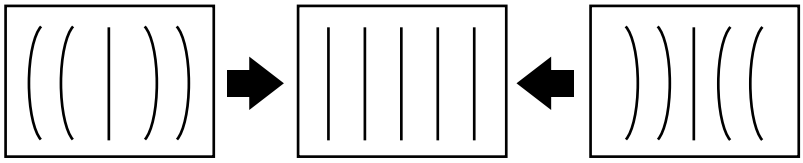
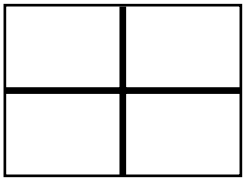
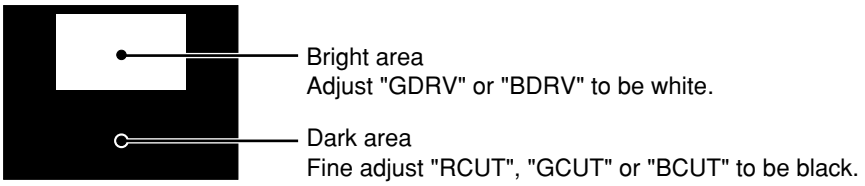
Refer to table-3 for data of design mode.
(See SETTING & ADJUSTING DATA on page 16)

## 3. ADJUSTING THE DATA

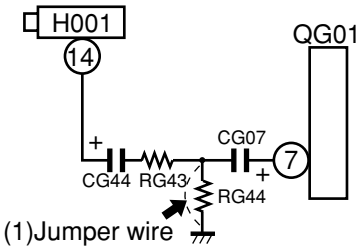
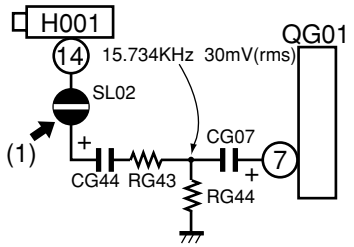
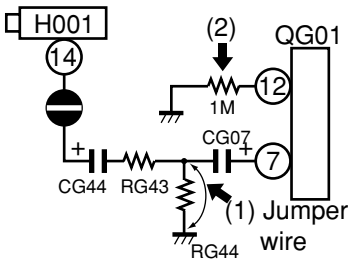
Pressing of VOLUME ▲ or ▼ button will change the value of data.

# ELECTRICAL ADJUSTMENT

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

| ITEM | ADJUSTMENT PROCEDURE |
|---|---|
| E-W PARABOLA<br>(DPC) | 1. Call up the adjustment mode display, then select the item **DPC**.<br>2. Press the TV/VIDEO button on Remote until the cross-hatch pattern appears on the screen.<br>3. Press the VOLUME ▲ or ▼ button to make vertical lines straight as shown below.<br>  |
| HORIZONTAL POSITION<br>(HPOS)<br>VERTICAL POSITION<br>(VPOS) | 1. Call up the adjustment mode display, then select the item **HPOS** or **VPOS**.<br>2. Press the TV/VIDEO button on Remote until the white cross-bar or black cross-bar pattern appears on the screen.<br>3. Adjust the HORIZONTAL and VERTICAL position alternately by pressing the VOLUME ▲ or ▼ button for proper picture position.<br>4. Check the picture with off-air signal.<br>  |
| HEIGHT<br>(HIT) | 1. Call up the adjustment mode display, then select the item **HIT**.<br>2. Press the VOLUME ▲ or ▼ button to get the picture so the top of raster begins to lack.<br>3. Press the VOLUME ▲ button to advance the data by 8 steps.<br>Note : Check the vertical picture position is correct. |
| WHITE BALANCE<br>(RCUT)<br>(GCUT)<br>(BCUT)<br>(GDRV)<br>(BDRV) | 1. Adjust the CONTRAST control to the center, and BRIGHTNESS control to the maximum.<br>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.<br>3. Adjust the following item with the CHANNEL ▲/▼ and VOLUME ▲/▼ buttons.<br>RCUT ⟶ Data : 40H<br>GCUT ⟶ Data : 40H<br>BCUT ⟶ Data : 40H<br>GDRV ⟶ Data : 80H<br>BDRV ⟶ Data : 80H<br>4. Press the TV/VIDEO button on TV to display a single horizontal line on the screen.<br>5. Turn the SCREEN control (FBT) fully counterclockwise and gradually rotate clockwise until the first horizontal line appears slightly on the screen.<br>6. Press the TV/VIDEO button to display the normal picture.<br>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.<br>  <br>Bright area<br>Adjust "GDRV" or "BDRV" to be white.<br>Dark area<br>Fine adjust "RCUT", "GCUT" or "BCUT" to be black. |

**MTS ADJUSTMENT (FOR N2N, N2F, N2ES CHASSIS)**

| No. | ITEM | INPUT SIGNAL | ADJUSTMENT PROCEDURE |
|---|---|---|---|
| 1 | ATTENUATOR<br>(ATT) | • 1kHz 30% mod. → ANT terminal | 1. Connect rms meter to pin 34 of QG01.<br>2. Display item **ATT** on screen.<br>3. Change data by VOLUME ▲/▼ buttons so that the reading of meter becomes value as close as 137mVrms. |
| 2 | STEREO VCO<br>(STVC) | • No signal<br>  | 1. Short circuit RG44 with a jumper wire.<br>2. Display item **STVC** on screen.<br>3. Connect frequency counter to pin 34 of QG01.<br>4. Change data by VOLUME ▲/▼ buttons so that the reading of counter becomes value as close as 15.73kHz.<br>5. Remove the short jumper from RG44. |
| 3 | STEREO FILTER<br>(STRF) | • 15.734kHz 30mV(rms) → Across Point between CG07 and RG44<br>  | 1. Unsolder the solder link SL02.<br>2. Display item **STRF** on screen.<br>3. Connect oscilloscope to pin 34 of QG01.<br>4. Change data by VOLUME ▲/▼ button to minimize AC output level on scope.<br>5. Resolder SL02. |
| 4 | STEREO SEPARATION<br>(WBAN) | • STEREO 300Hz (30% mod.) R-channel only → ANT | 1. Display item **WBAN** on screen.<br>2. Connect oscilloscope to pin 35 of QG01.<br>3. Change data by VOLUME ▲/▼ buttons so that 300Hz element on scope becomes minimum. |
| | (SPEC) | • STEREO 3kHz (30% mod.) R-channel only → ANT | 1. Display item **SPEC** on screen.<br>2. Connect oscilloscope to pin 35 of QG01.<br>3. Change data by VOLUME ▲/▼ buttons so that 3KHz element on scope becomes minimum. |
| 5 | SAP VCO<br>(SAVC) | • No signal<br>  | 1. Shortcircuit RG44 with a short jumper.<br>2. Connect 1Mohm resistor between pin 12 of QG01 and ground.<br>3. Display item **SAVC** on screen.<br>4. Connect frequency counter to pin 34 of QG01.<br>5. Change data by VOLUME ▲/▼ buttons so that the reading of counter becomes value as close as 78.67kHz.<br>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.

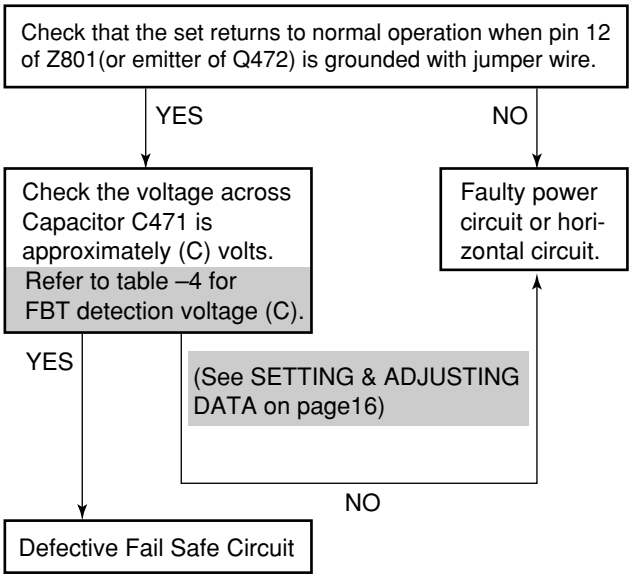
1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage must be measured below (B) kV.
   Refer to table-1 for high voltage (B).
   (See SETTING & ADJUSTING DATA on page 16)
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】

| | | 32" |
|---|---|---|
| HIGH VOLTAGE AT ZERO BEAM: | (A) | 31.2kV |
| MAX HIGH VOLTAGE: | (B) | 32.6kV |

**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 | 0AH | 09H |
| BRTC | SUB-BRIGHT | 40H | 43H |
| COLC | SUB-COLOR | 3AH | 3DH |
| TNTC | SUB-TINT | 44H | 48H |
| SAVC | SAP VCO | 20H | 25H |
| ATT | ATTENUATOR | 20H | 0FH |
| STVC | STEREO VCO | 20H | 21H |
| STRF | STEREO FILTER | 20H | 21H |
| SPEC | SPECTRAL | 20H | 1DH |

| Item | Name of adjustment | Preset | Data |
|---|---|---|---|
| WBAN | STEREO SEPARATION | 20H | 16H |
| HPOS | HORIZ. POSITION | 16H | 19H |
| VPOS | VERT. POSITION | 03H | ← |
| HIT | HEIGHT | 26H | 1CH |
| LIN | V-LINEARITY | 07H | ← |
| VSC | V-S CORRECTION | 02H | 03H |
| WID | PICTURE WIDTH | 35H | 25H |
| DPC | E-W PARABOLA (DPC) | 17H | 13H |
| CNR | E-W CORNER | 09H | 03H |
| TRAP | TRAPEZIUM | 08H | 07H |
| VPS | V-SHIFT | 01H | ← |
| VCP | V-COMPENSATION | 03H | ← |
| HCP | H-COMPENSATION | 00H | ← |
| VFC | V-F CORRECTION | 0FH | ← |

**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 | 00H | |

**Table-3**

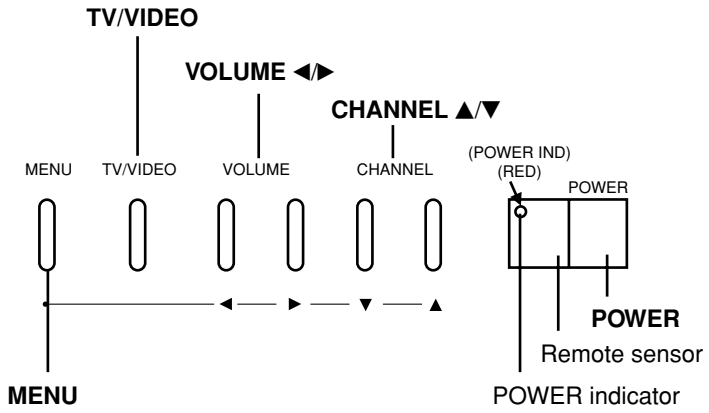
### 【CIRCUIT CHECKS】

| | | |
|---|---|---|
| FBT DETECTION VOLTAGE | (C) | 22.3 V |

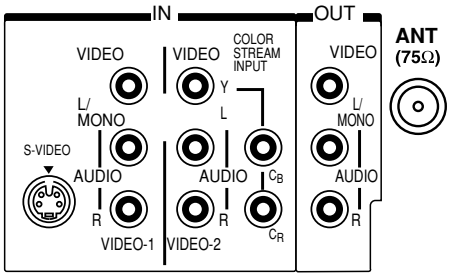
**Table-4**

# LOCATION OF CONTROLS

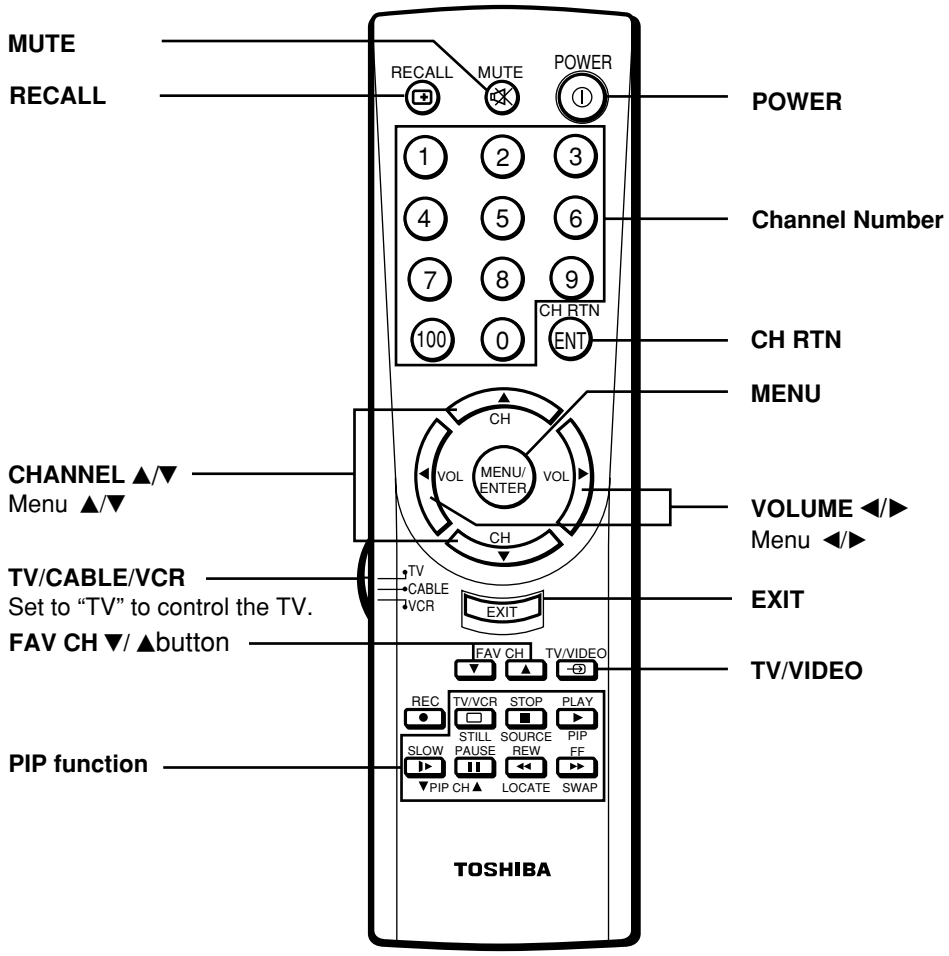
**Front Control**




**Back 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.**
If necessary, arrange the preset channels with the ADD/ERASE functions so that you can tune into only desired channels.

## TV/CABLE function

1. Press **POWER** to turn on the TV.
2. Press **MENU** repeatedly until the Setup menu is displayed on the screen.
3. Press ▼ or ▲ repeatedly until "TV/CABLE" is displayed in purple.
4. Press ► or ◄ until the mode that corresponds to your TV signal system is displayed in purple.
   **TV:** TV broadcasts signal
   (VHF channels 2 through 13 and UHF channel 14 through 69)
   **Cable:** Cable TV signals.
   (Cable channels 1 through 125)

## CH PROGRAM function

1. Press **MENU** repeatedly until the Setup menu is displayed on the screen.
2. Press ▼ or ▲ repeatedly until "CH PROGRAM" is displayed in purple.
3. Press ► or ◄ to start channel programming.
   The TV will automatically cycle through all the TV or CABLE channels depending on the mode selected, and store active channels in the channel memory.
3. When channel programming is complete, you will see the message on the screen.
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** repeatedly until the Setup menu is displayed on the screen.
3. Press ▼ or ▲ repeatedly until "ADD/ERASE" is displayed purple.
4. Press ► or ◄ :
   **To erase the channel**
   Press the button until "ERASE" is displayed in purple indicating that the channel has been erased from the memory.

   **To add the channel**
   Press the button until "ADD" is displayed in purple indicating that the channel has been memorized.
5. Repeat steps 1 to 4 for other channels.

You have now completed the channel programming.

*Please refer to owner's manual in detail.

# 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 com-ponents 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 : 32A32**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 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. | Parts No. | Description |
|---|---|---|
| **CAPACITORS** | | |
| C102 | 24792471 | ELECTROLYTIC, 6.3V 470UF M |
| C105 | 24212102 | CERAMIC DISC, 50V B 1000PF K |
| C106 | 24797479 | ELECTROLYTIC, 50V 4.7UF M |
| C107 | 24763221 | ELECTROLYTIC, 16V 220UF M |
| C201 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C204 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| C205 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| C216 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| C220 | 24539474 | PLASTIC FILM, 50V 0.47UF J |
| C221 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| C222 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| C223 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| C224 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C225 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C226 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C245 | 24206108 | ELECTROLYTIC, 50V 0.1UF M 7L 3A |
| C261 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C262 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C263 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C271 | 24109561 | CERAMIC CHIP, 50V B 560PF K |
| C305 | 24617912 | ELECTROLYTIC, 50V 2.2UF K 3A LI |
| C306 | 24764222 | ELECTROLYTIC CE04G 25V 2200UF M |
| C307 | 24082272 | PLASTIC FILM CQ922 M 100V 47000PF J |
| C308 | 24668221 | ELECTROLYTIC, 35V 220UF M 3A |
| C309 | 24109102 | CERAMIC CHIP, 50V B 1000PF K |
| C310 | 24766102 | ELECTROLYTIC CE04G 50V 1000UF M |
| C311 | 24214102 | CERAMIC DISC, 500V B 1000PF K |
| C313 | 24082057 | PLASTIC FILM, 100V 220000PF J |
| C314 | 24591222 | PLASTIC FILM, 50V 2200PF J |
| C317 | 24214471 | CERAMIC DISC, 500V B 470PF K |
| C318 | 24109102 | CERAMIC CHIP, 50V B 1000PF K |
| C319 | 24109102 | CERAMIC CHIP, 50V B 1000PF K |
| C320 | 24797101 | ELECTROLYTIC, 50V 100UF M |
| C323 | 24539474 | PLASTIC FILM, 50V 0.47UF J |
| C325 | 24539683 | PLASTIC FILM, 50V 0.068UF J |
| C326 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C327 | 24617915 | ELECTROLYTIC, 50V 1UF K 3A LI |
| C337 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |

| Location No. | Parts No. | Description |
|---|---|---|
| C370 | 24794101 | ELECTROLYTIC, 16V 100UF M |
| C371 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| C403 | 24539103 | PLASTIC FILM, 50V 0.01UF J |
| C404 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| C407 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C412 | 24214472 | CERAMIC DISK CK45 B 500V 4700PF K |
| C413 | 24214821 | CERAMIC DISC, 500V B 820PF K |
| C415 | 24539224 | PLASTIC FILM, 50V 0.22UF J |
| C416 | 24678010 | ELECTROLYTIC, 200V 1UF M 3A |
| C417 | 24214331 | CERAMIC DISC, 500V B 330PF K |
| C421 | 24539334 | PLASTIC FILM, 50V 0.33UF J |
| C430 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| C431 | 24794101 | ELECTROLYTIC, 16V 100UF M |
| C438 | 24092344 | CERAMIC DISC, 2KV 820PF K |
| ⚠ C439 | 24503125 | PLASTIC CAP T 400V 753J |
| ⚠ C442 | 24082924 | PLASTIC FILM CF92 T 315V 0.56UF J |
| ⚠ C443 | 24082963 | PLASTIC FILM, 1500VH 9100PF H |
| ⚠ C444 | 24082964 | PLASTIC FILM, 1500VH 10000PF H |
| C445 | 24082050 | PLASTIC FILM CF922 M 100V 56000PF J |
| C446 | 24679100 | ELECTROLYTIC, 250V 10UF M 3A |
| C448 | 24073118 | 04H 160V 330M |
| C449 | 24794102 | ELECTROLYTIC, 16V 1000UF M |
| C453 | 24539334 | PLASTIC FILM, 50V 0.33UF J |
| C457 | 24591222 | PLASTIC FILM, 50V 2200PF J |
| C463 | 24212152 | CERAMIC DISC, 50V B 1500PF K |
| C464 | 24640872 | ELECTROLYTIC CE04R 100V 10UF M 3A |
| C466 | 24567104 | PLASTIC FILM, 50V 0.1UF J |
| ⚠ C467 | 24503160 | PLASTIC CAP T 630V 433J |
| C471 | 24797479 | ELECTROLYTIC, 50V 4.7UF M |
| C474 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| C477 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| C478 | 24539563 | PLASTIC FILM, 50V 0.056UF J |
| C480 | 24747220 | ELECTROLYTIC CE04HS 50V 22UF M 7L 3A |
| C481 | 24539474 | PLASTIC FILM, 50V 0.47UF J |
| C482 | 24797478 | ELECTROLYTIC, 50V 0.47UF M |
| C483 | 24206108 | ELECTROLYTIC, 50V 0.1UF M 7L 3A |
| C499 | 24212102 | CERAMIC DISC, 50V B 1000PF K |
| C501 | 24109102 | CERAMIC CHIP, 50V B 1000PF K |
| C504 | 24591222 | PLASTIC FILM, 50V 2200PF J |

| Location No. | Parts No. | Description |
|---|---|---|
| C505 | 24105130 | CERAMIC CHIP, 50V CH 13PF J |
| C510 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| C511 | 24794101 | ELECTROLYTIC, 16V 100UF M |
| C512 | 24206228 | ELECTROLYTIC, 50V 0.22UF M 7L 3A |
| C582 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| C583 | 24762471 | ELECTROLYTIC, 10V 470UF M |
| C612 | 24794470 | ELECTORLYTIC, 16V 47UF M |
| C613 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| C661 | 24212102 | CERAMIC DISC, 50V B 1000PF K |
| C662 | 24212102 | CERAMIC DISC, 50V B 1000PF K |
| C663 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| C664 | 24796101 | ELECTROLYTIC, 35V 100UF M |
| C671 | 24667470 | ELECTROLYTIC, 25V 47UF M 3A |
| C672 | 24667470 | ELECTROLYTIC, 25V 47UF M 3A |
| C673 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| C676 | 24503041 | PLASTIC FILM , 63V 0.1UF J |
| C677 | 24503041 | PLASTIC FILM , 63V 0.1UF J |
| C678 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| C679 | 24667470 | ELECTROLYTIC, 25V 47UF M 3A |
| C681 | 24795102 | ELECTROLYTIC, 25V 1000UF M |
| C683 | 24795102 | ELECTROLYTIC, 25V 1000UF M |
| C801 | 24503002 | PLASTIC FILM, AC275V 0.22UF M |
| C802 | 24503001 | PLASTIC FILM, AC275V 0.1UF M |
| C805 | 24092623 | CERAMIC DISC CKS45F 250V 10000PFZ |
| C806 | 24092623 | CERAMIC DISC CKS45F 250V 10000PFZ |
| C808 | 24797470 | ELECTROLYTIC, 50V 47UF M |
| C810 | 24086061 | ELECTROLYTIC, 200V 470UF M 3F |
| C815 | 24092581 | CERAMIC DISC, AC250V E 1000PF M |
| C817 | 24092339 | CERAMIC DISC, 2KV 330PF K |
| C818 | 24082402 | PLASTIC FILM, 1250VH 2200PF H |
| C819 | 24795221 | ELECTROLYTIC, 25V 220UF M |
| C821 | 24214471 | CERAMIC DISC, 500V B 470PF K |
| C822 | 24092583 | CERAMIC DISC, AC250V E 2200PF M |
| C823 | 24092583 | CERAMIC DISC, AC250V E 2200PF M |
| C825 | 24212471 | CERAMIC DISC, 50V B 470PF K |
| C829 | 24590182 | PLASTIC FILM CQ922M 50V 1800PF J |
| C832 | 24539334 | PLASTIC FILM, 50V 0.33UF J |
| C840 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| C842 | 24792101 | ELECTROLYTIC, 6.3V 100UF M |
| C884 | 24640018 | ELECTROLYTIC, 160V 220UF |
| C885 | 24214471 | CERAMIC DISC, 500V B 470PF K |
| C889 | 24796222 | ELECTROLYTIC, 35V 2200UF M |
| C893 | 24092339 | CERAMIC DISC, 2KV 330PF K |
| C898 | 24539474 | PLASTIC FILM, 50V 0.47UF J |
| C902 | 24092345 | CERAMIC DISC, 2KV 0.001UF K |
| C904 | 24436391 | CERAMIC DISC, 50V SL 390PF J |
| C905 | 24436391 | CERAMIC DISC, 50V SL 390PF J |
| C906 | 24436391 | CERAMIC DISC, 50V SL 390PF J |
| C909 | 24679220 | ELECTROLYTIC, 250V 22UF M 3A |
| C910 | 24797478 | ELECTROLYTIC, 50V 0.47UF M |
| C911 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| C912 | 24763471 | ELECTROLYTIC, 16V 470UF M |
| C913 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| C914 | 24232103 | CERAMIC DISC, 50V F 10000PF Z |
| C920 | 24214101 | CERAMIC DISC, 500V B 100PF K |
| CA32 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CA37 | 24105101 | CERAMIC CHIP, 50V CH 100PF J |
| CA38 | 24105101 | CERAMIC CHIP, 50V CH 100PF J |
| CA42 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| CA43 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CA44 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CA68 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| CA69 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CB01 | 24794470 | ELECTORLYTIC, 16V 47UF M |
| CB48 | 24105101 | CERAMIC CHIP, 50V CH 100PF J |

| Location No. | Parts No. | Description |
|---|---|---|
| CB60 | 24085944 | ELECTROLYTIC, NONPOLAR, 50V 2.2UF M 11L |
| CB61 | 24591102 | PLASTIC FILM, 50V 1000PF J |
| CB62 | 24109561 | CERAMIC CHIP, 50V B 560PF K |
| CB63 | 24109122 | CERAMIC CHIP CC73B 50V 1200PF K |
| CB64 | 24763471 | ELECTROLYTIC, 16V 470UF M |
| CB65 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CG01 | 24794101 | ELECTROLYTIC, 16V 100UF M |
| CG02 | 24794220 | ELECTROLYTIC, 16V 22UF M |
| CG03 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| CG04 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CG05 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| CG06 | 24797479 | ELECTROLYTIC, 50V 4.7UF M |
| CG07 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CG08 | 24109473 | CERAMIC CHIP, 25V B 47000PFK |
| CG09 | 24797478 | ELECTROLYTIC, 50V 0.47UF M |
| CG10 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| CG12 | 24206108 | ELECTROLYTIC, 50V 0.1UF M 7L 3A |
| CG13 | 24088907 | TA SOLID ELEC. CHIP, 16V 3.3UF M A-CAE |
| CG14 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| CG16 | 24088098 | TA SOLID ELEC., 16V 10UF M B2-CA |
| CG17 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| CG18 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| CG19 | 24797479 | ELECTROLYTIC, 50V 4.7UF M |
| CG20 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| CG25 | 24797479 | ELECTROLYTIC, 50V 4.7UF M |
| CG26 | 24797479 | ELECTROLYTIC, 50V 4.7UF M |
| CG27 | 24109223 | CERAMIC CHIP, 25V B 0.022UF K |
| CG28 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CG29 | 24591102 | PLASTIC FILM, 50V 1000PF J |
| CG30 | 24206108 | ELECTROLYTIC, 50V 0.1UF M 7L 3A |
| CG31 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CG32 | 24591102 | PLASTIC FILM, 50V 1000PF J |
| CG33 | 24206108 | ELECTROLYTIC, 50V 0.1UF M 7L 3A |
| CG34 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CG35 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CG42 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| CG44 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| CM51 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| CM52 | 24108331 | CERAMIC CHIP, 50V SL 330PF J |
| CM58 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| CR01 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CR02 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CR03 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CS02 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CS04 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CS08 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CS10 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CS40 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| CS42 | 24797010 | ELECTROLYTIC, 50V 1UF M |
| CS43 | 24109331 | CERAMIC CHIP CK73B 50V 330pF K |
| CS44 | 24109331 | CERAMIC CHIP CK73B 50V 330pF K |
| CS45 | 24109331 | CERAMIC CHIP CK73B 50V 330pF K |
| CS46 | 24109331 | CERAMIC CHIP CK73B 50V 330pF K |
| CS51 | 24109102 | CERAMIC CHIP, 50V B 1000PF K |
| CS52 | 24109102 | CERAMIC CHIP, 50V B 1000PF K |
| CS70 | 24794220 | ELECTROLYTIC, 16V 22UF M |
| CS71 | 24794220 | ELECTROLYTIC, 16V 22UF M |
| CV01 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CV03 | 24206108 | ELECTROLYTIC, 50V 0.1UF M 7L 3A |
| CV05 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CV07 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CV09 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| CV10 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CV11 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |

| Location No. | Parts No. | Description |
|---|---|---|
| CV12 | 24539104 | PLASTIC FILM, 50V 0.1UF J |
| CV36 | 24794220 | ELECTROLYTIC, 16V 22UF M |
| CV38 | 24763471 | ELECTROLYTIC, 16V 470UF M |
| CV39 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CV41 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CV60 | 24763471 | ELECTROLYTIC, 16V 470UF M |
| CV61 | 24763471 | ELECTROLYTIC, 16V 470UF M |
| CZ01 | 24794101 | ELECTROLYTIC, 16V 100UF M |
| CZ02 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CZ03 | 24794100 | ELECTROLYTIC, 16V 10UF M |
| CZ04 | 24105181 | CERAMIC CHIP, 50V CH 180PF J |
| CZ05 | 24108620 | CHIP CERA CAP SL 50V 620J |
| CZ06 | 24105330 | CERAMIC CHIP, 50V CH 33PF J |
| CZ08 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CZ09 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CZ10 | 24794101 | ELECTROLYTIC, 16V 100UF M |
| CZ12 | 24105101 | CERAMIC CHIP, 50V CH 100PF J |
| CZ13 | 24105121 | CERAMIC CHIP, 50V CH 120PF J |
| CZ14 | 24105151 | CERAMIC CHIP, 50V CH 150PF J |
| CZ15 | 24109102 | CERAMIC CHIP, 50V B 1000PF K |
| CZ16 | 24105330 | CERAMIC CHIP, 50V CH 33PF J |
| CZ28 | 24212102 | CERAMIC DISC, 50V B 1000PF K |
| CZ29 | 24792101 | ELECTROLYTIC, 6.3V 100UF M |
| CZ30 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CZ31 | 24105100 | CERAMIC CHIP, 50V CH 10PF D |
| CZ32 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CZ33 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CZ34 | 24794101 | ELECTROLYTIC, 16V 100UF M |
| CZ35 | 24792101 | ELECTROLYTIC, 6.3V 100UF M |
| CZ36 | 24792101 | ELECTROLYTIC, 6.3V 100UF M |
| CZ37 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CZ39 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CZ41 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CZ42 | 24792101 | ELECTROLYTIC, 6.3V 100UF M |
| CZ43 | 24105181 | CERAMIC CHIP, 50V CH 180PF J |
| CZ44 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CZ45 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CZ46 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CZ47 | 24100104 | CERAMIC CHIP, 25V F 100000PF Z |
| CZ48 | 24109103 | CERAMIC CHIP, 50V B 0.01UF K |
| CZ49 | 24105330 | CERAMIC CHIP, 50V CH 33PF J |
| CZ50 | 24797229 | ELECTROLYTIC, 50V 2.2UF M |
| CZ57 | 24105181 | CERAMIC CHIP, 50V CH 180PF J |
| CZ58 | 24105560 | CERAMIC CHIP, 50V CH 56PF J |
| CZ96 | 24105270 | CERAMIC CHIP, 50V CH 27PF J |
| **RESISTORS** | | |
| R101 | 24553223 | OXIDE METAL FILM, 1W 22K OHM J |
| R203 | 24011474 | CHIP, METAL FILM, 1/20W 470K OHM J |
| R207 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| R208 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| R209 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| R216 | 24011223 | CHIP, METAL FILM, 1/20W 22K OHM J |
| R228 | 24553683 | OXIDE METAL FILM, 1W 68K OHM J |
| R238 | 24011473 | CHIP, METAL FILM, 1/20W 47K OHM J |
| R239 | 24011224 | CHIP, METAL FILM, 1/20W 220K OHM J |
| R240 | 24011562 | CHIP, METAL FILM, 1/20W 5.6K OHM J |
| R241 | 24011682 | CHIP, METAL FILM, 1/20W 6.8K OHM J |
| R245 | 24366104 | CARBON FILM, 1/6W 100K OHM J |
| R261 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| R262 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| R263 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| R264 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| R265 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| R266 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |

| Location No. | Parts No. | Description |
|---|---|---|
| R271 | 24366471 | CARBON FILM, 1/6W 470 OHM J |
| R272 | 24011222 | CHIP, METAL FILM, 1/20W 2.2K OHM J |
| R301 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| R303 | 24321109 | OXIDE METAL FILM, 1/2W 1 OHM J |
| R304 | 24011393 | CHIP, METAL FILM, 1/20W 39K OHM J |
| R305 | 24322688 | OXIDE METAL FILM, 1W 0.68 OHM J |
| R306 | 24366563 | CARBON FILM, 1/6W 56K OHM J |
| R307 | 24011474 | CHIP, METAL FILM, 1/20W 470K OHM J |
| R308 | 24382821 | OXIDE METAL FILM, 1W 82 OHM J |
| R310 | 24011153 | CHIP, METAL FILM, 1/2OW 15K OHM J |
| R311 | 24011392 | CHIP, METAL FILM, 1/20W 3.9K OHM J |
| R313 | 24011104 | CHIP, METAL FILM, 1/20W 100K OHM J |
| R314 | 24011105 | CHIP, METAL FILM, 1/20W 1M OHM J |
| R315 | 24011824 | CHIP, METAL FILM, 1/20W 820K OHM J |
| R317 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| R327 | 24339569 | OXIDE METAL FILM, 2W 5.6 OHM J |
| R328 | 24011824 | CHIP, METAL FILM, 1/20W 820K OHM J |
| R336 | 24383391 | OXIDE METAL FILM, 2W 390 OHM J |
| R360 | 24011104 | CHIP, METAL FILM, 1/20W 100K OHM J |
| R361 | 24011473 | CHIP, METAL FILM, 1/20W 47K OHM J |
| R370 | 24321109 | OXIDE METAL FILM, 1/2W 1 OHM J |
| R371 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| R372 | 24011392 | CHIP, METAL FILM, 1/20W 3.9K OHM J |
| R373 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| R374 | 24366183 | CARBON FILM, 1/6W 18K OHM J |
| R401 | 24011391 | CHIP, METAL FILM, 1/20W 390 OHM J |
| R403 | 24011562 | CHIP, METAL FILM, 1/20W 5.6K OHM J |
| R405 | 24382682 | OXIDE METAL FILM, 1W 6.8K OHM J |
| R406 | 24366473 | CARBON FILM, 1/6W 47K OHM J |
| R408 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| R410 | 24011271 | CHIP, METAL FILM, 1/20W 270 OHM J |
| R411 | 24366561 | CARBON FILM, 1/6W 560 OHM J |
| R415 | 24553272 | OXIDE METAL FILM, 1W 2.7K OHM J |
| R416 | 24510392 | CERAMIC COVERED G 5W 3.9K J |
| R418 | 24383181 | OXIDE METAL FILM, 2W 180 OHM J |
| R429 | 24366104 | CARBON FILM, 1/6W 100K OHM J |
| R430 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| R431 | 24366103 | CARBON FILM, 1/6W 10K OHM J |
| R432 | 24011222 | CHIP, METAL FILM, 1/20W 2.2K OHM J |
| R441 | 24532102 | FUSIBLE, 1W 1K OHM J |
| R448 | 24338478 | OXIDE METAL FILM, 1W 0.47 OHM J |
| R455 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| R457 | 24011104 | CHIP, METAL FILM, 1/20W 100K OHM J |
| R460 | 24366472 | CARBON FILM, 1/6W 4.7K OHM J |
| R461 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| R463 | 24322479 | METAL FILM, 1W 4R7 J |
| R464 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| R465 | 24011332 | CHIP, METAL FILM, 1/20W 3.3K OHM J |
| R466 | 24366103 | CARBON FILM, 1/6W 10K OHM J |
| R467 | 24011474 | CHIP, METAL FILM, 1/20W 470K OHM J |
| R472 | 24381270 | OXIDE FILM, 1/2W 27 J |
| R473 | 24366473 | CARBON FILM, 1/6W 47K OHM J |
| R474 | 24366184 | CARBON FILM, 1/6W 18OK OHM J |
| ⚠ R475 | 24011391 | CHIP, METAL FILM, 1/20W 390 OHM J |
| R476 | 24366823 | CARBON FILM, 1/6W 82K OHM J |
| R477 | 24011273 | CHIP, METAL FILM, 1/20W 27K OHM J |
| ⚠ R478 | 24327133 | METAL FILM, 1/4W 13K OHM F |
| R481 | 24011333 | CHIP, METAL FILM, 1/20W 33K OHM J |
| ⚠ R482 | 24327472 | METAL FILM, 1/4W 4R7K F |
| R485 | 24338568 | OXIDE METAL FILM, 1W 0.56 OHM J |
| R486 | 24552820 | OXIDE METAL FILM, 1/2W 82 OHM J |
| R487 | 24552301 | OXIDE METAL FILM, 1/2W 300 OHM J |
| R488 | 24327183 | METAL FILM, 1/4W 18K OHM F |
| R489 | 24327183 | METAL FILM, 1/4W 18K OHM F |
| R490 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |

| Location No. | Parts No. | Description |
|---|---|---|
| R493 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| R494 | 24366471 | CARBON FILM, 1/6W 470 OHM J |
| R495 | 24366561 | CARBON FILM, 1/6W 560 OHM J |
| R501 | 24011153 | CHIP, METAL FILM, 1/2OW 15K OHM J |
| R502 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| R503 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| R511 | 24366471 | CARBON FILM, 1/6W 470 OHM J |
| R612 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| R613 | 24011222 | CHIP, METAL FILM, 1/20W 2.2K OHM J |
| R614 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| R663 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| R664 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| R667 | 24011223 | CHIP, METAL FILM, 1/20W 22K OHM J |
| R668 | 24366103 | CARBON FILM, 1/6W 10K OHM J |
| R669 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| R674 | 24011153 | CHIP, METAL FILM, 1/2OW 15K OHM J |
| R676 | 24366229 | CARBON FILM, 1/6W 2.2 OHM J |
| R677 | 24366229 | CARBON FILM, 1/6W 2.2 OHM J |
| R678 | 24011153 | CHIP, METAL FILM, 1/2OW 15K OHM J |
| R808 | 24019474 | THERMISTOR, PTC THERMISTOR AC125V 1R5 M |
| R810 | 24568828 | CERAMIC COVERED G 7W 0.82 K |
| R814 | 24366182 | CARBON FILM, 1/6W 1.8K OHM J |
| R818 | 24510150 | CERAMIC COVERED G 5W 15 J |
| R820 | 24322208 | OXIDE METAL FILM, 1W 0.2 OHM J |
| R821 | 24321109 | OXIDE METAL FILM, 1/2W 1 OHM J |
| R822 | 24366152 | CARBON FILM, 1/6W 1.5K OHM J |
| R823 | 24366182 | CARBON FILM, 1/6W 1.8K OHM J |
| R829 | 24004945 | METAL FILM, 1W R18 J |
| R831 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| R835 | 24552681 | OXIDE METAL FILM, 1/2W 680 OHM J |
| R861 | 24366104 | CARBON FILM, 1/6W 100K OHM J |
| R862 | 24366104 | CARBON FILM, 1/6W 100K OHM J |
| R898 | 24010001 | CARBON FILM, 1/2W 3.9M J |
| R901 | 24552102 | OXIDE METAL FILM, 1/2W 1K OHM J |
| R902 | 24552102 | OXIDE METAL FILM, 1/2W 1K OHM J |
| R903 | 24552102 | OXIDE METAL FILM, 1/2W 1K OHM J |
| R904 | 24366103 | CARBON FILM, 1/6W 10K OHM J |
| R905 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| R914 | 24366561 | CARBON FILM, 1/6W 560 OHM J |
| R915 | 24366301 | CARBON FILM, 1/6W 300 OHM J |
| R916 | 24366820 | CARBON FILM, 1/6W 82 OHM J |
| R917 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| R918 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| R920 | 24000880 | FUSIBLE, 1W 5.1 OHM J |
| R921 | 24366561 | CARBON FILM, 1/6W 560 OHM J |
| R922 | 24366301 | CARBON FILM, 1/6W 300 OHM J |
| R924 | 24366820 | CARBON FILM, 1/6W 82 OHM J |
| R927 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| R928 | 24366561 | CARBON FILM, 1/6W 560 OHM J |
| R929 | 24366301 | CARBON FILM, 1/6W 300 OHM J |
| R930 | 24366820 | CARBON FILM, 1/6W 82 OHM J |
| R932 | 24366272 | CARBON FILM, 1/6W 2.7K OHM J |
| R934 | 24366271 | CARBON FILM, 1/6W 270 OHM J |
| R935 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| R936 | 24366750 | CARBON FILM, 1/6W 75 OHM J |
| R942 | 24366562 | CARBON FILM, 1/6W 5.6K OHM J |
| R943 | 24366562 | CARBON FILM, 1/6W 5.6K OHM J |
| R944 | 24366562 | CARBON FILM, 1/6W 5.6K OHM J |
| R960 | 24383153 | OXIDE METAL FILM, 2W 15K OHM J |
| R961 | 24383153 | OXIDE METAL FILM, 2W 15K OHM J |
| R962 | 24383153 | OXIDE METAL FILM, 2W 15K OHM J |
| R968 | 24366150 | CARBON FILM, 1/6W 15 OHM J |
| R977 | 24366122 | CARBON FILM, 1/6W 1.2K OHM J |
| RA03 | 24366102 | CARBON FILM, 1/6W 1K OHM J |

| Location No. | Parts No. | Description |
|---|---|---|
| RA04 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RA06 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RA07 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RA08 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA09 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA10 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA15 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA16 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA17 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA18 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA21 | 24366472 | CARBON FILM, 1/6W 4.7K OHM J |
| RA22 | 24011331 | CHIP, METAL FILM, 1/20W 330 OHM J |
| RA23 | 24011331 | CHIP, METAL FILM, 1/20W 330 OHM J |
| RA24 | 24011331 | CHIP, METAL FILM, 1/20W 330 OHM J |
| RA25 | 24011331 | CHIP, METAL FILM, 1/20W 330 OHM J |
| RA26 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA27 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA33 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RA35 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RA36 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RA37 | 24011331 | CHIP, METAL FILM, 1/20W 330 OHM J |
| RA38 | 24011331 | CHIP, METAL FILM, 1/20W 330 OHM J |
| RA40 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RA41 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RA61 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RA62 | 24366103 | CARBON FILM, 1/6W 10K OHM J |
| RA67 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| RA68 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| RA71 | 24011683 | CHIP, METAL FILM, 1/20W 68K OHM J |
| RA72 | 24011223 | CHIP, METAL FILM, 1/20W 22K OHM J |
| RA73 | 24366103 | CARBON FILM, 1/6W 10K OHM J |
| RA74 | 24366333 | CARBON FILM, 1/6W 33K OHM J |
| RB01 | 24366271 | CARBON FILM, 1/6W 270 OHM J |
| RB03 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| RB09 | 24327470 | METAL RES K 1/4W 470F |
| RB11 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RB24 | 24366472 | CARBON FILM, 1/6W 4.7K OHM J |
| RB25 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| RB40 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RB42 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RB43 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RB44 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RB45 | 24366181 | CARBON FILM, 1/6W 180 OHM J |
| RB46 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RB47 | 24011332 | CHIP, METAL FILM, 1/20W 3.3K OHM J |
| RB49 | 24011332 | CHIP, METAL FILM, 1/20W 3.3K OHM J |
| RB60 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RB61 | 24011224 | CHIP, METAL FILM, 1/20W 220K OHM J |
| RB62 | 24011123 | CHIP, METAL FILM, 1/20W 12K OHM J |
| RB63 | 24011392 | CHIP, METAL FILM, 1/20W 3.9K OHM J |
| RB64 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RB65 | 24366221 | CARBON FILM, 1/6W 220 OHM J |
| RB66 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RB67 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RG05 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RG08 | 24011394 | CHIP, METAL FILM, 1/20W 390K OHM J |
| RG09 | 24011473 | CHIP, METAL FILM, 1/20W 47K OHM J |
| RG14 | 24011332 | CHIP, METAL FILM, 1/20W 3.3K OHM J |
| RG15 | 24011152 | CHIP, METAL FILM, 1/20W 1.5K OHM J |
| RG16 | 24327153 | METAL FILM, 1/4W 15K OHM J |
| RG17 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| RG22 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| RG23 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| RG43 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| RG44 | 24011222 | CHIP, METAL FILM, 1/20W 2.2K OHM J |

| Location No. | Parts No. | Description |
|---|---|---|
| RR07 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RR93 | 24011472 | CHIP, METAL FILM, 1/20W 4.7K OHM J |
| RS02 | 24011682 | CHIP, METAL FILM, 1/20W 6.8K OHM J |
| RS04 | 24011682 | CHIP, METAL FILM, 1/20W 6.8K OHM J |
| RS08 | 24011682 | CHIP, METAL FILM, 1/20W 6.8K OHM J |
| RS10 | 24011682 | CHIP, METAL FILM, 1/20W 6.8K OHM J |
| RS28 | 24366472 | CARBON FILM, 1/6W 4.7K OHM J |
| RS40 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| RS41 | 24011152 | CHIP, METAL FILM, 1/20W 1.5K OHM J |
| RS42 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| RS60 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RS61 | 24011222 | CHIP, METAL FILM, 1/20W 2.2K OHM J |
| RS62 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RS63 | 24011222 | CHIP, METAL FILM, 1/20W 2.2K OHM J |
| RS64 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RS65 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RS66 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RS68 | 24011223 | CHIP, METAL FILM, 1/20W 22K OHM J |
| RS69 | 24011223 | CHIP, METAL FILM, 1/20W 22K OHM J |
| RS70 | 24011104 | CHIP, METAL FILM, 1/20W 100K OHM J |
| RS71 | 24011104 | CHIP, METAL FILM, 1/20W 100K OHM J |
| RV01 | 24011750 | CHIP, METAL FILM, 1/20W 75 OHM J |
| RV02 | 24011750 | CHIP, METAL FILM, 1/20W 75 OHM J |
| RV03 | 24011750 | CHIP, METAL FILM, 1/20W 75 OHM J |
| RV04 | 24011750 | CHIP, METAL FILM, 1/20W 75 OHM J |
| RV07 | 24366103 | CARBON FILM, 1/6W 10K OHM J |
| RV08 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RV09 | 24366103 | CARBON FILM, 1/6W 10K OHM J |
| RV10 | 24000445 | CHIP JUMPER, 1608TYPE |
| RV12 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| RV14 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RV15 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RV16 | 24366471 | CARBON FILM, 1/6W 470 OHM J |
| RV19 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RV20 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RV60 | 24552101 | OXIDE METAL FILM, 1/2W 100 OHM J |
| RV61 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RV62 | 24366750 | CARBON FILM, 1/6W 75 OHM J |
| RV63 | 24366221 | CARBON FILM, 1/6W 220 OHM J |
| RW02 | 24011750 | CHIP, METAL FILM, 1/20W 75 OHM J |
| RW03 | 24011750 | CHIP, METAL FILM, 1/20W 75 OHM J |
| RZ05 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| RZ06 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| RZ07 | 24366221 | CARBON FILM, 1/6W 220 OHM J |
| RZ08 | 24011151 | CHIP, METAL FILM, 1/20W 150 OHM J |
| RZ10 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RZ11 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RZ12 | 24011182 | CHIP, METAL FILM, 1/20W 1.8K OHM J |
| RZ13 | 24011392 | CHIP, METAL FILM, 1/20W 3.9K OHM J |
| RZ14 | 24011123 | CHIP, METAL FILM, 1/20W 12K OHM J |
| RZ15 | 24011151 | CHIP, METAL FILM, 1/20W 150 OHM J |
| RZ16 | 24366101 | CARBON FILM, 1/6W 100 OHM J |
| RZ17 | 24366181 | CARBON FILM, 1/6W 180 OHM J |
| RZ18 | 24011121 | CHIP, METAL FILM, 1/20W 120 OHM J |
| RZ21 | 24011471 | CHIP, METAL FILM, 1/20W 470 OHM J |
| RZ22 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| RZ28 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RZ34 | 24011474 | CHIP, METAL FILM, 1/20W 470K OHM J |
| RZ35 | 24011821 | CHIP, METAL FILM, 1/20W 820 OHM J |
| RZ36 | 24011123 | CHIP, METAL FILM, 1/20W 12K OHM J |
| RZ43 | 24011220 | CHIP, METAL FILM, 1/20W 22 OHM J |
| RZ44 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RZ45 | 24366220 | CARBON FILM, 1/6W 22 OHM J |
| RZ46 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RZ49 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |

| Location No. | Parts No. | Description |
|---|---|---|
| RZ60 | 24366102 | CARBON FILM, 1/6W 1K OHM J |
| RZ61 | 24011822 | CHIP, METAL FILM, 1/20W 8.2K OHM J |
| RZ62 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RZ63 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RZ65 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RZ66 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RZ68 | 24011102 | CHIP, METAL FILM, 1/20W 1K OHM J |
| RZ71 | 24011103 | CHIP, METAL FILM, 1/20W 10K OHM J |
| RZ75 | 24366330 | CARBON FILM, 1/6W 33 OHM J |
| **COILS & TRANSFORMERS** | | |
| L101 | 23289846 | COIL, PEAKING, TRF4101AT |
| L201 | 23238703 | COIL, PEAKING, TRF4820AJ |
| L301 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| L302 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| L303 | 23103775 | COIL, FERRITE CHOKE, TEM2014 |
| L401 | 23280016 | COIL, PEAKING, TRF4100AZ |
| ⚠ L441 | 23233092 | COIL, LIN-X20H34-3.5A-18MMH, TLN2138G |
| L442 | 23248121 | COIL, CHOKE, TLN3383D |
| ⚠ L447 | 23248318 | CHOKE 17X29H 47MMH |
| ⚠ L461 | 23248173 | COIL, CHOKE, TLN3333AD |
| L501 | 23238711 | COIL, PEAKING, TRF4180AJ |
| L502 | 23289844 | COIL, PEAKING, TRF4470AT |
| L805 | 23248213 | COIL, CHOKE, TLN3481AH |
| L806 | 23248213 | COIL, CHOKE, TLN3481AH |
| L815 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| L824 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| L883 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| L885 | 23248073 | COIL, CHOKE, TLN3299D |
| L886 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| L901 | 23200478 | COIL, DG 0.60CU 37T-2LOOP |
| L902 | 23280024 | COIL, PEAKING-220MMHJ, COLTRF4221AZ |
| L903 | 23280024 | COIL, PEAKING-220MMHJ, COLTRF4221AZ |
| L904 | 23280024 | COIL, PEAKING-220MMHJ, COLTRF4221AZ |
| LA01 | 23289840 | COIL, PEAKING, TRF4100AT |
| LG01 | 23289220 | COIL, PEAKING, TRF4220AF |
| LV01 | 23289840 | COIL, PEAKING, TRF4100AT |
| LV98 | 23103159 | FILTER, EMI, TEM2028AA, 7.5X6.4X8 60MMH 0.5A |
| LV99 | 23103159 | FILTER, EMI, TEM2028AA, 7.5X6.4X8 60MMH 0.5A |
| LZ01 | 23289840 | COIL, PEAKING, TRF4100AT |
| LZ02 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| LZ03 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| LZ20 | 23238718 | COIL, PEAKING, TRF4479AJ |
| LZ21 | 23238711 | COIL, PEAKING, TRF4180AJ |
| LZ22 | 23238506 | COIL, PEAKING, TRF4229AJ |
| LZ96 | 23238715 | COIL, PEAKING, TRF4829AJ |
| T401 | 23224367 | TRANSFORMER, HORIZ DRIVER, TLN1098AH |
| ⚠ T461 | 23236733 | TRANSFORMER, FLYBACK, TFB4192AS |
| T801 | 23211739 | COIL, LINE FILTER, TRF3229AL |
| T840 | 23217572 | TRANSFORMER, POWER EI28 1, TPW1571AT |
| ⚠ T862 | 23217558 | TRANSFORMER, CONV TRS EER, TPW3498AE |

| Location No. | Parts No. | Description |
|---|---|---|
| **SEMICONDUCTORS** | | |
| Q203 | 23314965 | TRANSISTOR, KTC3198 Y |
| Q204 | 23114460 | TRANSISTOR, RN1204 |
| Q205 | 23114460 | TRANSISTOR, RN1204 |
| Q301 | 23319787 | IC, LA7833S |
| Q301B | 72471082 | SCREW, 3X10MM |
| Q370 | 23314962 | TRANSISTOR, KTA1266 Y |
| Q402 | 23114755 | TRANSISTOR, 2SC2482FA-1 |
| Q403 | 23314444 | TRANSISTOR, 2SC4721, P |
| Q404 | 23314955 | TRANSISTOR, 2SD2553(FA) |
| Q404B | 72471082 | SCREW, 3X10MM |
| Q421 | 23009187 | IC, REGULATOR +9V 4%, KIA7809API |
| Q421B | 23035308 | SCREW, 3X8MM, TAPPING |
| Q460 | 23314938 | TRANSISTOR, 2SD2493(P) |
| Q460B | 72471082 | SCREW, 3X10MM |
| Q461 | 23314962 | TRANSISTOR, KTA1266 Y |
| Q471 | 23314961 | TRANSISTOR, VCEO-50V 150M |
| Q472 | 23314965 | TRANSISTOR, KTC3198 Y |
| Q480 | 23114759 | TRANSISTOR, 2SA949-Y |
| Q481 | 23314965 | TRANSISTOR, KTC3198 Y |
| Q482 | 23314965 | TRANSISTOR, KTC3198 Y |
| Q483 | 23114469 | TRANSISTOR, RN2201 |
| Q501 | 23906843 | IC, TA1310N |
| Q610 | 23000249 | IC, TA8265K |
| Q610B | 70391356 | SCREW, BITTB3X10 SZN |
| Q611 | 23114623 | TRANSISTOR, 2SC2878-A(TEM |
| Q612 | 23314962 | TRANSISTOR, KTA1266 Y |
| Q613 | 23114623 | TRANSISTOR, 2SC2878-A(TEM |
| ⚠ Q801 | 23135032 | IC,HYBRID VDSS=450V, STR-G5624A |
| Q801B | 72471082 | SCREW, 3X10MM |
| Q805 | 23114459 | TRANSISTOR, RN1205 |
| Q830 | 23009188 | IC, REGULATOR +5V 4%, KIA7805API |
| Q830B | 23035308 | SCREW, 3X8MM, TAPPING |
| Q831 | 23314965 | TRANSISTOR, KTC3198 Y |
| Q840 | 23000140 | IC, MM1437AS |
| Q843 | 23114459 | TRANSISTOR, RN1205 |
| Q901 | 23314780 | TRANSISTOR, 2SC4544 |
| Q902 | 23314965 | TRANSISTOR, KTC3198 Y |
| Q903 | 23314780 | TRANSISTOR, 2SC4544 |
| Q904 | 23314965 | TRANSISTOR, KTC3198 Y |
| Q905 | 23314780 | TRANSISTOR, 2SC4544 |
| Q906 | 23314965 | TRANSISTOR, KTC3198 Y |
| Q907 | 23314962 | TRANSISTOR, KTA1266 Y |
| Q908 | 23314965 | TRANSISTOR, KTC3198 Y |
| QA01 | 23009196 | IC, MCU 1CHIP 8BIT 8M 42P, 88CP38AN3PV2 |
| QA02 | 70129486 | IC, AT24C04 10PC |
| QB01 | 23314965 | TRANSISTOR, KTC3198 Y |
| QB03 | 23114459 | TRANSISTOR, RN1205 |
| QB23 | 23314965 | TRANSISTOR, KTC3198 Y |
| QB40 | 23314965 | TRANSISTOR, KTC3198 Y |
| QB41 | 23314965 | TRANSISTOR, KTC3198 Y |
| QB60 | 23314962 | TRANSISTOR, KTA1266 Y |
| QB61 | 23314965 | TRANSISTOR, KTC3198 Y |
| QB62 | 23314965 | TRANSISTOR, KTC3198 Y |
| QG01 | 23906499 | IC, UPC1851BCU |
| QS60 | 23314965 | TRANSISTOR, KTC3198 Y |
| QS61 | 23314965 | TRANSISTOR, KTC3198 Y |
| QS62 | 23114466 | TRANSISTOR, RN2204 |
| QS63 | 23114623 | TRANSISTOR, 2SC2878-A(TEM |
| QS64 | 23114623 | TRANSISTOR, 2SC2878-A(TEM |
| QV01 | 23000686 | IC, MM1311BD |
| QV02 | 23314965 | TRANSISTOR, KTC3198 Y |
| QV60 | 23314965 | TRANSISTOR, KTC3198 Y |
| QZ01 | 23009176 | IC, 3LINE-DIGITAL Y/C SEP, TC90A53N |

| Location No. | Parts No. | Description |
|---|---|---|
| QZ04 | 23314965 | TRANSISTOR, KTC3198 Y |
| QZ05 | 23314962 | TRANSISTOR, KTA1266 Y |
| QZ06 | 23314965 | TRANSISTOR, KTC3198 Y |
| QZ08 | 23314962 | TRANSISTOR, KTA1266 Y |
| QZ14 | 23314962 | TRANSISTOR, KTA1266 Y |
| QZ20 | 23314965 | TRANSISTOR, KTC3198 Y |
| QZ21 | 23314962 | TRANSISTOR, KTA1266 Y |
| QZ23 | 23314962 | TRANSISTOR, KTA1266 Y |
| D101 | 23316755 | DIODE, ZENER, MTZJ33C |
| D201 | 23118859 | DIODE, 1SS133 |
| D221 | 23118859 | DIODE, 1SS133 |
| D222 | 23118859 | DIODE, 1SS133 |
| D225 | 23357281 | DIODE, DZ9.1 BS A |
| D226 | 23357281 | DIODE, DZ9.1 BS A |
| D301 | 23357366 | DIODE, PIV=600V IF(AV)=1A |
| D302 | 23357366 | DIODE, PIV=600V IF(AV)=1A |
| D310 | 23118859 | DIODE, 1SS133 |
| D313 | 23118859 | DIODE, 1SS133 |
| D370 | 23357267 | DIODE, DZ5.6 BS B |
| D371 | 23118859 | DIODE, 1SS133 |
| D406 | 23357366 | DIODE, PIV=600V IF(AV)=1A |
| D408 | 23316414 | DIODE, 3JH41(FALC3) |
| D409 | 23118622 | DIODE, ZENER, RD10ES B2 |
| D411 | 23357279 | DIODE, DZ8.2 BS B |
| D430 | 23357283 | DIODE, DZ9.1 BS C |
| D441 | 23357282 | DIODE, DZ9.1 BS B |
| D444 | 23316254 | DIODE, ERC06-15 |
| D461 | 23118338 | DIODE, RU4AM LF-K2 |
| D462 | 23118859 | DIODE, 1SS133 |
| D466 | 23357248 | DIODE, DZ2.7 BS B |
| D467 | 23357366 | DIODE, PIV=600V IF(AV)=1A |
| D471 | 23357366 | DIODE, PIV=600V IF(AV)=1A |
| ⚠ D472 | 23115774 | DIODE, ZENER, RD6.2E(FA-1) |
| D473 | 23118859 | DIODE, 1SS133 |
| D480 | 23357299 | DIODE, DZ16 BS A |
| D611 | 23118859 | DIODE, 1SS133 |
| D612 | 23118859 | DIODE, 1SS133 |
| D801 | 23316391 | DIODE, D3SB60(4103) |
| D805 | 23118859 | DIODE, 1SS133 |
| D806 | 23357366 | DIODE, PIV=600V IF(AV)=1A |
| D807 | 23118859 | DIODE, 1SS133 |
| D810 | 23316269 | DIODE, AK04 |
| D830 | 23118859 | DIODE, 1SS133 |
| D840 | 23316962 | DIODE, S1WBA20 |
| D841 | 23357267 | DIODE, DZ5.6 BS B |
| D845 | 23118859 | DIODE, 1SS133 |
| D846 | 23118859 | DIODE, 1SS133 |
| D883 | 23357344 | DIODE, VRM=600V IF(AV)=1.5A, RU3AM |
| D885 | 23118094 | DIODE, EU2A |
| D899 | 24019485 | VARISTOR, TNR10V431K |
| D901 | 23118859 | DIODE, 1SS133 |
| D902 | 23118859 | DIODE, 1SS133 |
| D904 | 23118859 | DIODE, 1SS133 |
| D905 | 23118859 | DIODE, 1SS133 |
| D906 | 23118859 | DIODE, 1SS133 |
| D911 | 23118095 | DIODE, ERB44-06 |
| DA42 | 23357267 | DIODE, DZ5.6 BS B |
| DB03 | 23358522 | DIODE, LED, SIR-56SB3F |
| DB45 | 23118859 | DIODE, 1SS133 |
| DE50 | 23358571 | LED, LAMP RED, BT-H254N-31- |
| DV01 | 23357281 | DIODE, DZ9.1 BS A |
| DV03 | 23357281 | DIODE, DZ9.1 BS A |
| DV05 | 23357281 | DIODE, DZ9.1 BS A |
| DV09 | 23357281 | DIODE, DZ9.1 BS A |

| Location No. | Parts No. | Description |
|---|---|---|
| **MISCELLANEOUS** | | |
| B110 | 23929683 | BACK TERMINAL BOARD, 32A32 |
| B205 | 23974994 | BAND, KESSOKU |
| B230 | 23035312 | SCREW, BTB3X12SZN |
| B231 | 23035412 | SCREW, BTB4X12SZN |
| B232 | 23037312 | SCREW, BTBW3X12SZN |
| F470 | 23144906 | FUSE, CARTRIDGE F1.25U1 |
| F470A | 23165433 | FUSE HOLDER, 5.2 SOC |
| F801 | 23144518 | FUSE, CARTRIDGE 125V 10A |
| F801A | 23165433 | FUSE HOLDER, 5.2 SOC |
| F802 | 23144893 | FUSE, 3.15A |
| F802A | 23165433 | FUSE HOLDER, 5.2 SOC |
| F803 | 23144897 | FUSE, 2A 125V |
| F803A | 23165433 | FUSE HOLDER, 5.2 SOC |
| G217 | 24366153 | CARBON FILM, 1/6W 15K OHM J |
| G402 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| G403 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| G404 | 23238714 | COIL, PEAKING, TRF4100AJ |
| G500 | 23280016 | COIL, PEAKING, TRF4100AZ |
| G816 | 23103145 | FILTER, FERRITE CHOKE 3.5X4.5 TEM2011AA |
| G890 | 23280016 | COIL, PEAKING, TRF4100AZ |
| G891 | 23280016 | COIL, PEAKING, TRF4100AZ |
| G908 | 23280016 | COIL, PEAKING, TRF4100AZ |
| G933 | 24366750 | CARBON FILM, 1/6W 75 OHM J |
| GJ01 | 24000445 | CHIP JUMPER, 1608TYPE |
| GJ02 | 24000445 | CHIP JUMPER, 1608TYPE |
| GR01 | 24366470 | CARBON FILM, 1/6W 47 OHM J |
| GR02 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| GR03 | 24011101 | CHIP, METAL FILM, 1/20W 100 OHM J |
| KB01 | 23906805 | IC, REMOTE PHOTO RECIEVER, PIC-TB17 |
| M461B | 23504358 | CABLE, FOCUS |
| N726 | 23969041 | TAPE WHITE 3M #1, W=1 INCH TNP COMMON |
| P801 | 23372115 | POWER CORD, U/C 125V10A HSV 4 CMC-02P 3 |
| P910 | 23164725 | CONNECTOR, PLUG 2P |
| PV01 | 23365575 | JACK, Y/C JLC, YKF51-5575 |
| PV02 | 23365990 | JACK, PIN 6P INCHAN JACK 6P |
| PV03 | 23365991 | JACK, PIN 5P INCHAN JACK 5P |
| SA01 | 23344443 | SWITCH, TACTING SWITCH TSV TYP TSVB-1 |
| SA02 | 23344443 | SWITCH, TACTING SWITCH TSV TYP TSVB-1 |
| SA03 | 23344443 | SWITCH, TACTING SWITCH TSV TYP TSVB-1 |
| SA04 | 23344443 | SWITCH, TACTING SWITCH TSV TYP TSVB-1 |
| SA05 | 23344443 | SWITCH, TACTING SWITCH TSV TYP TSVB-1 |
| SA06 | 23344443 | SWITCH, TACTING SWITCH TSV TYP TSVB-1 |
| SA07 | 23344443 | SWITCH, TACTING SWITCH TSV TYP TSVB-1 |
| SR81 | 23146564 | RELAY, DC12V, TV5, DG-3 |
| SR83 | 23146564 | RELAY, DC12V, TV5, DG-3 |
| V901A | 23903147 | SOCKET, ISH46S-E ICE 29MM |
| W661 | 23351191 | SPEAKER, 60X120 8-OHM 5W |
| W662 | 23351191 | SPEAKER, 60X120 8-OHM 5W |
| X401 | 23153721 | CERAMIC RESONATOR, 503KHZ |
| X501 | 23153961 | CRYSTAL, 3.58MHZ |
| XA01 | 23153504 | CERAMIC RESONATOR, 8.00MHZ 25OHM |

| Location No. | Parts No. | Description |
|---|---|---|
| **PC BOARD ASSEMBLIES** | | |
| * U901 | 23787442 | CRT-D BOARD, PD0629A |
| * U902 | 23787441 | MAIN BOARD, PD0628A |
| **PICTURE TUBE** | | |
| ⚠ V901 | 23312973 | PICTURE TUBE, TDD32FSAK, A80AKB50X05 |
| **TUNER** | | |
| H001 | 23321435 | TUNER, EL971L, TIF 181CH F 5V MPX |
| **ACCESSORIES** | | |
| K912 | 23306359 | REMOCON HAND UNIT IR, CTVUSA CT-90037 |
| Y101 | 23565605 | OWNER'S MANUAL, ENGLISH, 32A32 |
| Y101F | 23565606 | OWNER'S MANUAL, FRENCH, 32A32 |
| **CABINET PARTS** | | |
| A201 | 23530246 | FRONT COVER ASSY 32A32 |
| A243 | 23430225 | FILTER RMT TNP LOCAL CF32E50 |
| A244 | 23445625 | POWER BUTTON 32A32 |
| A245 | 23445626 | CONTROL BUTTON 32A32 |
| A249 | 23836492 | SPRING |
| A411 | 23426481 | BACK COVER PROPER CF32E50 |
| A701 | 23525037 | CONTAINER CX32F60 LOCAL, CX32F60 |
| A703 | 23935368 | TOP PACKING LOCAL CF32E50 |
| A708 | 23935369 | BOTTOM PACKING CF32E50 LOCAL, CF32E50 |

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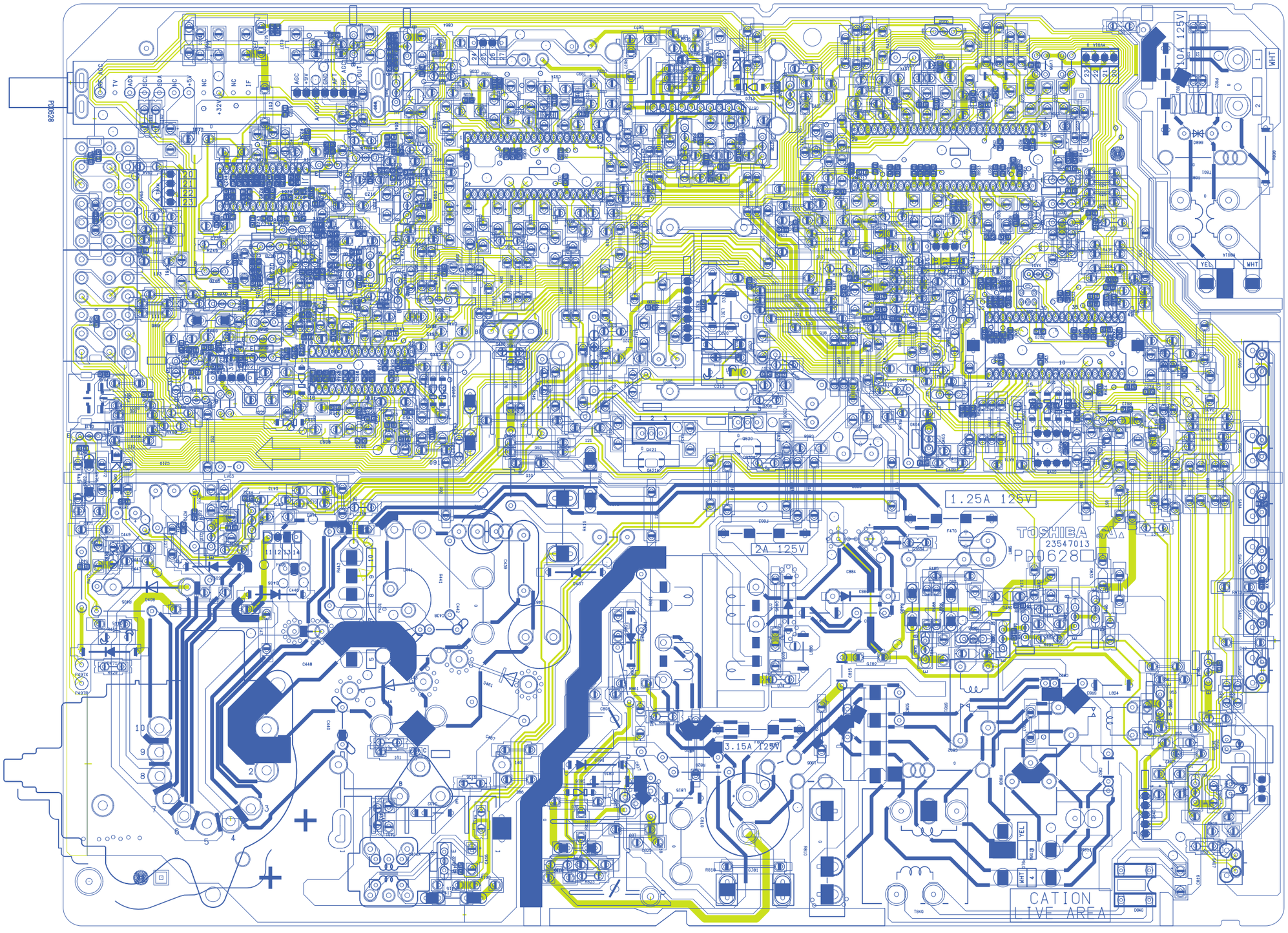
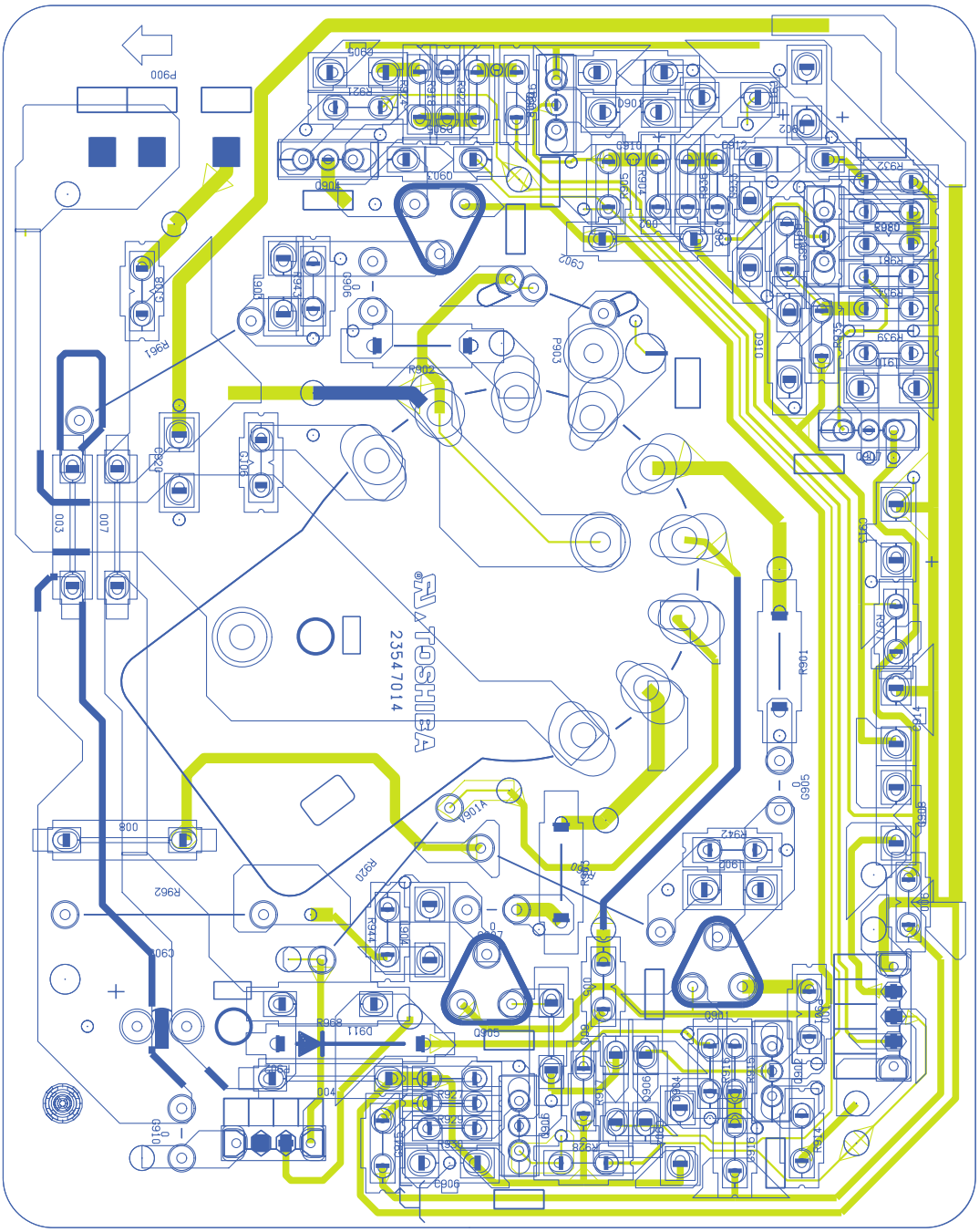
# MAIN BOARD PD0628

## BOTTOM (FOIL) SIDE



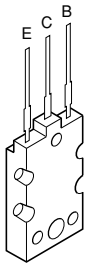
# CRT / DRIVE BOARD PD0629

**BOTTOM (FOIL) SIDE**

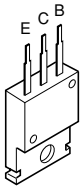


# TERMINAL VIEW OF TRANSISTORS

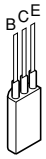
① 2SD2253
(old)
2SC5243



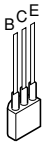

② 2SC3852
2SD1763A
2SC1569
2SC4544
2SA1788
2SA1306
2SA1186A



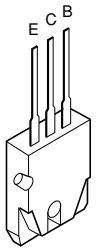

③ 2SC752GTM
2SC2482
2SC2655
2SC4721P



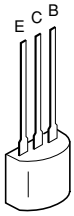

④ 2SC752
2SA562TM
2SA1015
2SC1815
2SC2878
2SC1740S
2SC2120
2SA9335



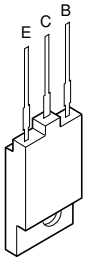

⑤ 2SA1788



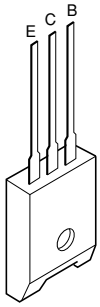

⑥ RN2203
RN2201
RN2004
RN1203
RN1204
RN2204
RN1205
RN1202
RN1201




⑦ 2SD1554
2SD2253
2SD1556
2SC5143
2SD2553




⑧ ON4409



# SCHEMATIC DIAGRAM

## MODEL : 32A32 Chassis No. TAC0245

**WARNING**: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON THE MANUAL FOR THIS MODEL.

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

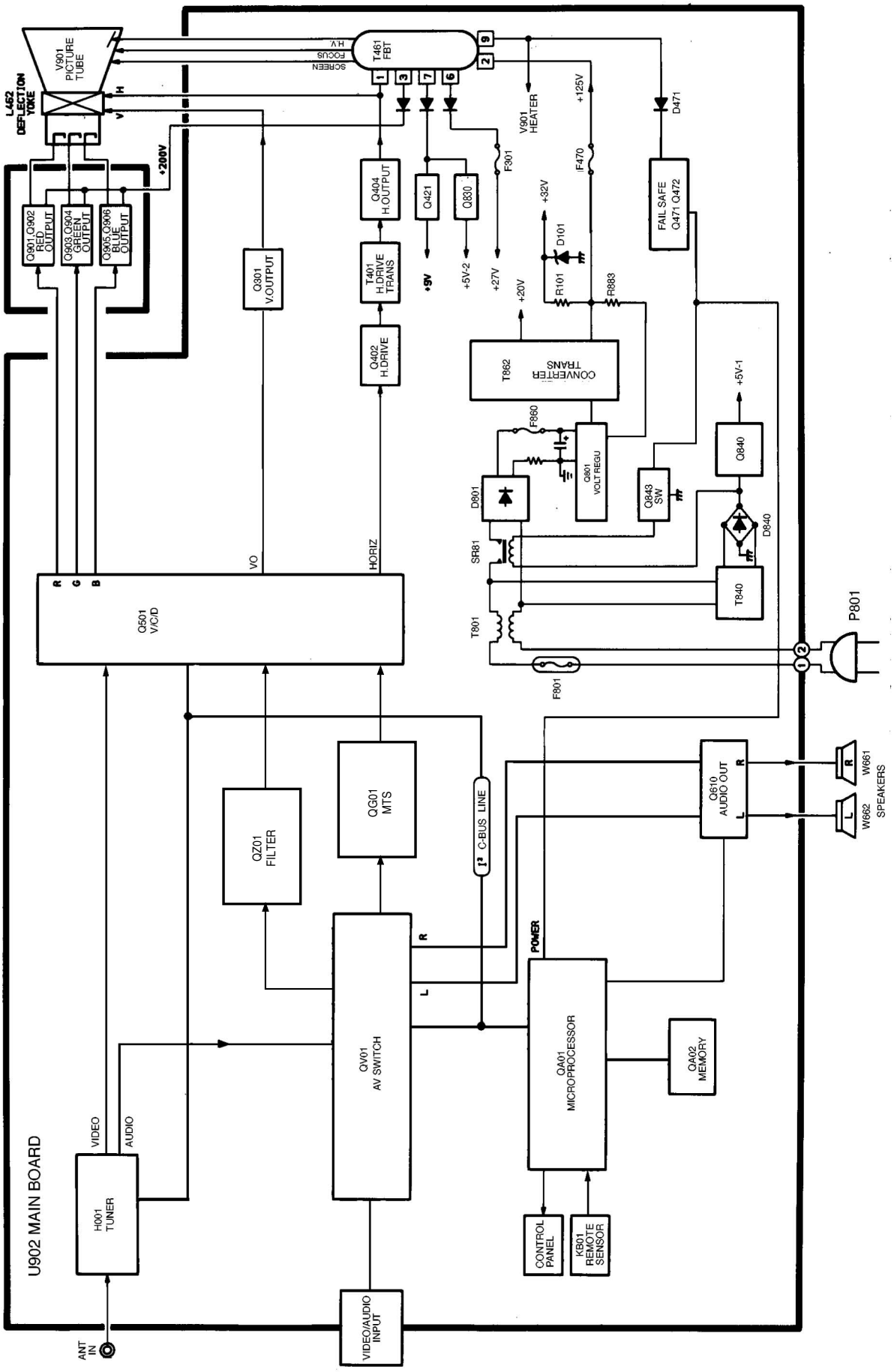
**NOTE:**

1. RESISTOR Resistance is shown in ohm [K = 1.000, M = 1.000.000]. All resistors are 1/6W and 5% tolerance carbon resistor, unless otherwise noted as the following marks.
   1/2R = Metal or Metal oxide of 1/2 watt  1/2S = Carbon compsistion of 1/2 watt
   1RF = Fuse resistor of 1 watt  10W = Cement of 10 watt
   K = ±10%  G = ±2%  F = ±1%
2. CAPACITOR Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in $\mu$F, and the values more than 1 in pF.
   All capacitors are ceramic 50V, unless otherwise noted as the following marks.
    Electolytic capacitor  Mylar capacitor
3. The parts indicated with " ⚠ " have special characteristics, and should be replaced with identical parts only.
4. Voltages read with DIGITAL MULTI-METER from point indicated to chassing ground, using a color bar signal with all controls at normal, line voltage 120 volts.
5. Waveforms are taken receiving color bar signal with enough sensitivity.
6. Voltage reading shown are nominal values and may vary ±20% except H.V.

■ **SCHEMATIC DIAGRAM STRUCTURE:**

- MAIN Circuit
- CRT-D Circuit
- FRONT AV Circuit

# CIRCUIT BLOCK DIAGRAM



| SPECIFICATIONS | |
|---|---|
| TELEVISION SYSTEM | NTSC standard |
| CHANNEL COVERAGE | VHF: 2 through 13<br>UHF: 14 through 69<br>Cable TV: mid band (A-8 through A-1, A through I)<br>super band (J through W)<br>hyper band (AA through ZZ, AAA, BBB)<br>ultra band (65 through 94, 100 through 125) |
| POWER SOURCE | 120V AC, 60Hz, 94W |
| AUDIO POWER | 5W + 5W |
| SPEAKER TYPE | 2-3/8 x 4-3/4 inches (60 x 120 mm) |
| VIDEO/AUDIO TERMINALS | S-VIDEO INPUT<br>Y-INPUT: 1V (p-p), 75 ohm, negative sync.<br>C-INPUT: 0.286V (p-p) (burst signal), 75 ohm<br>VIDEO/AUDIO INPUT (VIDEO1/VIDEO2)<br>VIDEO: 1V(p-p), 75 ohm, negative sync.<br>AUDIO: 150mV(rms) (30% modulation equivalent, 47k ohm)<br>ColorStream™ (component video) INPUT<br>Y: 1V (p-p), 75 ohm<br>$C_R$: 0.7V (p-p), 75 ohm<br>$C_B$: 0.7V (p-p), 75 ohm<br>VIDEO/AUDIO OUTPUT<br>VIDEO: 1V(p-p), 75 ohm, negative sync.<br>AUDIO: 150mV(rms) (30% modulation equivalent, 4.7k ohm) |
| DIMENSIONS | Width 773 mm<br>Height 714 mm<br>Depth 577 mm |
| MASS | 53.5 kg |

∗ Please refer to owner's manual in detail.

– END –

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