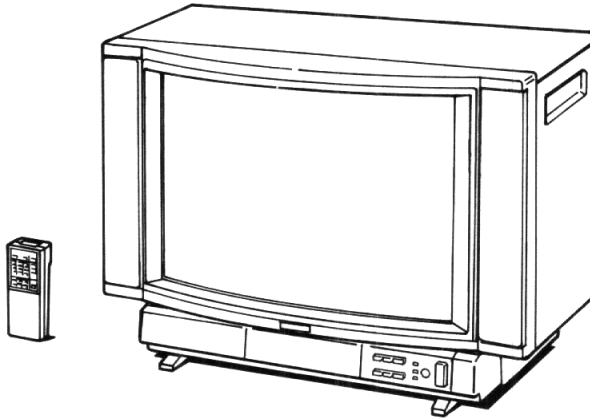


# KV-20TX11

## RM-756

# SERVICE MANUAL

*US Model*  
Chassis No. SCC-B55E-A



# P3A CHASSIS

**Note:** The service manual for RM-756 has been issued separately.

### MODELS OF THE SAME SERIES

KV-20TX11	KV-20TS11
KV-20TX10	
KV-20TR11	

### SPECIFICATIONS

Television system American TV standards  
Channel coverage VHF: 2-13  
UHF: 14-69  
Cable TV: 1-125

Picture tube Microblack Trinitron tube  
**20-inch picture measured diagonally**  
21-inch picture tube measured diagonally

Input VIDEO INPUT (phono jacks)  
Video: 1 Vp-p, 75-ohms  
unbalanced, sync negative  
Audio: 500 mVrms (100% modulation)  
Impedance: 47 kilohms

Output AUDIO OUTPUT (VARIABLE) (phono jacks)  
More than 408 mVrms at the maximum volume setting (variable) (100% modulation)  
Impedance: 10 kilohms

Dimensions Approx. 665×473×480  
Weight Approx. 24.7 kg

Power requirements 120 V AC, 60 Hz  
Power consumption 130W (max.)  
5W (in standby condition)

Accessories supplied Remote Commander RM-756  
with 2 size AA batteries  
Telescopic dipole antenna  
Antenna connector (300 ohms to 75 ohms matching transformer)

Optional accessories U/V mixer EAC-66  
Connecting cords  
VMC-810S (1m)  
VMC-820S (2m)  
RK-C74 (1.5m)  
RK-C150 (3m)

Design and specifications subject to change without notice.



# TRINITRON® COLOR TV

# SONY®


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WARNING !!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS. THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

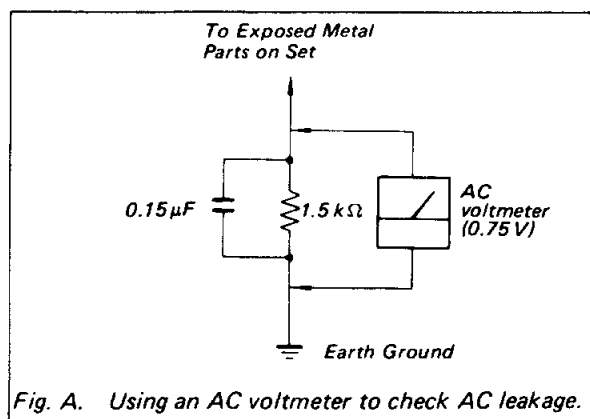
SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the condition of the monopole antenna (if any).  
Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.
8. Check the B+ and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.



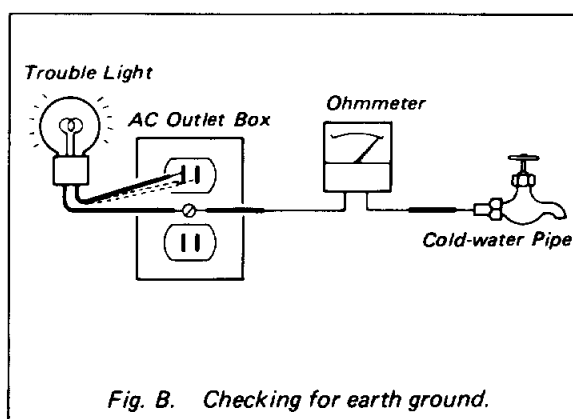
## LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

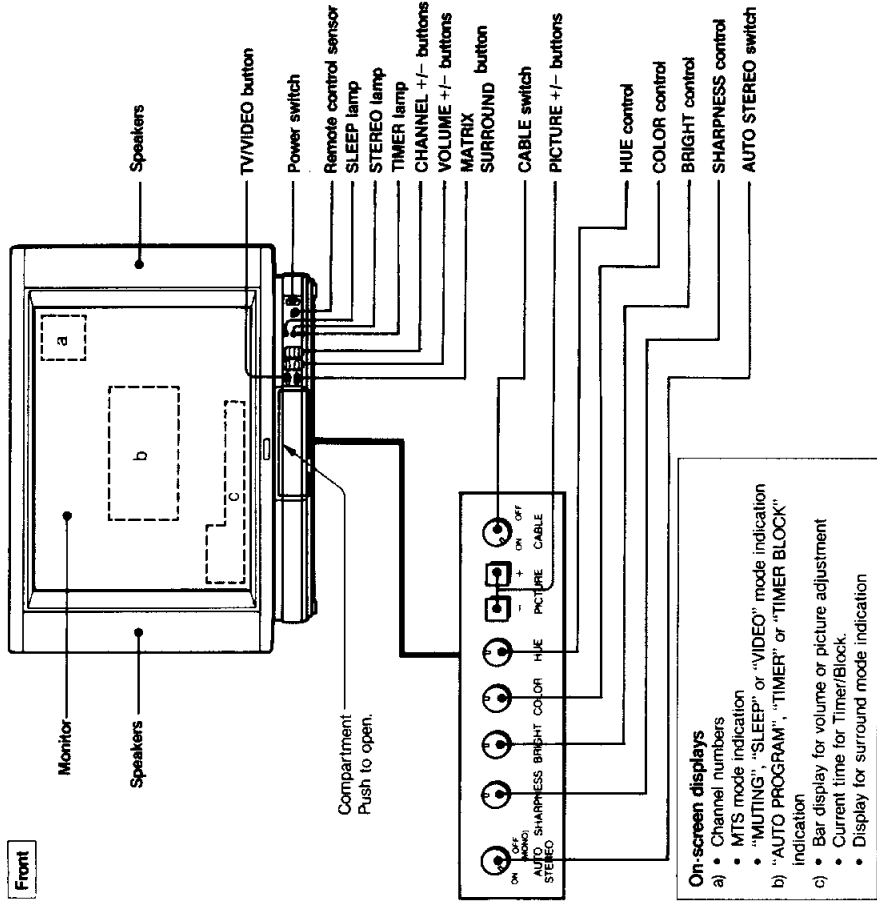
## HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60-100 watts trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B)



# SECTION 1 GENERAL

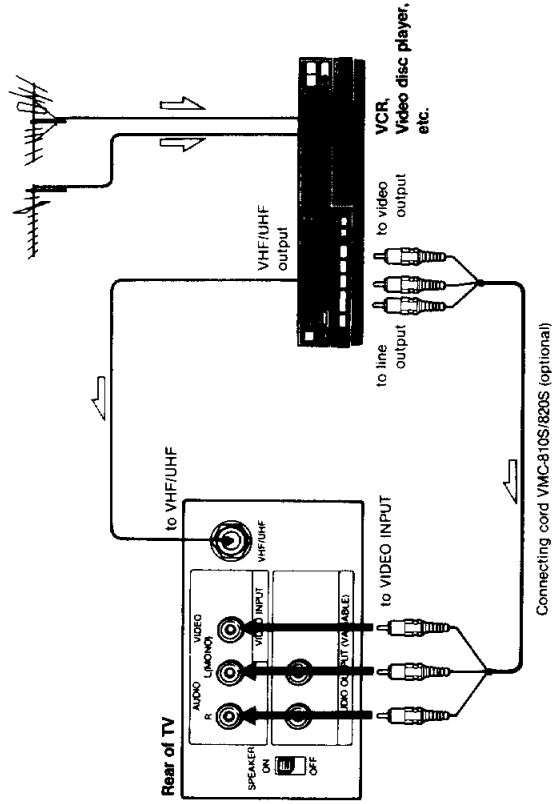
## 1-1. LOCATION OF CONTROLS



-4-

## 1-2. CONNECTING OTHER OPTIONAL EQUIPMENT

### Connecting a VCR



With this connection, you will be able to...

- View the playback of video tapes
- Record TV programs
- Record a TV program while viewing another

#### To watch the VCR picture

- 1 Turn on the TV.
- 2 Press the TV/VIDEO button on the TV so that the "VIDEO" indication appears on the screen.
- 3 Set the VCR in playback mode.

#### To return to the TV mode

Press the TV/VIDEO button on the TV until a channel number appears on the screen.

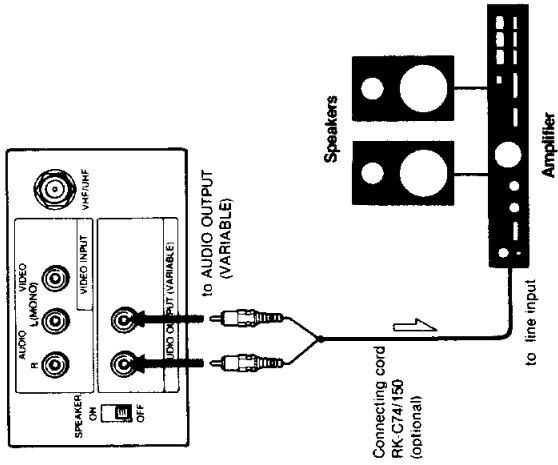
- If you connect a monaural VCR, connect the audio output of the VCR to the L jack of the TV. The monaural sound is heard from both speakers.
- For operation, refer to the instruction manual furnished with the VCR.
- Keep the VCR away from the TV, if the picture or sound is affected.
- When no signal is fed through the VIDEO INPUT jacks even though the TV is in the video mode, "VIDEO" indication will appear on the screen.



### 1-3. PREPARING REMOTE COMMANDER

#### Connecting an Audio System

— To monitor the TV or connected VCR sound through an audio system



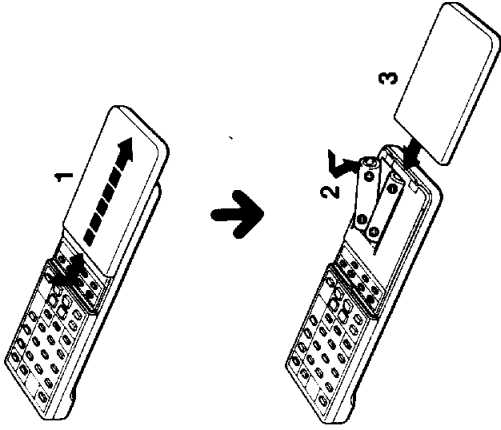
#### To adjust the sound level

Keep the amplifier volume, bass and treble controls to certain positions (usually at the medium position) and adjust the level with the VOLUME buttons on the TV or the VOL buttons on the Commander.

When an audio system is connected to AUDIO OUTPUT, be sure to set the SPEAKER switch on the TV to OFF. The sound from the TV's speakers will be cut off.

#### Battery installation

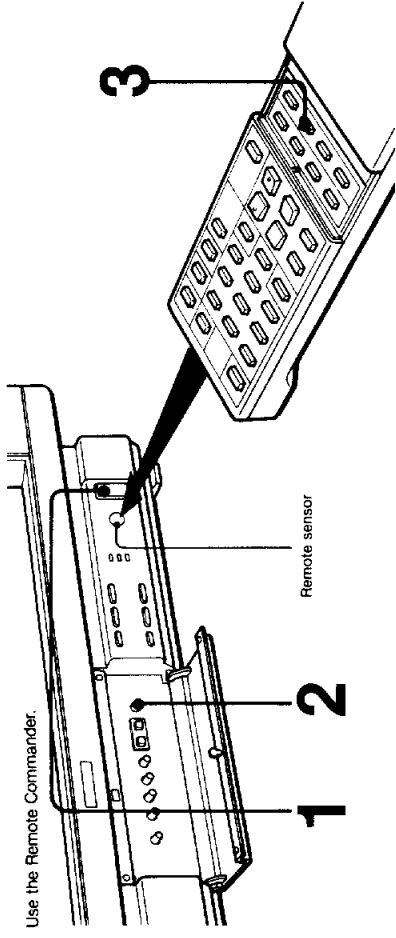
- 1 Slide the cover all the way so that the battery compartment appears, then take it off.
- 2 Place batteries in the Commander with correct polarity as illustrated inside the case.
- 3 Replace the cover.



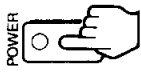
- In normal operation, batteries will last up to half a year. If the unit does not operate properly, the batteries might be exhausted. Replace them with new ones.
- To avoid damage from possible battery leakage, remove the batteries when the Commander will not be used for a long time.
- If a Remote Commander that is not recommended is used to operate this TV, or if the supplied Remote Commander is used to operate another TV, the TV may not operate properly.

### 1-4. PRESETTING TV CHANNELS

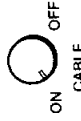
Use the Remote Commander.



#### 1 Turn the TV on.



#### 2 Set CABLE to the correct position.

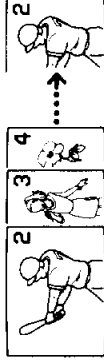


To preset cable TV channels  
To preset VHF or UHF channels

#### 3 Press AUTO PROG.



"AUTO PROGRAM" is displayed on the screen and receivable channels (other than the channels already preset) will be preset in numerical sequence. The channels previously preset remain in the unit's memory.  
When no more channels can be found, the programming stops and the lowest numbered channel is displayed.



#### Receivable channels of this TV are:

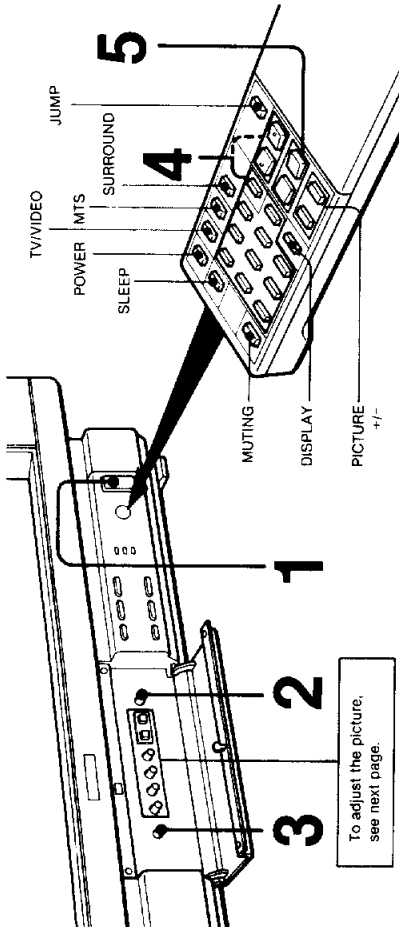
VHF: 2-13  
UHF: 14-69  
Cable: 1-125

#### To check preset channels

Press CHANNEL +/-

To add the channels that could not be preset with this automatic programming because their signal strength was too weak, or to erase unnecessary channels, follow the steps in "To preset only the desired channels" on the next page.

1-5. WATCHING TV PROGRAMS



3 Set AUTO STEREO to ON.

2 Set CABLE to the appropriate position.

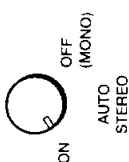
1 Press POWER to turn the TV on.



To adjust the picture, see next page.



To view cable TV channels  
To view VHF or UHF channels



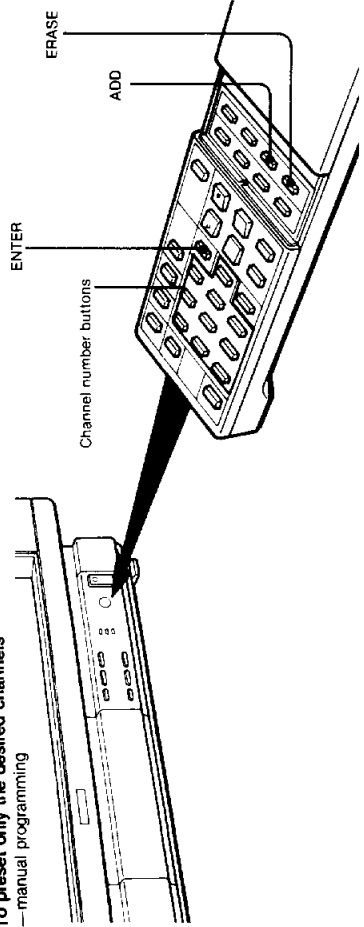
**To mute the sound**  
Press Muting. The "MUTING" indication will appear on the screen. To restore the sound, press MUTING again or VOL +/-.

**To keep the channel display on the screen**  
Press DISPLAY.

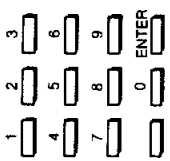
**When receiving a Multichannel TV Sound program**  
Each time MTS is pressed, MAIN, SAP (Second Audio Program), or both are selected in sequence. The corresponding indication will appear on the screen for a while.

**If noise makes it hard to receive a very weak TV stereo program**  
Set AUTO STEREO on the TV to OFF so that the STEREO lamp goes off.  
The stereo effect will be cancelled, but reception will be stabilized and the noise will be reduced.

To preset only the desired channels  
— manual programming



1 Press the channel number button(s) and then ENTER to select the channel to be added.



A "+" appears for a moment to the left of the on-screen channel number display. This channel has now been added to the channel scan memory.

2 Press ADD.



To add other channels  
Repeat steps 1 to 2.

**To erase channels**  
1 Select the channel to be erased.  
2 Press ERASE.  
A "-" appears for a moment to the left of the on-screen channel number display. This channel has now been erased from the channel scan memory.



Repeat steps 1 and 2 for other channels to be erased.

**When a VHF or UHF channel is erased**  
The cable TV channel with the same number is also erased and vice versa.






**Cable TV channel chart\***  
Cable TV systems use letters or numbers to designate channels. To tune in a channel, refer to the chart below.

Number on this TV																					
Corresponding CATV channel																					
1	5	6	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
A-8	A-7	A-6	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q		
31	32	33	34	35	36	37	38	39	93	94	95	96	97	98	99	100	101	102	123	124	125
R	S	T	U	V	W	W+1	W+2	W+3	W-57	W+58	A-5	A-4	A-3	A-2	A-1	W-59	W-60	W-61	W-62	W-63	W-64

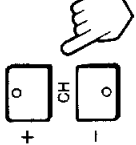
Check with your local cable TV company for more complete information on the available channels.

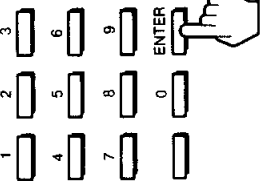
\*The designation of the cable TV channels conforms to the EIA/NCITA recommendation.

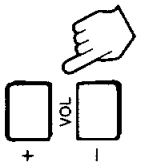
To adjust the picture

 SHARPNESS	for less sharpness for more sharpness	 BRIGHT	for less brightness for more brightness	 COLOR	for less color intensity for more color intensity	 HUE	skin tones become purplish skin tones become greenish	 PICTURE	Press to decrease picture contrast with soft color Press to increase picture contrast with vivid color
--	--	---	--	--	--	--	--	--	---

4 Select a channel in one of the following two ways:

To scan the preset channels in numerical sequence, press CH +/-.  


To select a channel directly, press the channel number button(s) and then ENTER.  
For example, to select channel 10, press 1, 0 and ENTER.  


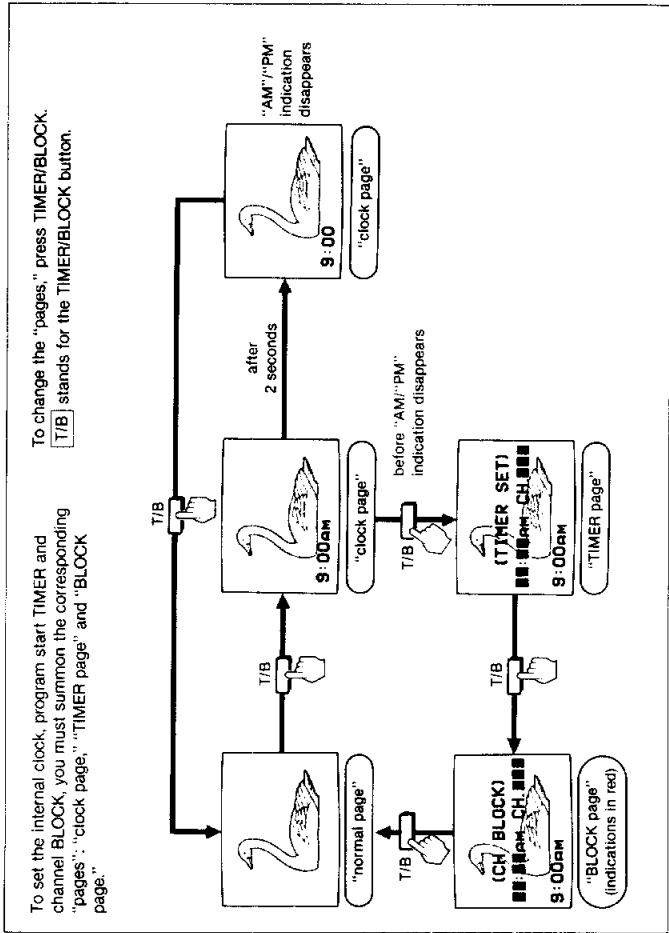
5 Press VOL + or - to adjust the volume.  


1-6. TIMER/BLOCK

Available functions

Internal clock	Once the internal clock is set, the current time will appear on the screen. It is necessary to set the clock correctly to activate the program start TIMER and BLOCK.
Program start TIMER	Makes a program of your choice appear on the screen automatically at the desired time.
Channel BLOCK	Blocks a channel from appearing on the screen for 12 hours. Use channel BLOCK to prevent children from watching undesirable programs.

The buttons used for the above functions are located on the Remote Commander.





**To switch quickly between 2 channels**  
Press JUMP. Each time JUMP is pressed, the channel which appeared on the screen directly before is recalled. This button enables you to keep track of two programs alternately.

**To have the TV turn off automatically after about 1 hour**  
Press SLEEP. The "SLEEP" indication will appear on the screen for a few seconds and the SLEEP lamp on the TV will remain lit until the TV is turned off.

**To cancel the SLEEP timer**, press SLEEP again so that the SLEEP lamp goes out, or turn off the TV.

**To turn off the system**  
Press POWER again.

**To enjoy MATRIX surround effect**  
To enjoy sound reproduction with the atmosphere of a movie theater or a concert hall, press the SURROUND button.  
Press the button again to deactivate MATRIX surround effect.  
This MATRIX surround effect works only at stereo broadcasting.

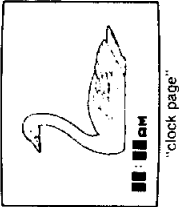
Surround	On-screen indication
Turned ON	
Turned OFF	

- All settings will be erased from the unit's memory if the unit is unplugged, or if a power failure occurs.
- The TIMER and BLOCK will operate only if the clock is set correctly.
- If the TIMER and BLOCK are set for overlapping times on the same channel, the blocked channel will appear on the screen at the time set on the TIMER.

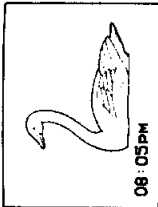
How to Set Internal Clock

Example: To set the clock to 8:05 PM

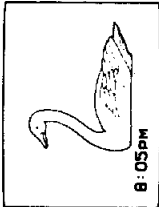
- 1 Press TIMER/BLOCK once to change from "normal page" to "clock page."



- 2 Press 0, 8, 0, 5, AM/PM (0 necessary).



- 3 If you have performed the operation correctly, press ENTER. The numbers will "wink" to indicate that the clock has been set. (The 0 in front will disappear.)



If you have made a mistake, press CLEAR and return to step 2.

The "AM/PM" indication will disappear after 2 seconds.

To summon "TIMER page," press TIMER/BLOCK before the "AM"/"PM" indication disappears.

To return to "normal page," press TIMER/BLOCK after the "AM"/"PM" indication has disappeared.

To reset the clock, summon "clock page" and press CLEAR before the "AM"/"PM" indication disappears. Then follow the steps above from step 2.

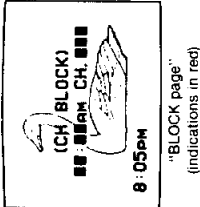
12:00 AM stands for midnight.  
12:00 PM stands for noon.

How to Set the Channel BLOCK

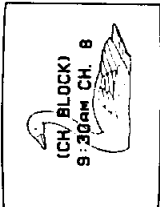
Make sure that the clock has been set correctly before setting the channel BLOCK.

Example: To set the BLOCK for a program which begins at 9:30 AM on channel 8

- 1 Press TIMER/BLOCK three times to change from "normal page" to "BLOCK page."



- 2 Press 0, 9, 3, 0, ENTER (0 necessary). Numbers will "wink" to indicate that the time has been set. Press 8, ENTER (0 not necessary). Numbers will "wink" to indicate that the channel has been set.



The BLOCK has now been set. If you have made a mistake, press CLEAR and return to step 2.

At the preset time, the picture of the selected channel will be blocked from view and the sound will be muted. A red "BLOCKED" indication will appear on the screen while the channel is blocked. Normal reception will be resumed after 12 hours.

To return to normal reception while the channel is blocked, recall "BLOCK page" and press CLEAR.

The BLOCK setting blocks a specified channel for the same 12-hour period everyday.

To clear BLOCK setting, summon "BLOCK page" and press CLEAR.

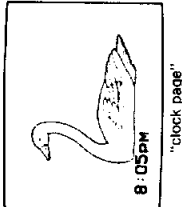
To reset, clear the setting and follow the steps above from step 2.

How to Set the Program Start TIMER

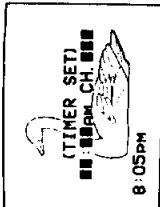
Make sure that the clock has been set correctly before setting the program start TIMER.

Example: To set the TIMER for a program which begins at 10:30 PM on channel 12

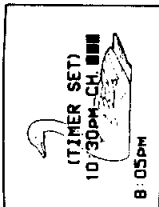
- 1 Press TIMER/BLOCK once to change from "normal page" to "clock page."



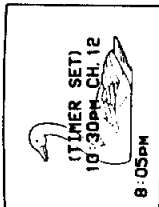
- 2 Press TIMER/BLOCK before the "AM"/"PM" indication disappears and summon "TIMER page."



- 3 Press 1, 0, 3, 0, AM/PM, ENTER. Numbers will "wink" to indicate that the time has been set.



- 4 Press 1, 2, ENTER (0 not necessary). Numbers will "wink" to indicate that the channel has been set.



The TIMER operates only once, but the time and the channel will remain in the unit's memory.

If you want to preset the same channel at the same time for a future date, press TIMER OFF/REPEAT. The TIMER lamp will light up to indicate that the TIMER has been reactivated.

To deactivate the TIMER, press TIMER OFF/REPEAT again so that the TIMER lamp goes out. It is not necessary to summon "TIMER page" to use the TIMER OFF/REPEAT button. Furthermore, this button is effective even if the TV has been turned off.

To clear the TIMER setting, summon "TIMER page" and press CLEAR.

To reset, clear the setting and follow the steps from step 3.

The TIMER lamp will light up to indicate that the TIMER has been set. If you have made a mistake, press CLEAR and return to step 3.

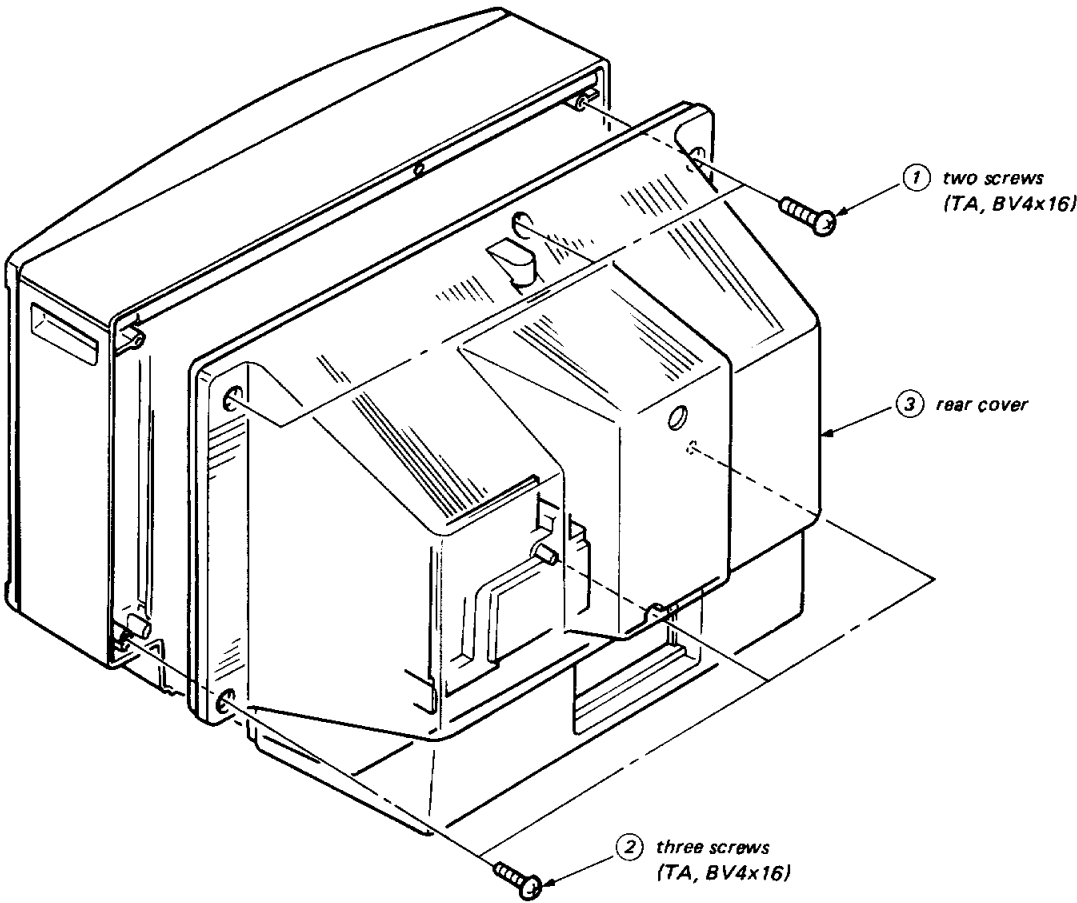
At the preset time, the selected channel will appear on the screen and the TIMER lamp will go out. The TIMER will operate whether you are watching a TV program or a VCR playback, or even if you have turned off the TV.

If no button is pressed within 2 hours after the preset time, an "OFF" indication will appear on the screen for 1 minute. If a button is still not touched during the 1 minute, the TV will turn off automatically as a safety precaution.

## SECTION 2 DISASSEMBLY

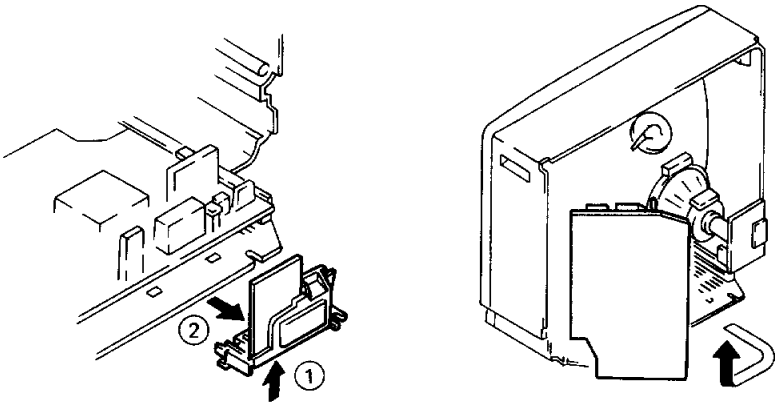
**Note:** Follow the disassembly procedure in the numerical order given.

### 2-1. REAR COVER REMOVAL

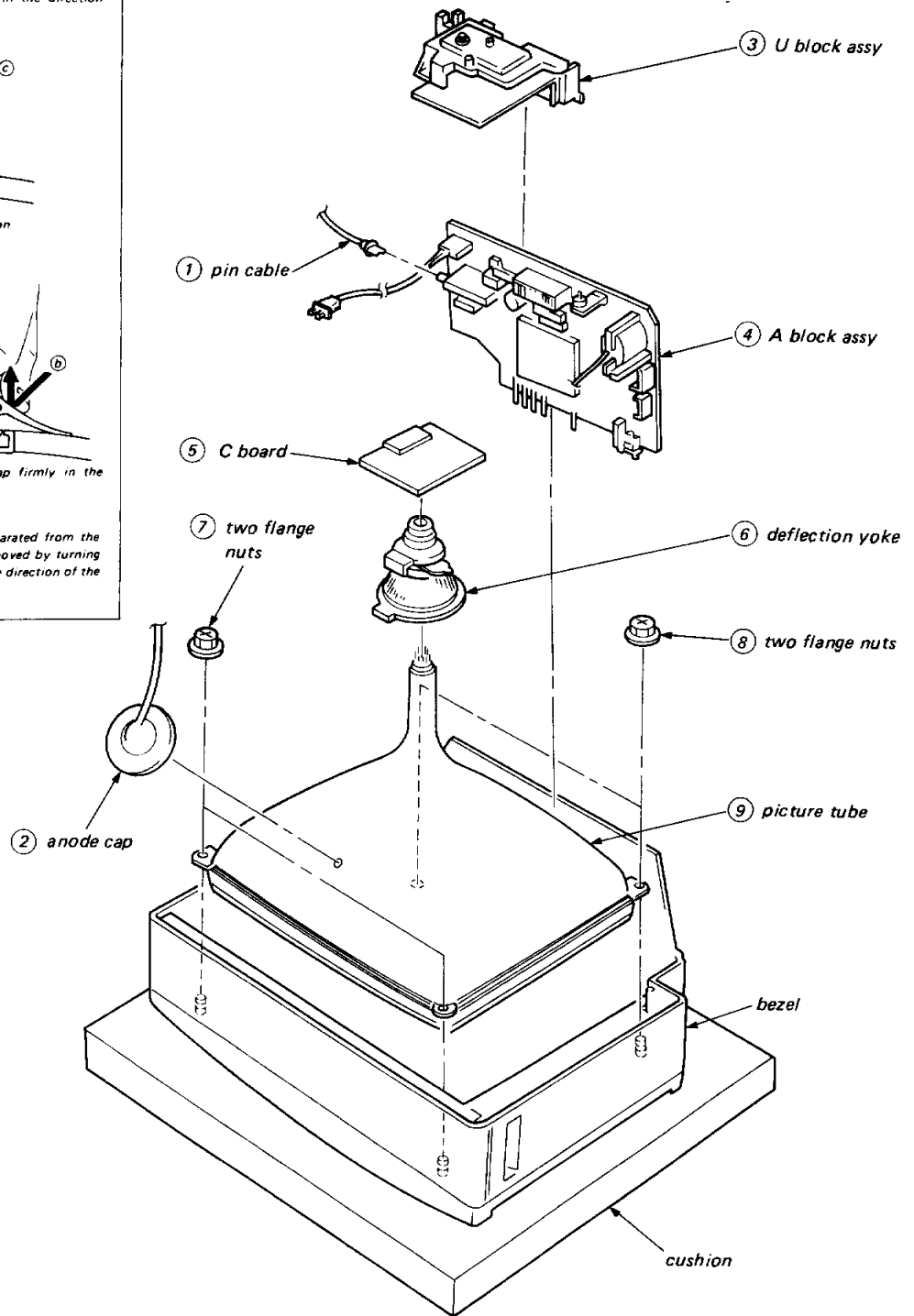
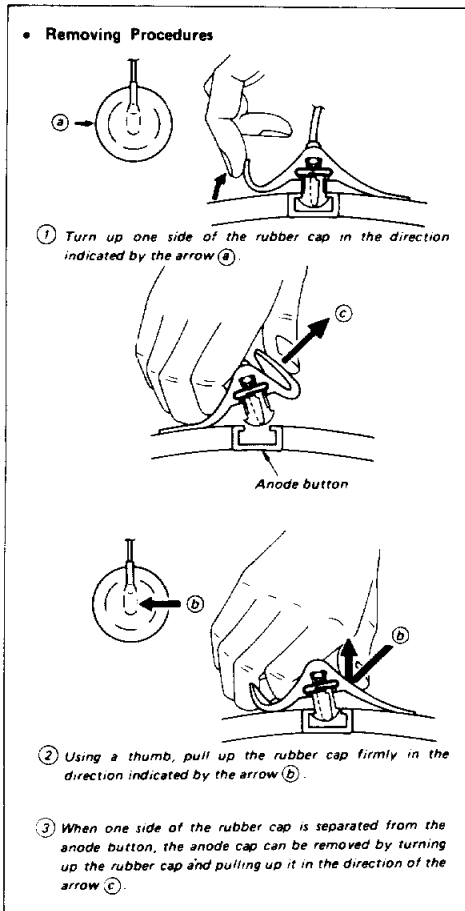


### 2-2. SERVICE POSITION

#### SERVICE POSITION



## 2-3. PICTURE TUBE REMOVAL



## SECTION 3

### SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustments should be performed with rated power supply voltage unless otherwise noted.

Controls and switch should be set as follows unless otherwise noted:

PICTURE button ..... MAXIMUM

BRIGHTNESS control ..... Click Position

Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. White Balance
5. Sub Brightness

**Note:** Test Equipment Required.

1. Color-bar/Pattern Generator
2. Degausser
3. Oscilloscope

#### 3-1. BEAM LANDING

Preparation:

- Feed in the white pattern.
  - Before starting, degauss the entire screen.
1. Loosen deflection yoke screw.
  2. Adjust purity control as shown in Fig. 3-1.
  3. Slide deflection yoke as far forward as it will go.
  4. Turn the raster signal of the pattern generator to red.
  5. Adjust purity control to center vertical red band as shown in Fig. 3-2.
  6. Slide deflection yoke back for a uniform red screen.
  7. Check green and blue rasters for uniformity by performing the same way as steps 4, 5 and 6.
  8. Tighten the deflection yoke screw.
  9. Check if mislanding appears at corners a--d as shown in Fig. 3-3. If mislanding is observed, correct it as shown in Fig. 3-3.
  10. Confirm that beam landing is correct when the receiver is faced in all directions.

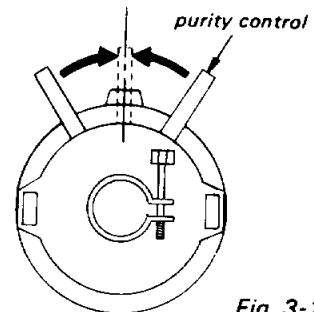
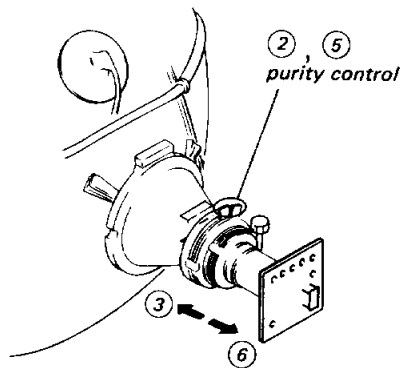


Fig. 3-1.

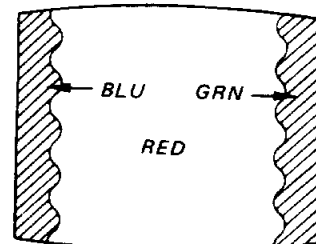


Fig. 3-2.

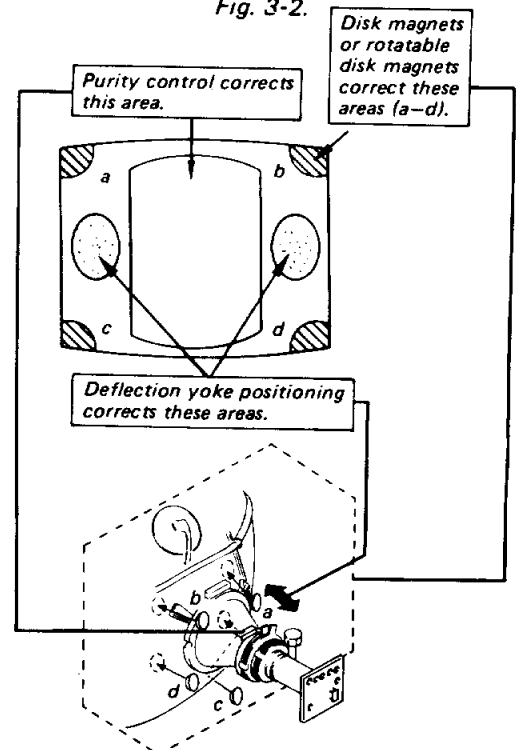
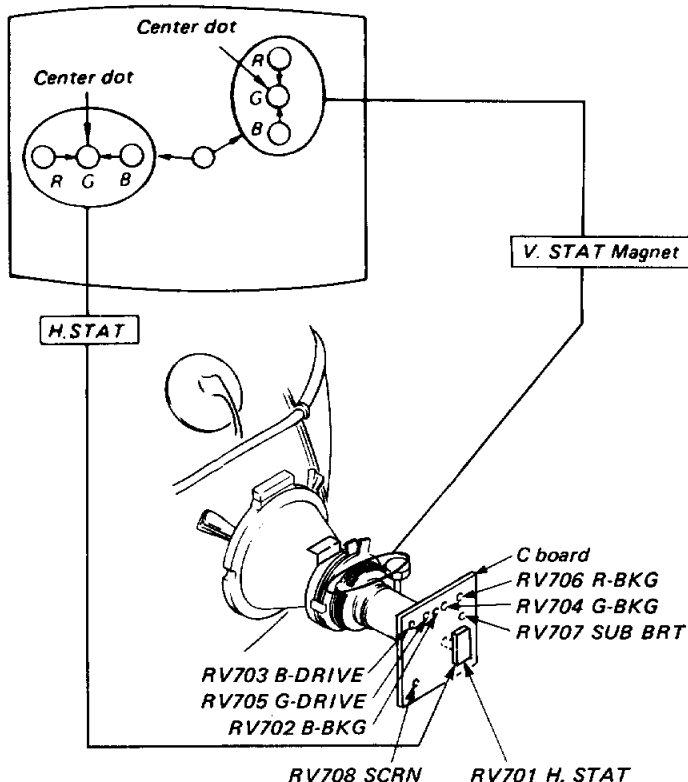


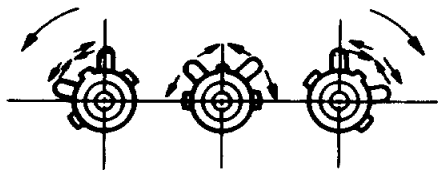
Fig. 3-3.

**3-2. CONVERGENCE****Preparation:**

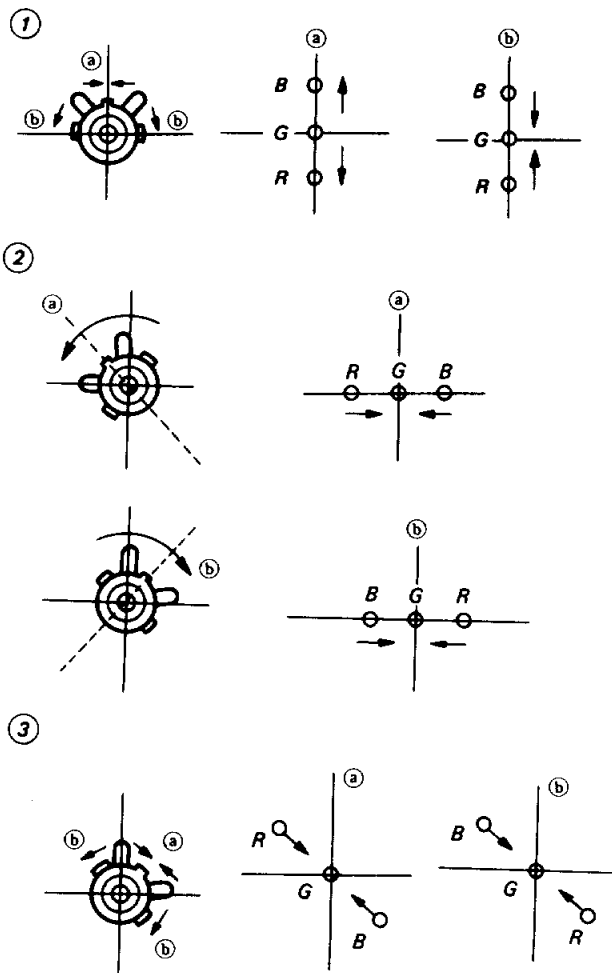
- Before starting, perform FOCUS, H. SIZE and V. SIZE adjustments.
- Set BRIGHTNESS control to fully counterclockwise.
- Feed in the dot pattern.

**(1) Horizontal and Vertical Static Convergence**

1. Adjust H. STAT VR to coincide red, green and blue dots on the center of screen (Horizontal movement)
  2. Adjust V. STAT magnet to coincide red, green and blue dots on the center of screen (Vertical movement)
  3. If the red, green and blue dots do not coincide on the center of screen with H. STAT VR, perform horizontal convergence adjustment using H. STAT VR and V. STAT magnet as shown below. (In this case, H. STAT VR and V. STAT magnet effect each other.)
- Tilt the V. STAT magnet and adjust static convergence to open or close the V. STAT magnet.



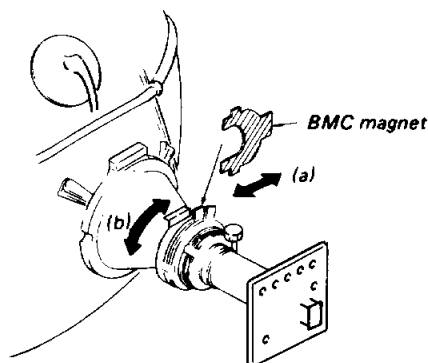
4. When the V. STAT magnet is moved in the direction of arrow (a) and (b), Red, Green and Blue dots move as shown below.



If blue dot does not coincide with red and green dots, perform following steps.

- Move BMC magnet (a) to correct insufficient H. static convergence.
- Rotate BMC magnet (b) to correct insufficient V. static convergence.

In either case, repeat Beam Landing Adjustment.

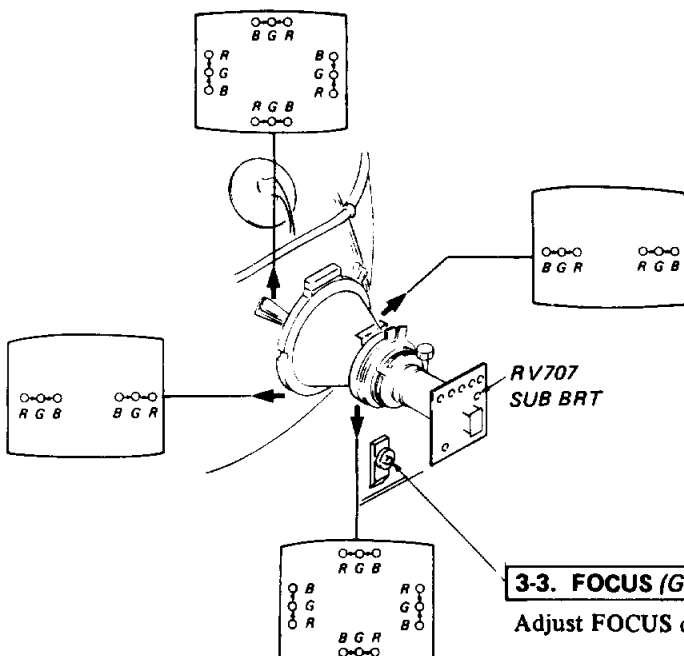




## (2) Dynamic Convergence Adjustment

### Preparation:

- Before starting, perform Horizontal and Vertical Static Convergence Adjustment.
- 1. Loosen deflection yoke screw.
- 2. Remove deflection yoke spacers.
- 3. Move the deflection yoke for best convergence as shown below.
- 4. Tighten the deflection yoke screw.
- 5. Install the deflection yoke spacers.



Adjust FOCUS control for a best picture.

### 3-4. WHITE BALANCE

- Input dot signal from pattern generator.
- PICTURE button . . . . .80%  
BRIGHTNESS control . . .center

#### [SCREEN(G2)]

1. Adjust BKG VRs (RV702, RV704, and RV706) so that voltages on the red, green and blue cathodes are 180Vdc with an oscilloscope as shown in Fig. 3-5.

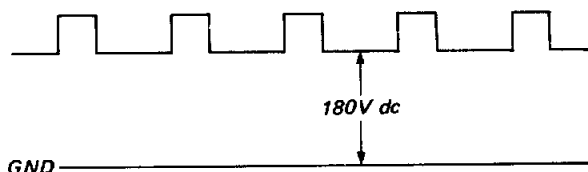
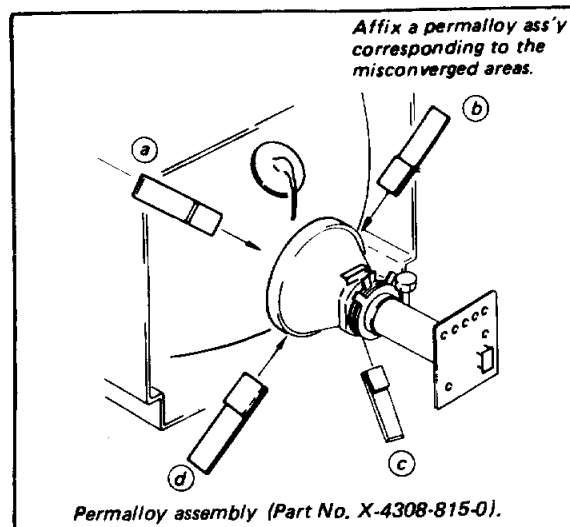
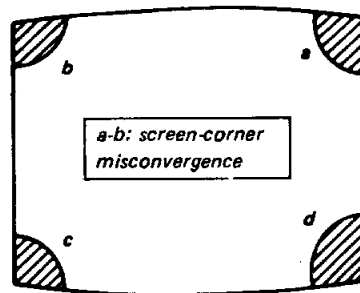


Fig. 3-5.

2. Observe the screen and adjust RV708 (SCREEN) to obtain the faintly visible background of dot signal.  
Note the color that first becomes visible by turning SCREEN VR.  
Do not turn a BKG control for this color.

## (3) Screen-corner Convergence



#### [WHITE BALANCE]

1. Input entirely white signal from pattern generator.
2. Set the PICTURE button to obtain the faintly visible raster on the screen.
3. Observe the screen and adjust the other two BKG VRs for best white balance.
4. Set the PICTURE button at maximum.
5. Observe the screen and adjust the DRIVE VRs (RV703, RV705) for best white balance.
6. Repeat steps 2 through 5 several times.

### 3-5. SUB BRT (RV707)

1. Feed in a cross-hatch pattern.
2. PICTURE button . . . . .minimum  
BRIGHTNESS control . .click position
3. Turn RV707 (SUB BRT) slowly to obtain a faintly visible cross-hatch.

## SECTION 4

### SAFETY RELATED ADJUSTMENTS

#### R381 CONFIRMATION METHOD (HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components (marked with  $\blacksquare$  on the schematic diagram).

IC301, PM501, R378, R379, R382, R512, R381

##### (1) Preparation before confirmation

1. Turn the POWER switch ON, and receive entirely white signals and set the PICTURE and BRIGHTNESS controls to maximum.
2. Confirm that the voltage of the TP85 is more than 13 V dc when the set is operating normally with 120 V ac supply.

##### (2) Hold-down operation confirmation

1. Turn the POWER switch ON, and receive entirely white signals and adjust ABL current to  $1400 \pm 20 \mu\text{A}$  with PICTURE and BRIGHT etc controls.
2. Apply DC voltage of over 13.0 V gradually to the TP85 via 1T40 from the DC stabilized power source. Confirm that the minimum voltage is less than 18.00 V dc whereby the raster disappears during operation of hold-down circuit.

Note: When the hold-down circuit starts operating, switch OFF the POWER of the set immediately.

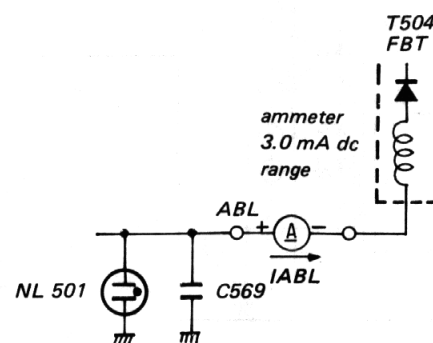
3. Turn the POWER switch ON, and receive dot signals and adjust ABL current to  $230 \pm 10 \mu\text{A}$  with PICTURE and BRIGHT etc controls.

4. Apply DC voltage of over 13.0 V gradually to TP85 via 1T40 from the DC stabilized power source. Confirm that the minimum voltage is less than 19.34 V dc whereby the raster disappears during operation of hold-down circuit.

Note: When the hold-down circuit starts operating, switch OFF the POWER of the set immediately.

##### (3) Hold-down readjustment

When step (2) is not satisfied, readjustment should be performed by altering the resistance value of R381 (a component marked with  $\blacksquare$ ).



\* Use a digital multimeter whose input impedance is over 100 M $\Omega$  when confirming the voltage of TP85.

#### CONFIRMATION WHEN REPLACING T504 (FLYBACK TRANSFORMER)

The following adjustments should always be performed with reference to whether an X-ray radiation control circuit is connected or not, when replacing T504 (FLYBACK TRANSFORMER).

\* This check is to be performed when T504 (FLYBACK TRANSFORMER) only is replaced, and has no relation to the hold-down circuit readjustment for replacement of parts marked  $\blacksquare$ .

##### (1) Connection confirmation

1. Turn the POWER switch ON, and receive entirely white signals and set the PICTURE and BRIGHTNESS controls to maximum.
2. When the set is operating normally with 120 V ac supply, confirm the voltage of the TP85 is over 13 V dc.

#### +B VOLTAGE CONFIRMATION

The following adjustments should always be performed when replacing IC601.

##### (1) The +B voltage confirmation

1. Supply  $130 \pm 10 \text{ V}$  ac to with variable auto-transformer.
2. Receive monoscope signals.
3. Set the PICTURE control in to 80% and BRIGHTNESS control in to DETENT.
4. Confirm the voltage of TP91 is less than 138.6 V dc.
5. If step 4 is not satisfied, replace IC601 and repeat above steps.

#### PICTURE BLANKING CONFIRMATION

The following adjustment should always be performed when replacing the following components (marked with  $\blacksquare$  on the components circuit).

Regrading components of  $\blacksquare$  R383.

R380, R341, D506, IC301, PM501, R383, R378, R379, R382

1. Turn the POWER switch ON, and receive monoscope signal.
2. Set the PICTURE control into 80% and BRIGHTNESS control into DETENT.
3. Confirm that the picture is blanked till the voltage of TP91 is more than 108.0 V DC.
4. Confirm that the Picture is not blanked when INPUT voltage is more than 96 V AC.

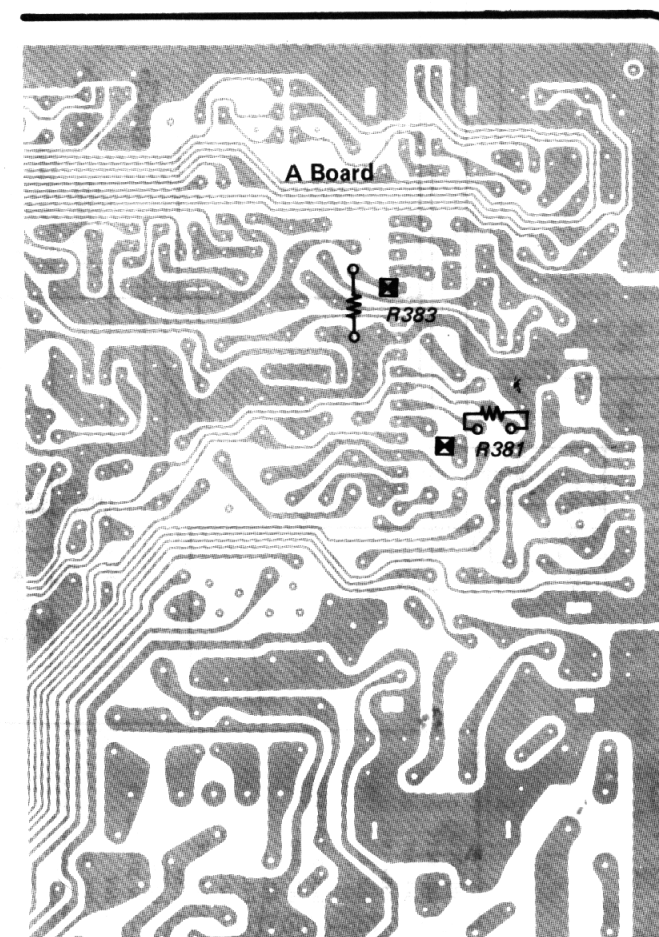
#### V. SIZE CONFIRMATION

The following adjustments should always be performed when replacing the following components (marked with  $\blacksquare$  on the components circuit).

Regrading components of  $\blacksquare$  R555 (V. SIZE).

DY, IC301, R514, R515, R555, R556, T504, RV507.

1. Turn the POWER switch ON, and receive monoscope signal.
2. Set the PICTURE control in to 80% and the BRIGHTNESS control in to DETENT.
3. Adjust RV507 (V. SIZE) so that the V. SIZE becomes minimum, and confirm that the raster size is 22 cm or more.



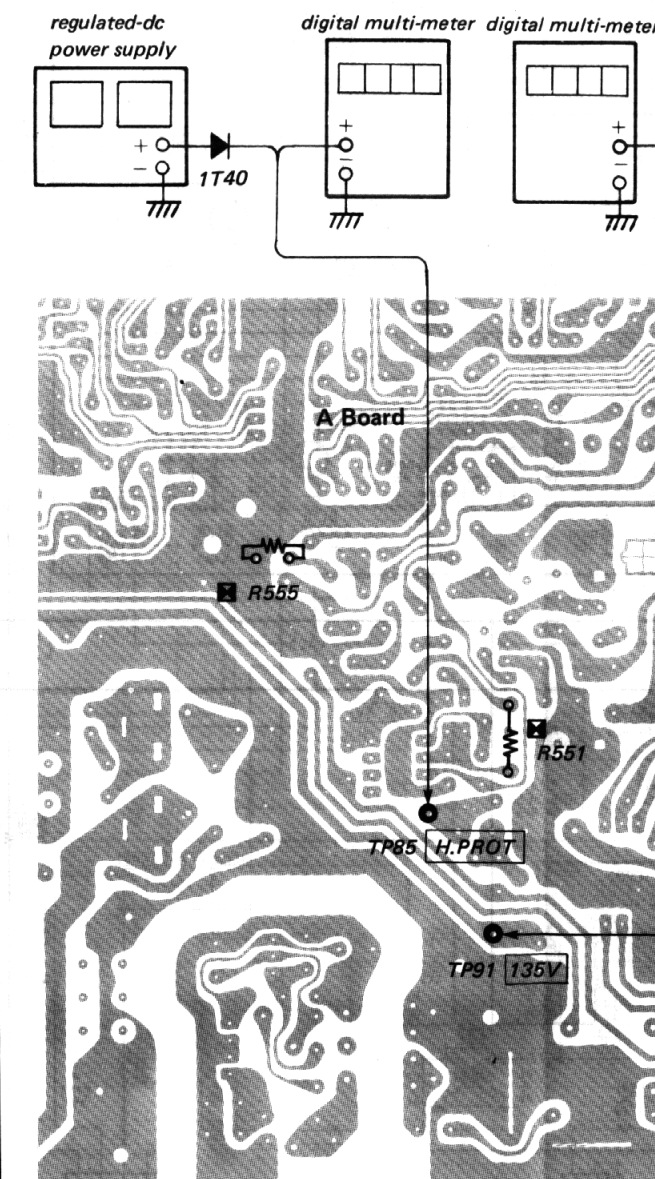
#### H. SIZE CONFIRMATION

The following adjustments should always be performed when replacing the following components (marked with  $\blacksquare$  on the components circuit).

Regrading components of  $\blacksquare$  R551 (H. SIZE).

C563, C565, DY, R551, R554, RV506, T504.

1. Turn the POWER switch ON, and receive monoscope signal.
2. Set the PICTURE control in to 80% and the BRIGHTNESS control in to DETENT.
3. Confirm that the H. SIZE at minimum should not exceed 16.4 frames by adjusting RV506 (H. SIZE).

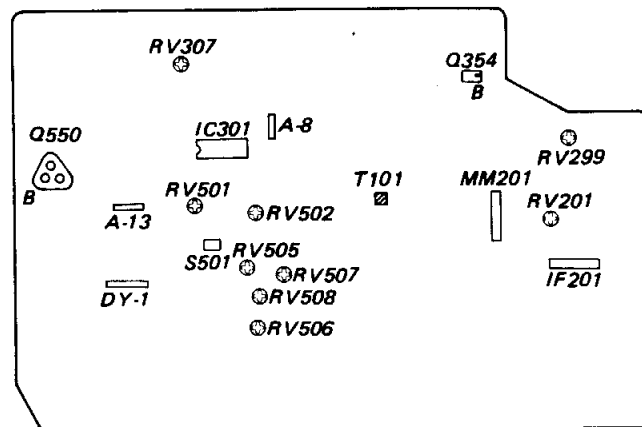


## SECTION 5 CIRCUIT ADJUSTMENTS

### 5-1. A BOARD ADJUSTMENTS

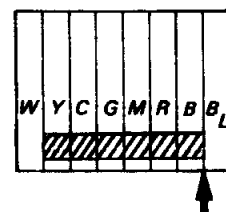
#### A BOARD

(COMPONENT SIDE)



#### BAR POSITION ADJUSTMENT (T101)

1. Receive a color-bar signal.
2. Set the PICTURE button to maximum.
3. Adjust T101 to the point where the arrow indicate.

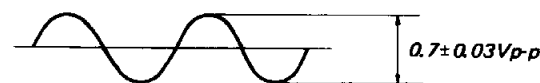


#### RF AGC ADJUSTMENT (IF201)

1. Receive an off-air signal.
2. Adjust AGC VR (AGC VR of IF201) so that snow noise and cross-modulation just disappear from the picture.

#### MPX LEVEL ADJUSTMENT (RV201)

1. Receive 400Hz (100% modulation) sound signal.
2. Connect an oscilloscope to PIN ② of MM201.
3. Adjust RV201 so that the MPX level is  $0.7 \pm 0.03$  Vp-p.

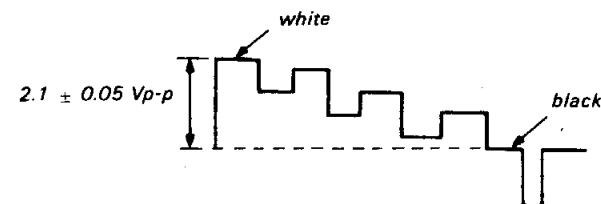


#### AUDIO BALANCE ADJUSTMENT (RV299)

1. Receive monoral signal.
2. Connect the dual-trace-oscilloscope at SP out Lch (A-6 connector) and Rch (A-17 connector).
3. Adjust RV299 so that Lch and Rch are same level.

#### SUB CONTRAST ADJUSTMENT (RV307)

1. Receive a color-bar signal.  
PICTURE ..... MAX  
BRT ..... CENTER  
COLOR ..... MIN
2. Short circuit between Base of Q354 and 9.3V Line with a jumper wire.
3. Draw A-8 - C-3 connector (C Board)
4. Connect an oscilloscope to the pin ④ of A-8 connector (blue out).
5. Adjust RV307 (SUB CONT) so that voltage is  $2.1 \pm 0.05$  Vp-p.



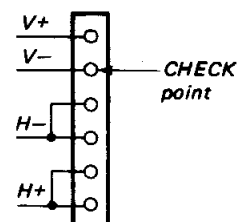
#### H. FREQ ADJUSTMENT (RV501)

1. Receive an off air signal.
2. Short circuit between pin ④⑧ of IC301 (H IN) and pin ③⑥ of IC301 (VCC 2) with a jumper wire.
3. Connect the frequency counter across Base of Q550 and ground.
4. Adjust RV501 for 15,734 kHz  $\pm 50$  Hz on the frequency counter.
5. Disconnect a jumper wire from IC301.

#### V. FREQ ADJUSTMENT (RV502)

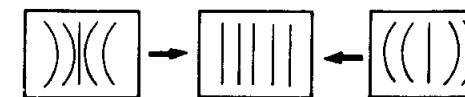
1. Receive an off air signal.
2. Short circuit between pin ④⑦ of IC301 (V IN) and pin ③⑥ of IC301 (VCC 2) with a jumper wire.
3. Connect the frequency counter across DY-1 connector (V. DY ⊖) and ground.
4. Adjust RV502 for 55.0  $\pm 0.3$  Hz on the frequency counter.
5. Disconnect a jumper wire from IC301.

DY-1 connector



#### PIN AMP ADJUSTMENT (RV505)

Adjust pin amplification with RV505



#### H. CENT, H. SIZE, ADJUSTMENT (A-13, RV506)

1. Receive a cross-hatch signal.
2. Set PICTURE and BRT to normal.  
Adjust H. CENT (H. CENT TAP = A-13), H. SIZE (RV506) for best picture.

#### V. CENT, V. SIZE ADJUSTMENT (S501, RV507)

1. Receive a cross-hatch signal.
2. Set PICTURE and BRT to normal.
3. Adjust V. CENT (S501) and V. SIZE (RV507) for best picture.

#### PIN PHASE ADJUSTMENT (RV508)

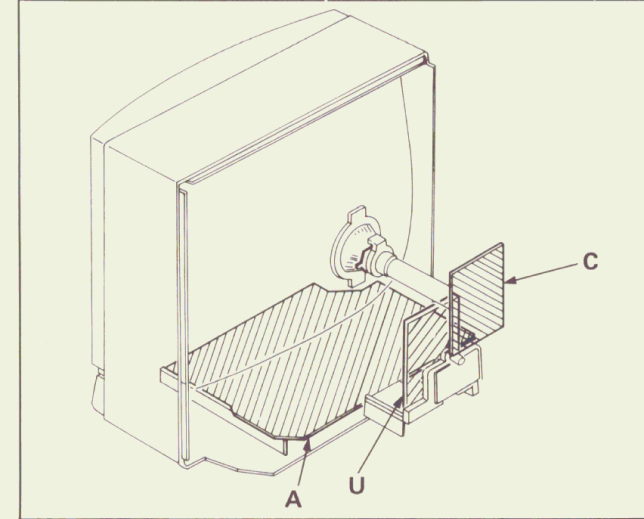
Adjust pin phase with RV508.





## SECTION 6 DIAGRAMS

### 6-1. CIRCUIT BOARDS LOCATION



### 6-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

Note:

Note: The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

- All capacitors are in  $\mu\text{F}$  unless otherwise noted; pF:  $\mu\text{F}$  50WV or less are not indicated except for electrolytics.
- All resistors are in ohms.
- Indication of resistance, which does not have one for rating electrical power is as follows.  
Pinch: 5mm

Rating electrical power: 1/4W

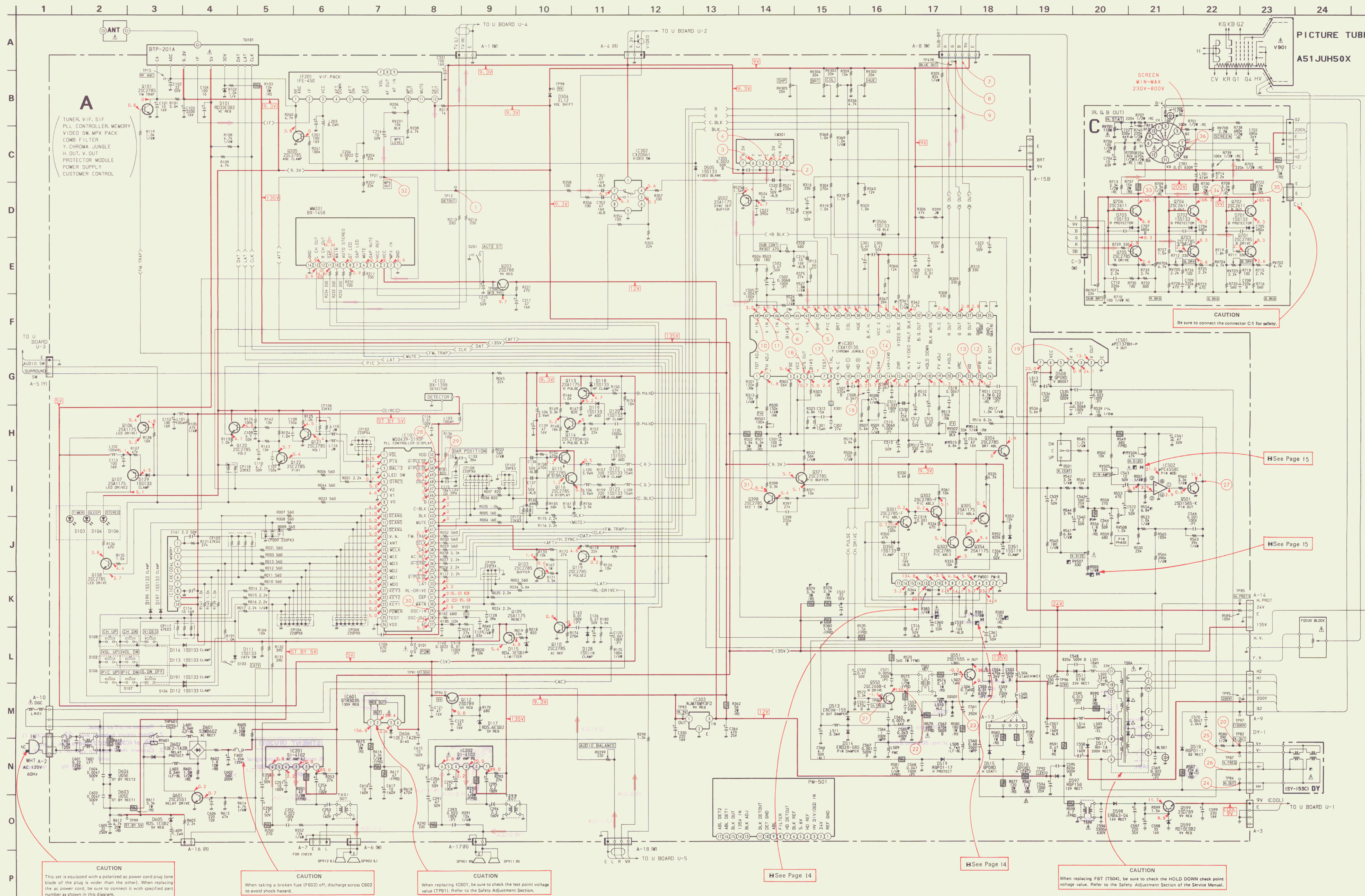
- SW**: nonflammable resistor.
- △**: internal component.
- : panel designation.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- The components identified by **■** in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.
- When replacing components identified by **■**, make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by **■** and repeat the adjustment until the specified value is achieved. (Refer to R381, R383, R551 and R555 adjustments on page 14, 15.)
- When replacing the part in below table, be sure to perform the related adjustment.

Adjustment (■)	Part replaced (■)
R381 HOLD DOWN CONFIRMATION	IC301, PM501, R378, R379, R381, R382, R512
R383 PICTURE BLANKING	IC301, D506, PM501, R341, R378, R379, R380, R382, R383
R551 H.551, H.552	C563, C565, DY, R551, R554, RV506, T504
R555 V.555	R514, R515, R555, R556, T504, RV507, DY, IC301

#### Reference information

- RESISTOR: RN METAL FILM  
RC SOLID  
FPFD NONFLAMMABLE CARBON  
FUSE NONFLAMMABLE FUSIBLE  
FPMO NONFLAMMABLE WIREWOUND (OLD TYPE)  
RS NONFLAMMABLE WIREWOUND (NEW TYPE)  
RB NONFLAMMABLE CEMENT  
ADJUSTMENT RESISTOR
- COIL: LF-BL MICRO INDUCTOR  
CAPACITOR: TA TANTALUM  
PS STYROL  
PP POLYPROPYLENE  
PT MYLAR  
MPS METALIZED POLYESTER  
MPP METALIZED POLYPROPYLENE  
ALB BIPOLEAR  
ALT HIGH TEMPERATURE  
AIR HIGH RIPPLE

- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a 10M $\Omega$  digital multimeter.
- : adjustment for repair.
- Readings are taken with color-bar signal input.
- MODE (AUDIO)  
No mark: BOTH  
( ) : MAIN  
< > : SUB
- Voltage variations may be noted due to normal production tolerances.
- : B+ bus
- : signal path



**CAUTION**  
This set is equipped with a polarized ac power cord plug (type blade of the plug is wider than the other). When replacing the ac power cord, be sure to connect it with specified part number as shown in this diagram.

**CAUTION**  
When taking a broken fuse (F602) off, discharge across C602 to avoid shock hazard.

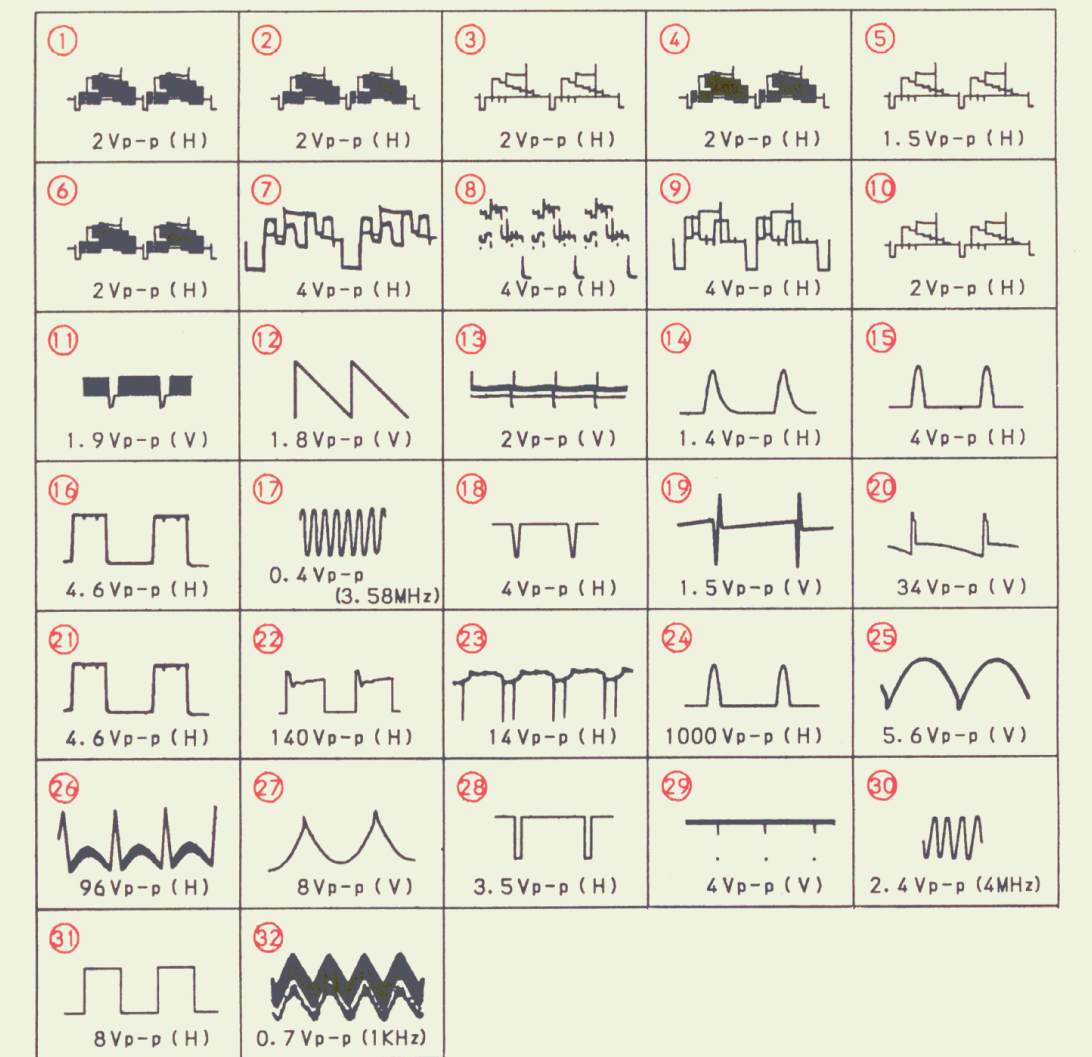
**CAUTION**  
When replacing IC601, be sure to check the test point voltage value (TP911). Refer to the Safety Adjustment Section.

See Page 14

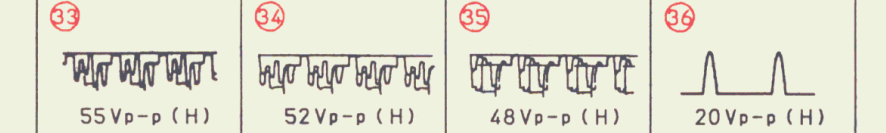
See Page 14

**CAUTION**  
When replacing FBT (T504), be sure to check the HOLD DOWN check point voltage value. Refer to the Safety Adjustment Section of the Service Manual.

### WAVEFORMS OF A BOARD

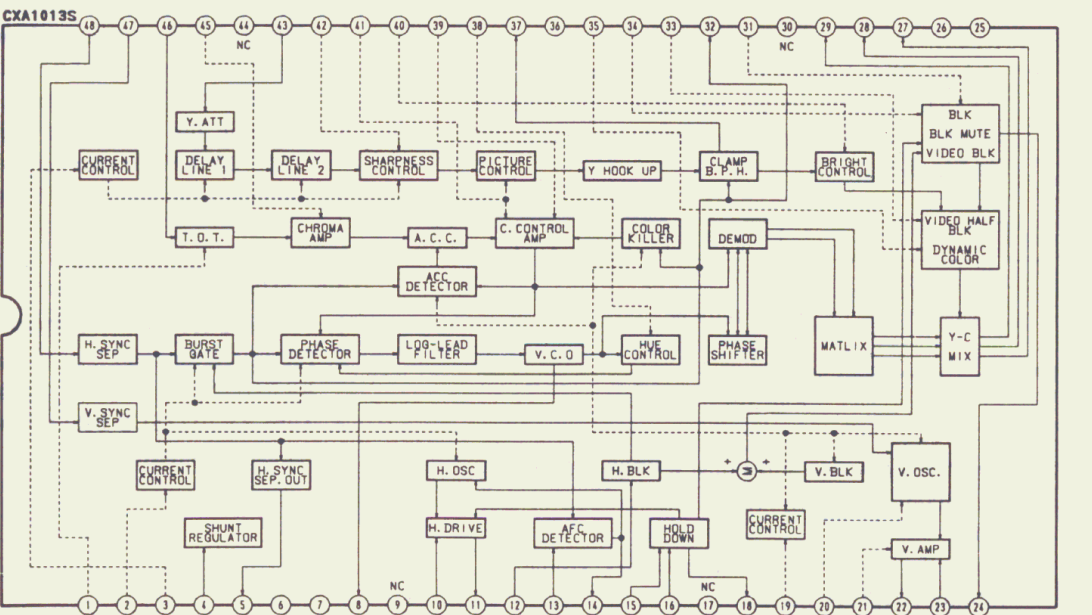


### WAVEFORMS OF C BOARD



### A BOARD

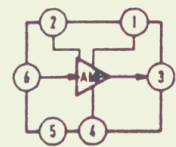
#### IC301 BLOCK DIAGRAM



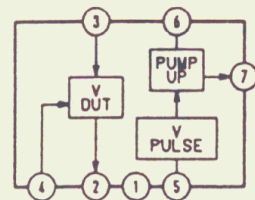


**C** (R.G.B OUT)  
— Conductor Side —  
— C Board —

[IC201 SI-4102 AF AMP]

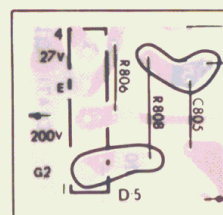


[IC501 UPC1378H V OUT]

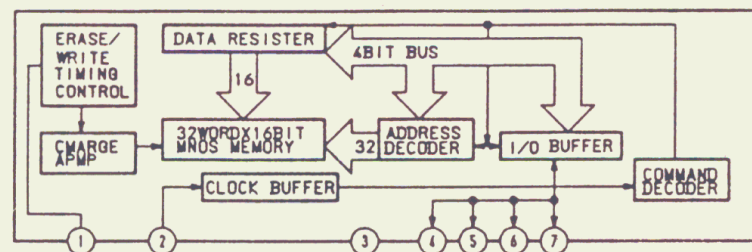


**NOTE:**

The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.



[IC102 CXK1004L MEMORY]



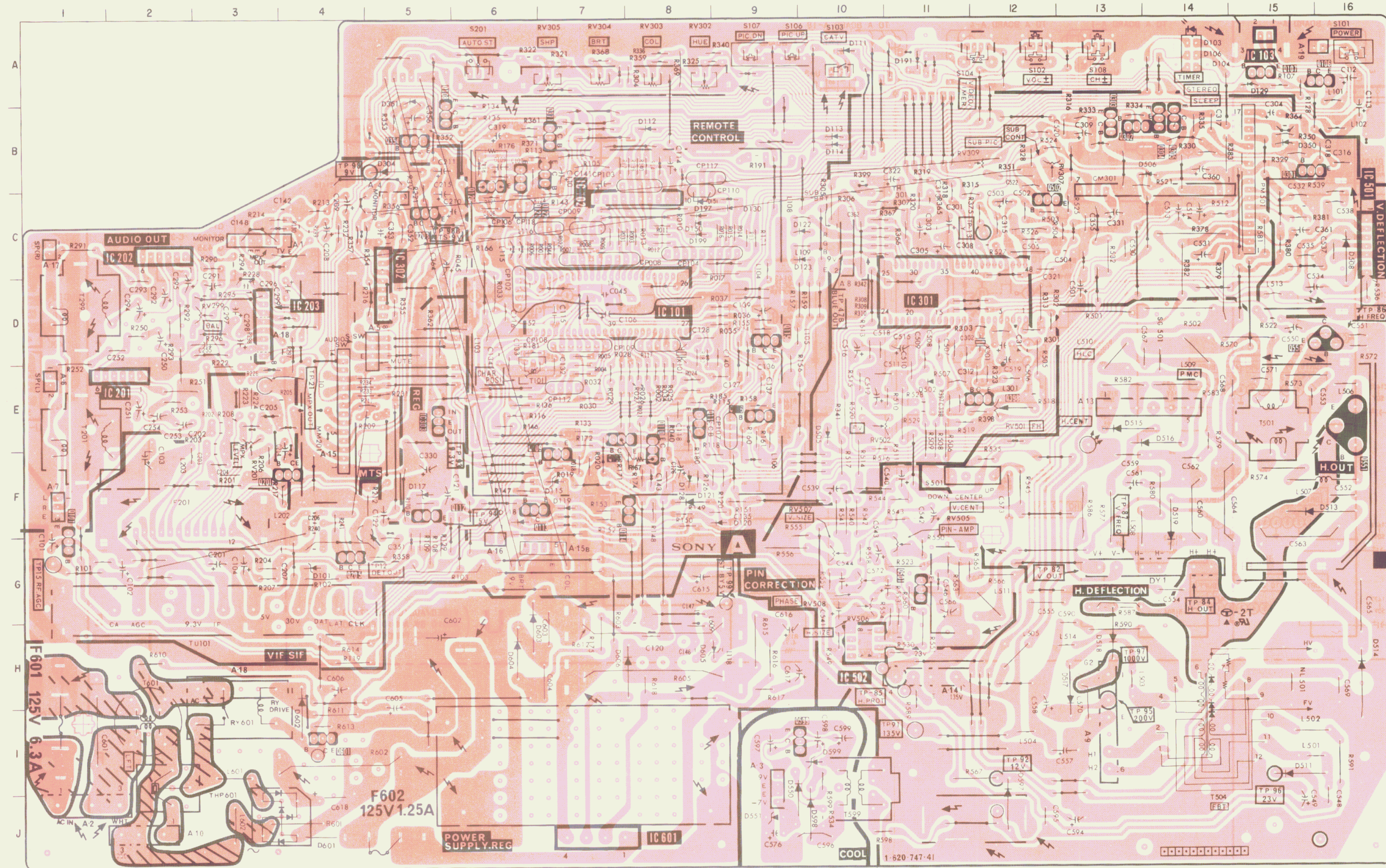
**KV-20TX11**  
RM-756

**KV-20TX11**  
RM-756

**A**

TUNER, VIF, SIF, PLL CONTROLLER, MEMORY,  
VIDEO SW, MPX PACK, COMB FILTER, Y.CHROMA JUNGLE,  
H.OUT, V.OUT, PROTECTOR MODULE,  
POWER SUPPLY, CUSTOMER CONTROL,

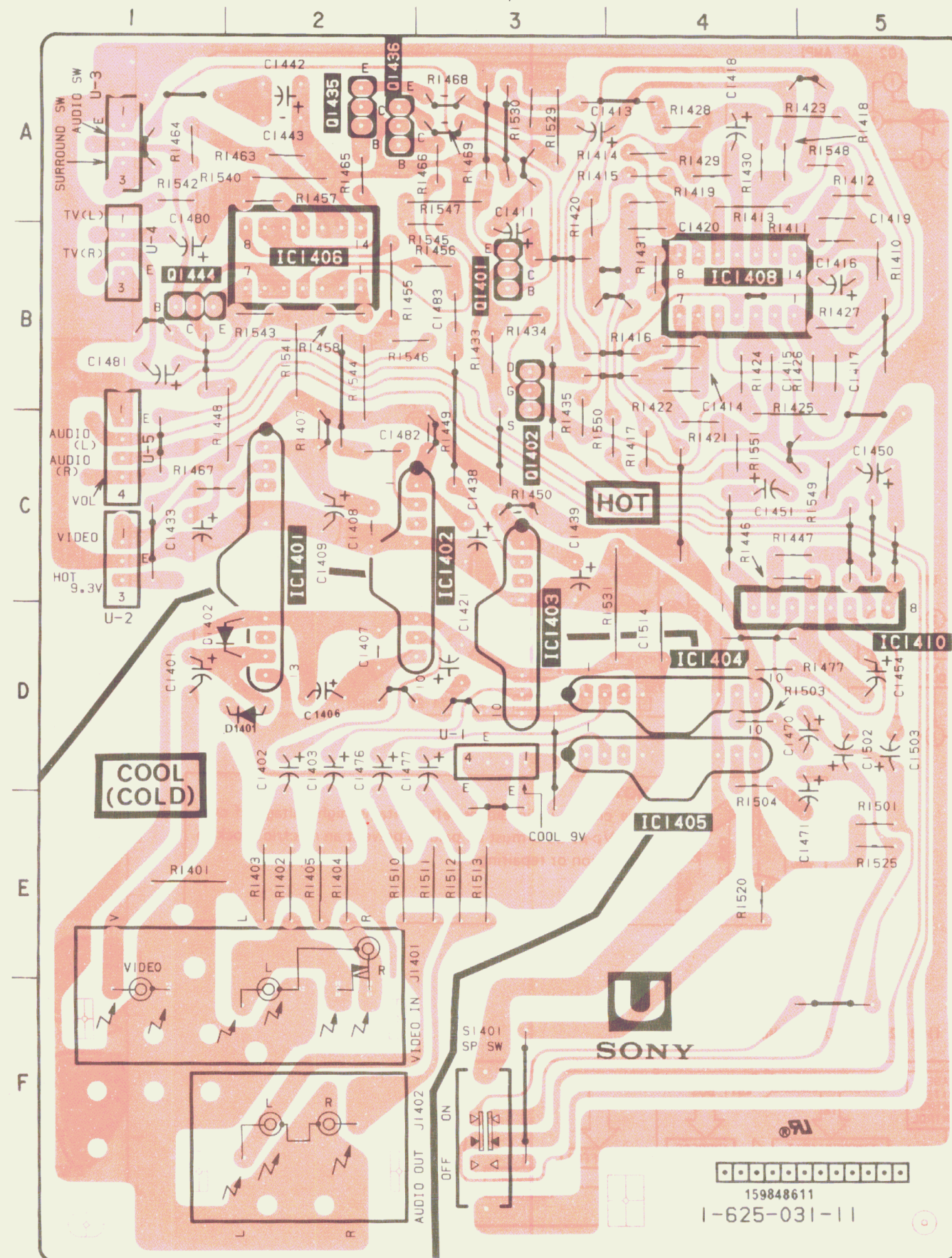
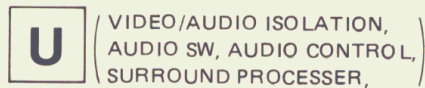
— A Board —



**A BOARD**

DIODE	TRANSISTOR
D101	G-4
D103	A-14
D104	A-14
D106	A-14
D111	A-10
D112	B-8
D113	B-10
D114	B-10
D115	F-7
D117	F-5
D118	F-6
D119	F-7
D120	F-9
D121	F-8
D122	C-10
D123	C-10
D128	F-8
D129	A-15
D191	A-11
D197	C-8
D199	C-8
D304	B-5
D350	B-15
D351	A-5
D605	E-10
D597	I-12
D598	I-2
D599	I-15
D601	J-4
D602	I-4
D603	H-6
D604	H-6
D605	H-8
D606	H-7
IC	
IC101	D-8
IC102	C-7
IC103	A-15
IC201	E-2
IC202	C-2
IC301	D-11
IC302	C-5
IC303	E-5
IC501	C-10
IC502	H-16
IC601	J-8
MM201	E-4
RV	
RV201	F-3
RV299	D-3
RV302	A-8
RV303	A-8
RV304	A-7
RV305	A-7
RV307	B-12
RV501	E-12
RV502	E-11
RV505	F-11
IC	
RV506	G-10
RV507	F-9
RV508	G-10
COIL	
T101	E-6



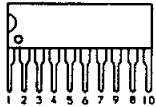


6-3. SEMICONDUCTORS

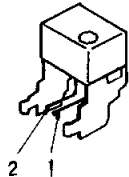
M50439-S19SP



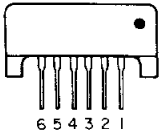
CXK1004L



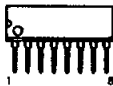
BX-1398



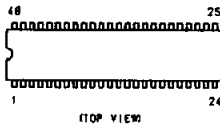
SI-4102



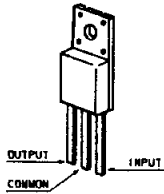
MB3110A



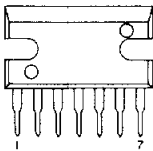
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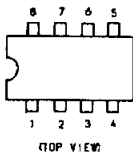
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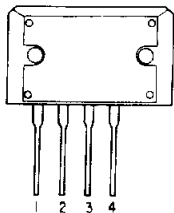
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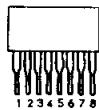
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BA4558  
NJM4558D  
HA17558



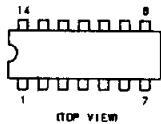
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CX20061



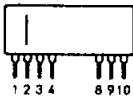
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μPC324C



1VM1



1AM1



2SK105A-30



2SD1555-LB-S1



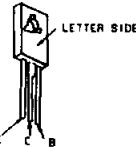
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2SD788



2SD1585-K  
2SC3851-Y



2SC2611  
2SC2688



2SC2785  
2SA1175



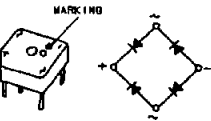
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2SC1740SS  
2SC2458  
2SC2603  
2SA1048  
2SA1115



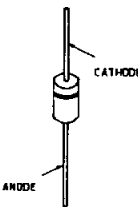
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2SA933S-Q  
2SA933S-R  
2SC2551



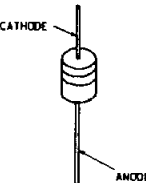
S3WB60Z



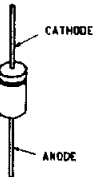
ERB43-08  
ERB43-04



RD10ES-B2  
RD33ES-B2  
1SS133  
1SS148  
1SS119  
RD4.3ES-B1  
RD5.6ES-B2  
RD5.1ES-B2



ERC06-15C  
ERD28-08S  
1S1555  
EL1Z  
10E2  
RGP01-17PKG23  
ES1F



GP08DPKG23  
U05E  
U05G  
V19E  
V19G






SECTION 7  
EXPLODED VIEWS

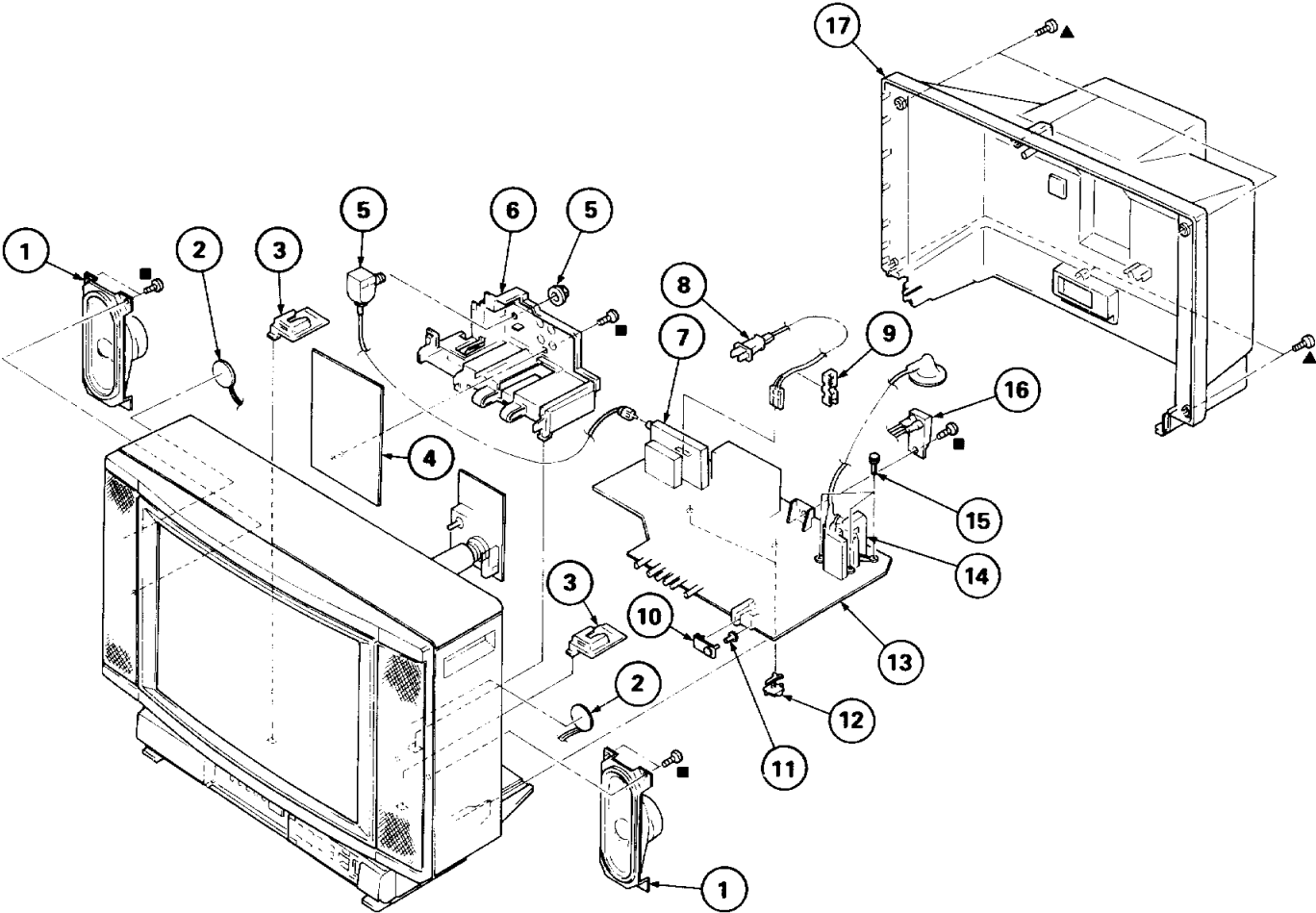
NOTE:








- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

7-1. BEZEL

- ; TA, BV3x12      7-685-648-79
- ▲; TA, BV4x16      7-685-663-79

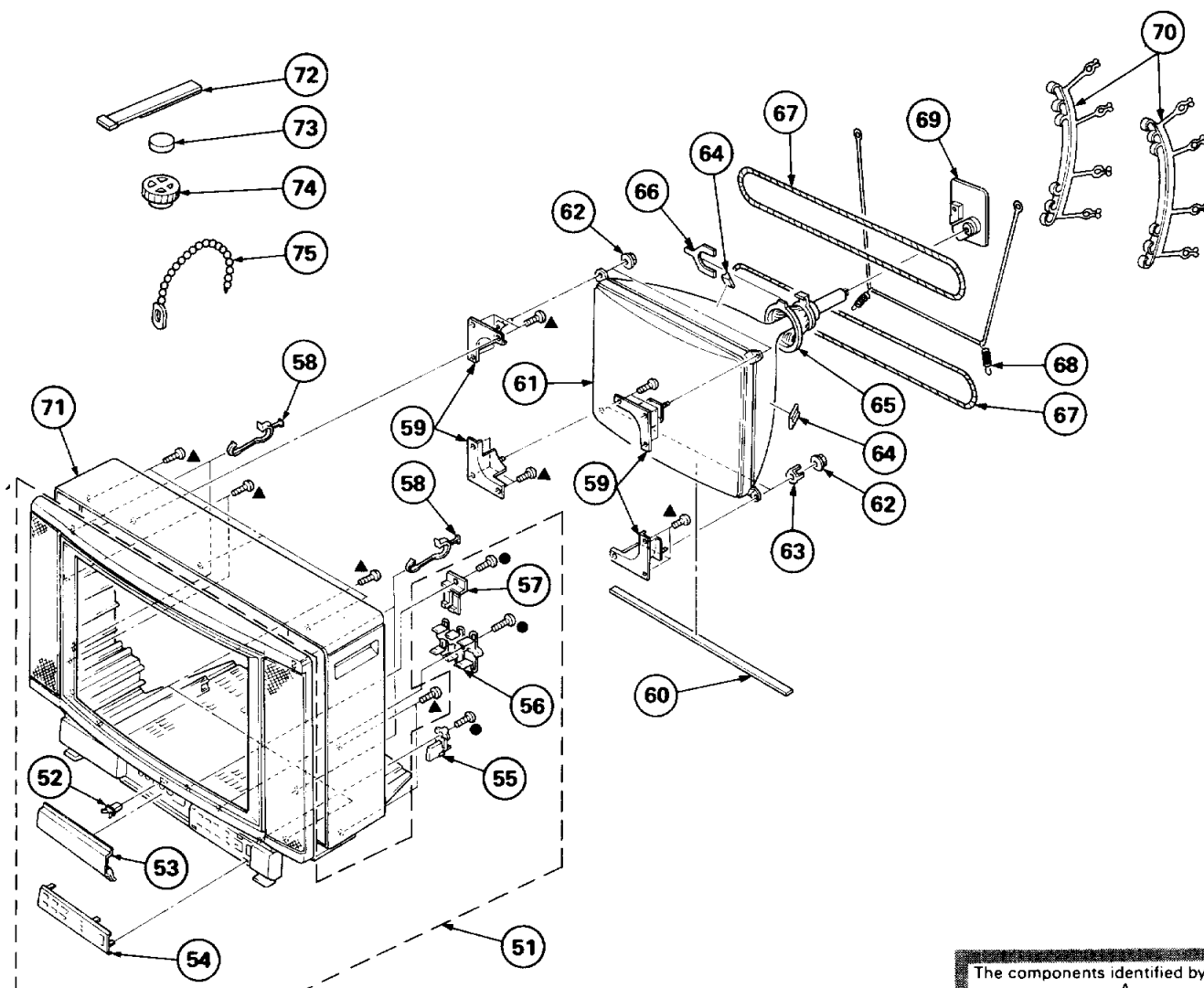


No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
1	1-503-749-11	SPEAKER		10	*4-381-686-01	BRACKET (B), BAR, OPTICAL	
2	1-529-062-11	BUZZER		11	*4-374-987-01	GUIDE, LIGHT	
3	*4-375-695-01	STOPPER, ANCHOR		12	*4-376-053-01	ANCHOR, PC BOARD	
4	*A-1389-910-A	U BOARD, COMPLETE		13	*A-1296-410-A	A BOARD, COMPLETE	
5	 .1-536-678-21	ANTENNA BLOCK		14	 .1-439-415-11	TRANSFORMER ASSY, FLYBACK	
6	 .4-388-467-11	TERMINAL BOARD, ANTENNA		15	3-531-576-31	RIVET (DIA. 3), NYLON	
7	 .1-463-771-11	TUNER, ET (BTP-201A)		16	 .1-238-043-11	RESISTOR ASSY, HIGH-VOLTAGE	
8	 .1-559-396-11	CORD, POWER		17	X-4367-275-1	COVER ASSY, BACK	
9	 .4-334-223-02	GROMMET, AC CORD					



## 7-2. PICTURE TUBE

- ; TA, BV4x12      7-685-661-14  
▲; TA, BV4x16      7-685-663-79



The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
51	X-4367-274-2	BEZEL ASSY	52-57	64	3-703-961-01	SPACER, DY	
52	4-386-710-01	CATCHER, PUSH		65	▲.1-451-268-11	DEFLECTION YOKE (SY-153C)	
53	4-375-697-01	DOOR, CONTROL		66	1-452-277-00	MAGNET, BMC	
54	4-375-696-01	PANEL, ORNAMENTAL		67	▲.1-426-358-11	COIL, DEMAGNETIZATION	
55	4-388-460-01	BUTTON, POWER		68	*4-375-394-01	SPRING, TENSION	
56	4-388-465-21	BUTTON, MULTI		69	*A-1330-824-A	C BOARD, COMPLETE	
57	4-341-738-01	BUTTON, PICTURE		70	*4-341-778-01	BAND, DEGAUSSING COIL	
58	*4-370-098-01	HOLDER, DGC		71	X-4367-255-3	CABINET ASSY	
59	*4-375-619-03	BRACKET (C), PICTURE TUBE		72	X-4308-815-0	PERMALLOY ASSY, CONVERGENCE	
60	4-385-725-01	CLOTH		73	1-452-032-00	MAGNET, DISK; 10MM Ø	
61	▲.8-738-752-05	PICTURE TUBE (A51JUH50X)		74	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM Ø	
62	4-306-034-00	FLANGE NUT, (B) 5MM		75	4-308-870-00	CLIP, LEAD WIRE	
63	4-370-090-01	WASHER, POSITIONING, PICTURE TUBE					



SECTION 8  
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark **A** are critical for safety.  
Replace only with part number specified.

- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

CAPACITORS

• MF :  $\mu$ F, PF :  $\mu$  $\mu$ F

COILS

• MMH : mH, UH :  $\mu$ H

- The components identified by **M** in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
	*A-1296-410-A	A BOARD, COMPLETE *****		C140	1-102-121-00	CERAMIC 0.0022MF 10% 50V	
	*4-341-736-01	BRACKET, FOCUS VR		C141	1-124-925-11	ELECT 2.2MF 20% 50V	
	*4-341-752-01	EYELET		C143	1-106-367-00	MYLAR 0.01MF 10% 100V	
CONNECTOR				C201	1-126-101-11	ELECT 100MF 20% 16V	
A1	*1-566-055-11	PIN, CONNECTOR 3P		C204	1-102-121-00	CERAMIC 0.0022MF 10% 50V	
A2	*1-506-349-21	3P PLUG (L)		C211	1-124-477-11	ELECT 47MF 20% 16V	
A3	*1-560-124-00	PLUG, CONNECTOR (2.5MM) 4P		C214	1-123-875-11	ELECT 10MF 20% 50V	
A4	*1-566-055-11	PIN, CONNECTOR 3P		C215	1-123-875-11	ELECT 10MF 20% 50V	
A5	*1-566-055-11	PIN, CONNECTOR 3P		C250	1-124-910-11	ELECT 47MF 20% 50V	
A6	*1-566-054-11	PIN, CONNECTOR 2P		C251	1-124-667-11	ELECT 10MF 20% 100V	
A7	*1-560-123-00	PLUG, CONNECTOR (2.5MM) 3P		C252	1-108-381-91	MYLAR 0.022MF 10% 100V	
A8	*1-566-058-11	PIN, CONNECTOR 6P		C253	1-123-930-00	ELECT 2.2MF 20% 160V	
A9	*1-508-768-00	6P PLUG		C254	1-124-925-11	ELECT 2.2MF 20% 100V	
A10	*1-508-765-00	3P PLUG (M)		C255	1-124-910-11	ELECT 47MF 20% 50V	
A13	*1-508-767-00	5P PLUG		C256	1-124-910-11	ELECT 47MF 20% 50V	
A14	*1-508-766-00	4P PLUG (M)		C291	1-124-910-11	ELECT 47MF 20% 50V	
A15B	*1-560-125-00	PLUG, CONNECTOR (2.5MM) 5P		C292	1-124-667-11	ELECT 10MF 20% 100V	
A17	*1-566-054-11	PIN, CONNECTOR 2P		C293	1-108-381-91	MYLAR 0.022MF 10% 100V	
A18	*1-566-056-11	PIN, CONNECTOR 4P		C294	1-123-930-00	ELECT 2.2MF 20% 160V	
DY1	*1-564-038-00	CONNECTOR PLUG, DY (MINI) 6P		C295	1-124-925-11	ELECT 2.2MF 20% 100V	
CAPACITOR				C301	1-124-902-00	ELECT 0.47MF 20% 50V	
C101	1-123-356-00	ELECT 10MF 20% 16V		C302	1-102-961-00	CERAMIC 27PF 5% 50V	
C102	1-124-908-11	ELECT 22MF 20% 50V		C303	1-126-101-11	ELECT 100MF 20% 16V	
C103	1-124-556-11	ELECT 2200MF 20% 16V		C305	1-124-902-00	ELECT 0.47MF 20% 50V	
C104	1-126-101-11	ELECT 100MF 20% 16V		C309	1-124-499-11	ELECT 1MF 20% 50V	
C106	1-119-160-00	ELECT 470MF 10V		C312	1-102-951-00	CERAMIC 15PF 5% 50V	
C107	1-101-361-00	CERAMIC 150PF 5% 50V		C315	1-124-284-00	ELECT 10MF 20% 16V	
C108	1-101-361-00	CERAMIC 150PF 5% 50V		C316	1-124-655-11	ELECT 0.47MF 20% 50V	
C109	1-124-927-11	ELECT 4.7MF 20% 50V		C317	1-124-646-00	ELECT 22MF 20% 16V	
C110	1-124-927-11	ELECT 4.7MF 20% 50V		C318	1-102-074-00	CERAMIC 0.001MF 10% 50V	
C112	1-126-101-11	ELECT 100MF 20% 16V		C321	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C113	1-126-101-11	ELECT 100MF 20% 16V		C322	1-123-875-11	ELECT 10MF 20% 50V	
C114	1-123-356-00	ELECT 10MF 20% 16V		C330	1-124-120-11	ELECT 220MF 20% 16V	
C115	1-162-205-31	CERAMIC 18PF 5% 50V		C331	1-126-101-11	ELECT 100MF 20% 16V	
C116	1-106-367-00	MYLAR 0.01MF 10% 100V		C351	1-124-631-11	ELECT 47MF 20% 16V	
C118	1-106-367-00	MYLAR 0.01MF 10% 100V		C352	1-124-631-11	ELECT 47MF 20% 16V	
C120	1-106-383-00	MYLAR 0.047MF 10% 100V		C355	1-102-121-00	CERAMIC 0.0022MF 10% 50V	
C121	1-124-477-11	ELECT 47MF 20% 16V		C356	1-124-908-11	ELECT 22MF 20% 50V	
C122	1-124-963-11	ELECT 33MF 20% 16V		C360	1-123-875-11	ELECT 10MF 20% 50V	
C126	1-124-902-00	ELECT 0.47MF 20% 50V		C361	1-124-902-00	ELECT 0.47MF 20% 50V	
C127	1-102-963-00	CERAMIC 33PF 5% 50V		C364	1-124-480-11	ELECT 470MF 20% 25V	
C128	1-102-965-00	CERAMIC 39PF 5% 50V		C398	1-102-110-00	CERAMIC 220PF 10% 50V	
C132	1-102-965-00	CERAMIC 39PF 5% 50V		C501	1-126-101-11	ELECT 100MF 20% 16V	
C133	1-102-964-00	CERAMIC 36PF 5% 50V		C502	1-108-375-91	MYLAR 0.0068MF 10% 100V	
C135	1-102-074-00	CERAMIC 0.001MF 10% 50V		C503	1-124-902-00	ELECT 0.47MF 20% 50V	
C136	1-124-499-11	ELECT 1MF 20% 50V		C505	1-108-373-91	MYLAR 0.0047MF 10% 100V	
C137	1-124-499-11	ELECT 1MF 20% 50V		C507	1-102-110-00	CERAMIC 220PF 10% 50V	
C139	1-124-477-11	ELECT 47MF 20% 16V		C508	1-101-006-00	CERAMIC 0.047MF 50V	
				C509	1-101-006-00	CERAMIC 0.047MF 50V	
				C510	1-108-375-91	MYLAR 0.0068MF 10% 100V	
				C511	1-108-383-00	MYLAR 0.033MF 10% 100V	
				C512	1-124-925-11	ELECT 2.2MF 20% 50V	
				C513	1-124-499-11	ELECT 1MF 20% 50V	

The components identified by shading and mark **A** are critical for safety.  
Replace only with part number specified.

**A**

Ref.No.	Part No.	Description			Remark	Ref.No.	Part No.	Description	Remark
C514	1-123-875-11	ELECT	10MF	20%	50V				
C515	1-124-464-11	ELECT	0.22MF	20%	50V			FILTER	
C516	1-124-477-11	ELECT	47MF	20%	16V				
C518	1-102-125-00	CERAMIC	0.0047MF	10%	50V	CM301	1-464-720-11	FILTER BLOCK, COM (CFB-1)	
C520	1-124-005-11	ELECT	4.7MF	20%	50V				
								NETWORK	
C522	1-102-822-00	CERAMIC	390PF	5%	50V				
C530	1-124-280-00	ELECT	4.7MF	20%	25V	CP008	1-235-823-11	NETWORK	
C531	1-124-908-11	ELECT	22MF	20%	50V	CP009	1-235-822-11	NETWORK	
C532	1-124-284-00	ELECT	10MF	20%	16V	CP104	1-235-823-11	NETWORK	
C534	1-124-122-11	ELECT	100MF	20%	35V				
								DIODE	
C535	1-102-030-00	CERAMIC	330PF	10%	500V				
C537	1-108-375-91	MYLAR	0.0068MF	10%	100V				
C538	1-108-381-91	MYLAR	0.022MF	10%	100V	D101	8-719-110-78	DIODE RD33ES-B2	
C539	1-124-927-11	ELECT	4.7MF	20%	50V	D103	1-807-643-11	LED UNIT (LEDU-1)	
C540	1-124-925-11	ELECT	2.2MF	20%	50V	D104	1-807-643-11	LED UNIT (LEDU-1)	
						D106	1-807-643-11	LED UNIT (LEDU-1)	
C541	1-124-910-11	ELECT	47MF	20%	50V	D111	8-719-911-19	DIODE 1SS119	
C542	1-123-587-00	ELECT	560MF	10%	25V				
C543	1-123-875-11	ELECT	10MF	20%	50V	D112	8-719-911-19	DIODE 1SS119	
C544	1-124-925-11	ELECT	2.2MF	20%	50V	D113	8-719-911-19	DIODE 1SS119	
C546	1-106-343-00	MYLAR	0.001MF	10%	100V	D114	8-719-911-19	DIODE 1SS119	
						D115	8-719-109-74	DIODE RD4.3ES-B1	
C548	1-102-212-00	CERAMIC	820PF	10%	500V	D117	8-719-109-89	DIODE RD5.6ES-B2	
C549	1-124-479-11	ELECT	330MF	20%	25V				
C550	1-124-902-00	ELECT	0.47MF	20%	50V	D118	8-719-911-19	DIODE 1SS119	
C551	1-102-114-00	CERAMIC	470PF	10%	50V	D119	8-719-911-19	DIODE 1SS119	
C552	A 1-162-135-51	CERAMIC	560PF	10%	2KV	D120	8-719-911-19	DIODE 1SS119	
						D121	8-719-815-55	DIODE 1S1555	
C553	1-102-030-00	CERAMIC	330PF	10%	500V	D122	8-719-911-19	DIODE 1SS119	
C554	A 1-162-134-51	CERAMIC	470PF	10%	2KV				
C555	A 1-129-714-51	FILM	0.01MF	10%	630V	D123	8-719-911-19	DIODE 1SS119	
C557	1-123-024-00	ELECT	33MF		160V	D128	8-719-911-19	DIODE 1SS119	
C558	1-123-933-00	ELECT	10MF	20%	160V	D129	8-719-911-19	DIODE 1SS119	
						D191	8-719-911-19	DIODE 1SS119	
C559	1-108-433-00	MYLAR	0.1MF		200V	D197	8-719-911-19	DIODE 1SS119	
C560	1-136-109-00	FILM	0.68MF	5%	200V				
	*4-341-751-01	PAWL; C560				D199	8-719-911-19	DIODE 1SS119	
C561	1-123-943-00	ELECT	1MF	20%	250V	D304	8-719-302-43	DIODE EL1Z	
C562	A 1-102-228-91	CERAMIC	470PF	10%	500V	D350	8-719-911-19	DIODE 1SS119	
						D351	8-719-911-19	DIODE 1SS119	
C563	A 1-136-309-11	FILM	0.0075MF	3%	1.4KV	D505	8-719-911-19	DIODE 1SS119	
	*4-341-751-01	PAWL; C563							
C564	A 1-136-111-11	FILM	1MF	5%	200V	D506	8-719-911-19	DIODE 1SS119	
	*4-341-751-01	PAWL; C564				D508	8-719-911-55	DIODE U05G	
C565	A 1-136-312-51	FILM	0.043MF	5%	400V	D511	8-719-918-77	DIODE V19G	
						D513	8-719-945-80	DIODE ERC06-15S	
	*4-341-751-01	PAWL; C565				D514	8-719-928-08	DIODE ERD28-08S	
C566	1-124-192-00	ELECT	4.7MF	20%	50V				
C567	A 1-162-318-51	CERAMIC	0.001MF	10%	500V	D515	8-719-911-55	DIODE U05G	
C568	1-106-383-00	MYLAR	0.047MF	10%	100V	D516	8-719-911-55	DIODE U05G	
C569	1-108-425-00	MYLAR	0.022MF		200V	D517	8-719-300-76	DIODE RH-1A	
						D518	8-719-300-65	DIODE ES1F	
C570	1-162-114-00	CERAMIC	0.0047MF		2KV	D519	8-719-300-65	DIODE ES1F	
C571	1-108-418-51	MYLAR	0.0056MF		200V				
C572	1-123-875-11	ELECT	10MF	20%	50V	D597	8-719-921-53	DIODE RGP15G	
C573	1-108-393-00	MYLAR	0.22MF	10%	100V	D598	8-719-549-41	DIODE ERB43-08	
C590	1-108-422-51	MYLAR	0.012MF		200V	D599	8-719-110-17	DIODE RD10ES-B2	
						D601	A 8-719-503-06	DIODE S3WB60Z	
C594	1-124-557-11	ELECT	1000MF	20%	25V	D602	A 8-719-200-02	DIODE 10E2	
C595	1-102-212-00	CERAMIC	820PF	10%	500V				
C596	1-129-708-00	FILM	0.0033MF	10%	630V	D603	8-719-911-55	DIODE U05G	
C597	1-124-484-11	ELECT	220MF	20%	35V	D604	8-719-911-55	DIODE U05G	
C598	1-124-963-11	ELECT	33MF	20%	16V	D605	8-719-109-85	DIODE RD5.1ES-B2	
						D606	8-719-911-55	DIODE U05G	
C599	1-124-120-11	ELECT	220MF	20%	16V				
C601	A 1-108-745-52	MYLAR	0.22MF	20%	125V				
C602	A 1-125-457-11	ELECT(BLOCK)	560MF	20%	200V				
C603	1-161-830-00	CERAMIC	0.0047MF		500V			FUSE	
C604	1-161-830-00	CERAMIC	0.0047MF		500V	F601	A 1-532-509-11	FUSE, GLASS TUBE 6.3A/125V	
							1-533-190-11	CLIP, FUSE; F601	
C605	1-123-948-00	ELECT	22MF	20%	250V	F602	A 1-532-741-11	FUSE, GLASS TUBE 1.25A/125V	
C606	1-124-444-00	ELECT	220MF	20%	10V		*1-533-189-11	HOLDER, FUSE; F602	
C615	1-123-933-00	ELECT	10MF	20%	160V				
C616	1-123-933-00	ELECT	10MF	20%	160V				
C617	1-123-933-00	ELECT	10MF	20%	160V				

A

The components identified by shading and mark A are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
<u>IC</u>				Q109	8-729-117-54	TRANSISTOR 2SA1175	
IC101	8-759-605-39	IC M50439-519SP		Q110	8-729-178-54	TRANSISTOR 2SC2785	
IC102	8-759-803-24	IC CXK1004L		Q112	8-729-378-91	TRANSISTOR 2SD789	
IC103	8-741-139-80	IC 8X-1398		Q113	8-729-117-54	TRANSISTOR 2SA1175	
IC201A	8-749-900-15	IC SI-4102		Q114	8-729-178-54	TRANSISTOR 2SC2785	
IC202A	8-749-900-15	IC SI-4102		Q115	8-729-178-54	TRANSISTOR 2SC2785	
IC301	8-752-030-69	IC CXA1013S		Q116	8-729-178-54	TRANSISTOR 2SC2785	
IC302	8-759-006-10	IC CX20061		Q119	8-729-178-54	TRANSISTOR 2SC2785	
IC303	8-759-710-04	IC NJM78M93FD		Q120	8-729-178-54	TRANSISTOR 2SC2785	
IC501	8-759-105-82	IC UPC1378H-P		Q121	8-729-178-54	TRANSISTOR 2SC2785	
IC502	8-759-145-58	IC UPC4558C		Q122	8-729-178-54	TRANSISTOR 2SC2785	
IC601A	8-749-930-35	IC STR3035		Q203	8-729-378-84	TRANSISTOR 2SD788	
	4-369-267-01	SPACER, MICA; IC601		Q205	8-729-178-54	TRANSISTOR 2SC2785	
MM201	8-749-900-80	IC 8X-1458		Q301	8-729-178-54	TRANSISTOR 2SC2785	
				Q302	8-729-178-54	TRANSISTOR 2SC2785	
<u>IF BLOCK</u>				Q303	8-729-178-54	TRANSISTOR 2SC2785	
IF201	1-464-755-11	IF BLOCK (IFE-450)		Q304	8-729-178-54	TRANSISTOR 2SC2785	
<u>COIL</u>				Q305	8-729-117-54	TRANSISTOR 2SA1175	
L101	1-410-482-41	INDUCTOR 100UH		Q354	8-729-117-54	TRANSISTOR 2SA1175	
L102	1-410-482-41	INDUCTOR 100UH		Q371	8-729-178-54	TRANSISTOR 2SC2785	
L103	1-410-482-41	INDUCTOR 100UH		Q398	8-729-178-54	TRANSISTOR 2SC2785	
L104	1-410-465-41	INDUCTOR 3.9UH		Q501	8-729-107-26	TRANSISTOR 2SD1585-K	
L105	1-410-465-41	INDUCTOR 3.9UH		Q502	8-729-117-54	TRANSISTOR 2SA1175	
L106	1-410-465-41	INDUCTOR 3.9UH		Q550	8-729-168-82	TRANSISTOR 2SC2688	
L108	1-410-472-41	INDUCTOR 15UH		Q551	8-729-203-80	TRANSISTOR 2SD1555-LB-S1	
L109	1-410-472-41	INDUCTOR 15UH		Q599	8-729-378-91	TRANSISTOR 2SD789	
L203	1-410-469-41	INDUCTOR 8.2UH		Q601	8-729-255-12	TRANSISTOR 2SC2551	
L301	1-410-421-11	INDUCTOR 15UH		<u>RESISTOR</u>			
L501	1-410-666-31	INDUCTOR 18UH		R001	1-249-421-11	CARBON 2.2K 5% 1/4W	
L502	1-408-938-00	INDUCTOR 22UH		R002	1-249-414-11	CARBON 560 5% 1/4W	
L503	1-410-669-31	INDUCTOR 33UH		R003	1-249-414-11	CARBON 560 5% 1/4W	
L504	1-459-313-00	COIL WITH CORE (HWC)		R004	1-249-414-11	CARBON 560 5% 1/4W	
L505	1-459-104-00	COIL, DUST CORE		R005	1-249-414-11	CARBON 560 5% 1/4W	
L506	1-407-365-00	COIL, CHOKE		R006	1-249-414-11	CARBON 560 5% 1/4W	
L507	1-408-349-00	COIL, CHOKE		R007	1-249-414-11	CARBON 560 5% 1/4W	
L508	1-408-239-00	INDUCTOR 4.7MMH		R008	1-249-414-11	CARBON 560 5% 1/4W	
L509 A	1-459-390-11	COIL (WITH CORE)		R009	1-249-414-11	CARBON 560 5% 1/4W	
L510 A	1-459-626-12	HLC		R010	1-249-414-11	CARBON 560 5% 1/4W	
	*4-341-751-01	PAWL; L510		R011	1-249-414-11	CARBON 560 5% 1/4W	
L511	1-459-075-00	COIL, DYNAMIC CONVERSION CHOKE		R012	1-249-414-11	CARBON 560 5% 1/4W	
L513	1-410-665-31	INDUCTOR 15UH		R013	1-249-414-11	CARBON 560 5% 1/4W	
L514	1-459-407-00	COIL, FERRITE CHOKE		R014	1-249-421-11	CARBON 2.2K 5% 1/4W	
L601 A	1-408-225-21	INDUCTOR 3.3UH		R015	1-249-421-11	CARBON 2.2K 5% 1/4W	
L602 A	1-408-225-21	INDUCTOR 3.3UH		R016	1-249-421-11	CARBON 2.2K 5% 1/4W	
L609	1-410-459-11	INDUCTOR 1.2UH		R017	1-247-717-11	CARBON 2.2K 5% 1/4W	
<u>NEON LAMP</u>				R018	1-249-416-11	CARBON 820 5% 1/4W	
NL501	1-519-237-11	LAMP, NEON		R019	1-249-429-11	CARBON 10K 5% 1/4W	
<u>MODULE</u>				R020	1-249-429-11	CARBON 10K 5% 1/4W	
PM501	1-235-962-11	PROTECTOR MODULE (PM-8)		R021	1-246-507-00	CARBON 27K 5% 1/4W	
<u>TRANSISTOR</u>				R022	1-249-414-11	CARBON 560 5% 1/4W	
Q101	8-729-178-54	TRANSISTOR 2SC2785		R024	1-249-421-11	CARBON 2.2K 5% 1/4W	
Q103	8-729-178-54	TRANSISTOR 2SC2785		R025	1-249-421-11	CARBON 2.2K 5% 1/4W	
Q106	8-729-117-54	TRANSISTOR 2SA1175		R026	1-249-421-11	CARBON 2.2K 5% 1/4W	
Q107	8-729-117-54	TRANSISTOR 2SA1175		R027	1-249-421-11	CARBON 2.2K 5% 1/4W	
Q108	8-729-178-54	TRANSISTOR 2SC2785		R028	1-249-423-11	CARBON 3.3K 5% 1/4W	
				R029	1-249-414-11	CARBON 560 5% 1/4W	
				R030	1-249-414-11	CARBON 560 5% 1/4W	
				R031	1-249-414-11	CARBON 560 5% 1/4W	
				R032	1-249-414-11	CARBON 560 5% 1/4W	
				R033	1-247-710-11	CARBON 560 5% 1/4W	
				R034	1-249-426-11	CARBON 5.6K 5% 1/4W	
				R035	1-249-417-11	CARBON 1K 5% 1/4W	
				R036	1-249-416-11	CARBON 820 5% 1/4W	

The components identified by shading and mark **A** are critical for safety.  
Replace only with part number specified.

**A**

Ref.No.	Part No.	Description	Remark			Ref.No.	Part No.	Description	Remark		
R037	1-249-416-11	CARBON	820	5%	1/4W	R207	1-249-435-11	CARBON	33K	5%	1/4W
R040	1-249-460-11	CARBON	15K	5%	1/4W	R208	1-249-425-11	CARBON	4.7K	5%	1/4W
R044	1-249-414-11	CARBON	560	5%	1/4W	R211	1-249-411-11	CARBON	330	5%	1/4W
R045	1-249-433-11	CARBON	22K	5%	1/4W	R213	1-249-411-11	CARBON	330	5%	1/4W
R101	1-249-426-11	CARBON	5.6K	5%	1/4W	R214	1-249-411-11	CARBON	330	5%	1/4W
R102	1-247-713-11	CARBON	1K	5%	1/4W	R217	1-249-417-11	CARBON	1K	5%	1/4W
R103	1-215-923-00	METAL OXIDE	10K	5%	3W	R221	1-249-413-11	CARBON	470	5%	1/4W
R105	1-249-465-11	CARBON	47K	5%	1/4W	R231	1-249-405-11	CARBON	100	5%	1/4W
R107	1-249-437-11	CARBON	47K	5%	1/4W	R232	1-249-411-11	CARBON	330	5%	1/4W
R108	1-247-721-11	CARBON	4.7K	5%	1/4W	R233	1-249-411-11	CARBON	330	5%	1/4W
R109	1-249-425-11	CARBON	4.7K	5%	1/4W	R234	1-249-411-11	CARBON	330	5%	1/4W
R113	1-249-417-11	CARBON	1K	5%	1/4W	R240	1-249-425-11	CARBON	4.7K	5%	1/4W
R115	1-249-421-11	CARBON	2.2K	5%	1/4W	R241	1-249-441-11	CARBON	100K	5%	1/4W
R116	1-249-421-11	CARBON	2.2K	5%	1/4W	R250	1-249-410-11	CARBON	270	5%	1/4W
R117	1-249-421-11	CARBON	2.2K	5%	1/4W	R251	<b>A</b> 1-246-987-11	CARBON	47	5%	1/8W
R118	1-249-433-11	CARBON	22K	5%	1/4W	R252	1-249-459-11	CARBON	12K	5%	1/4W
R119	1-247-713-11	CARBON	1K	5%	1/4W	R253	1-249-434-11	CARBON	27K	5%	1/4W
R120	1-249-437-11	CARBON	47K	5%	1/4W	R254	1-249-403-11	CARBON	68	5%	1/4W
R121	1-249-434-11	CARBON	27K	5%	1/4W	R290	1-249-411-11	CARBON	330	5%	1/4W
R124	1-249-417-11	CARBON	1K	5%	1/4W	R291	1-249-459-11	CARBON	12K	5%	1/4W
R125	1-249-417-11	CARBON	1K	5%	1/4W	R292	<b>A</b> 1-246-987-11	CARBON	47	5%	1/8W
R126	1-249-429-11	CARBON	10K	5%	1/4W	R293	1-249-434-11	CARBON	27K	5%	1/4W
R128	1-249-429-11	CARBON	10K	5%	1/4W	R298	1-249-417-11	CARBON	1K	5%	1/4W
R131	1-249-412-11	CARBON	390	5%	1/4W	R301	1-215-471-00	METAL	120K	1%	1/6W
R132	1-249-412-11	CARBON	390	5%	1/4W	R302	1-249-438-11	CARBON	56K	5%	1/4W
R133	1-249-429-11	CARBON	10K	5%	1/4W	R303	1-249-429-11	CARBON	10K	5%	1/4W
R134	1-249-413-11	CARBON	470	5%	1/4W	R304	1-215-479-00	CARBON	270K	5%	1/4W
R135	1-249-417-11	CARBON	1K	5%	1/4W	R305	1-249-468-11	CARBON	82K	5%	1/4W
R136	1-249-405-11	CARBON	100	5%	1/4W	R306	1-249-437-11	CARBON	47K	5%	1/4W
R139	1-249-417-11	CARBON	1K	5%	1/4W	R307	1-249-429-11	CARBON	10K	5%	1/4W
R140	1-249-417-11	CARBON	1K	5%	1/4W	R308	1-249-411-11	CARBON	330	5%	1/4W
R141	1-249-417-11	CARBON	1K	5%	1/4W	R309	1-249-411-11	CARBON	330	5%	1/4W
R142	1-249-429-11	CARBON	10K	5%	1/4W	R310	1-249-411-11	CARBON	330	5%	1/4W
R143	1-249-429-11	CARBON	10K	5%	1/4W	R313	1-249-460-11	CARBON	15K	5%	1/4W
R146	1-249-417-11	CARBON	1K	5%	1/4W	R315	1-249-417-11	CARBON	1K	5%	1/4W
R147	1-249-416-11	CARBON	820	5%	1/4W	R316	1-249-411-11	CARBON	330	5%	1/4W
R148	1-249-432-11	CARBON	18K	5%	1/4W	R318	1-249-417-11	CARBON	1K	5%	1/4W
R149	1-249-423-11	CARBON	3.3K	5%	1/4W	R319	1-249-417-11	CARBON	1K	5%	1/4W
R150	1-249-437-11	CARBON	47K	5%	1/4W	R320	1-249-417-11	CARBON	1K	5%	1/4W
R151	1-249-429-11	CARBON	10K	5%	1/4W	R323	1-249-427-11	CARBON	6.8K	5%	1/4W
R152	1-249-433-11	CARBON	22K	5%	1/4W	R328	1-249-414-11	CARBON	560	5%	1/4W
R153	1-249-428-11	CARBON	8.2K	5%	1/4W	R329	1-249-441-11	CARBON	100K	5%	1/4W
R154	1-247-895-00	CARBON	470K	5%	1/4W	R330	1-249-426-11	CARBON	5.6K	5%	1/4W
R155	1-249-439-11	CARBON	68K	5%	1/4W	R333	1-249-429-11	CARBON	10K	5%	1/4W
R156	1-249-424-11	CARBON	3.9K	5%	1/4W	R334	1-249-413-11	CARBON	470	5%	1/4W
R157	1-247-704-11	CARBON	220	5%	1/4W	R335	1-249-425-11	CARBON	4.7K	5%	1/4W
R158	1-247-895-00	CARBON	470K	5%	1/4W	R336	1-249-425-11	CARBON	4.7K	5%	1/4W
R159	1-247-704-11	CARBON	220	5%	1/4W	R340	1-249-430-11	CARBON	12K	5%	1/4W
R160	1-249-439-11	CARBON	68K	5%	1/4W	R341	1-247-717-11	CARBON	2.2K	5%	1/4W
R161	1-249-424-11	CARBON	3.9K	5%	1/4W	R342	1-249-421-11	CARBON	2.2K	5%	1/4W
R166	1-249-429-11	CARBON	10K	5%	1/4W	R350	1-249-437-11	CARBON	47K	5%	1/4W
R167	1-215-493-00	CARBON	1M	5%	1/4W	R352	1-215-491-00	CARBON	820K	5%	1/4W
R170	1-249-415-11	CARBON	680	5%	1/4W	R353	1-249-429-11	CARBON	10K	5%	1/4W
R171	1-249-423-11	CARBON	3.3K	5%	1/4W	R354	1-249-405-11	CARBON	100	5%	1/4W
R172	1-249-434-11	CARBON	27K	5%	1/4W	R355	1-249-433-11	CARBON	22K	5%	1/4W
R174	1-215-479-00	CARBON	270K	5%	1/4W	R356	1-249-405-11	CARBON	100	5%	1/4W
R175	1-249-469-11	CARBON	100K	5%	1/4W	R357	1-249-405-11	CARBON	100	5%	1/4W
R176	1-249-441-11	CARBON	100K	5%	1/4W	R358	1-249-405-11	CARBON	100	5%	1/4W
R180	1-249-426-11	CARBON	5.6K	5%	1/4W	R359	1-249-431-11	CARBON	15K	5%	1/4W
R181	1-249-416-11	CARBON	820	5%	1/4W	R361	1-249-429-11	CARBON	10K	5%	1/4W
R182	1-249-415-11	CARBON	680	5%	1/4W	R362	1-216-449-11	METAL OXIDE	56	5%	2W
R185	1-249-429-11	CARBON	10K	5%	1/4W	R366	1-249-430-11	CARBON	12K	5%	1/4W
R191	1-249-417-11	CARBON	1K	5%	1/4W	R367	1-249-436-11	CARBON	39K	5%	1/4W
R204	1-249-435-11	CARBON	33K	5%	1/4W	R368	1-249-417-11	CARBON	1K	5%	1/4W
R206	1-249-417-11	CARBON	1K	5%	1/4W	R369	1-247-713-11	CARBON	1K	5%	1/4W

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• The components identified by **M** in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description	Remark			
R371	1-249-429-11	CARBON	10K	5%	1/4W	
R375	1-249-434-11	CARBON	27K	5%	1/4W	
R378	1-215-920-11	METAL OXIDE	3.3K	5%	3W	F
R379	1-215-920-11	METAL OXIDE	3.3K	5%	3W	F
R380	1-249-419-11	CARBON	1.5K	5%	1/4W	F
<b>M</b> R381 <b>A</b>		CARBON			1/6W	
R382	1-202-830-00	SOL ID	10K	10%	1/2W	
<b>M</b> R383 <b>A</b>		CARBON			1/4W	
R397	1-249-434-11	CARBON	27K	5%	1/4W	
R398	1-249-423-11	CARBON	3.3K	5%	1/4W	
R501	1-215-920-11	METAL OXIDE	3.3K	5%	3W	F
R502	1-216-484-00	METAL OXIDE	3.9K	5%	3W	F
R503	1-249-408-11	CARBON	180	5%	1/4W	
R504	1-249-411-11	CARBON	330	5%	1/4W	
R505	1-214-780-00	METAL	130K	1%	1/4W	
R506	1-247-702-11	CARBON	150	5%	1/4W	
R507	1-249-426-11	CARBON	5.6K	5%	1/4W	
R508	1-249-465-11	CARBON	47K	5%	1/4W	
R509	1-246-507-00	CARBON	27K	5%	1/4W	
R510	1-249-422-11	CARBON	2.7K	5%	1/4W	
R511	1-202-727-00	SOL ID	4.7M	10%	1/2W	
R512	1-249-411-11	CARBON	330	5%	1/4W	
R513	1-215-472-00	METAL	130K	1%	1/6W	
R514	1-214-765-00	METAL	33K	1%	1/4W	
R515	1-249-427-11	CARBON	6.8K	5%	1/4W	
R516	1-249-428-11	CARBON	8.2K	5%	1/4W	
R517	1-247-713-11	CARBON	1K	5%	1/4W	
R519	1-249-424-11	CARBON	3.9K	5%	1/4W	
R521	1-247-887-00	CARBON	220K	5%	1/4W	
R523	1-247-713-11	CARBON	1K	5%	1/4W	
R524	1-249-417-11	CARBON	1K	5%	1/4W	
R525	1-249-419-11	CARBON	1.5K	5%	1/4W	
R526	1-249-747-11	CARBON	1.5M	5%	1/4W	
R527	1-249-748-11	CARBON	1.8M	5%	1/4W	
R530	1-249-433-11	CARBON	22K	5%	1/4W	
R532	1-249-466-11	CARBON	56K	5%	1/4W	
R535	1-249-419-11	CARBON	1.5K	5%	1/4W	F
R536	1-249-426-11	CARBON	5.6K	5%	1/4W	
R539	1-215-373-31	METAL	10	1%	1/6W	
R540	1-247-703-11	CARBON	180	5%	1/4W	
R541	1-247-723-11	CARBON	6.8K	5%	1/4W	
R542	1-247-719-11	CARBON	3.3K	5%	1/4W	
R543	1-249-430-11	CARBON	12K	5%	1/4W	
R544	1-249-424-11	CARBON	3.9K	5%	1/4W	
R545	1-247-714-11	CARBON	1.2K	5%	1/4W	
R549	1-249-415-11	CARBON	680	5%	1/4W	F
R550	1-249-429-11	CARBON	10K	5%	1/4W	
<b>M</b> R551 <b>A</b>		CARBON			1/4W	
R553	1-249-413-11	CARBON	470	5%	1/4W	
R554	1-249-427-11	CARBON	6.8K	5%	1/4W	
<b>M</b> R555 <b>A</b>		CARBON			1/4W	
R556	1-216-352-11	METAL OXIDE	1.8	5%	1W	F
R558	1-249-410-11	CARBON	270	5%	1/4W	
R559	1-249-415-11	CARBON	680	5%	1/4W	
R560	1-247-719-11	CARBON	3.3K	5%	1/4W	
R563	1-246-511-00	CARBON	39K	5%	1/4W	
R565	1-249-441-11	CARBON	100K	5%	1/4W	
R566	1-246-535-00	CARBON	390K	5%	1/4W	
R567 <b>A</b>	1-216-350-51	METAL OXIDE	1.2	5%	1W	F
R570	1-216-431-11	METAL OXIDE	560	5%	1W	F
R572	1-249-423-11	CARBON	3.3K	5%	1/4W	
R573	1-247-764-11	CARBON	10K	5%	1/2W	F
R574	1-216-345-11	METAL OXIDE	0.47	5%	1W	F
R577	1-216-451-11	METAL OXIDE	120	5%	2W	F
R579 <b>A</b>	1-249-415-51	CARBON	680	5%	1/4W	F

Ref.No.	Part No.	Description	Remark			
R580	1-216-428-00	METAL OXIDE	180	5%	1W	F
R581	1-247-708-11	CARBON	470	5%	1/4W	F
R582	1-215-863-11	METAL OXIDE	100	5%	1W	F
R583	1-215-863-11	METAL OXIDE	100	5%	1W	F
R586	1-247-746-11	CARBON	390	5%	1/2W	
R587 <b>A</b>	1-215-899-51	METAL OXIDE	15K	5%	2W	F
R589	1-249-441-11	CARBON	100K	5%	1/4W	
R590 <b>A</b>	1-216-445-51	METAL OXIDE	12	5%	2W	F
R591	1-216-345-11	METAL OXIDE	0.47	5%	1W	F
R598	1-249-389-11	CARBON	4.7	5%	1/4W	F
R599	1-249-419-11	CARBON	1.5K	5%	1/4W	
R601 <b>A</b>	1-202-719-51	SOL ID	1M	10%	1/2W	
R602 <b>A</b>	1-205-792-11	WIREWOUND	1.8	5%	10W	
R605 <b>A</b>	1-205-691-11	WIREWOUND	150	5%	20W	
R610 <b>A</b>	1-217-224-11	WIREWOUND	100	10%	2W	F
R611	1-215-872-11	METAL OXIDE	3.3K	5%	1W	F
R612	1-205-744-11	WIREWOUND	4.7K	5%	20W	
R612	1-205-744-11	WIREWOUND	4.7K	5%	20W	
R613	1-249-437-11	CARBON	47K	5%	1/4W	
R614	1-247-721-11	CARBON	4.7K	5%	1/4W	
R615	1-216-463-00	METAL OXIDE	12K	5%	2W	F
R616	1-247-719-11	CARBON	3.3K	5%	1/4W	F
R617	1-249-401-11	CARBON	47	5%	1/4W	F
R618	1-247-895-00	CARBON	470K	5%	1/4W	

VARIABLE RESISTOR

RV201	1-228-994-00	RES, ADJ, CARBON 10K
RV299	1-230-625-11	RES, ADJ, CARBON 330
RV302	1-230-935-11	RES, VAR, CARBON 20KX4
RV303	1-230-935-11	RES, VAR, CARBON 20KX4
RV304	1-230-935-11	RES, VAR, CARBON 20KX4
RV305	1-230-935-11	RES, VAR, CARBON 20KX4
RV307	1-228-989-00	RES, ADJ, METAL GLAZE 470
RV501	1-228-728-00	RES, ADJ, CERAMIC CARBON 100K
RV502	1-228-997-00	RES, ADJ, CARBON 100K
RV505	1-228-995-00	RES, ADJ, CARBON 22K
RV506	1-230-633-41	RES, ADJ, CARBON 47K
RV507	1-230-625-11	RES, ADJ, CARBON 330
RV508	1-230-627-11	RES, ADJ, CARBON 1K

RELAY

RY601 <b>A</b>	1-515-573-11	RELAY, POWER
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SWITCH

S101 <b>A</b>	1-554-804-12	SWITCH, PUSH (1 KEY)
S102	1-570-577-11	SWITCH, PUSH
S103	1-570-240-11	SWITCH, ROTARY
S104	1-570-577-11	SWITCH, PUSH
S106	1-554-804-11	SWITCH, PUSH (1 KEY)
S107	1-554-804-11	SWITCH, PUSH (1 KEY)
S108	1-570-577-11	SWITCH, PUSH
S201	1-570-240-11	SWITCH, ROTARY
S501	1-554-186-00	SWITCH, LEVER

SPARK GAP


SG501	1-519-063-XX	DISCHARGING GAP
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The components identified by shading and mark **A** are critical for safety.  
Replace only with part number specified.



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
TRANSFORMER				Q706	8-729-326-11	TRANSISTOR 2SC2611	
T101	1-404-538-11	COIL		RESISTOR			
T201	1-427-479-00	TRANSFORMER (SOT)		R701	1-202-838-00	SOL ID	100K 10% 1/2W
T299	1-427-479-00	TRANSFORMER (SOT)		R702	1-216-394-00	METAL OXIDE	2.7 5% 3W F
T501	1-437-090-00	HDT		R703	1-202-842-11	SOL ID	220K 10% 1/2W
T599	<b>A</b> 1-421-857-11	TRANSFORMER, FERRITE		R704	1-202-846-00	SOL ID	470K 10% 1/2W
T601	<b>A</b> 1-421-357-31	TRANSFORMER, LINE FILTER		R705	1-202-837-00	SOL ID	82K 10% 1/2W
THERMISTOR				R706	1-202-549-00	SOL ID	100 10% 1/2W
THP601	<b>A</b> 1-808-081-11	THERMISTOR, POSITIVE		R707	1-202-842-11	SOL ID	220K 10% 1/2W
TUNER				R708	1-202-824-00	SOL ID	3.3K 10% 1/2W
TU101	<b>A</b> 1-463-771-11	TUNER, ET (BTP-201A)		R709	1-202-824-00	SOL ID	3.3K 10% 1/2W
CRYSTAL				R710	1-202-359-21	SOL ID	100 5% 1/4W
X101	1-567-192-11	OSCILLATOR, CERAMIC		R710	1-202-359-41	SOL ID	100 10% 1/4W
X301	1-567-505-11	OSCILLATOR, CRYSTAL		R711	1-249-411-11	CARBON	330 5% 1/4W
*****				R712	1-249-411-11	CARBON	330 5% 1/4W
*A-1330-824-A C BOARD, COMPLETE				R713	1-202-824-00	SOL ID	3.3K 10% 1/2W
*****				R714	1-249-421-11	CARBON	2.2K 5% 1/4W
<b>A</b> 1-526-798-42 SOCKET, PICTURE TUBE				R715	1-249-422-11	CARBON	2.7K 5% 1/4W
*4-379-160-01 COVER (REAR LID), CV				R716	1-249-414-11	CARBON	560 5% 1/4W
*4-379-167-01 COVER (MAIN), CV				R718	1-249-405-11	CARBON	100 5% 1/4W
CONNECTOR				R719	1-249-420-11	CARBON	1.8K 5% 1/4W
C1	*1-506-371-00	2P PLUG (L)		R720	1-249-414-11	CARBON	560 5% 1/4W
C2	*1-508-768-00	6P PLUG		R722	1-206-692-00	METAL OXIDE	15K 5% 2W F
C3	*1-566-058-11	PIN, CONNECTOR 6P		R723	1-249-413-11	CARBON	470 5% 1/4W
CAPACITOR				R725	1-249-421-11	CARBON	2.2K 5% 1/4W
C701	1-129-714-00	FILM	0.01MF 10% 630V	R726	1-249-405-11	CARBON	100 5% 1/4W
C702	1-162-116-00	CERAMIC	680PF 10% 2KV	R727	1-249-419-11	CARBON	1.5K 5% 1/4W
C704	1-124-915-11	ELECT	10MF 20% 63V	R728	1-249-413-11	CARBON	470 5% 1/4W
C705	1-102-116-00	CERAMIC	680PF 10% 50V	R729	1-249-411-11	CARBON	330 5% 1/4W
C706	1-102-116-00	CERAMIC	680PF 10% 50V	R730	1-206-692-00	METAL OXIDE	15K 5% 2W F
C707	1-102-116-00	CERAMIC	680PF 10% 50V	R732	1-215-408-00	CARBON	300 5% 1/4W
C708	1-102-110-00	CERAMIC	220PF 10% 50V	R733	1-249-422-11	CARBON	2.7K 5% 1/4W
C709	1-102-110-00	CERAMIC	220PF 10% 50V	R734	1-249-421-11	CARBON	2.2K 5% 1/4W
C710	1-102-110-00	CERAMIC	220PF 10% 50V	R735	1-249-405-11	CARBON	100 5% 1/4W
C722	1-162-622-11	CERAMIC	330PF 10% 6.3KV	R737	1-206-692-00	METAL OXIDE	15K 5% 2W F
DIODE				R738	1-202-848-00	SOL ID	680K 10% 1/2W
D701	8-719-911-19	DIODE 1SS119		R739	1-202-838-00	SOL ID	100K 10% 1/2W
D702	8-719-911-19	DIODE 1SS119		R740	1-202-842-11	SOL ID	220K 10% 1/2W
D703	8-719-911-19	DIODE 1SS119		VARIABLE RESISTOR			
COIL				RV701	<b>A</b> 1-230-619-11	RES, ADJ, METAL GLAZE 110M	
L701	1-408-450-31	INDUCTOR	47UH	RV702	1-230-271-71	RES, ADJ, CARBON 4.7K	
TRANSISTOR				RV703	1-230-628-71	RES, ADJ, CARBON 2.2K	
Q701	8-729-178-54	TRANSISTOR 2SC2785		RV704	1-230-271-71	RES, ADJ, CARBON 4.7K	
Q702	8-729-326-11	TRANSISTOR 2SC2611		RV705	1-230-628-71	RES, ADJ, CARBON 2.2K	
Q703	8-729-178-54	TRANSISTOR 2SC2785		RV706	1-230-271-71	RES, ADJ, CARBON 4.7K	
Q704	8-729-326-11	TRANSISTOR 2SC2611		RV707	1-230-631-71	RES, ADJ, CARBON 22K	
Q705	8-729-178-54	TRANSISTOR 2SC2785		RV708	1-230-641-21	RES, ADJ, METAL GLAZE 2.2M	
*****				*****			
*****				*A-1389-910-A U BOARD, COMPLETE			
*****				*****			
CAPACITOR				C1401	1-123-322-00	ELECT	330MF 20% 16V
C1402	1-124-499-11	ELECT	1MF 20% 50V	C1403	1-124-499-11	ELECT	1MF 20% 50V
C1406	1-123-322-00	ELECT	330MF 20% 16V	C1409	1-123-322-00	ELECT	330MF 20% 16V
C1411	1-123-875-11	ELECT	10MF 20% 50V				


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The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description	Remark			Ref.No.	Part No.	Description	Remark		
C1413	1-123-875-11	ELECT	10MF	20%	50V	R1416	1-249-441-11	CARBON	100K	5%	1/4W
C1414	1-102-963-00	CERAMIC	33PF	5%	50V	R1417	1-249-433-11	CARBON	22K	5%	1/4W
C1415	1-108-373-91	MYLAR	0.0047MF	10%	100V	R1418	1-249-433-11	CARBON	22K	5%	1/4W
C1416	1-124-477-11	ELECT	47MF	20%	16V	R1419	1-249-433-11	CARBON	22K	5%	1/4W
C1417	1-106-343-00	MYLAR	0.001MF	10%	100V	R1420	1-247-895-00	CARBON	470K	5%	1/4W
C1418	1-124-477-11	ELECT	47MF	20%	16V	R1421	1-249-429-11	CARBON	10K	5%	1/4W
C1419	1-102-963-00	CERAMIC	33PF	5%	50V	R1422	1-249-441-11	CARBON	100K	5%	1/4W
C1420	1-102-963-00	CERAMIC	33PF	5%	50V	R1423	1-249-462-11	CARBON	22K	5%	1/4W
C1450	1-124-499-11	ELECT	1MF	20%	50V	R1424	1-249-425-11	CARBON	4.7K	5%	1/4W
C1451	1-124-499-11	ELECT	1MF	20%	50V	R1425	1-249-462-11	CARBON	22K	5%	1/4W
C1454	1-126-103-11	ELECT	470MF	20%	16V	R1426	1-249-433-11	CARBON	22K	5%	1/4W
C1470	1-124-499-11	ELECT	1MF	20%	50V	R1427	1-249-429-11	CARBON	10K	5%	1/4W
C1471	1-124-499-11	ELECT	1MF	20%	50V	R1428	1-249-423-11	CARBON	3.3K	5%	1/4W
C1476	1-124-499-11	ELECT	1MF	20%	50V	R1429	1-249-423-11	CARBON	3.3K	5%	1/4W
C1477	1-124-499-11	ELECT	1MF	20%	50V	R1430	1-249-433-11	CARBON	22K	5%	1/4W
C1480	1-123-875-11	ELECT	10MF	20%	50V	R1431	1-249-434-11	CARBON	27K	5%	1/4W
C1481	1-123-875-11	ELECT	10MF	20%	50V	R1433	1-249-433-11	CARBON	22K	5%	1/4W
C1482	1-124-284-00	ELECT	10MF	20%	16V	R1434	1-249-437-11	CARBON	47K	5%	1/4W
C1483	1-124-284-00	ELECT	10MF	20%	16V	R1435	1-249-433-11	CARBON	22K	5%	1/4W
C1502	1-123-875-11	ELECT	10MF	20%	50V	R1446	1-249-431-11	CARBON	15K	5%	1/4W
C1503	1-123-875-11	ELECT	10MF	20%	50V	R1447	1-249-431-11	CARBON	15K	5%	1/4W
C1514	1-161-742-51	CERAMIC	0.0022MF	20%	400V	R1448	1-249-469-11	CARBON	100K	5%	1/4W
DIODE						R1455	1-247-700-11	CARBON	100	5%	1/4W
D1401	8-719-911-19	DIODE 1SS119				R1456	1-249-405-11	CARBON	100	5%	1/4W
D1402	8-719-911-19	DIODE 1SS119				R1457	1-249-405-11	CARBON	100	5%	1/4W
IC						R1458	1-249-405-11	CARBON	100	5%	1/4W
IC1401	1-235-783-11	INSULATED MODULE, VIDEO(I/M-1)				R1463	1-247-885-00	CARBON	180K	5%	1/4W
IC1402	1-235-784-11	INSULATED MODULE, AUDIO(IAM-1)				R1464	1-249-429-11	CARBON	10K	5%	1/4W
IC1403	1-235-784-11	INSULATED MODULE, AUDIO(IAM-1)				R1465	1-249-405-11	CARBON	100	5%	1/4W
IC1404	1-235-784-11	INSULATED MODULE, AUDIO(IAM-1)				R1466	1-249-405-11	CARBON	100	5%	1/4W
IC1405	1-235-784-11	INSULATED MODULE, AUDIO(IAM-1)				R1467	1-249-409-11	CARBON	220	5%	1/4W
IC1406	8-759-140-66	IC UPD4066BC				R1477	1-249-405-11	CARBON	100	5%	1/4W
IC1408	8-759-132-40	IC UPC324C				R1501	1-249-425-11	CARBON	4.7K	5%	1/4W
IC1410	8-759-940-88	IC MB3110A				R1503	1-249-429-11	CARBON	10K	5%	1/4W
JACK						R1504	1-249-429-11	CARBON	10K	5%	1/4W
J1401	1-563-303-21	JACK BLOCK, PIN 3P				R1510	1-247-713-11	CARBON	1K	5%	1/4W
J1402	1-563-302-11	JACK BLOCK, PIN 2P				R1511	1-249-469-11	CARBON	100K	5%	1/4W
TRANSISTOR						R1512	1-247-713-11	CARBON	1K	5%	1/4W
Q1401	8-729-900-89	TRANSISTOR DTC144ES				R1513	1-249-469-11	CARBON	100K	5%	1/4W
Q1402	8-729-115-30	TRANSISTOR 2SK105A-30				R1520	1-249-425-11	CARBON	4.7K	5%	1/4W
Q1435	8-729-178-54	TRANSISTOR 2SC2785				R1525	1-249-425-11	CARBON	4.7K	5%	1/4W
Q1436	8-729-178-54	TRANSISTOR 2SC2785				R1529	1-247-721-11	CARBON	4.7K	5%	1/4W
Q1444	8-729-900-89	TRANSISTOR DTC144ES				R1530	1-249-425-11	CARBON	4.7K	5%	1/4W
RESISTOR						R1531	1-202-726-91	SOL ID	3.9M	10%	1/2W
R1401	1-247-699-11	CARBON	82	5%	1/4W	R1540	1-249-466-11	CARBON	56K	5%	1/4W
R1402	1-249-466-11	CARBON	56K	5%	1/4W	R1541	1-249-466-11	CARBON	56K	5%	1/4W
R1403	1-249-465-11	CARBON	47K	5%	1/4W	R1542	1-249-438-11	CARBON	56K	5%	1/4W
R1404	1-249-466-11	CARBON	56K	5%	1/4W	R1543	1-249-438-11	CARBON	56K	5%	1/4W
R1405	1-249-465-11	CARBON	47K	5%	1/4W	R1544	1-249-466-11	CARBON	56K	5%	1/4W
R1410	1-249-434-11	CARBON	27K	5%	1/4W	R1545	1-249-438-11	CARBON	56K	5%	1/4W
R1411	1-249-433-11	CARBON	22K	5%	1/4W	R1546	1-249-438-11	CARBON	56K	5%	1/4W
R1412	1-249-433-11	CARBON	22K	5%	1/4W	R1547	1-249-466-11	CARBON	56K	5%	1/4W
R1413	1-249-462-11	CARBON	22K	5%	1/4W	R1548	1-249-431-11	CARBON	15K	5%	1/4W
R1414	1-249-433-11	CARBON	22K	5%	1/4W	R1549	1-249-417-11	CARBON	1K	5%	1/4W
R1415	1-249-433-11	CARBON	22K	5%	1/4W	R1550	1-249-431-11	CARBON	15K	5%	1/4W
						R1551	1-249-417-11	CARBON	1K	5%	1/4W
						SWITCH					
						S1401	1-570-145-11	SWITCH, SLIDE			
						CONNECTOR					
						U1	*1-560-124-00	PLUG, CONNECTOR (2.5MM) 4P			
						U2	*1-566-055-11	PIN, CONNECTOR 3P			
						U3	*1-566-055-11	PIN, CONNECTOR 3P			










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Ref.No.	Part No.	Description	Remark
U4	*1-566-055-11	PIN, CONNECTOR 3P	
U5	*1-566-056-11	PIN, CONNECTOR 4P	

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MISCELLANEOUS  
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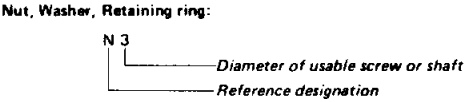
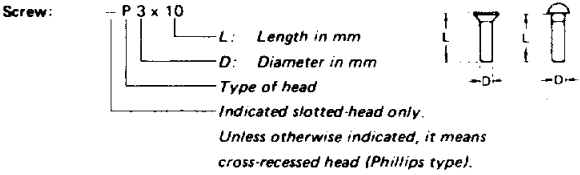
	1-238-043-11	RESISTOR ASSY, HIGH-VOLTAGE
	1-451-268-11	DEFLECTION YOKE (SY-153C)
	1-452-032-00	MAGNET, DISK; 10MM $\phi$
	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM $\phi$
	1-452-277-00	MAGNET, BMC
	1-503-749-11	SPEAKER
	1-529-062-11	BUZZER
	1-536-678-21	ANTENNA BLOCK
	1-559-396-11	CORD, POWER
L901	 1-426-358-11	COIL, DEMAGNETIZATION
T504	 1-439-415-11	TRANSFORMER ASSY, FLYBACK
V901	 8-738-752-05	PICTURE TUBE (A51JUH50X)

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ACCESSORIES AND PACKING MATERIALS  
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Part No.	Description	Remark
A-1470-823-A	COMMANDER ASSY (RM-756)	
1-501-372-21	ANTENNA, TELESCOPIC	
1-562-443-11	CNNECTOR, ANTENNA	
*4-366-617-01	BAG, PROTECTION	
*4-375-621-01	CUSHION (UPPER) (ASSY)	
*4-375-622-01	CUSHION (LOWER) (ASSY)	
*4-375-623-06	INDIVIDUAL CARTON (FOR SDP)	
*4-388-987-01	INDIVIDUAL CARTON (FOR VTM)	
4-482-541-21	MANUAL, INSTRUCTION	

HARDWARE NOMENCLATURE



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazier-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	