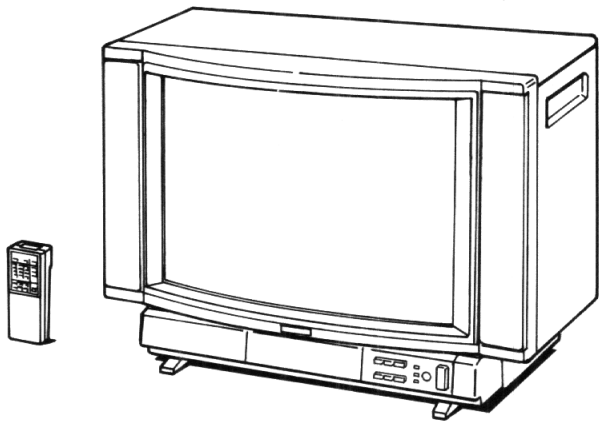
KV-20TX11
RM-756

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 trasformer)
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.

MICROFILM

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 2 V 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)

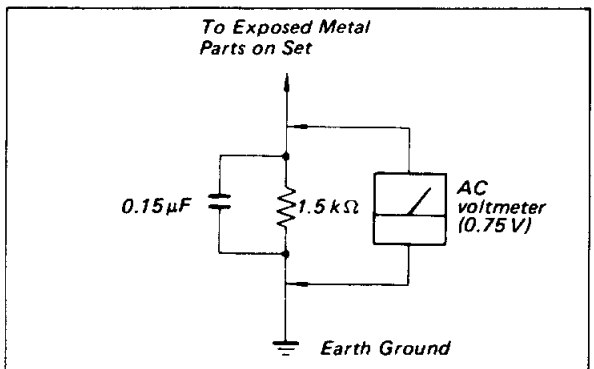


Fig. A. Using an AC voltmeter to check AC leakage.

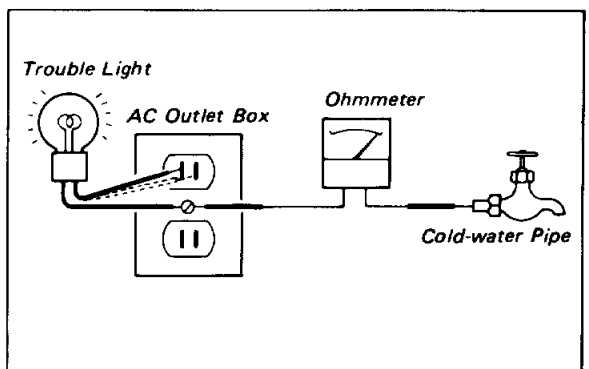
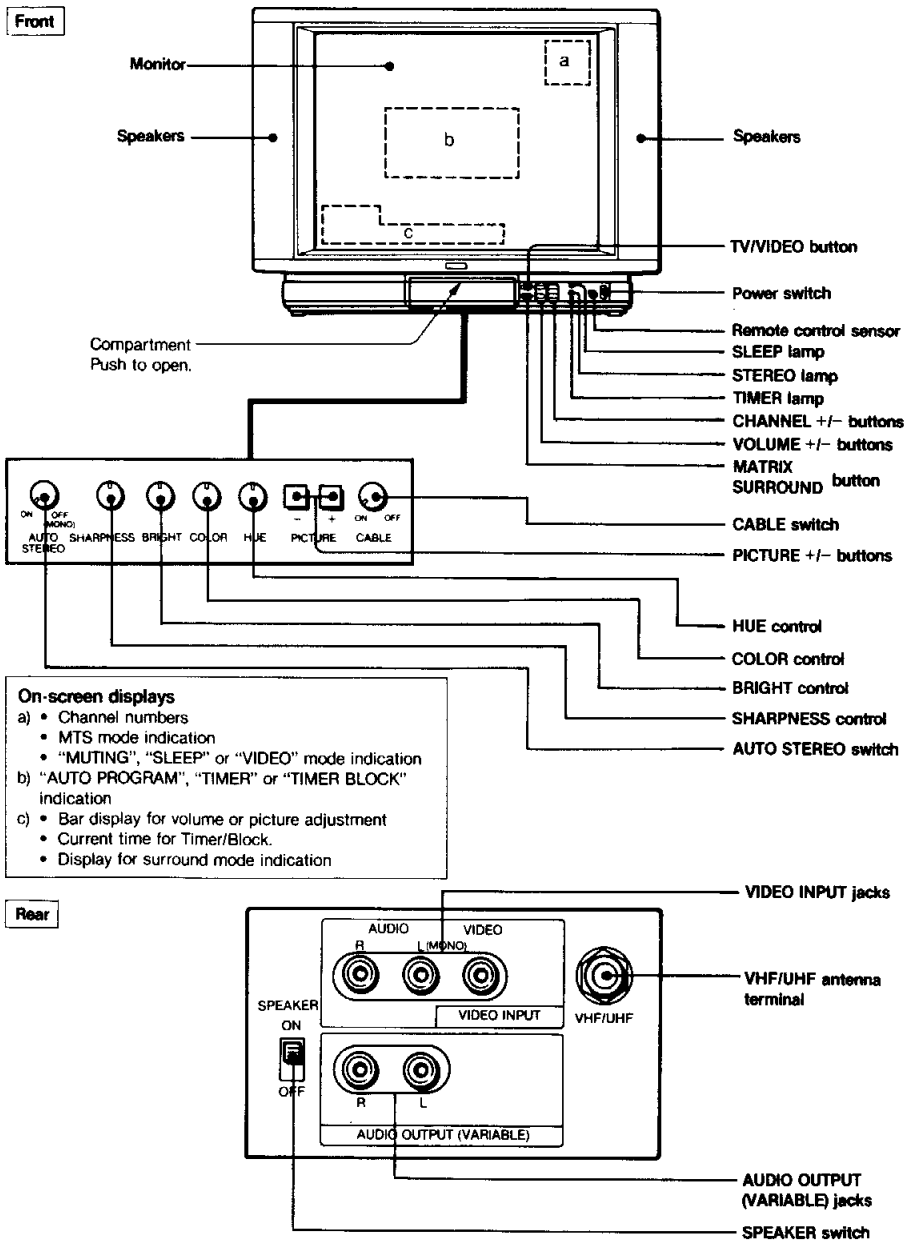


Fig. B. Checking for earth ground.

SECTION 1
GENERAL

1-1. LOCATION OF CONTROLS



On-screen displays

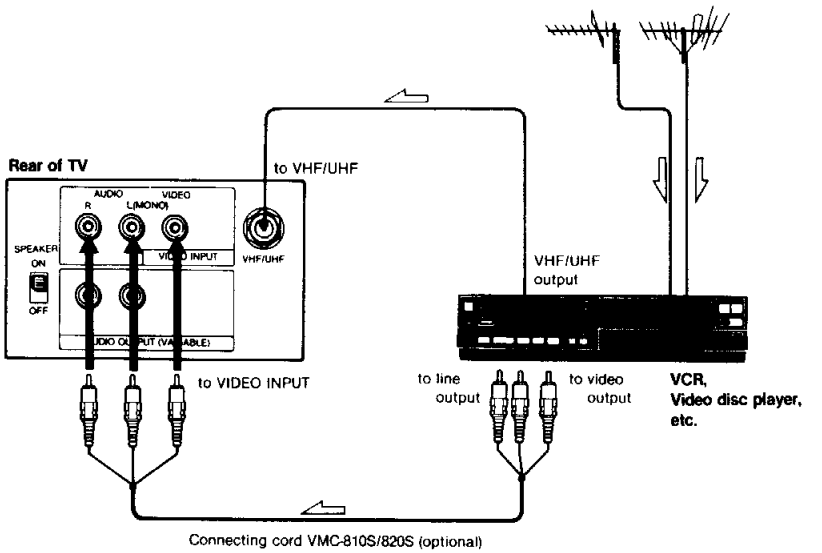
a) • Channel numbers
- MTS mode indication
- "MUTING", "SLEEP" or "VIDEO" mode indication

b) "AUTO PROGRAM", "TIMER" or "TIMER BLOCK" indication

c) • Bar display for volume or picture adjustment
- Current time for Timer/Block.
- Display for surround mode indication

1-2. CONNECTING OTHER OPTIONAL EQUIPMENT

Connecting a VCR



Connecting cord VMC-810S/820S (optional)

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

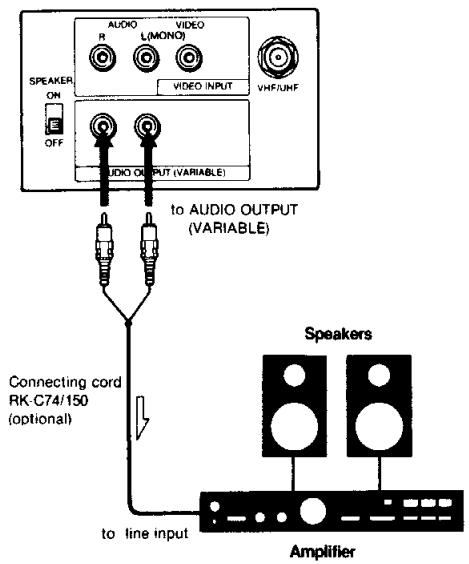
Press the TV/VIDEO button on the TV until a channel number appears on the screen.

- 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



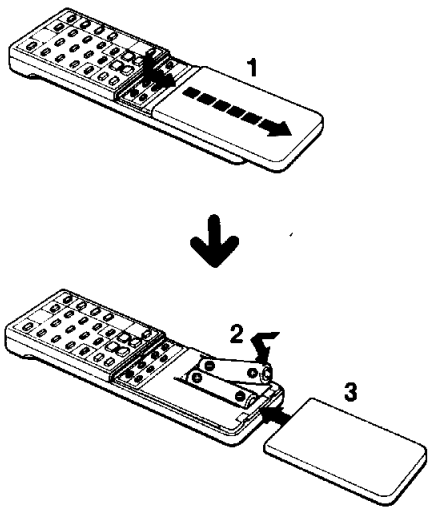
To adjust the sound level

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.

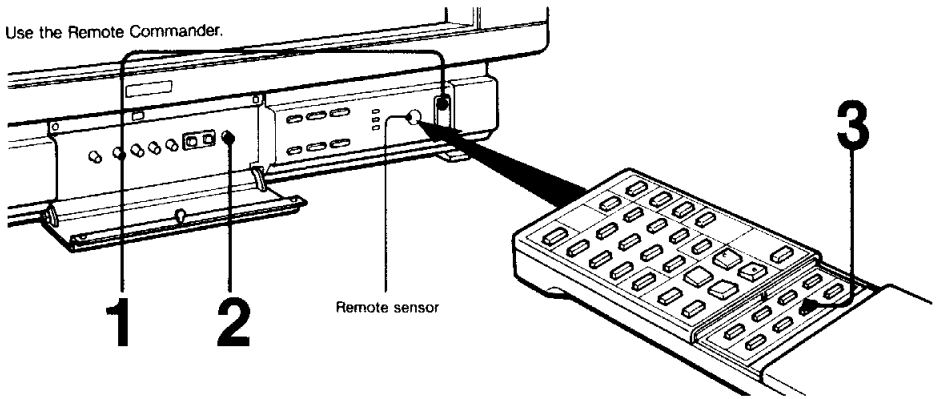
Battery installation

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.

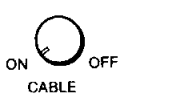
1-4. PRESETTING TV CHANNELS



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.

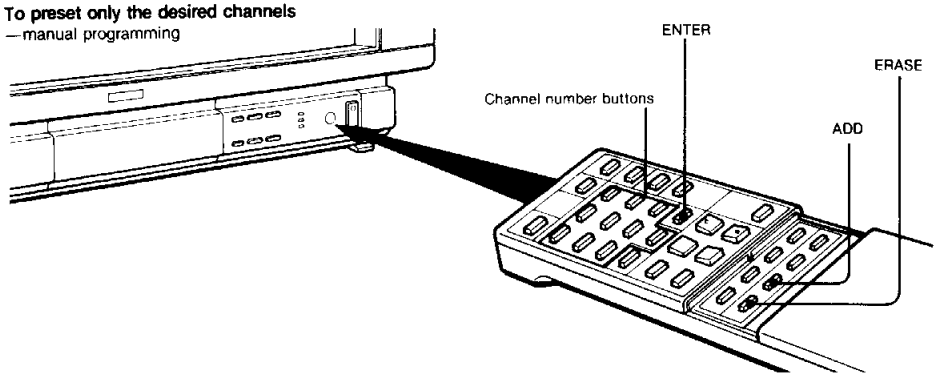


Receivable channels of this TV are:
VHF: 2-13
UHF: 14-69
Cable: 1-125

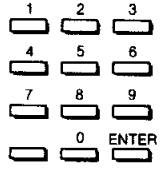
To check preset channels
Press CHANNEL +/−.

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.

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.**





2 **Press ADD.**



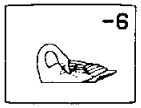
A "+" appears for a moment to the left of the on-screen channel number display. This channel has now been added to the channel scan memory.



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	1	5	6	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Corresponding CATV channel	A–8	A–7	A–6	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q

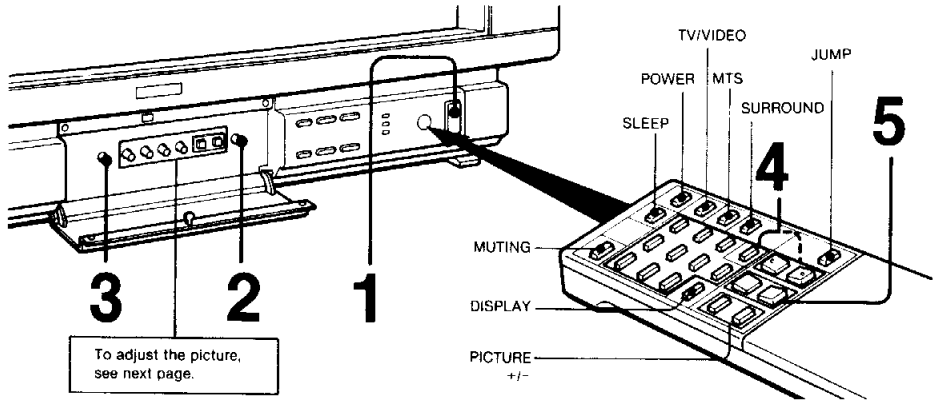
31	32	33	34	35	36	37	38	39	.....	93	94	95	96	97	98	99	100	101	102	.....	123	124	125
R	S	T	U	V	W	W+1	W+2	W+3	.....	W+57	W+58	A–5	A–4	A–3	A–2	A–1	W+59	W+60	W+61	.....	W+82	W+83	W+84

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

Pay cable TV systems use scrambled or encoded signals and require special converters (decorders) in addition to the normal cable connection.

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

1-5. WATCHING TV PROGRAMS



To adjust the picture, see next page.

1 **Press POWER to turn the TV on.**



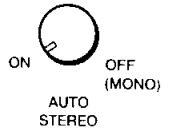
2 **Set CABLE to the appropriate position.**



To view cable TV channels

To view VHF or UHF channels

3 **Set AUTO STEREO to ON.**



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

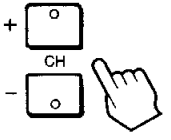
To keep the channel display on the screen
Press DISPLAY.

To adjust the picture

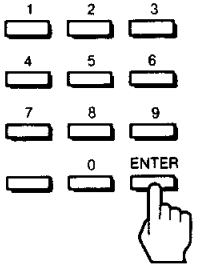
SHARPNESS	BRIGHT	COLOR	HUE	PICTURE
for less sharpness / for more sharpness	for less brightness / for more brightness	for less color intensity / for more color intensity	skin tones become purplish / skin tones become greenish	Press to decrease picture contrast with soft color / Press to increase picture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

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

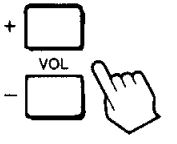
To scan the preset channels in numerical sequence, press CH +/−.



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.



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	▮▪▮▮▪·▮▮▪▮ ⇨ ▮▪·▮

1-6. TIMER/BLOCK

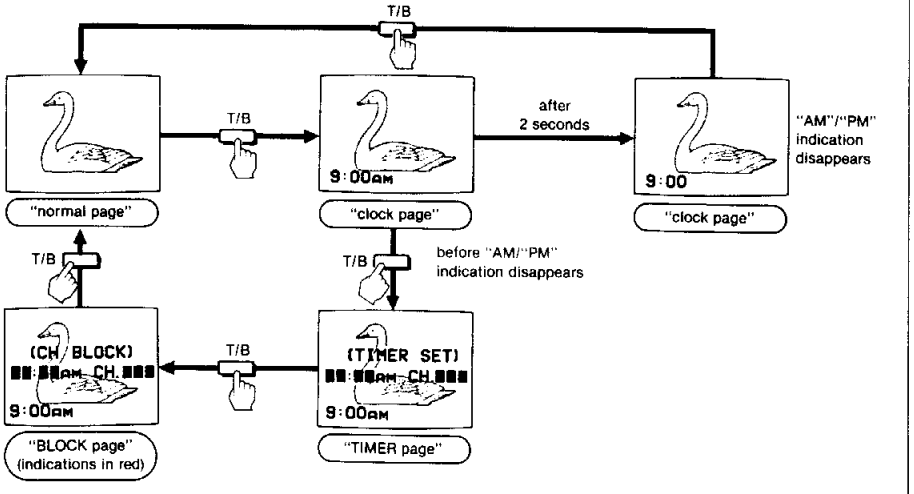
Available functions

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 channel 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 set the internal clock, program start TIMER and channel BLOCK, you must summon the corresponding "pages": "clock page," "TIMER page" and "BLOCK page."

To change the "pages," press TIMER/BLOCK.
T/B stands for the TIMER/BLOCK button.

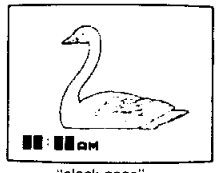


- All settings will be erased from the unit's memory if the unit is unplugged, or if a power failure occurs.
- The TIMER and BLOCK will operate only if the clock is set correctly.
- If the TIMER and BLOCK are set for overlapping times on the same channel, the blocked channel will appear on the screen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

How to Set Internal Clock

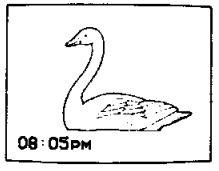
Example: To set the clock to 8:05 PM

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

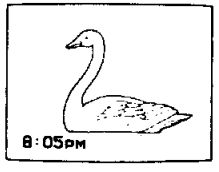


"clock page"

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.

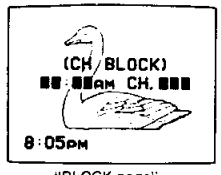
12:00 AM stands for midnight.
12:00 PM stands for noon.

How to Set the Channel BLOCK

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

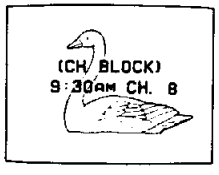
Example: To set the BLOCK for a program which begins at 9:30 AM on channel 8

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



"BLOCK page"
(indications in red)

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.

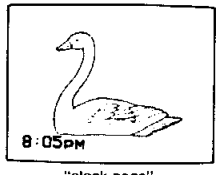
To clear BLOCK setting, summon "BLOCK page" and press CLEAR.
To reset, clear the setting and follow the steps above from step 2.

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."



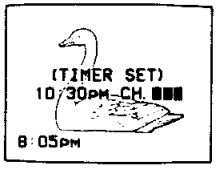
"clock page"

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

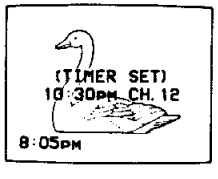


"TIMER page"

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.

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.

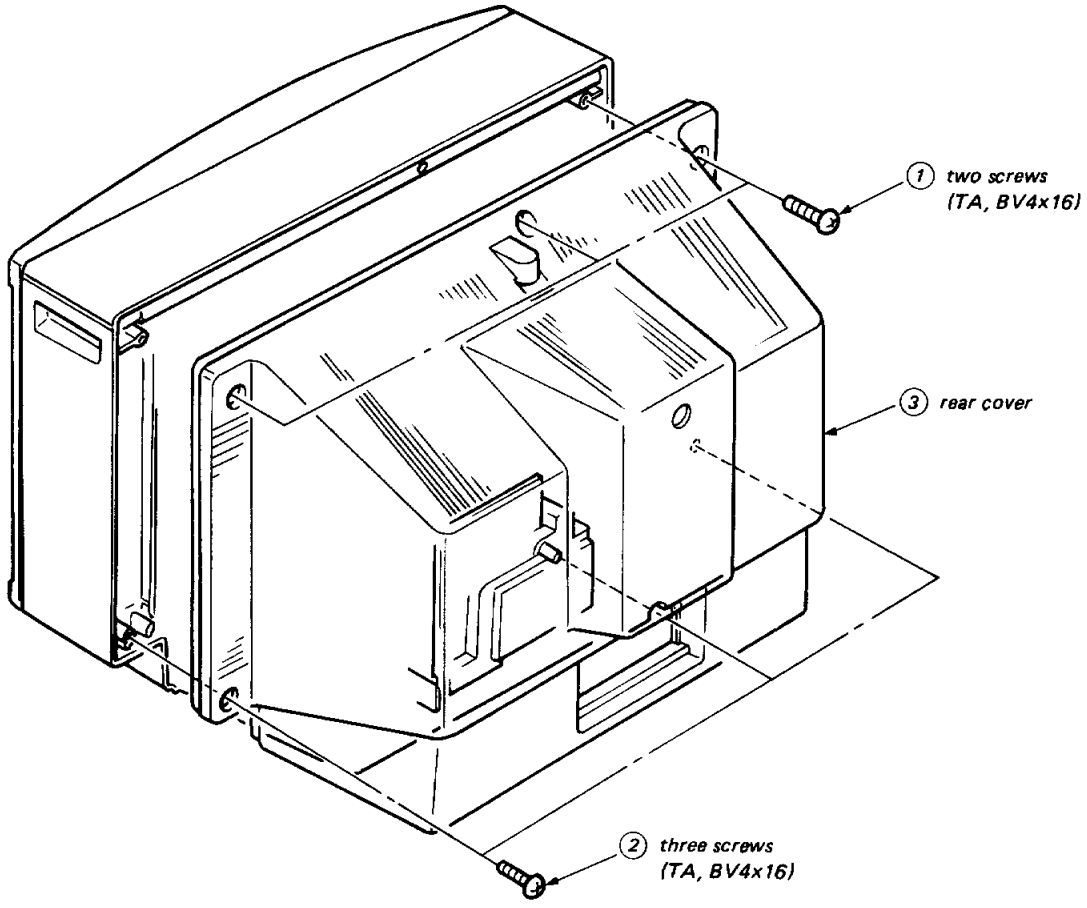
If you want to deactivate the TIMER, press TIMER OFF/REPEAT again so that the TIMER lamp goes out.
It is not necessary to summon "TIMER page" to use the TIMER OFF/REPEAT button. Furthermore, this button is effective even if the TV has been turned off.

To clear the TIMER setting, summon "TIMER page" and press CLEAR.
To reset, clear the setting and follow the steps from step 3.

SECTION 2
DISASSEMBLY

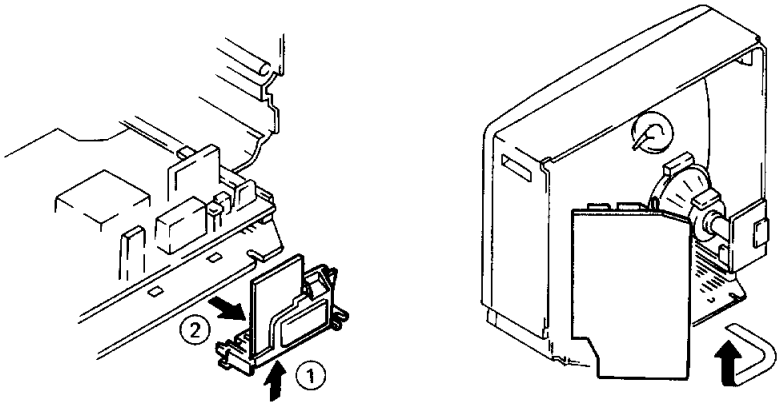
Note: Follow the disassembly procedure in the numerical over given.

2-1. REAR COVER REMOVAL



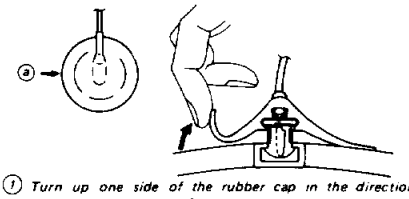
2-2. SERVICE POSITION

SERVICE POSITION

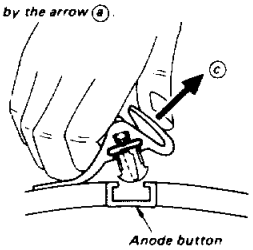


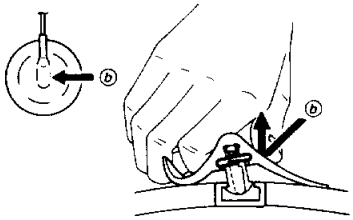
2-3. PICTURE TUBE REMOVAL

• **Removing Procedures**



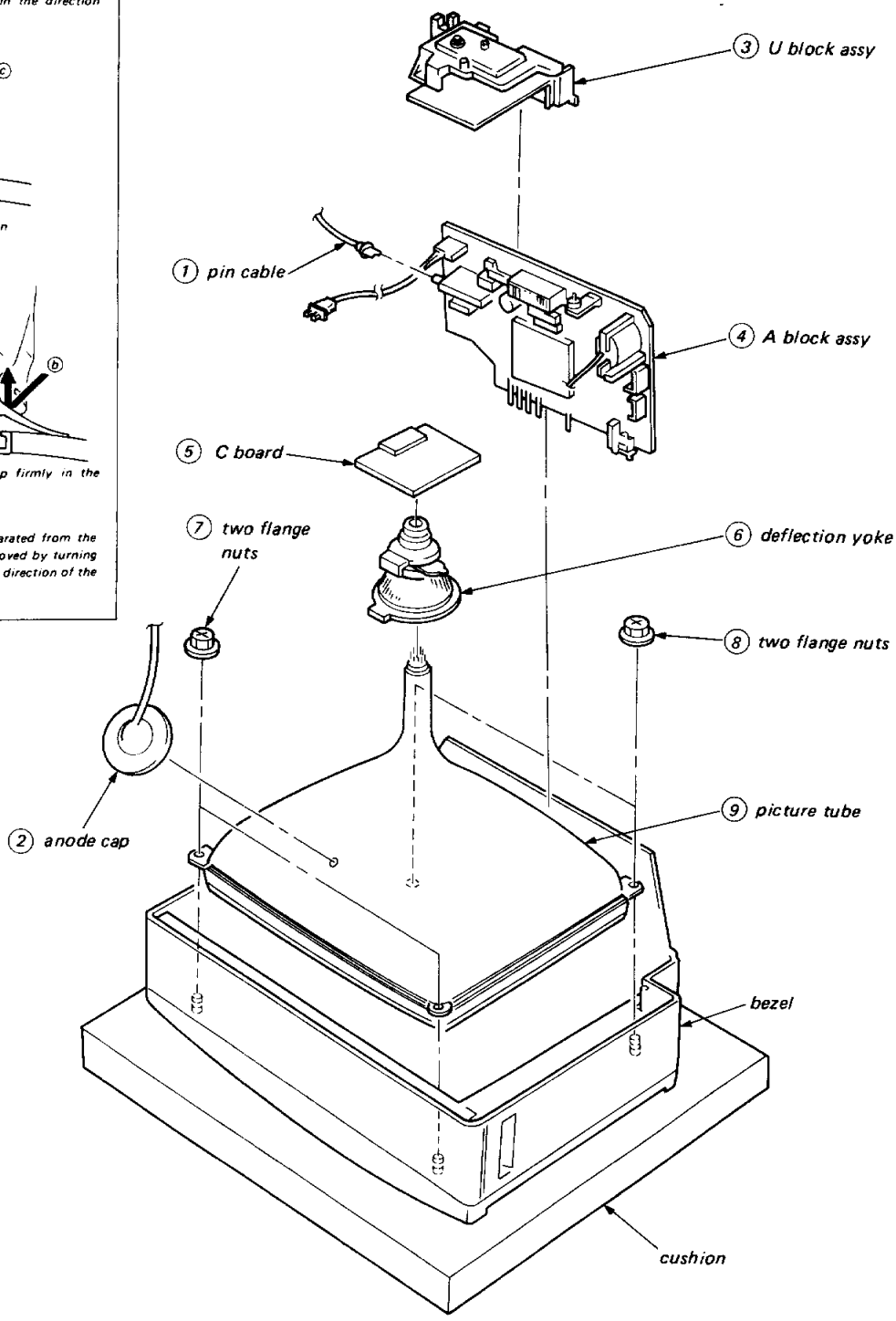
① *Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.*





② *Using a thumb, pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.*

③ *When one side of the rubber cap is separated from the anode button, the anode cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow ⓒ.*



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

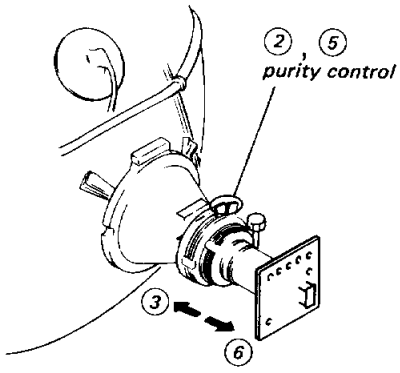
Note: Test Equipment Required.
1. Color-bar/Pattern Generator
2. Degausser
3. Oscilloscope

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.



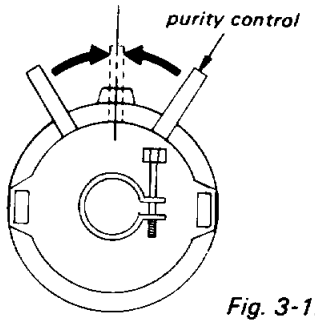


Fig. 3-1.

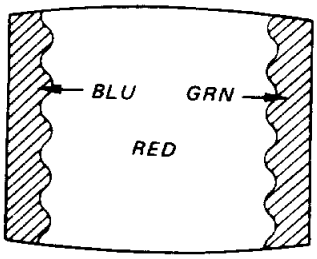


Fig. 3-2.

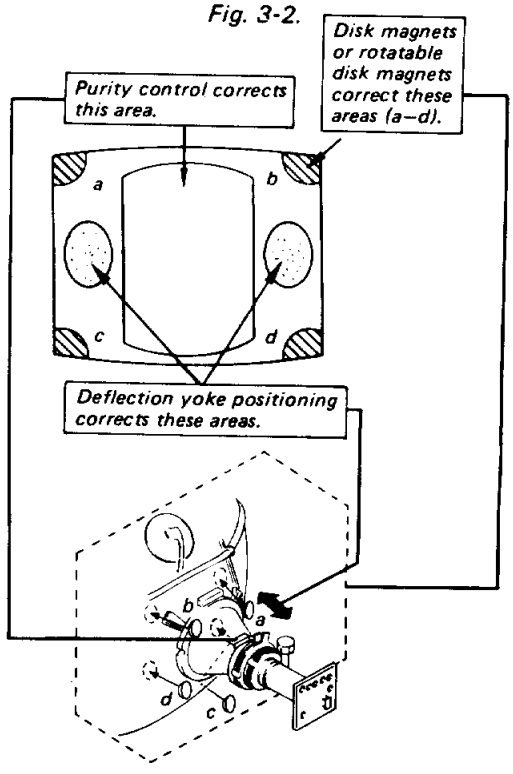


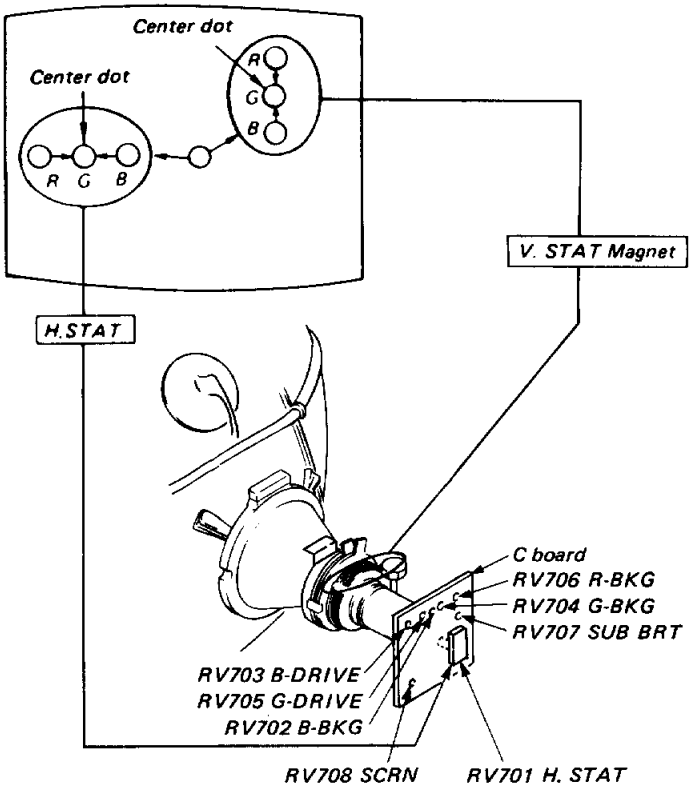
Fig. 3-3.

3-2. CONVERGENCE

Preparation:

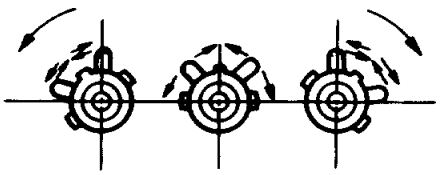
- Before starting, perform FOCUS, H. SIZE and V. SIZE adjustments.
- Set BRIGHTNESS control to fully counterclockwise.
- Feed in the dot pattern.

(1) Horizontal and Vertical Static Convergence

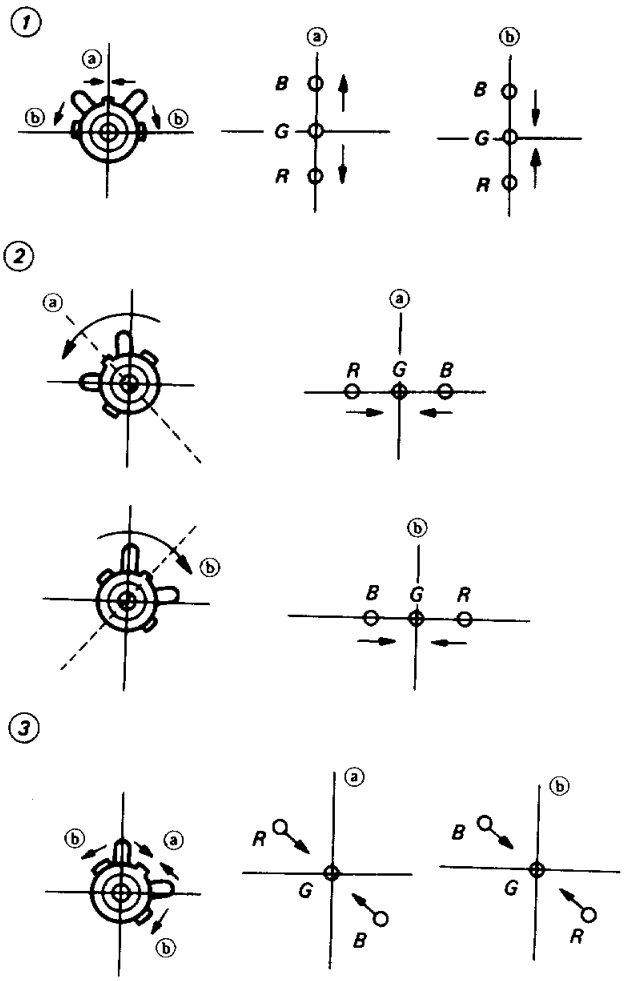


1. Adjust H. STAT VR to coincide red, green and blue dots on the center of screen (Horizontal movement)
2. Adjust V. STAT magnet to coincide red, green and blue dots on the center of screen (Vertical movement)
3. If the red, green and blue dots do not coincide on the center of screen with H. STAT VR, 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.



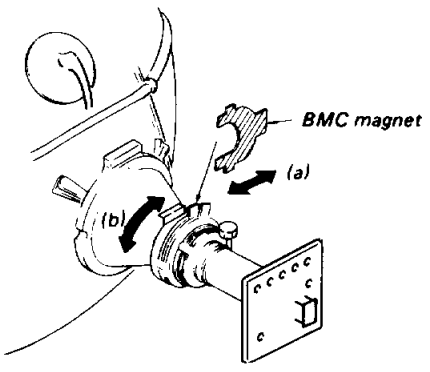
4. When the V. STAT magnet is moved in the direction of arrow ⓐ and ⓑ , Red, Green and Blue dots move as shown below.



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.

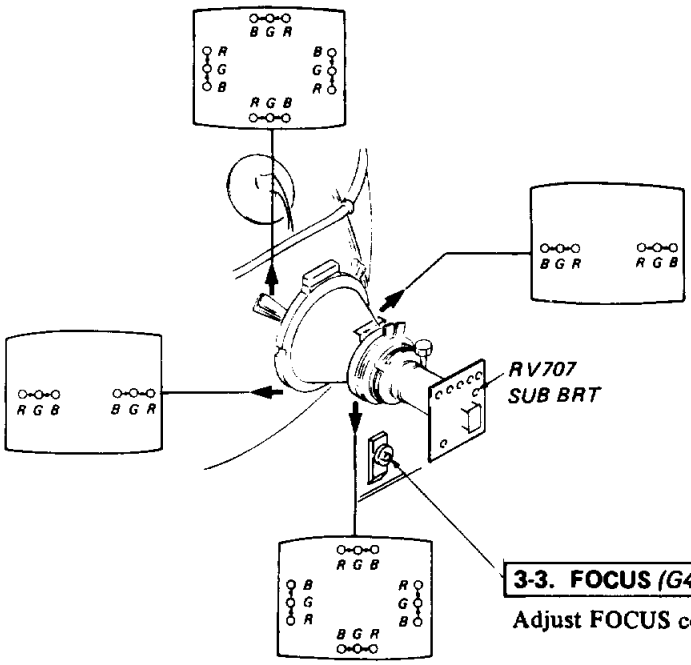


(2) Dynamic Convergence Adjustment

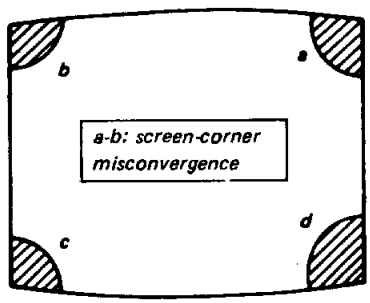
Preparation:

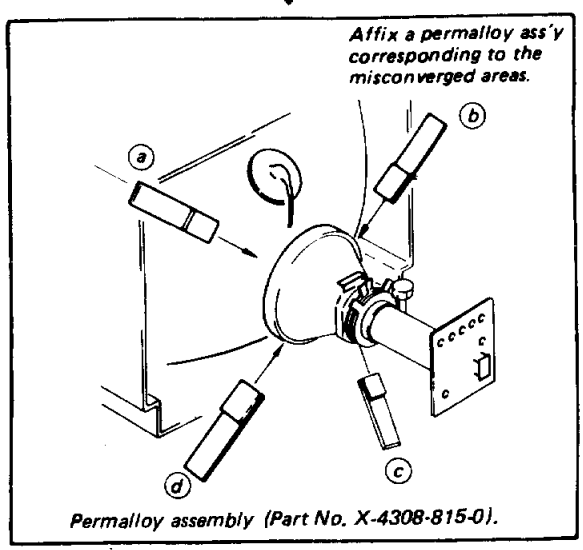
- Before starting, perform Horizontal and Vertical Static Convergence Adjustment.

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.



(3) Screen-corner Convergence





3-3. FOCUS (G4)

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.

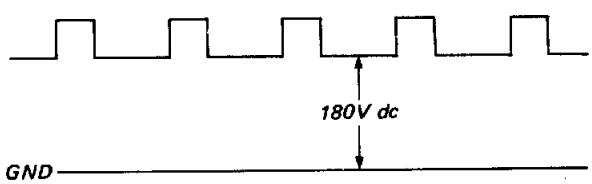


Fig. 3-5.

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.

[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

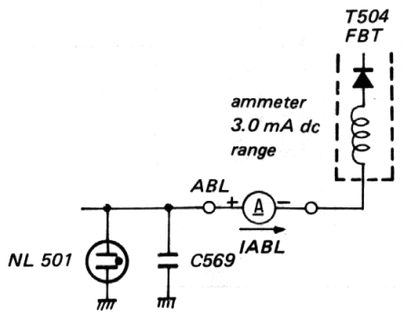
⊠ R381 CONFIRMATION METHOD (HOLD-DOWN COMFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components (marked with ◪ 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 TP-85 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 ± 20 μA with PICTURE and BRIGHT etc controls.*
2. *Apply DC voltage of over 13.0 V gradually to the TP85 via 1T40 from the DC stavilized 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 ± 10 μA with PICTURE and BRIGHT etc controls.*
4. *Apply DC voltage of over 13.0 V gradually to TP85 via 1T40 from the DC stavilized 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 ⊠).



** Use a digital multimeter whose input impedance is over 100 MΩ 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 ◪ .*

(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^{+1}_{-0} 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 ◪ on the components circuit).
Regrading components of ⊠ 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

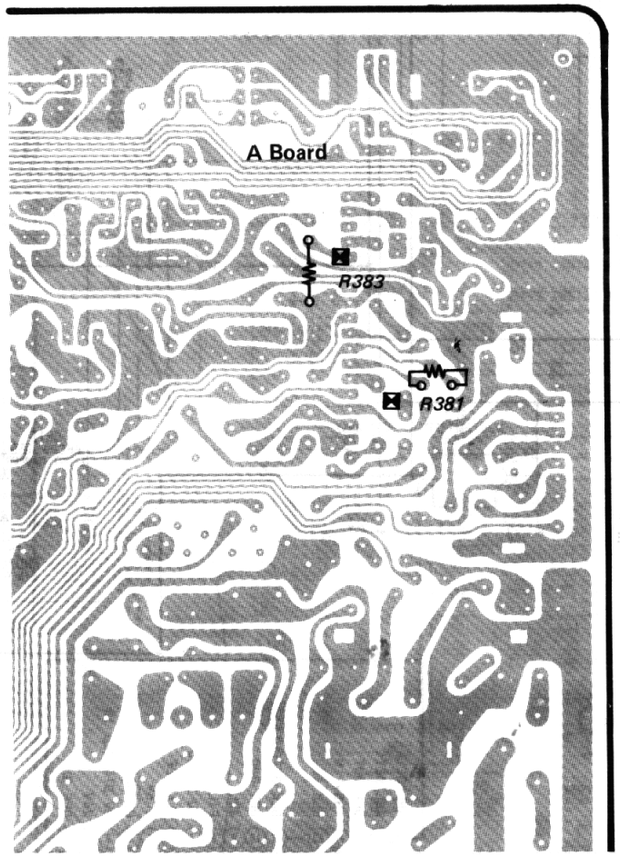
The following adjustments should always be performed when replacing the following components (marked with ◪ on the components circuit).
Regrading components of ⊠ R555 (V. SIZE).
DY, IC301, R514, R515, R555, R556, T504, RV507.

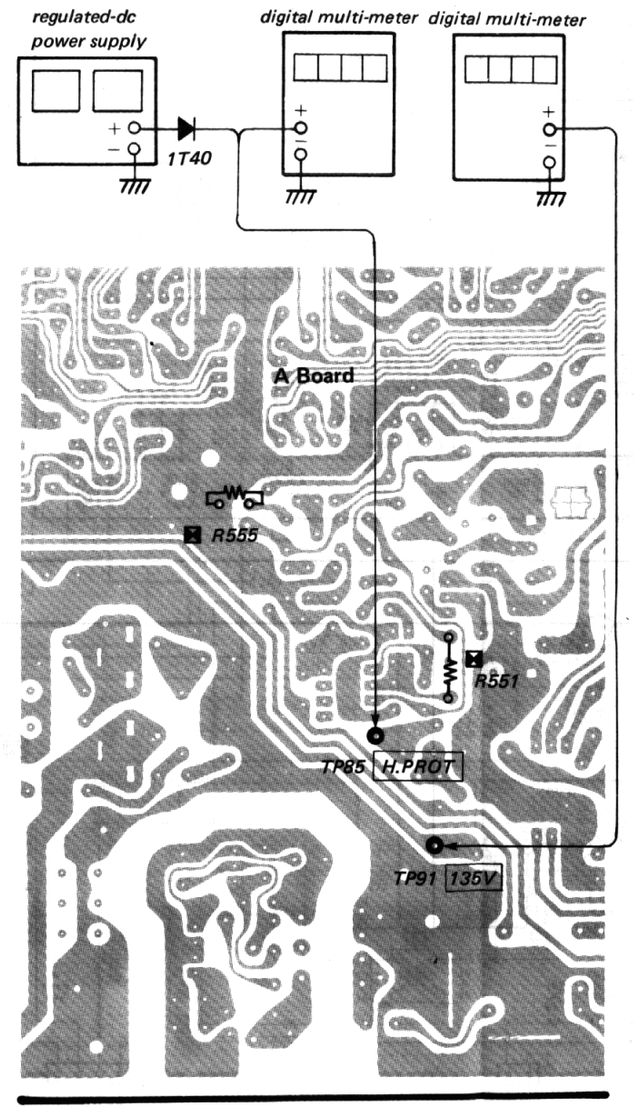
1. *Turn the POWER switch ON, and receive monoscope signal.*
2. *Set the PICTURE control in to 80% and the BRIGHTNESS control in to DETENT.*
3. *Adjust RV507 (V. SIZE) so that the V. SIZE becomes minimum, and confirm that the raster size is 22 cm or more.*

H. SIZE CONFIRMATION

The following adjustments should always be performed when replacing the following components (marked with ◪ on the components circuit).
Regrading components of ⊠ 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).*



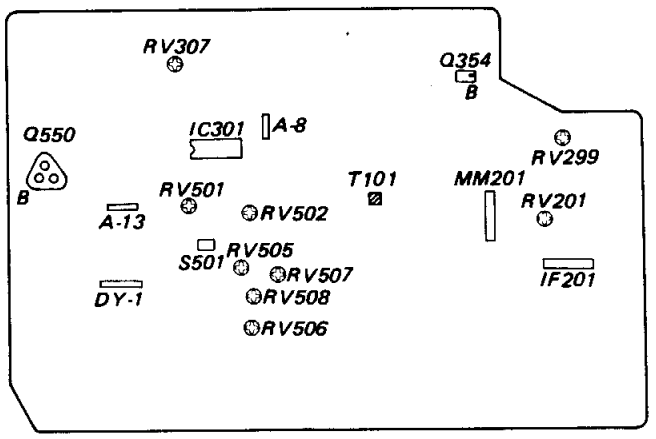


SECTION 5
CIRCUIT ADJUSTMENTS

5-1. A BOARD ADJUSTMENTS

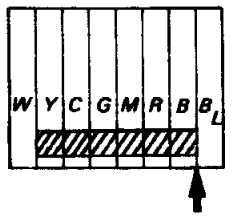
A BOARD

(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.*

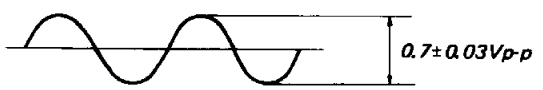


RF AGC ADJUSTMENT (IF201)

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 ±0.03 Vp-p.*

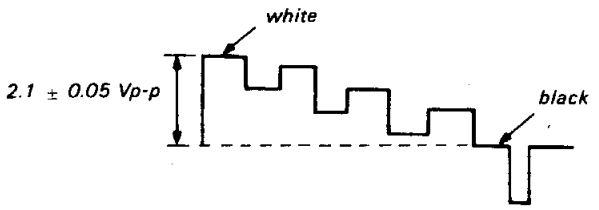


AUDIO BALANCE ADJUSTMENT (RV299)

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 ± 0.05 Vp-p.*



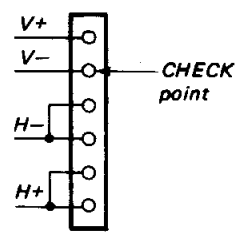
H. FREQ ADJUSTMENT (RV501)

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 ±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 ±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.*

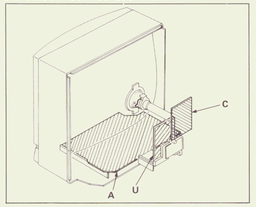
PIN PHASE ADJUSTMENT (RV508)

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 ⚠ are critical for safety. Replace only with part number specified.

- All capacitors are in μF unless otherwise noted. pF : μμF
  50WV or less are not indicated except for electrolytics
- All resistors are in ohms.
  kΩ = 1000Ω, MΩ = 1000kΩ
- Indication of resistance, which does not have one for rating electrical power is as follows.
  Pitch: 5mm
  Rating electrical power: 1/4W
- : 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.

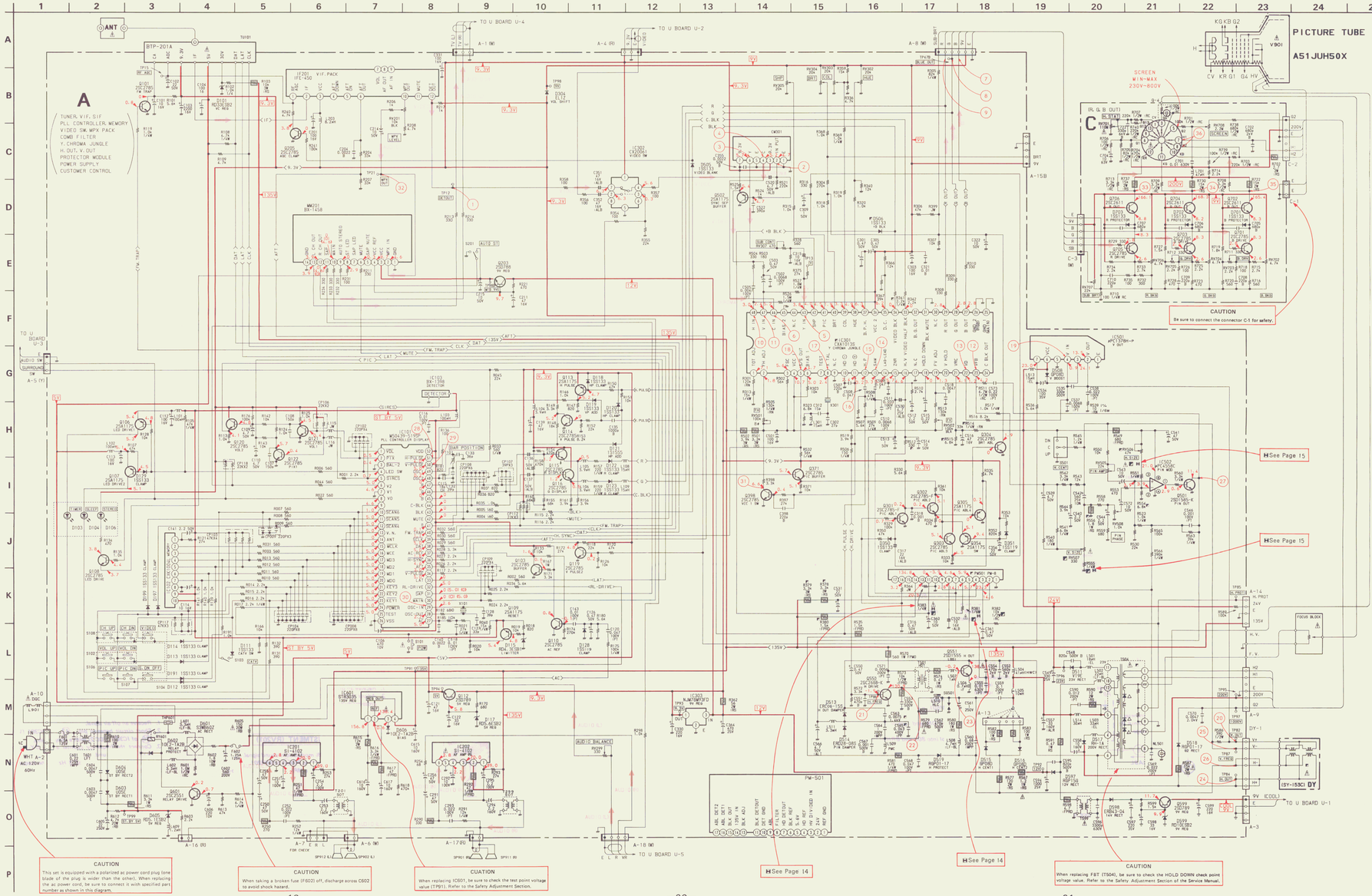
Adjustment (▮▮)	Part replaced (◪)
R381 HOLD-DOWN CONFIRMATION	IC301, PM501, R378, R379, R381, R382, R512
R383 PICTURE BLANKING	IC301, D506, PM501, R341, R378 R379, R380, R382, R383
R551 H.SIZE	C563, C565, DY, R551, R554, RV506, T504
R555 V.SIZE	R514, R515, R555, R556, T504, RV507, DY, IC301

Reference information

RESISTOR : RN METAL FILM
: RC SOLID
: FPRD NONFLAMMABLE CARBON
: FUSE NONFLAMMABLE FUSIBLE
: FPMO NONFLAMMABLE WIREWOUND (OLD TYPE)
: RS NONFLAMMABLE WIREWOUND (NEW TYPE)
: RB NONFLAMMABLE CEMENT
: ADJUSTMENT RESISTER

COIL : LF-BL MICRO INDUCTOR
CAPACITOR : TA TANTALUM
: PS STYROL
: PP POLYPROPYLENE
: PT MYLAR
: MPS METALIZED POLYESTER
: MPP METALIZED POLYPROPYLENE
: ALB BIPOLAR
: ALT HIGH TEMPERATUNE
: AIR HIGH RIPPLE

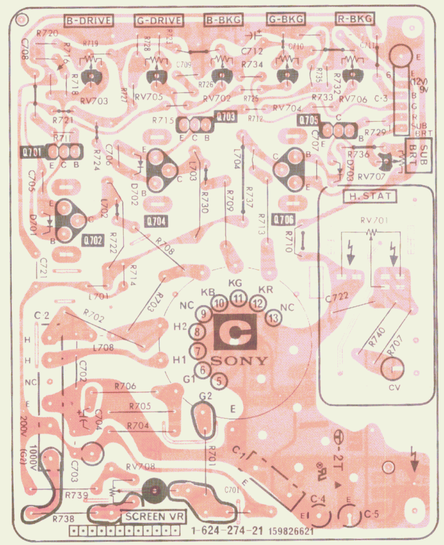
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a 10MΩ digital multimeter.
- : adjustment for repair.
- Readings are taken with color-bar signal input.
  MODE (AUDIO)
  No mark: BOTH
  ( ) : MAIN
  < > : SUB
- Voltage variations may be noted due to normal production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



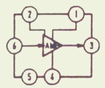
C (R.G.B OUT)

– Conductor Side –

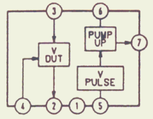
– C Board –

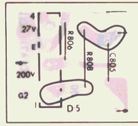


[IC201 SI-4102 AF AMP]



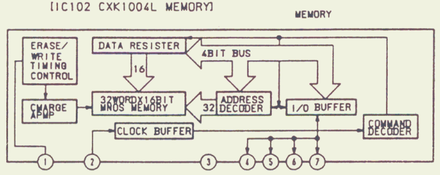
[IC501 UPC1378H V OUT]





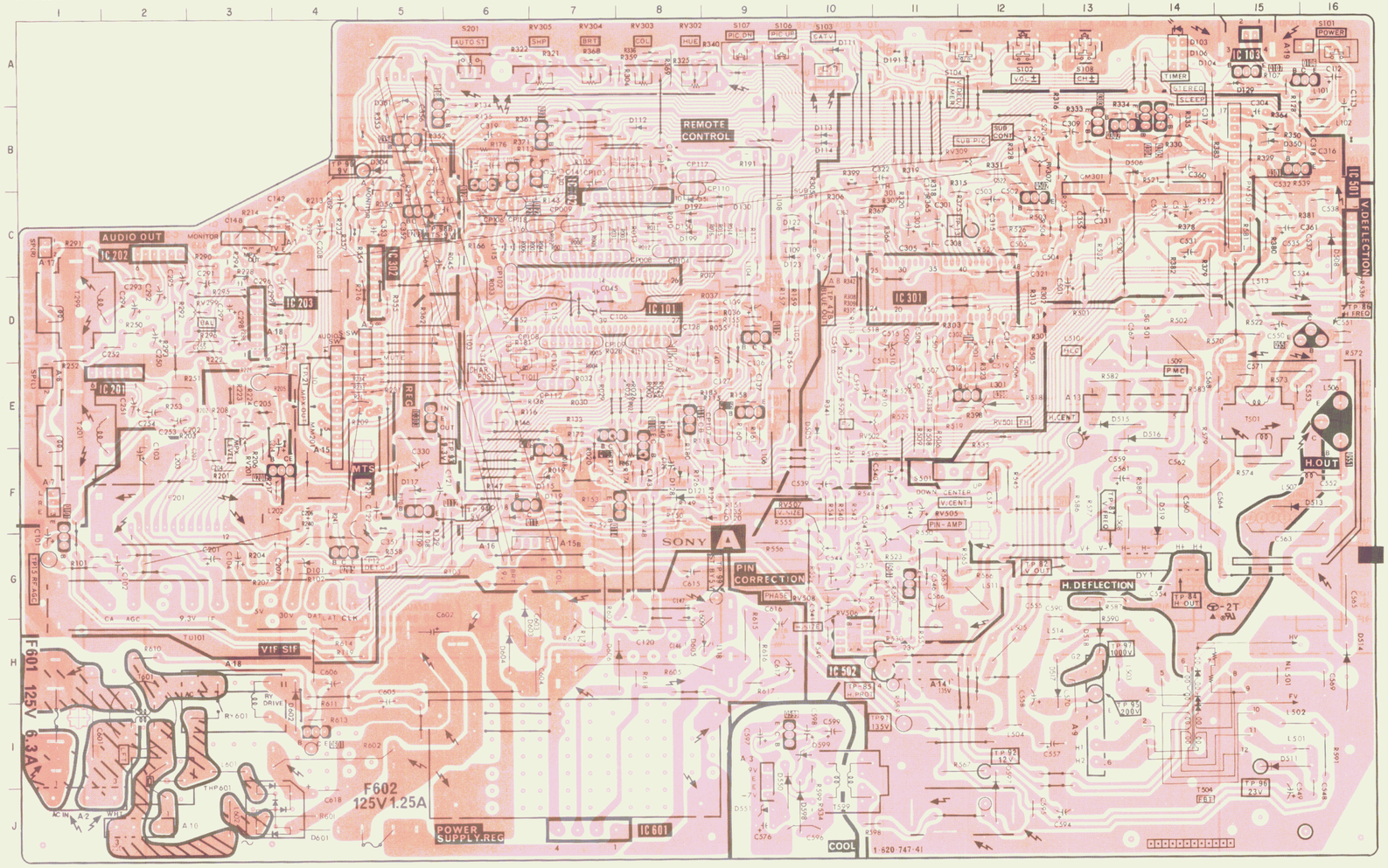
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

[IC102 CXK1004L MEMORY]



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 –

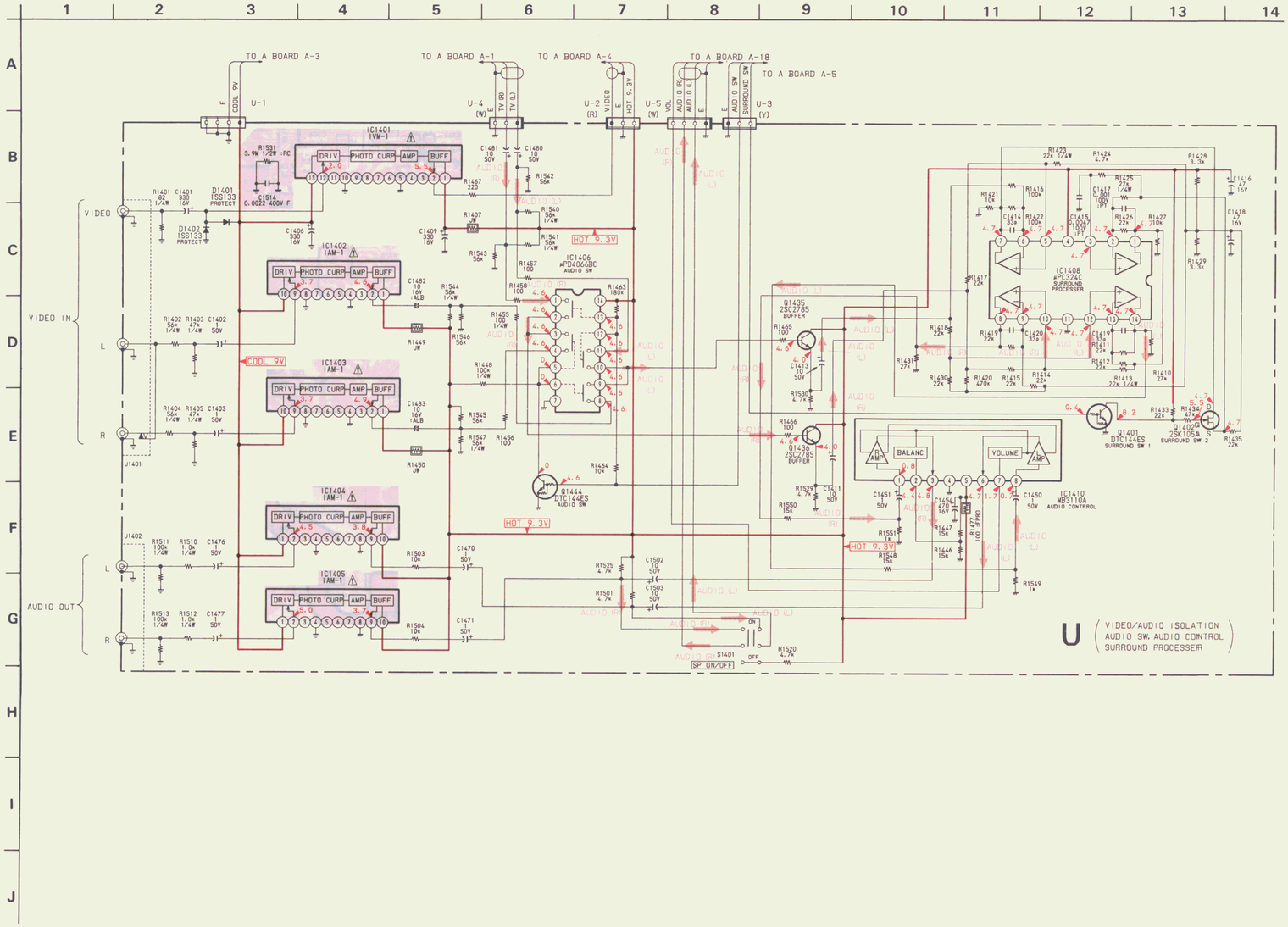


A BOARD

DIODE		TRANSISTOR	
D101	G-4	Q101	F-1
D103	A-14	Q103	F-7
D104	A-14	Q106	A-16
D106	A-14	Q107	A-15
D111	A-10	Q108	A-5
D112	B-8	Q109	E-6
D113	B-10	Q110	E-8
D114	B-10	Q112	F-6
D115	F-7	Q113	F-6
D117	F-5	Q114	F-7
D118	F-6	Q115	D-9
D119	F-7	Q116	E-9
D120	F-9	Q119	E-8
D121	F-8	Q120	C-6
D122	C-10	Q121	C-6
D123	C-10	Q122	C-7
D128	F-8	Q203	C-5
D129	A-15	Q205	G-4
D191	A-11	Q301	B-15
D197	C-8	Q302	B-13
D199	C-8	Q303	B-13
D304	B-5	Q304	B-14
D350	B-15	Q305	B-14
D351	A-5	Q354	B-5
D505	E-10	Q371	B-7
D506	B-14	Q398	E-12
D508	C-16	Q501	G-11
D511	I-15	Q502	C-12
D513	F-16	Q550	D-15
D514	H-16	Q551	F-16
D515	E-13	Q599	I-9
D516	E-14	Q601	I-4
D517	H-13		
D518	H-13	RV	
D519	F-14	RV201	F-3
D597	I-12	RV299	D-3
D598	-	RV302	A-8
D599	-	RV303	A-8
D601	J-4	RV304	A-7
D602	I-4	RV305	A-7
D603	H-6	RV307	B-12
D604	H-6	RV501	E-12
D605	H-8	RV502	E-11
D606	H-7	RV505	F-11
IC		RV506	G-10
IC101	D-8	RV507	F-9
IC102	C-7	RV508	G-10
IC103	A-15	COIL	
IC201	E-2	T101	E-6
IC202	C-2		
IC301	D-11		
IC302	C-5		
IC303	E-5		
IC501	C-16		
IC502	H-10		
IC601	J-8		
MM201	E-4		

KV-20TX11
RM-756

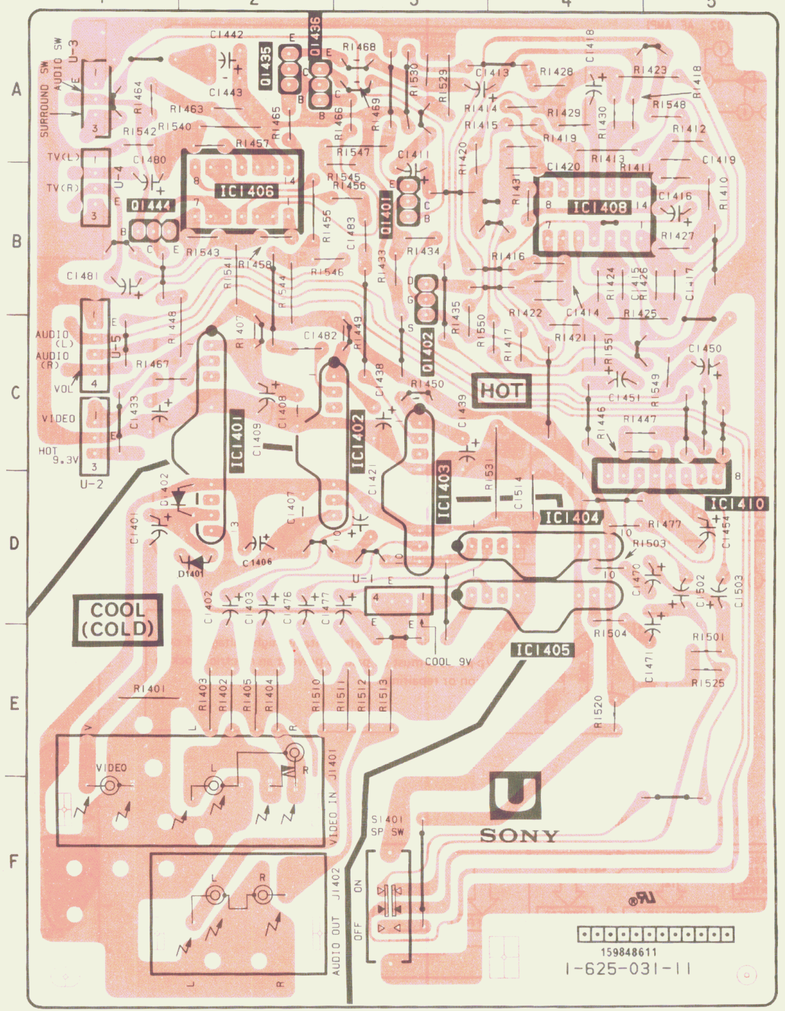
KV-20TX11
RM-756



U BOARD

DIODE	
D1401	D-2
D1402	D-1
IC	
IC1401	C-2
IC1402	C-2
IC1403	C-3
IC1404	D-4
IC1405	E-4
IC1406	B-2
IC1408	B-4
IC1410	D-5
TRANSISTOR	
Q1401	B-3
Q1402	C-3
Q1435	A-2
Q1436	A-2
Q1444	B-1

U (VIDEO/AUDIO ISOLATION, AUDIO SW, AUDIO CONTROL, SURROUND PROCESSER)

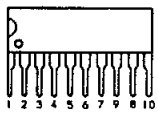


6-3. SEMICONDUCTORS

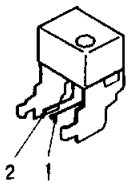
M50439-519SP



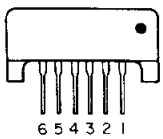
CXK1004L



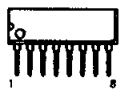
BX-1398



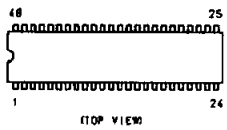
SI-4102



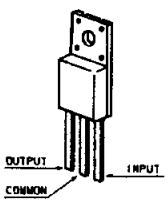
MB3110A



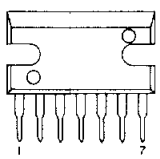
CXA1013S



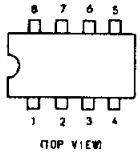
NJM78M93FD



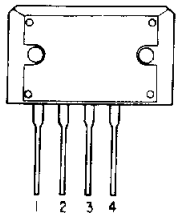
μPC1378H-P



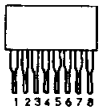
μPC4558C
BA4558
NJM4558D
HA17558



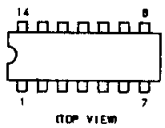
STR3035



CX20061



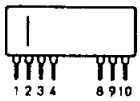
μPD4066BC
μPC324C



IVM1



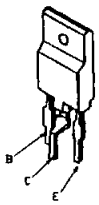
IAM1



2SK105A-30



2SD1555-LB-SI



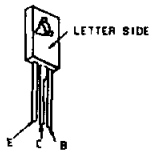
2SD789
2SD788



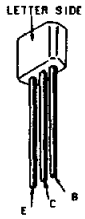
2SD1585-K
2SC3851-Y



2SC2611
2SC2688



2SC2785
2SA1175



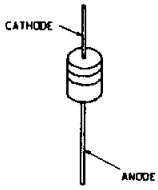
DTC144ES
2SC1740SS
2SC2458
2SC2603
2SA1048
2SA1115



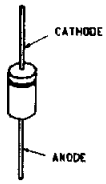
2SC1740SR
2SA933S-Q
2SA933S-R
2SC2551



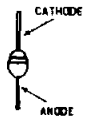
RD10ES-B2
RD33ES-B2
1SS133
1SS148
1SS119
RD4.3ES-B1
RD5.6ES-B2
RD5.1ES-B2



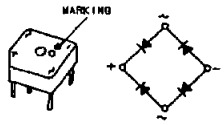
ERC06-15C
ERD28-08S
1S1555
EL1Z
10E2
RGP01-17PKG23
ES1F



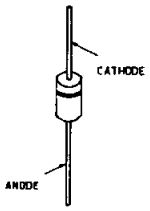
GP08DPKG23
U05E
U05G
V19E
V19G



S3WB60Z



ERB43-08
ERB43-04



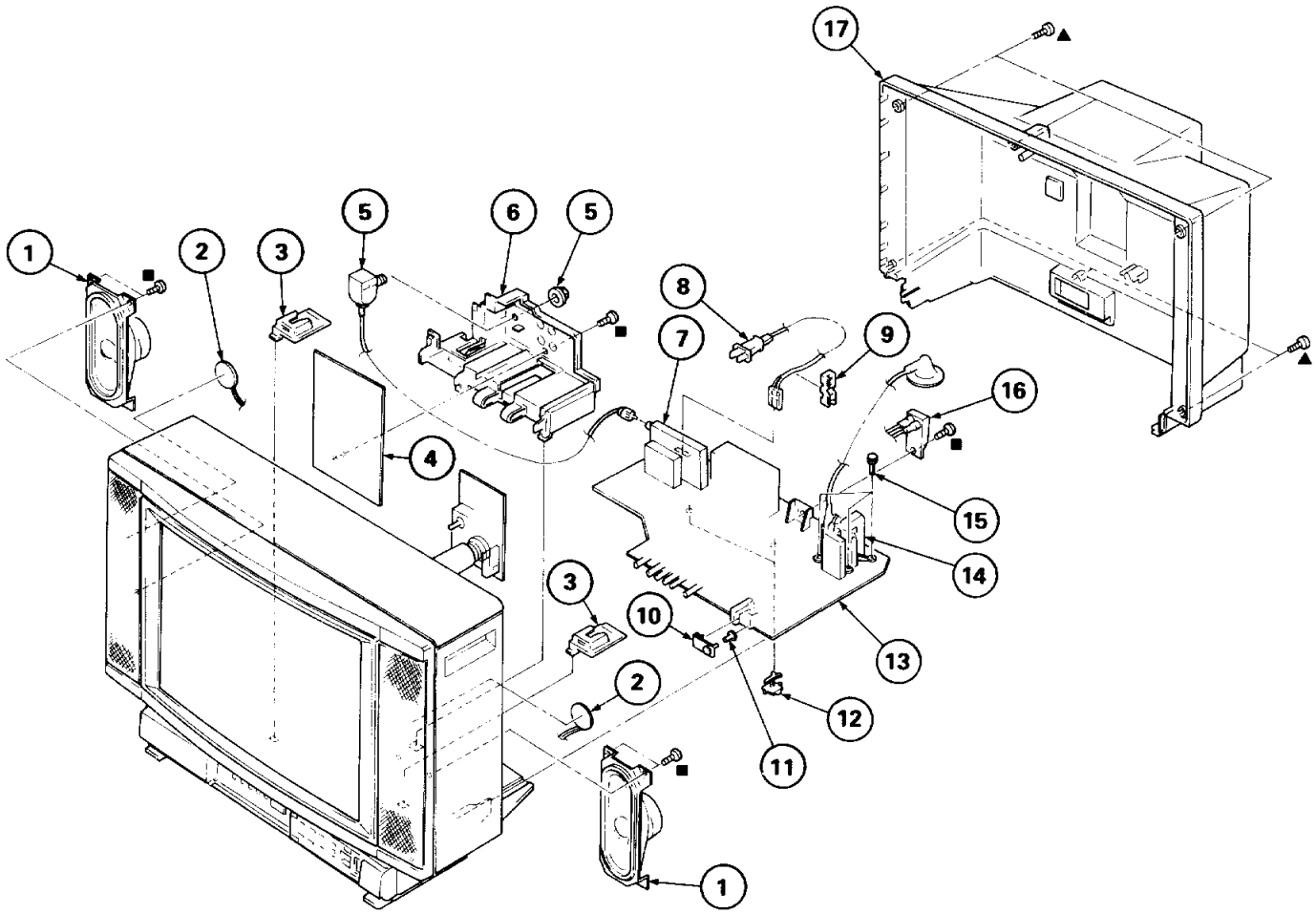
SECTION 7
EXPLODED VIEWS

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

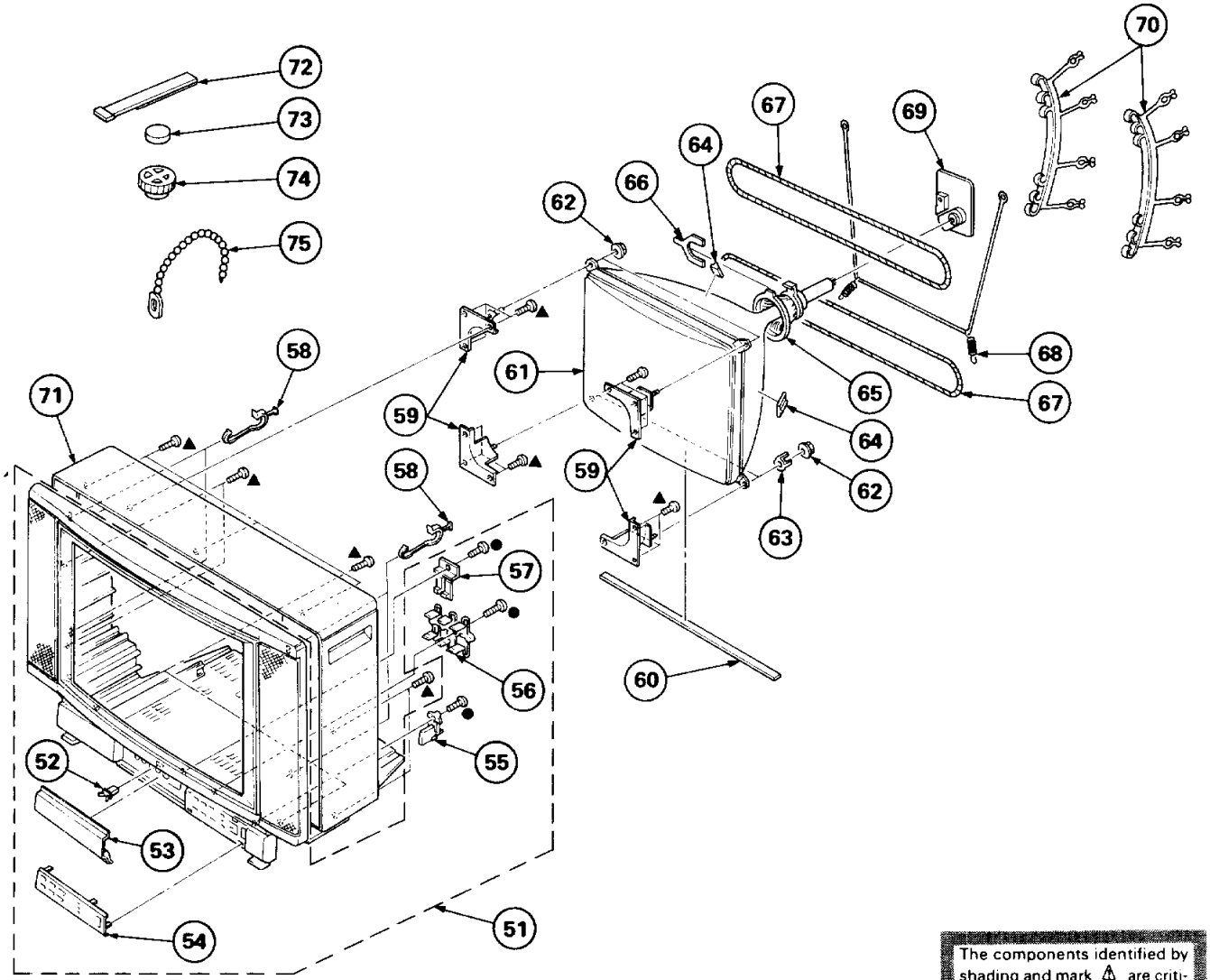
■; TA, BV3x12 7-685-648-79
▲; TA, BV4x16 7-685-663-79



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

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
51	X-4367-274-2	BEZEL ASSY	52-57
52	4-386-710-01	CATCHER, PUSH	
53	4-375-697-01	DOOR, CONTROL	
54	4-375-696-01	PANEL, ORNAMENTAL	
55	4-388-460-01	BUTTON, POWER	
56	4-388-465-21	BUTTON, MULTI	
57	4-341-738-01	BUTTON, PICTURE	
58	*4-370-098-01	HOLDER, DGC	
59	*4-375-619-03	BRACKET (C), PICTURE TUBE	
60	4-385-725-01	CLOTH	
61	⚠.8-738-752-05	PICTURE TUBE (A51JUH50X)	
62	4-306-034-00	FLANGE NUT, (B) 5MM	
63	4-370-090-01	WASHER, POSITIONING, PICTURE TUBE	

No.	Part No.	Description	Remark
64	3-703-961-01	SPACER, DY	
65	⚠.1-451-268-11	DEFLECTION YOKE (SY-153C)	
66	1-452-277-00	MAGNET, BMC	
67	⚠.1-426-358-11	COIL, DEMAGNETIZATION	
68	*4-375-394-01	SPRING, TENSION	
69	*A-1330-824-A	C BOARD, COMPLETE	
70	*4-341-778-01	BAND, DEGAUSSING COIL	
71	X-4367-255-3	CABINET ASSY	
72	X-4308-815-0	PERMALLOY ASSY, CONVERGENCE	
73	1-452-032-00	MAGNET, DISK; 10MM ø	
74	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM ø	
75	4-308-870-00	CLIP, LEAD WIRE	

A

SECTION 8
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ 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 : μF, PF : μμF

COILS
- MMH : mH, UH : μH

- 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.

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

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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
C516	1-124-477-11	ELECT	47MF	20%	16V
C518	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C520	1-124-005-11	ELECT	4.7MF	20%	50V
C522	1-102-822-00	CERAMIC	390PF	5%	50V
C530	1-124-280-00	ELECT	4.7MF	20%	25V
C531	1-124-908-11	ELECT	22MF	20%	50V
C532	1-124-284-00	ELECT	10MF	20%	16V
C534	1-124-122-11	ELECT	100MF	20%	35V
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
C539	1-124-927-11	ELECT	4.7MF	20%	50V
C540	1-124-925-11	ELECT	2.2MF	20%	50V
C541	1-124-910-11	ELECT	47MF	20%	50V
C542	1-123-587-00	ELECT	560MF	10%	25V
C543	1-123-875-11	ELECT	10MF	20%	50V
C544	1-124-925-11	ELECT	2.2MF	20%	50V
C546	1-106-343-00	MYLAR	0.001MF	10%	100V
C548	1-102-212-00	CERAMIC	820PF	10%	500V
C549	1-124-479-11	ELECT	330MF	20%	25V
C550	1-124-902-00	ELECT	0.47MF	20%	50V
C551	1-102-114-00	CERAMIC	470PF	10%	50V
C552 ⚠	1-162-135-51	CERAMIC	560PF	10%	2KV
C553	1-102-030-00	CERAMIC	330PF	10%	500V
C554 ⚠	1-162-134-51	CERAMIC	470PF	10%	2KV
C555 ⚠	1-129-714-51	FILM	0.01MF	10%	630V
C557	1-123-024-00	ELECT	33MF		160V
C558	1-123-933-00	ELECT	10MF	20%	160V
C559	1-108-433-00	MYLAR	0.1MF		200V
C560	1-136-109-00	FILM	0.68MF	5%	200V
	*4-341-751-01	PAWL; C560			
C561	1-123-943-00	ELECT	1MF	20%	250V
C562 ⚠	1-102-228-91	CERAMIC	470PF	10%	500V
C563 ⚠	1-136-309-11	FILM	0.0075MF	3%	1.4KV
	*4-341-751-01	PAWL; C563			
C564 ⚠	1-136-111-11	FILM	1MF	5%	200V
	*4-341-751-01	PAWL; C564			
C565 ⚠	1-136-312-51	FILM	0.043MF	5%	400V
	*4-341-751-01	PAWL; C565			
C566	1-124-192-00	ELECT	4.7MF	20%	50V
C567 ⚠	1-162-318-51	CERAMIC	0.001MF	10%	500V
C568	1-106-383-00	MYLAR	0.047MF	10%	100V
C569	1-108-425-00	MYLAR	0.022MF		200V
C570	1-162-114-00	CERAMIC	0.0047MF		2KV
C571	1-108-418-51	MYLAR	0.0056MF		200V
C572	1-123-875-11	ELECT	10MF	20%	50V
C573	1-108-393-00	MYLAR	0.22MF	10%	100V
C590	1-108-422-51	MYLAR	0.012MF		200V
C594	1-124-557-11	ELECT	1000MF	20%	25V
C595	1-102-212-00	CERAMIC	820PF	10%	500V
C596	1-129-708-00	FILM	0.0033MF	10%	630V
C597	1-124-484-11	ELECT	220MF	20%	35V
C598	1-124-963-11	ELECT	33MF	20%	16V
C599	1-124-120-11	ELECT	220MF	20%	16V
C601 ⚠	1-108-745-52	MYLAR	0.22MF	20%	125V
C602 ⚠	1-125-457-11	ELECT(BLOCK)	560MF	20%	200V
C603	1-161-830-00	CERAMIC	0.0047MF		500V
C604	1-161-830-00	CERAMIC	0.0047MF		500V
C605	1-123-948-00	ELECT	22MF	20%	250V
C606	1-124-444-00	ELECT	220MF	20%	10V
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

Ref.No.	Part No.	Description	Remark
		FILTER	
CM301	1-464-720-11	FILTER BLOCK, COM (CFB-1)	
		NETWORK	
CP008	1-235-823-11	NETWORK	
CP009	1-235-822-11	NETWORK	
CP104	1-235-823-11	NETWORK	
		DIODE	
D101	8-719-110-78	DIODE RD33ES-B2	
D103	1-807-643-11	LED UNIT (LEDU-1)	
D104	1-807-643-11	LED UNIT (LEDU-1)	
D106	1-807-643-11	LED UNIT (LEDU-1)	
D111	8-719-911-19	DIODE 1SS119	
D112	8-719-911-19	DIODE 1SS119	
D113	8-719-911-19	DIODE 1SS119	
D114	8-719-911-19	DIODE 1SS119	
D115	8-719-109-74	DIODE RD4.3ES-B1	
D117	8-719-109-89	DIODE RD5.6ES-B2	
D118	8-719-911-19	DIODE 1SS119	
D119	8-719-911-19	DIODE 1SS119	
D120	8-719-911-19	DIODE 1SS119	
D121	8-719-815-55	DIODE 1S1555	
D122	8-719-911-19	DIODE 1SS119	
D123	8-719-911-19	DIODE 1SS119	
D128	8-719-911-19	DIODE 1SS119	
D129	8-719-911-19	DIODE 1SS119	
D191	8-719-911-19	DIODE 1SS119	
D197	8-719-911-19	DIODE 1SS119	
D199	8-719-911-19	DIODE 1SS119	
D304	8-719-302-43	DIODE EL1Z	
D350	8-719-911-19	DIODE 1SS119	
D351	8-719-911-19	DIODE 1SS119	
D505	8-719-911-19	DIODE 1SS119	
D506	8-719-911-19	DIODE 1SS119	
D508	8-719-911-55	DIODE U05G	
D511	8-719-918-77	DIODE V19G	
D513	8-719-945-80	DIODE ERC06-15S	
D514	8-719-928-08	DIODE ERD28-08S	
D515	8-719-911-55	DIODE U05G	
D516	8-719-911-55	DIODE U05G	
D517	8-719-300-76	DIODE RH-1A	
D518	8-719-300-65	DIODE ES1F	
D519	8-719-300-65	DIODE ES1F	
D597	8-719-921-53	DIODE RGP15G	
D598	8-719-549-41	DIODE ERB43-08	
D599	8-719-110-17	DIODE RD10ES-B2	
D601 ⚠	8-719-503-06	DIODE S3WB60Z	
D602 ⚠	8-719-200-02	DIODE 10E2	
D603	8-719-911-55	DIODE U05G	
D604	8-719-911-55	DIODE U05G	
D605	8-719-109-85	DIODE RD5.1ES-B2	
D606	8-719-911-55	DIODE U05G	
		FUSE	
F601 ⚠	1-532-509-11	FUSE, GLASS TUBE 6.3A/125V	
	1-533-190-11	CLIP, FUSE; F601	
F602 ⚠	1-532-741-11	FUSE, GLASS TUBE 1.25A/125V	
	*1-533-189-11	HOLDER, FUSE; F602	

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Ref.No.	Part No.	Description	Remark
		IC	
IC101	8-759-605-39	IC M50439-519SP	
IC102	8-759-803-24	IC CXK1004L	
IC103	8-741-139-80	IC BX-1398	
IC201⚠	**8-749-900-15**	**IC SI-4102**	
IC202⚠	**8-749-900-15**	**IC SI-4102**	
IC301	8-752-030-69	IC CXA1013S	
IC302	8-759-006-10	IC CX20061	
IC303	8-759-710-04	IC NJM78M93FD	
IC501	8-759-105-82	IC UPC1378H-P	
IC502	8-759-145-58	IC UPC4558C	
IC601⚠	**8-749-930-35**	**IC STR3035**	
	4-369-267-01	SPACER, MICA; IC601	
MM201	8-749-900-80	IC BX-1458	
		IF BLOCK	
IF201	1-464-755-11	IF BLOCK (IFE-450)	
		COIL	
L101	1-410-482-41	INDUCTOR 100UH	
L102	1-410-482-41	INDUCTOR 100UH	
L103	1-410-482-41	INDUCTOR 100UH	
L104	1-410-465-41	INDUCTOR 3.9UH	
L105	1-410-465-41	INDUCTOR 3.9UH	
L106	1-410-465-41	INDUCTOR 3.9UH	
L108	1-410-472-41	INDUCTOR 15UH	
L109	1-410-472-41	INDUCTOR 15UH	
L203	1-410-469-41	INDUCTOR 8.2UH	
L301	1-410-421-11	INDUCTOR 15UH	
L501	1-410-666-31	INDUCTOR 18UH	
L502	1-408-938-00	INDUCTOR 22UH	
L503	1-410-669-31	INDUCTOR 33UH	
L504	1-459-313-00	COIL WITH CORE (HWC)	
L505	1-459-104-00	COIL, DUST CORE	
L506	1-407-365-00	COIL, CHOKE	
L507	1-408-349-00	COIL, CHOKE	
L508	1-408-239-00	INDUCTOR 4.7MMH	
L509 ⚠	**1-459-390-11**	**COIL (WITH CORE)**	
L510 ⚠	**1-459-626-12**	**HLC**	
	*4-341-751-01	PAWL; L510	
L511	1-459-075-00	COIL, DYNAMIC CONVERSION CHOKE	
L513	1-410-665-31	INDUCTOR 15UH	
L514	1-459-407-00	COIL, FERRITE CHOKE	
L601 ⚠	**1-408-225-21**	**INDUCTOR 3.3UH**	
L602 ⚠	**1-408-225-21**	**INDUCTOR 3.3UH**	
L609	1-410-459-11	INDUCTOR 1.2UH	
		NEON LAMP	
NL501	1-519-237-11	LAMP, NEON	
		MODULE	
PM501	1-235-962-11	PROTECTOR MODULE (PM-8)	
		TRANSISTOR	
Q101	8-729-178-54	TRANSISTOR 2SC2785	
Q103	8-729-178-54	TRANSISTOR 2SC2785	
Q106	8-729-117-54	TRANSISTOR 2SA1175	
Q107	8-729-117-54	TRANSISTOR 2SA1175	
Q108	8-729-178-54	TRANSISTOR 2SC2785	
Q109	8-729-117-54	TRANSISTOR 2SA1175	
Q110	8-729-178-54	TRANSISTOR 2SC2785	
Q112	8-729-378-91	TRANSISTOR 2SD789	
Q113	8-729-117-54	TRANSISTOR 2SA1175	
Q114	8-729-178-54	TRANSISTOR 2SC2785	
Q115	8-729-178-54	TRANSISTOR 2SC2785	
Q116	8-729-178-54	TRANSISTOR 2SC2785	
Q119	8-729-178-54	TRANSISTOR 2SC2785	
Q120	8-729-178-54	TRANSISTOR 2SC2785	
Q121	8-729-178-54	TRANSISTOR 2SC2785	
Q122	8-729-178-54	TRANSISTOR 2SC2785	
Q203	8-729-378-84	TRANSISTOR 2SD788	
Q205	8-729-178-54	TRANSISTOR 2SC2785	
Q301	8-729-178-54	TRANSISTOR 2SC2785	
Q302	8-729-178-54	TRANSISTOR 2SC2785	
Q303	8-729-178-54	TRANSISTOR 2SC2785	
Q304	8-729-178-54	TRANSISTOR 2SC2785	
Q305	8-729-117-54	TRANSISTOR 2SA1175	
Q354	8-729-117-54	TRANSISTOR 2SA1175	
Q371	8-729-178-54	TRANSISTOR 2SC2785	
Q398	8-729-178-54	TRANSISTOR 2SC2785	
Q501	8-729-107-26	TRANSISTOR 2SD1585-K	
Q502	8-729-117-54	TRANSISTOR 2SA1175	
Q550	8-729-168-82	TRANSISTOR 2SC2688	
Q551	8-729-203-80	TRANSISTOR 2SD1555-LB-S1	
Q599	8-729-378-91	TRANSISTOR 2SD789	
Q601	8-729-255-12	TRANSISTOR 2SC2551	
		RESISTOR	
R001	1-249-421-11	CARBON 2.2K 5% 1/4W	
R002	1-249-414-11	CARBON 560 5% 1/4W	
R003	1-249-414-11	CARBON 560 5% 1/4W	
R004	1-249-414-11	CARBON 560 5% 1/4W	
R005	1-249-414-11	CARBON 560 5% 1/4W	
R006	1-249-414-11	CARBON 560 5% 1/4W	
R007	1-249-414-11	CARBON 560 5% 1/4W	
R008	1-249-414-11	CARBON 560 5% 1/4W	
R009	1-249-414-11	CARBON 560 5% 1/4W	
R010	1-249-414-11	CARBON 560 5% 1/4W	
R011	1-249-414-11	CARBON 560 5% 1/4W	
R012	1-249-414-11	CARBON 560 5% 1/4W	
R013	1-249-414-11	CARBON 560 5% 1/4W	
R014	1-249-421-11	CARBON 2.2K 5% 1/4W	
R015	1-249-421-11	CARBON 2.2K 5% 1/4W	
R016	1-249-421-11	CARBON 2.2K 5% 1/4W	
R017	1-247-717-11	CARBON 2.2K 5% 1/4W	
R018	1-249-416-11	CARBON 820 5% 1/4W	
R019	1-249-429-11	CARBON 10K 5% 1/4W	
R020	1-249-429-11	CARBON 10K 5% 1/4W	
R021	1-246-507-00	CARBON 27K 5% 1/4W	
R022	1-249-414-11	CARBON 560 5% 1/4W	
R024	1-249-421-11	CARBON 2.2K 5% 1/4W	
R025	1-249-421-11	CARBON 2.2K 5% 1/4W	
R026	1-249-421-11	CARBON 2.2K 5% 1/4W	
R027	1-249-421-11	CARBON 2.2K 5% 1/4W	
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	

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Ref.No.	Part No.	Description				Remark
R037	1-249-416-11	CARBON	820	5%	1/4W	
R040	1-249-460-11	CARBON	15K	5%	1/4W	
R044	1-249-414-11	CARBON	560	5%	1/4W	
R045	1-249-433-11	CARBON	22K	5%	1/4W	
R101	1-249-426-11	CARBON	5.6K	5%	1/4W	
R102	1-247-713-11	CARBON	1K	5%	1/4W	
R103	1-215-923-00	METAL OXIDE	10K	5%	3W	F
R105	1-249-465-11	CARBON	47K	5%	1/4W	
R107	1-249-437-11	CARBON	47K	5%	1/4W	
R108	1-247-721-11	CARBON	4.7K	5%	1/4W	
R109	1-249-425-11	CARBON	4.7K	5%	1/4W	
R113	1-249-417-11	CARBON	1K	5%	1/4W	
R115	1-249-421-11	CARBON	2.2K	5%	1/4W	
R116	1-249-421-11	CARBON	2.2K	5%	1/4W	
R117	1-249-421-11	CARBON	2.2K	5%	1/4W	
R118	1-249-433-11	CARBON	22K	5%	1/4W	
R119	1-247-713-11	CARBON	1K	5%	1/4W	
R120	1-249-437-11	CARBON	47K	5%	1/4W	
R121	1-249-434-11	CARBON	27K	5%	1/4W	
R124	1-249-417-11	CARBON	1K	5%	1/4W	
R125	1-249-417-11	CARBON	1K	5%	1/4W	
R126	1-249-429-11	CARBON	10K	5%	1/4W	
R128	1-249-429-11	CARBON	10K	5%	1/4W	
R131	1-249-412-11	CARBON	390	5%	1/4W	
R132	1-249-412-11	CARBON	390	5%	1/4W	
R133	1-249-429-11	CARBON	10K	5%	1/4W	
R134	1-249-413-11	CARBON	470	5%	1/4W	
R135	1-249-417-11	CARBON	1K	5%	1/4W	
R136	1-249-405-11	CARBON	100	5%	1/4W	
R139	1-249-417-11	CARBON	1K	5%	1/4W	
R140	1-249-417-11	CARBON	1K	5%	1/4W	
R141	1-249-417-11	CARBON	1K	5%	1/4W	
R142	1-249-429-11	CARBON	10K	5%	1/4W	
R143	1-249-429-11	CARBON	10K	5%	1/4W	
R146	1-249-417-11	CARBON	1K	5%	1/4W	
R147	1-249-416-11	CARBON	820	5%	1/4W	
R148	1-249-432-11	CARBON	18K	5%	1/4W	
R149	1-249-423-11	CARBON	3.3K	5%	1/4W	
R150	1-249-437-11	CARBON	47K	5%	1/4W	
R151	1-249-429-11	CARBON	10K	5%	1/4W	
R152	1-249-433-11	CARBON	22K	5%	1/4W	
R153	1-249-428-11	CARBON	8.2K	5%	1/4W	
R154	1-247-895-00	CARBON	470K	5%	1/4W	
R155	1-249-439-11	CARBON	68K	5%	1/4W	
R156	1-249-424-11	CARBON	3.9K	5%	1/4W	
R157	1-247-704-11	CARBON	220	5%	1/4W	
R158	1-247-895-00	CARBON	470K	5%	1/4W	
R159	1-247-704-11	CARBON	220	5%	1/4W	
R160	1-249-439-11	CARBON	68K	5%	1/4W	
R161	1-249-424-11	CARBON	3.9K	5%	1/4W	
R166	1-249-429-11	CARBON	10K	5%	1/4W	
R167	1-215-493-00	CARBON	1M	5%	1/4W	
R170	1-249-415-11	CARBON	680	5%	1/4W	
R171	1-249-423-11	CARBON	3.3K	5%	1/4W	
R172	1-249-434-11	CARBON	27K	5%	1/4W	
R174	1-215-479-00	CARBON	270K	5%	1/4W	
R175	1-249-469-11	CARBON	100K	5%	1/4W	
R176	1-249-441-11	CARBON	100K	5%	1/4W	
R180	1-249-426-11	CARBON	5.6K	5%	1/4W	
R181	1-249-416-11	CARBON	820	5%	1/4W	
R182	1-249-415-11	CARBON	680	5%	1/4W	
R185	1-249-429-11	CARBON	10K	5%	1/4W	
R191	1-249-417-11	CARBON	1K	5%	1/4W	
R204	1-249-435-11	CARBON	33K	5%	1/4W	
R206	1-249-417-11	CARBON	1K	5%	1/4W	
R207	1-249-435-11	CARBON	33K	5%	1/4W	
R208	1-249-425-11	CARBON	4.7K	5%	1/4W	
R211	1-249-411-11	CARBON	330	5%	1/4W	
R213	1-249-411-11	CARBON	330	5%	1/4W	
R214	1-249-411-11	CARBON	330	5%	1/4W	
R217	1-249-417-11	CARBON	1K	5%	1/4W	
R221	1-249-413-11	CARBON	470	5%	1/4W	
R231	1-249-405-11	CARBON	100	5%	1/4W	
R232	1-249-411-11	CARBON	330	5%	1/4W	
R233	1-249-411-11	CARBON	330	5%	1/4W	
R234	1-249-411-11	CARBON	330	5%	1/4W	
R240	1-249-425-11	CARBON	4.7K	5%	1/4W	
R241	1-249-441-11	CARBON	100K	5%	1/4W	
R250	1-249-410-11	CARBON	270	5%	1/4W	F
R251 ⚠	1-246-987-11	CARBON	47	5%	1/8W	F
R252	1-249-459-11	CARBON	12K	5%	1/4W	
R253	1-249-434-11	CARBON	27K	5%	1/4W	
R254	1-249-403-11	CARBON	68	5%	1/4W	
R290	1-249-411-11	CARBON	330	5%	1/4W	F
R291	1-249-459-11	CARBON	12K	5%	1/4W	
R292 ⚠	1-246-987-11	CARBON	47	5%	1/8W	F
R293	1-249-434-11	CARBON	27K	5%	1/4W	
R298	1-249-417-11	CARBON	1K	5%	1/4W	
R301	1-215-471-00	METAL	120K	1%	1/6W	
R302	1-249-438-11	CARBON	56K	5%	1/4W	
R303	1-249-429-11	CARBON	10K	5%	1/4W	
R304	1-215-479-00	CARBON	270K	5%	1/4W	
R305	1-249-468-11	CARBON	82K	5%	1/4W	
R306	1-249-437-11	CARBON	47K	5%	1/4W	
R307	1-249-429-11	CARBON	10K	5%	1/4W	
R308	1-249-411-11	CARBON	330	5%	1/4W	
R309	1-249-411-11	CARBON	330	5%	1/4W	
R310	1-249-411-11	CARBON	330	5%	1/4W	
R313	1-249-460-11	CARBON	15K	5%	1/4W	
R315	1-249-417-11	CARBON	1K	5%	1/4W	
R316	1-249-411-11	CARBON	330	5%	1/4W	
R318	1-249-417-11	CARBON	1K	5%	1/4W	
R319	1-249-417-11	CARBON	1K	5%	1/4W	
R320	1-249-417-11	CARBON	1K	5%	1/4W	
R323	1-249-427-11	CARBON	6.8K	5%	1/4W	
R328	1-249-414-11	CARBON	560	5%	1/4W	
R329	1-249-441-11	CARBON	100K	5%	1/4W	
R330	1-249-426-11	CARBON	5.6K	5%	1/4W	
R333	1-249-429-11	CARBON	10K	5%	1/4W	
R334	1-249-413-11	CARBON	470	5%	1/4W	
R335	1-249-425-11	CARBON	4.7K	5%	1/4W	
R336	1-249-425-11	CARBON	4.7K	5%	1/4W	
R340	1-249-430-11	CARBON	12K	5%	1/4W	
R341	1-247-717-11	CARBON	2.2K	5%	1/4W	
R342	1-249-421-11	CARBON	2.2K	5%	1/4W	
R350	1-249-437-11	CARBON	47K	5%	1/4W	
R352	1-215-491-00	CARBON	820K	5%	1/4W	
R353	1-249-429-11	CARBON	10K	5%	1/4W	
R354	1-249-405-11	CARBON	100	5%	1/4W	
R355	1-249-433-11	CARBON	22K	5%	1/4W	
R356	1-249-405-11	CARBON	100	5%	1/4W	
R357	1-249-405-11	CARBON	100	5%	1/4W	
R358	1-249-405-11	CARBON	100	5%	1/4W	
R359	1-249-431-11	CARBON	15K	5%	1/4W	
R361	1-249-429-11	CARBON	10K	5%	1/4W	
R362	1-216-449-11	METAL OXIDE	56	5%	2W	F
R366	1-249-430-11	CARBON	12K	5%	1/4W	
R367	1-249-436-11	CARBON	39K	5%	1/4W	
R368	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 ⋈ 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 ⚠ 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
⋈R381 ⚠		CARBON			1/6W	
R382	1-202-830-00	SOLID	10K	10%	1/2W	
⋈R383 ⚠		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	SOLID	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	
⋈R551 ⚠		CARBON			1/4W	
R553	1-249-413-11	CARBON	470	5%	1/4W	
R554	1-249-427-11	CARBON	6.8K	5%	1/4W	
⋈R555 ⚠		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 ⚠	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 ⚠	1-249-415-51	CARBON	680	5%	1/4W	F
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 ⚠	1-215-899-51	METAL OXIDE	15K	5%	2W	F
R589	1-249-441-11	CARBON	100K	5%	1/4W	
R590 ⚠	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 ⚠	1-202-719-51	SOLID	1M	10%	1/2W	
R602 ⚠	1-205-792-11	WIREWOUND	1.8	5%	10W	
R605 ⚠	1-205-691-11	WIREWOUND	150	5%	20W	
R610 ⚠	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 ⚠	1-515-573-11	RELAY, POWER

SWITCH

S101 ⚠	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 ⚠ are critical for safety.
Replace only with part number specified.

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

U

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

Ref.No.	Part No.	Description				Remark
C1413	1-123-875-11	ELECT	10MF	20%	50V	
C1414	1-102-963-00	CERAMIC	33PF	5%	50V	
C1415	1-108-373-91	MYLAR	0.0047MF	10%	100V	
C1416	1-124-477-11	ELECT	47MF	20%	16V	
C1417	1-106-343-00	MYLAR	0.001MF	10%	100V	
C1418	1-124-477-11	ELECT	47MF	20%	16V	
C1419	1-102-963-00	CERAMIC	33PF	5%	50V	
C1420	1-102-963-00	CERAMIC	33PF	5%	50V	
C1450	1-124-499-11	ELECT	1MF	20%	50V	
C1451	1-124-499-11	ELECT	1MF	20%	50V	
C1454	1-126-103-11	ELECT	470MF	20%	16V	
C1470	1-124-499-11	ELECT	1MF	20%	50V	
C1471	1-124-499-11	ELECT	1MF	20%	50V	
C1476	1-124-499-11	ELECT	1MF	20%	50V	
C1477	1-124-499-11	ELECT	1MF	20%	50V	
C1480	1-123-875-11	ELECT	10MF	20%	50V	
C1481	1-123-875-11	ELECT	10MF	20%	50V	
C1482	1-124-284-00	ELECT	10MF	20%	16V	
C1483	1-124-284-00	ELECT	10MF	20%	16V	
C1502	1-123-875-11	ELECT	10MF	20%	50V	
C1503	1-123-875-11	ELECT	10MF	20%	50V	
C1514⚠	1-161-742-51	CERAMIC	0.0022MF	20%	400V	

DIODE

D1401	8-719-911-19	DIODE 1SS119
D1402	8-719-911-19	DIODE 1SS119

IC

IC1401⚠	1-235-783-11	INSULATED MODULE, VIDEO(IVM-1)
IC1402⚠	1-235-784-11	INSULATED MODULE, AUDIO(IAM-1)
IC1403⚠	1-235-784-11	INSULATED MODULE, AUDIO(IAM-1)
IC1404⚠	1-235-784-11	INSULATED MODULE, AUDIO(IAM-1)
IC1405⚠	1-235-784-11	INSULATED MODULE, AUDIO(IAM-1)
IC1406	8-759-140-66	IC UPD4066BC
IC1408	8-759-132-40	IC UPC324C
IC1410	8-759-940-88	IC MB3110A

JACK

J1401	1-563-303-21	JACK BLOCK, PIN 3P
J1402	1-563-302-11	JACK BLOCK, PIN 2P

TRANSISTOR

Q1401	8-729-900-89	TRANSISTOR DTC144ES
Q1402	8-729-115-30	TRANSISTOR 2SK105A-30
Q1435	8-729-178-54	TRANSISTOR 2SC2785
Q1436	8-729-178-54	TRANSISTOR 2SC2785
Q1444	8-729-900-89	TRANSISTOR DTC144ES

RESISTOR

R1401	1-247-699-11	CARBON	82	5%	1/4W
R1402	1-249-466-11	CARBON	56K	5%	1/4W
R1403	1-249-465-11	CARBON	47K	5%	1/4W
R1404	1-249-466-11	CARBON	56K	5%	1/4W
R1405	1-249-465-11	CARBON	47K	5%	1/4W
R1410	1-249-434-11	CARBON	27K	5%	1/4W
R1411	1-249-433-11	CARBON	22K	5%	1/4W
R1412	1-249-433-11	CARBON	22K	5%	1/4W
R1413	1-249-462-11	CARBON	22K	5%	1/4W
R1414	1-249-433-11	CARBON	22K	5%	1/4W
R1415	1-249-433-11	CARBON	22K	5%	1/4W
R1416	1-249-441-11	CARBON	100K	5%	1/4W
R1417	1-249-433-11	CARBON	22K	5%	1/4W
R1418	1-249-433-11	CARBON	22K	5%	1/4W
R1419	1-249-433-11	CARBON	22K	5%	1/4W
R1420	1-247-895-00	CARBON	470K	5%	1/4W
R1421	1-249-429-11	CARBON	10K	5%	1/4W
R1422	1-249-441-11	CARBON	100K	5%	1/4W
R1423	1-249-462-11	CARBON	22K	5%	1/4W
R1424	1-249-425-11	CARBON	4.7K	5%	1/4W
R1425	1-249-462-11	CARBON	22K	5%	1/4W
R1426	1-249-433-11	CARBON	22K	5%	1/4W
R1427	1-249-429-11	CARBON	10K	5%	1/4W
R1428	1-249-423-11	CARBON	3.3K	5%	1/4W
R1429	1-249-423-11	CARBON	3.3K	5%	1/4W
R1430	1-249-433-11	CARBON	22K	5%	1/4W
R1431	1-249-434-11	CARBON	27K	5%	1/4W
R1433	1-249-433-11	CARBON	22K	5%	1/4W
R1434	1-249-437-11	CARBON	47K	5%	1/4W
R1435	1-249-433-11	CARBON	22K	5%	1/4W
R1446	1-249-431-11	CARBON	15K	5%	1/4W
R1447	1-249-431-11	CARBON	15K	5%	1/4W
R1448	1-249-469-11	CARBON	100K	5%	1/4W
R1455	1-247-700-11	CARBON	100	5%	1/4W
R1456	1-249-405-11	CARBON	100	5%	1/4W
R1457	1-249-405-11	CARBON	100	5%	1/4W
R1458	1-249-405-11	CARBON	100	5%	1/4W
R1463	1-247-885-00	CARBON	180K	5%	1/4W
R1464	1-249-429-11	CARBON	10K	5%	1/4W
R1465	1-249-405-11	CARBON	100	5%	1/4W
R1466	1-249-405-11	CARBON	100	5%	1/4W
R1467	1-249-409-11	CARBON	220	5%	1/4W
R1477	1-249-405-11	CARBON	100	5%	1/4W F
R1501	1-249-425-11	CARBON	4.7K	5%	1/4W
R1503	1-249-429-11	CARBON	10K	5%	1/4W
R1504	1-249-429-11	CARBON	10K	5%	1/4W
R1510	1-247-713-11	CARBON	1K	5%	1/4W
R1511	1-249-469-11	CARBON	100K	5%	1/4W
R1512	1-247-713-11	CARBON	1K	5%	1/4W
R1513	1-249-469-11	CARBON	100K	5%	1/4W
R1520	1-249-425-11	CARBON	4.7K	5%	1/4W
R1525	1-249-425-11	CARBON	4.7K	5%	1/4W
R1529	1-247-721-11	CARBON	4.7K	5%	1/4W
R1530	1-249-425-11	CARBON	4.7K	5%	1/4W
R1531⚠	1-202-726-91	SOLID	3.9M	10%	1/2W
R1540	1-249-466-11	CARBON	56K	5%	1/4W
R1541	1-249-466-11	CARBON	56K	5%	1/4W
R1542	1-249-438-11	CARBON	56K	5%	1/4W
R1543	1-249-438-11	CARBON	56K	5%	1/4W
R1544	1-249-466-11	CARBON	56K	5%	1/4W
R1545	1-249-438-11	CARBON	56K	5%	1/4W
R1546	1-249-438-11	CARBON	56K	5%	1/4W
R1547	1-249-466-11	CARBON	56K	5%	1/4W
R1548	1-249-431-11	CARBON	15K	5%	1/4W
R1549	1-249-417-11	CARBON	1K	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

U

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

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 ø	
	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM ø	
	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)	

****

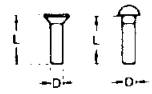
ACCESSORIES AND PACKING MATERIALS
****

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

Screw:

P 3 x 10
- *L: Length in mm*
- *D: Diameter in mm*
- *Type of head*
- *Indicated slotted-head only.*
- *Unless otherwise indicated, it means cross-recessed head (Phillips type).*



Nut, Washer, Retaining ring:

N 3
- *Diameter of usable screw or shaft*
- *Reference designation*

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	

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