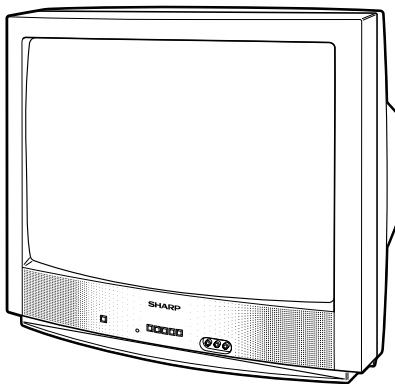


SHARP**SERVICE MANUAL**

S21P825R-S100

**COLOR TELEVISION****Chassis No. SN-012****MODEL 25R-S100**

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

CONTENTS

	Page
• ELECTRICAL SPECIFICATIONS	1
• IMPORTANT SERVICE SAFETY PRECAUTION	2
• LOCATION OF USER'S CONTROL	4
• INSTALLATION AND SERVICE INSTRUCTIONS	5
• CHASSIS LAYOUT	11
• BLOCK DIAGRAM	12
• SCHEMATIC DIAGRAMS	13
• PRINTED WIRING BOARD ASSEMBLIES	19
• REPLACEMENT PARTS LIST	22
• PACKING OF THE SET	29

ELECTRICAL SPECIFICATIONS

POWER INPUT	120 V AC 60 Hz
POWER RATING	100 W
PICTURE SIZE	2,032cm ² (315sq inch)
CONVERGENCE	Magnetic
SWEEP DEFLECTION	Magnetic
FOCUS	Hi-Bi-Potential Electrostatic
INTERMEDIATE FREQUENCIES	
Picture IF Carrier Frequency	45.75 MHz
Sound IF Carrier Frequency	41.25 MHz
Color Sub-Carrier Frequency	42.17 MHz (Nominal)
AUDIO POWER	1.5 W+1.5 W (at 10% distortion and Dual CH Operate)

SPEAKER	
SIZE	8 cm (Round)
VOICE COIL IMPEDANCE	32 ohm at 400 Hz
ANTENNA INPUT IMPEDANCE	
VHF/UHF	75 ohm Unbalanced
TUNING RANGES	
VHF-Channels	2 thru 13
UHF-Channels	14 thru 69
CATV Channels	1 thru 125
	(EIA, Channel Plan U.S.A.)

Specifications are subject to change without prior notice.

SHARP CORPORATION

This document has been published to be used for after sales service only.

The contents are subject to change without notice.

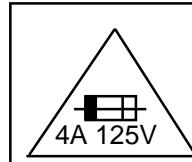
IMPORTANT SERVICE SAFETY PRECAUTION

- Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and the servicing guidelines which follow:

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.
4. The chassis in this receiver has two ground systems which are separated by insulating material. The non-isolated (hot) ground system is for the B+ voltage regulator circuit and the horizontal output circuit. The isolated ground system is for the low B+ DC voltages and the secondary circuit of the high voltage transformer.

To prevent electrical shock use an isolation transformer between the line cord and power receptacle, when servicing this chassis.



CAUTION: FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 4A-125V FUSE.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the picture tube ground and the anode lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in current solid state TV receivers is the picture tube. However, the picture tube does not emit measurable X-Ray radiation, if the high voltage is as specified in the "High Voltage Check" instructions. It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube including the lead in the glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that servicemen have available at all times an accurate high voltage meter. The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value –no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and;also, under certain conditions, may produce radiation in exceeding of desirable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do not use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When trouble shooting and taking test measurements on a receiver with excessive high voltage, avoid being unnecessarily close to the receiver. Do not operate the receiver longer than is necessary to locate the cause of excessive voltage.

IMPORTANT SERVICE SAFETY PRECAUTION

(Continued)

BEFORE RETURNING THE RECEIVER

(Fire & Shock Hazard)

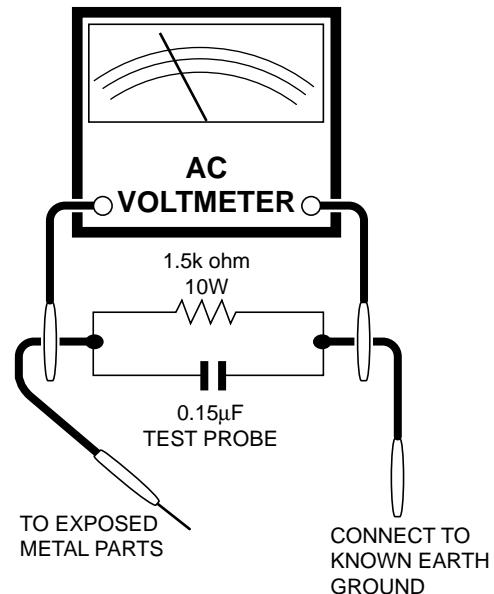
Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
 2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc.
 3. To be sure that no shock hazard exists, check for leakage current in the following manner.
- Plug the AC cord directly into a 120 volt AC outlet, (Do not use an isolation transformer for this test).
 - Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15μF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
 - Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity to measure the AC voltage drop across the resistor.

- Connect the resistor connection to all exposed metal parts having a return to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.

All checks must be repeated with the AC line cord plug connection reversed. (If necessary, a non-polarized adapter plug must be used only for the purpose of completing these check.)

Any current measured must not exceed 0.5 milliamp. Any measurements not within the limits outlined above indicate of a potential shock hazard and corrective action must be taken before returning the instrument to the customer.



SAFETY NOTICE

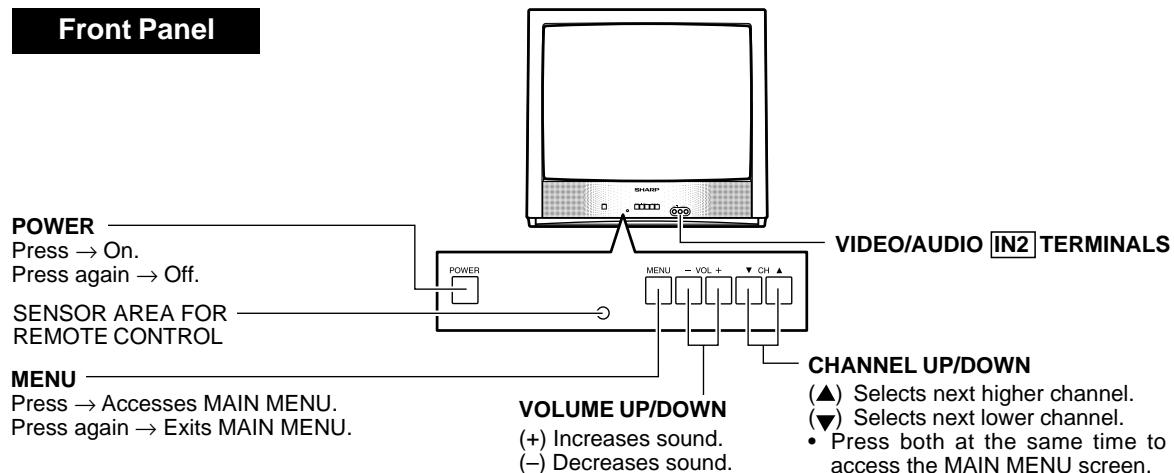
Many electrical and mechanical parts in television receivers have special safety-related characteristics. These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" and shaded areas in the Replacement Parts Lists and Schematic Diagrams.

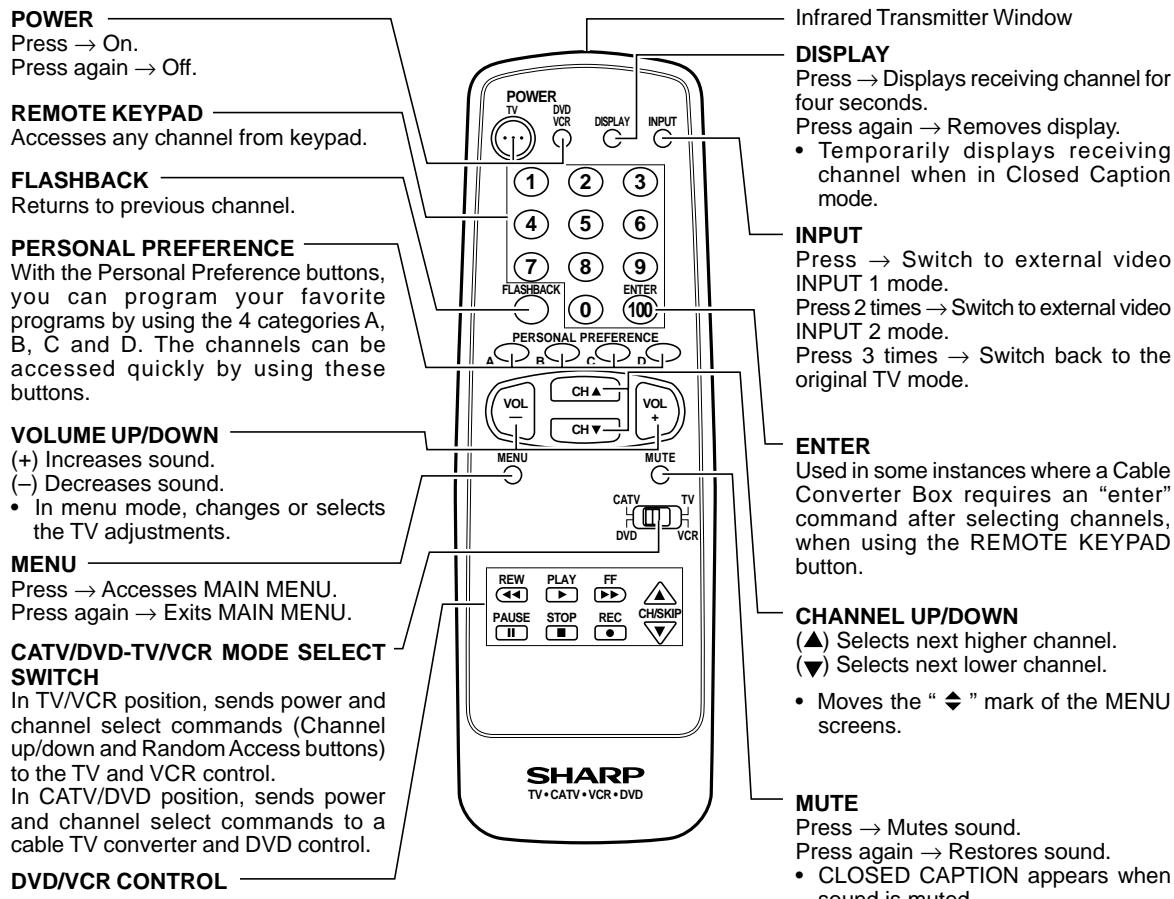
For continued protection, replacement parts must be identical to those used in the original circuit. The use of substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

LOCATION OF USER'S CONTROL

Front Panel



Basic Remote Control Functions



Note:

- The above shaded buttons on the Remote Control glow in the dark. To use the glow-in-the-dark display on the remote control, place it under a fluorescent light or other lighting.
- The phosphorescent material contains no radioactive or toxic material, so it is safe to use.
- The degree of illumination will vary depending on the strength of lighting used.
- The degree of illumination will decrease with time and depending on the temperature.
- The time needed to charge the phosphorescent display will vary depending on the surrounding lighting.
- Sunlight and fluorescent lighting are the most effective when charging the display.

INSTALLATION AND SERVICE INSTRUCTIONS

- Note:**
- (1) When performing any adjustments to resistor controls and transformers use non-metallic screwdrivers or TV alignment tools.
 - (2) Before performing adjustments, the TV set must be on at least 15 minutes.

CIRCUIT PROTECTION

The receiver is protected by a 4.0A fuse (F701), mounted on PWB-A, wired into one side of the AC line input.

X-RADIATION PROTECTOR CIRCUIT TEST

After service has been performed on the horizontal deflection system, high voltage system, B+ system, test the X-Radiation protection circuit to ascertain proper operation as follows:

1. Apply 120V AC using a variac transformer for accurate input voltage.
2. Allow for warm up and adjust all customer controls for normal picture and sound.
3. Receive a good local channel.
4. Connect a digital voltmeter to TP653 and make sure that the voltmeter reads $21.9 \pm 1.4V$.
5. Apply external 27.8V DC at TP653 by using an external DC supply, TV must be shut off.
6. To reset the protector, unplug the AC cord and make a short circuit between TP651 and TP652. Now make sure that normal picture appears on the screen.
7. If the operation of the horizontal oscillator does not stop in step 5, the circuit must be repaired before the set is returned to the customer.

HIGH VOLTAGE CHECK

High voltage is not adjustable but must be checked to verify that the receiver is operating within safe and efficient design limitations as specified checks should be as follows:

1. Connect an accurate high voltage meter between ground and anode of picture tube.
2. Operate receiver for at least 15 minutes at 120V AC line voltage, with a strong air signal or a properly tuned in test signal.
3. Enter the service mode and select the service adjustment "S03" and Bus data "01" (Y-mute on).
4. The voltage should be approximately, 27.8kV (at zero beam).

If a correct reading cannot be obtained, check circuitry for malfunctioning components. After the voltage test, make Y-mute off to the normal mode.

For adjustments of this model, the bus data is converted to various analog signals by the D/A converter circuit.

Note: There are still a few analog adjustments in this series such as focus and master screen voltage. Follow the steps below whenever the service adjustment is required.

To enter the service mode and exit service mode.

While pressing the Vol-up and Ch-up buttons at the sametime, plug the AC cord into a wall socket.

Now, the TV set is switched on and enters the service mode.

To exit the service mode, turn the television off by pressing the power button.

1. Service mode.

Before putting unit into the service mode, check that customer adjustments are in the normal mode. Use the reset function in the video adjustment menu to ensure customer control are in their proper (reset) position.

2. Service number selection.

In the service mode, you will see the window screen as window ①. There are 4 adjustment categories ②DEF, ③SIGNAL, ④FEATURE, ⑤FIX VALUE as show in **Figure A**.

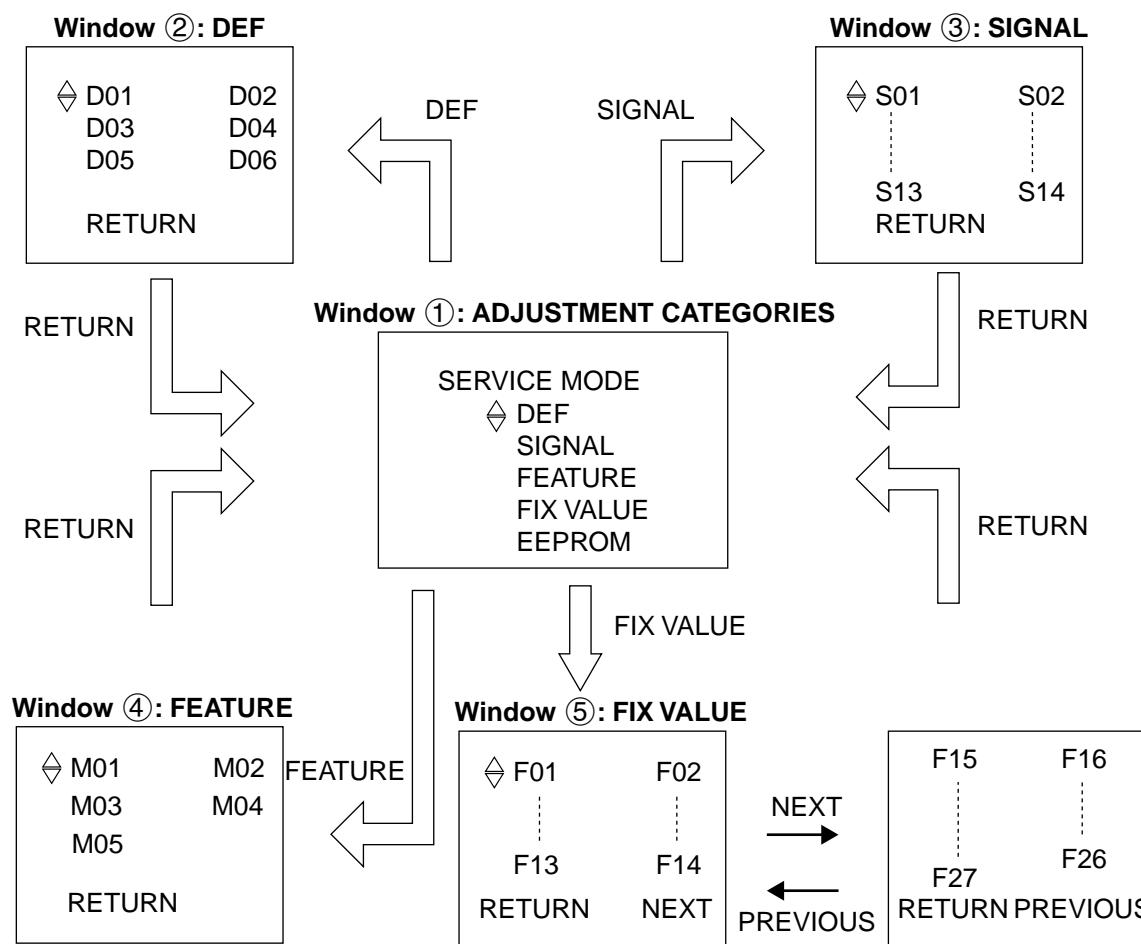


Figure A: ADJUSTMENT CATEGORIES

Press CH UP/DOWN button for selection and enter by VOL UP or VOL DOWN.

Press CH UP/DOWN button to select the adjustment item and VOL UP/DOWN

to adjust the data number for each categories.

(OSD disturbance can be erased by R/C display key)

(Note: EEPROM - factory used only)

Below are the adjustments ranges and initial values for FIX VALUE category.

FIX VALUE

SERVICE POSITION	ADJUST ITEM	DATA		
		RANGE	INITIAL VALUE	(Hex)
F01	OPTION 1	00-FF	B3	B3
F02	OPTION 2	00-FF	07	07
F03	E-SAVE	00-3F	2A	2A
F04	TUNER SETUP	00, 01	00	00
F05	R-TONE RD	00-7F	03	03
F06	R-TONE BD	00-7F	7C	7C
F07	B-TONE RD	00-7F	00	00
F08	B-TONE BD	00-7F	04	04
F09	FM LEVEL	00-1F	16	16
F10	AFC GAIN	00, 01	00	00
F11	G DRIVE	00, 0F	0F	0F
F12	FBT BLK SW	00, 01	01	01
F13	V COMP	00-07	07	07
F14	OSD CONT	00-03	01	01
F15	SHARPNESS	00-3F	0D	19
F16	FLT SYS	00-07	01	01
F17	KILLER OP	00-07	02	02
F18	PRE SHOOT	00-03	00	00
F19	CORING	00-03	04	04
F20	DC REST	00-03	02	02
F21	BS START	00-03	01	01
F22	BS GAIN	00-03	01	01
F23	ABL START	00-07	00	00
F24	R/B ANGLE	00-0F	08	08
F25	H BLK R	00-0F	03	03
F26	H BLK L	00-0F	00	00
F27	YC	00-07	05	04

Table - A

Below are the ranges and initial values for each adjustment and in each categories.

DEF

SERVICE POSITION	ADJUST ITEM	DATA		ADJUSTMENT CONTENTS
		RANGE	INITIAL VALUE	
D01	H-PHASE	00-1F	0C	
D02	V-SIZE	00-7F	40	
D03	V-POSITION	00-3F	20	
D04	CC-POSITION	00-FF	1A	
D05	V-LINEARITY	00-1F	18	Must be "13"
D06	V-S-CORRECTION	00-1F	0C	Must be "10"

Table - B

SIGNAL

SERVICE POSITION	ADJUST ITEM	DATA		ADJUSTMENT CONTENTS
		RANGE	INITIAL VALUE	
S01	RF AGC	00-3F	14	
S02	VIDEO LEVEL	00-07	03	
S03	Y-MUTE	00-03	00	"01": Y-MUTE, "02": V-STOP & Y-MUTE "03": Activate color killer circuit.
S04	SUB BIAS	00-FF	30	Must be "30"
S05	R-BIAS	00-FF	00	
S06	G-BIAS	00-FF	00	
S07	B-BIAS	00-7F	00	
S08	R-DRIVE	00-7F	53	
S09	B-DRIVE	00-7F	53	
S10	CONTRAST	00-7F	5A	
S11	TINT	00-7F	40	
S12	COLOR	00-7F	40	
S13	BRIGHTNESS	00-7F	40	
S14	BRIGHTNESS 2	00-7F	40	

Note: Refer to the SERVICE ADJUSTMENT for each corresponding values.

Table - C

FEATURE

SERVICE POSITION	ADJUST ITEM	DATA		ADJUSTMENT CONTENTS
		RANGE	INITIAL VALUE	
M01	MS LEVEL	00-0F	0A	
M02	MTS-VCO	00-3F	20	
M03	FILTER	00-3F	1C	
M04	LOW SEPARATION	00-3F	20	
M05	HIGH SEPARATION	00-3F	1B	

Note: Refer to the SERVICE ADJUSTMENT for each corresponding values.

Table - D

Holding down both the Vol-up/Ch-down buttons on the TV set at service mode for more than 2 seconds will automatically write the above initial values into IC2102.

PART REPLACED	ADJUSTMENT		NOTES
	NECESSARY	UNNECESSARY	
IC2001		X	Data is stored in IC2102.
IC201	X		The adjustment is needed to compensate for characteristics of parts including IC201.
IC2102	X		Holding down both the Vol-up/Ch-down buttons on the TV set in the service mode for more than 2 seconds will automatically write the above initial values into IC2102.
IC3001	X		Adjust items related MTS only.
CRT	X		Adjust items related to picture tube only.

Table - E

■ SERVICE ADJUSTMENT

Note: Before making the service adjustment, make the bus data settings.

+B Adjustment

(1) For the chassis with the +B adjustment control

1. Receive a good local channel.
2. Select VIDEO ADJUSTMENT RESET on the menu to get the video reset.
3. Connect a DC voltmeter between the +B line (at SW transformer) of R611 and the ground terminal.
4. Adjust R738 so that the voltmeter should read $128.5 \pm 0.5V$.

(2) For the chassis without the +B adjustment control

1. Receive a good local channel.
2. Select VIDEO ADJUSTMENT RESET on the menu to get the video reset.
3. Connect a DC voltmeter between the +B line (at SW transformer) of R611 and the ground terminal.
4. Make sure that the voltmeter reads $128.5 \pm 1.5V$.

Video Level (TV Det Video Level) Adjustment

Adjustment

1. Receive a good local channel.
2. Enter the service mode signal category and select the service adjustment "S02".
3. Set the data value to "02" first, then adjust the data to "04". (If out of spec, readjust the data in the range of "00" to "07" to obtain a normal contrast level.)

RF AGC Adjustment

1. Receive a good local channel.
2. Enter the service mode signal category and select the service adjustment "S01".
3. Set the data value to point where no noise or beat appears.
4. Select another channel to confirm that no noise or beat appears.

Note: You have to exit the service mode first to select another channel.

Screen Adjustment

1. Connect to oscilloscope probe between TP854 and ground of the CRT unit.
2. Receive a good local channel.
3. Enter the service mode Signal category and set the service adjustment "S04" to step 30. Then select the service adjustment "S12" and set the data value to "00" to set the color level to the minimum level. (record the original data first). You may skip this step, if you selected a B/W picture or monoscope pattern. Set also the "S05/S06/S07" data to minimum level ("00").

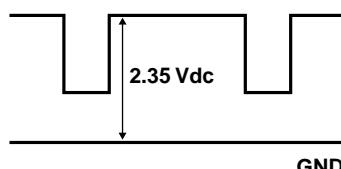


Figure B: WAVEFORM FOR SCREEN ADJUSTMENT

4. Select the service adjustment "S03" and set the data value to "01" to turn off the luminance signal (Y-mute).
5. Select the service adjustment "S14" and adjust the data value to obtain 2.35 volts as shown in **Figure B**.
6. Adjust the master screen control until the raster darkens to the point where raster is barely seen.
7. Adjust the service adjustment "S05" red, "S06" green, "S07" blue to obtain a good grey scale with normal white at low brightness level.
8. Select the service a adjustment "S03" and reset data to "00". Select the service adjustment "S12" and reset data to obtain normal color level.
9. Remove probe and reset the master screen control to obtain normal brightness range.

White Balance Adjustment

1. Receive a good local channel.
2. Select the service adjustment "S12" and set the data value to "00" to set the color level to the minimum. You may skip this step, if you selected a B/W picture or monoscope.
3. Alternately adjust the service adjustment data of "S08" and "S09" until a good grey scale with normal white is obtained.
4. Select the service adjustment "S12" and reset data to obtain normal color level.

Sub-Picture Adjustment

1. Receive a good local channel.
2. Make sure the customer picture control is set to maximum.
3. Enter the service mode and select the service adjustment "S10".
4. Adjust the data value to achieve normal contrast range.

Sub-Tint Adjustment

1. Receive a good local channel.
2. Set the customer tint control to the center of its range.
3. Enter the service mode and select the service adjustment "S11".
4. Adjust "S11" data value to obtain normal fresh tones.

Sub-Color Adjustment

1. Receive a good local channel.
2. Make sure the customer color control is set to center position.
3. Enter the service mode and select the service adjustment "S12".
4. Adjust "S12" data value to obtain normal color level.

Sub-Brightness Adjustment

1. Receive a good local channel.
2. Make sure the customer brightness control is set to center position.
3. Enter the service mode and select the service adjustment "S13".
4. Adjust "S13" data value to obtain normal brightness level.

Vertical-Size, V-Linearity and V-S Correction Adjustments

1. Receive a good local channel.
2. Enter the service mode DEF category and select the adjustment "D02" for Vertical Size, "D05" for V-Linearity and "D06" for V-S Correction Adjustment.
3. Set in order "D05" for V-Linearity, "D06" for V-S Correction and set the data to get the best linearity.
4. Then adjust "D02" data until it become a proper vertical size.

Horizontal Position Adjustment

1. Receive a good local channel.
2. Enter the service mode DEF category and select the adjustment "D01".
3. Adjust "D01" data value to center the picture.

Vertical-Phase Adjustment

1. Receive a good local channel.
2. Enter the service mode DEF category and select the adjustment "D03".
3. Adjust "D03" bus data to get the most acceptable vertical position.

Note: The step range is 20 (32)+12 (3 steps)
-20 (5 steps).
(Push once move 4 steps.)

Caption Position Adjustment (Horizontal)

1. Receive a good local channel.
2. Enter the service mode DEF category and select the adjustment "D04".
3. A black text box will appear on the screen. (see **Figure C.** below)
4. Adjust "D04" data value to balance the text box position in the center. (A=B).

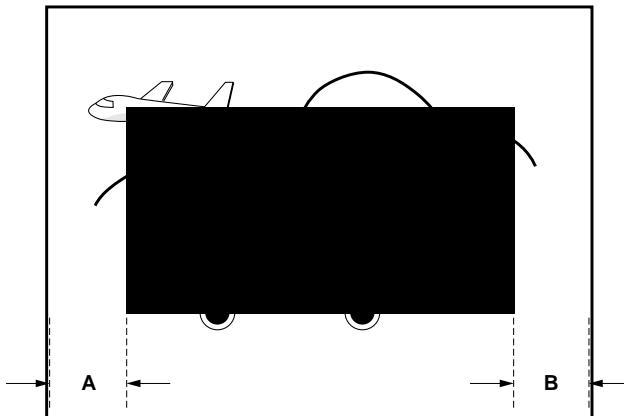


Figure C.

■ MTS ADJUSTMENT

MTS Level Adjustment

1. Feed the following monaural signal to pin (14) of IC3001.
Monaural signal: 300Hz, 245mVrms
2. Connect the rms voltmeter to pin (39) of IC3001.
3. Enter the service mode and select the service adjustment "M01".
4. Adjust the data so that the rms voltmeter reads 490 ±10mVrms.

MTS VCO Adjustment

1. Keep the unit in no-signal state.
2. Connect the frequency counter to pin (39) of IC3001.
3. Connect a capacitor (100µF, 50V) in between positive(+) side of C3005 and ground.
4. Enter the service mode and select the service adjustment "M02"
5. Adjust the data so that the frequency counter reads 62.94 ±0.75kHz.

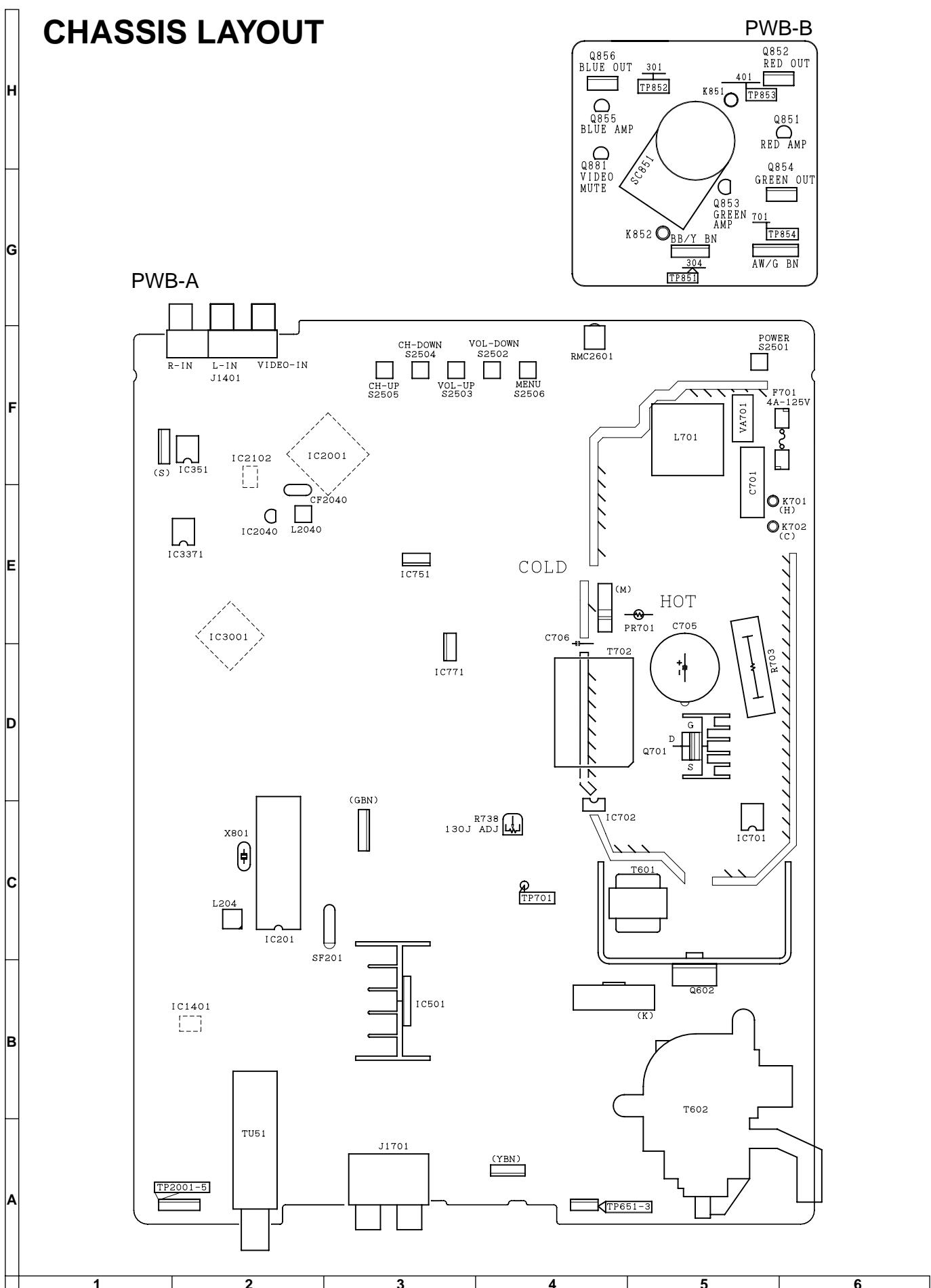
Filter Adjustment

1. Feed the following stereo pilot signal to pin (14) of IC3001 .
Stereo pilot signal: 9.4kHz, 600mVrms.
2. Enter the service mode and select the service adjustment "M03".
3. Adjust the data at the point where "OK" appears on the screen. The "OK" represents the approximate center of the adjustable range of the data.

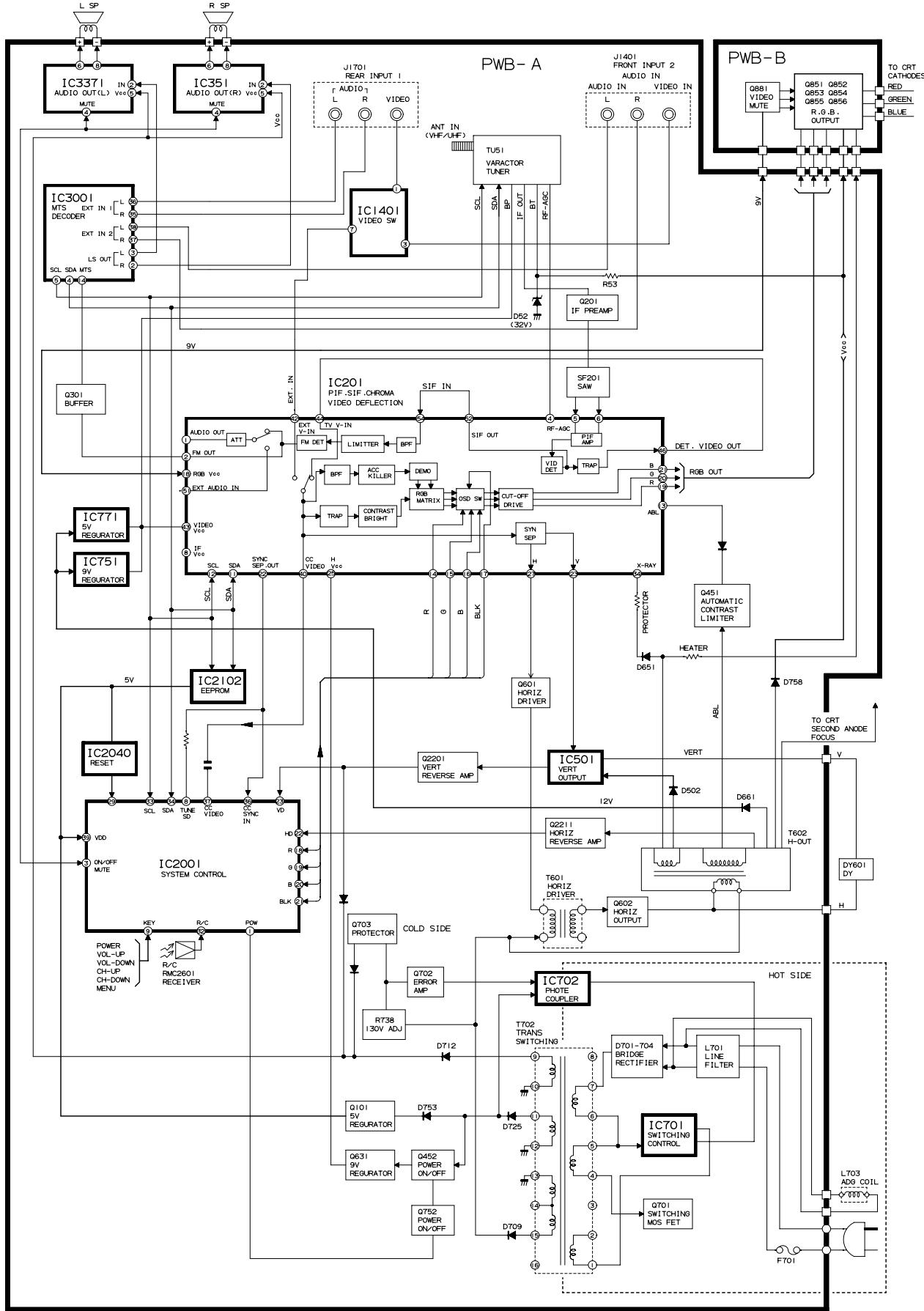
Separation Adjustment

1. Connect the rms voltmeter to pin (39) of IC3001.
2. Receive the following composite stereo signal 1.
Composite stereo signal: 30% modulation, left channel only, noise reduction on, 300Hz
3. Enter the service mode and select the service adjustment "M04".
4. Adjust the data until the AC voltage reading of the rms voltmeter is minimum.
5. Receive the following composite stereo signal 2.
Stereo signal: 30% modulation, left channel only, noise reduction on, 3kHz
6. Enter the service mode and select the service adjustment "M05".
7. Adjust the data until the AC voltage reading of the rms voltmeter is minimum.
8. Take the above steps 1 thru 7 again for fine adjustment.

CHASSIS LAYOUT



BLOCK DIAGRAM



DESCRIPTION OF SCHEMATIC DIAGRAM

NOTES:

1. The unit of resistance "ohm" is omitted.
($K=k\Omega=1000\Omega$, $M=M\Omega$)
2. All resistors are 1/16 watt, unless otherwise noted.
3. All capacitors are μF , unless otherwise noted.
($P=pF=\mu\mu F$)
4. (G) indicates $\pm 2\%$ tolerance may be used.
5. \nparallel indicates line isolated ground.

VOLTAGE MEASUREMENT CONDITIONS:

1. All DC voltages are measured with DVM connected between points indicated and chassis ground, line voltage set at 120V AC and all controls set for normal picture unless otherwise indicated.
2. All voltages measured with $1000\mu V$ B & W or Color signal.

WAVEFORM MEASUREMENT CONDITIONS:

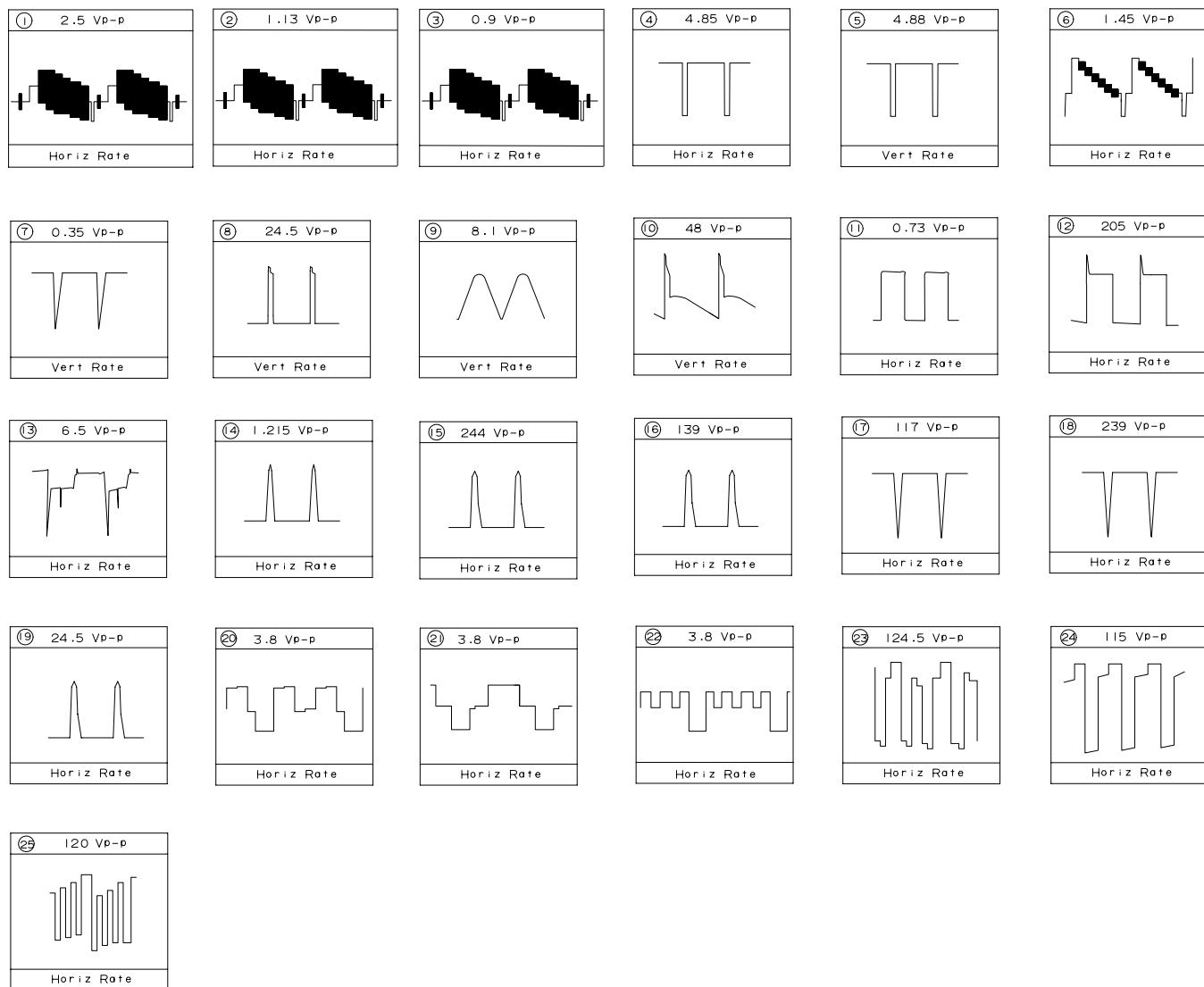
1. Photographs taken on a standard gated color bar signal, the tint setting adjusted for proper color. The wave shapes at the red, green and blue cathodes of the picture tube depend on the tint, color level and picture control.
2.  indicates waveform check points (See chart, waveforms are measured from point indicated to chassis ground.)

 AND SHADED () COMPONENTS = SAFETY RELATED PARTS.

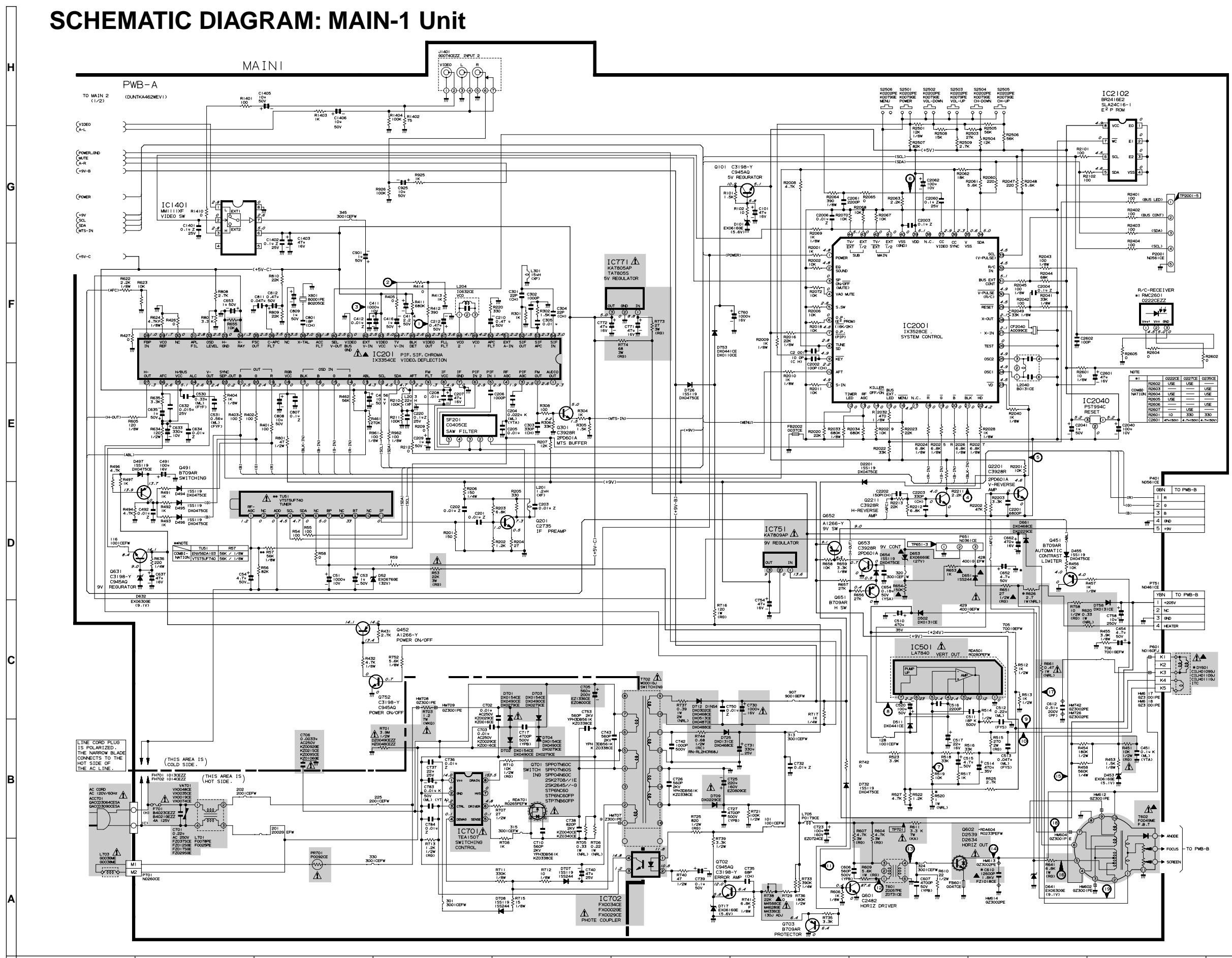
 MARK= X-RAY RELATED PARTS.

This circuit diagram is a standard one, printed circuits may be subject to change for product improvement without prior notice.

WAVE FORMS

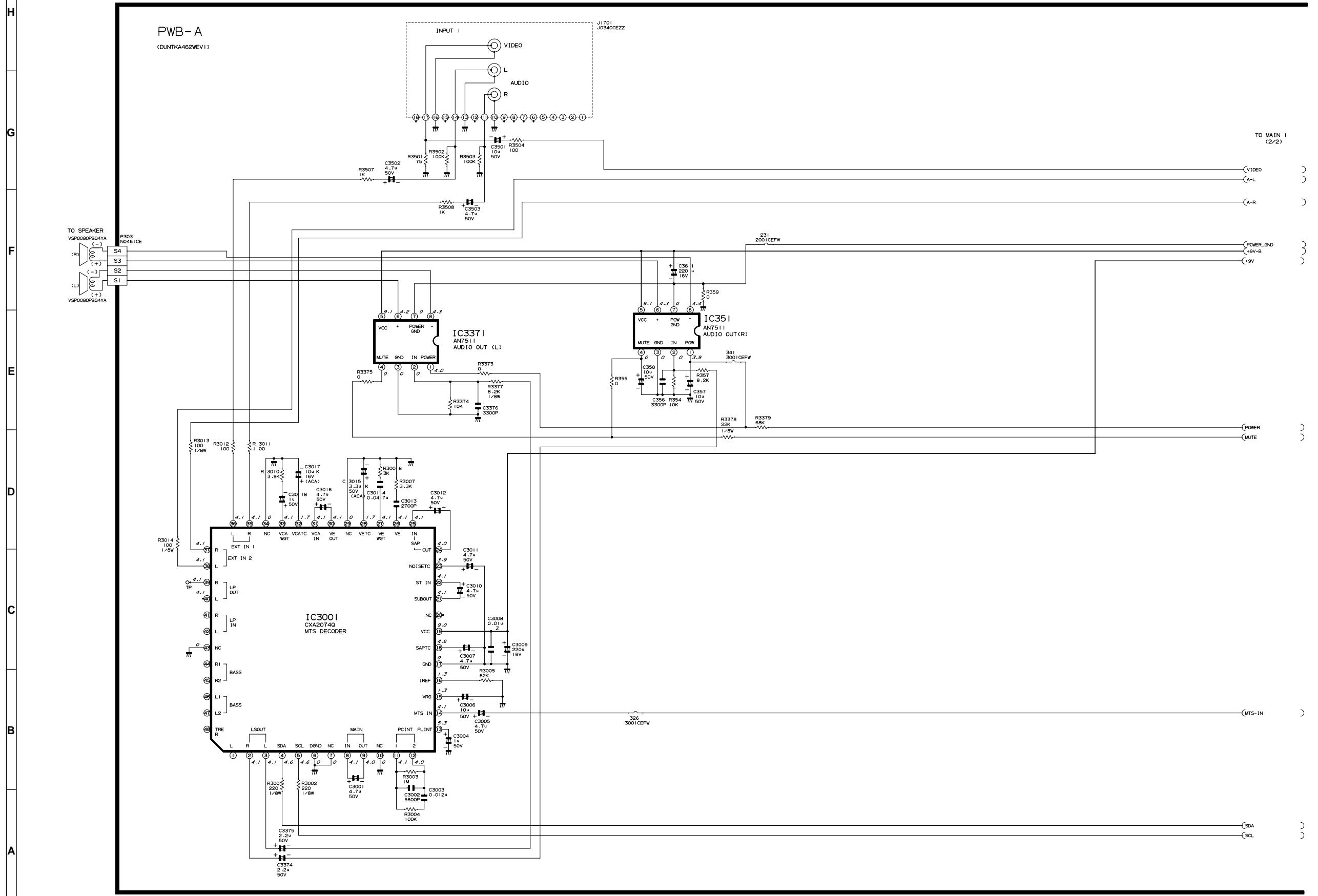


SCHEMATIC DIAGRAM: MAIN-1 Unit



SCHEMATIC DIAGRAM: MAIN-2 Unit

MAIN2



SCHEMATIC DIAGRAM: CRT Unit

H

G

F

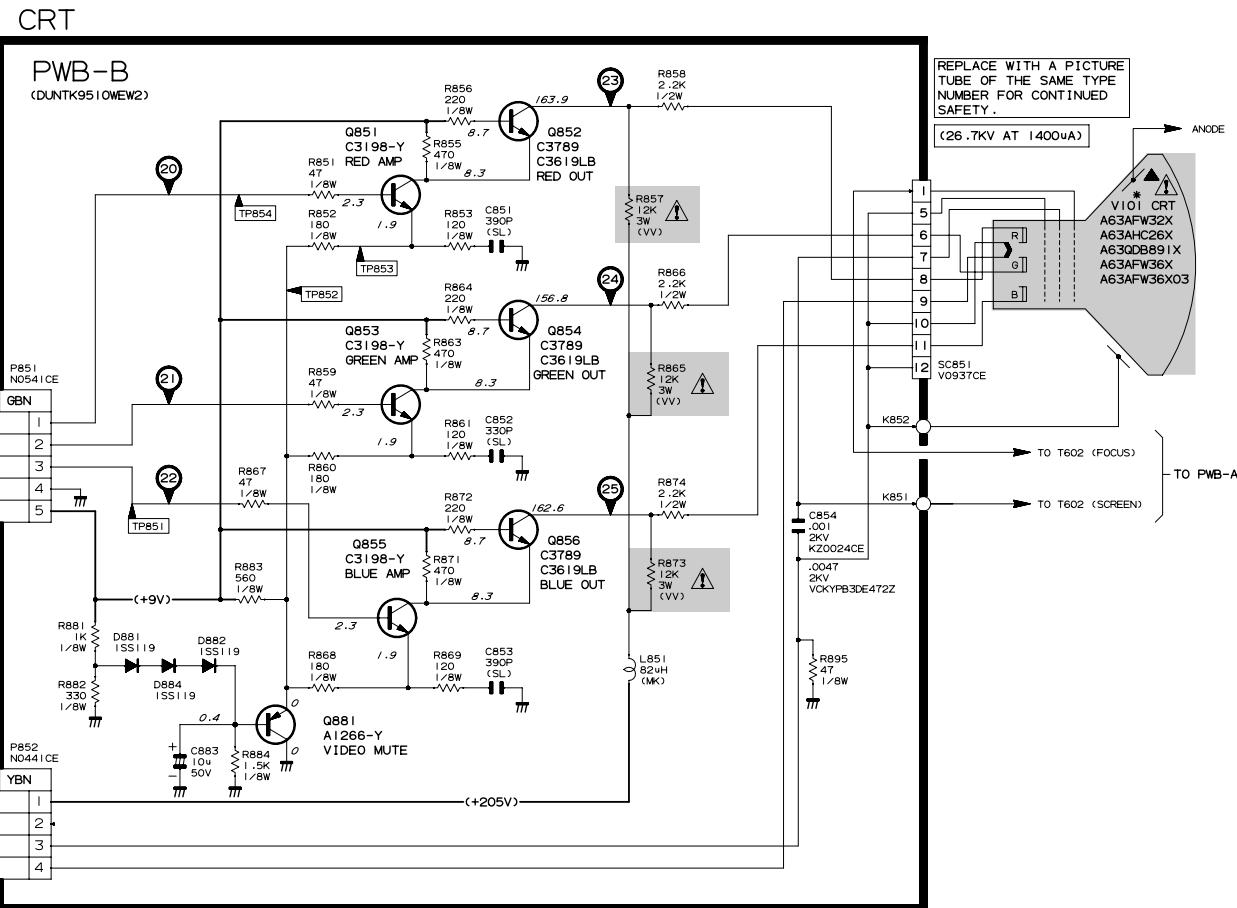
E

D

C

B

A



* NOTE

	CRT	DY	R626	R621
COMBI-NATION	A63AFW36X A63AFW32X	CILH0109J	2.7/IW	-
	A63AHC26X	CILH0110J	-	I.2/2W
	A630DB891X	CILH0111J	2.7/IW	-
	A63AFW36X03	ITC	2.7/IW	-

PRINTED WIRING BOARD ASSEMBLIES

H

G

F

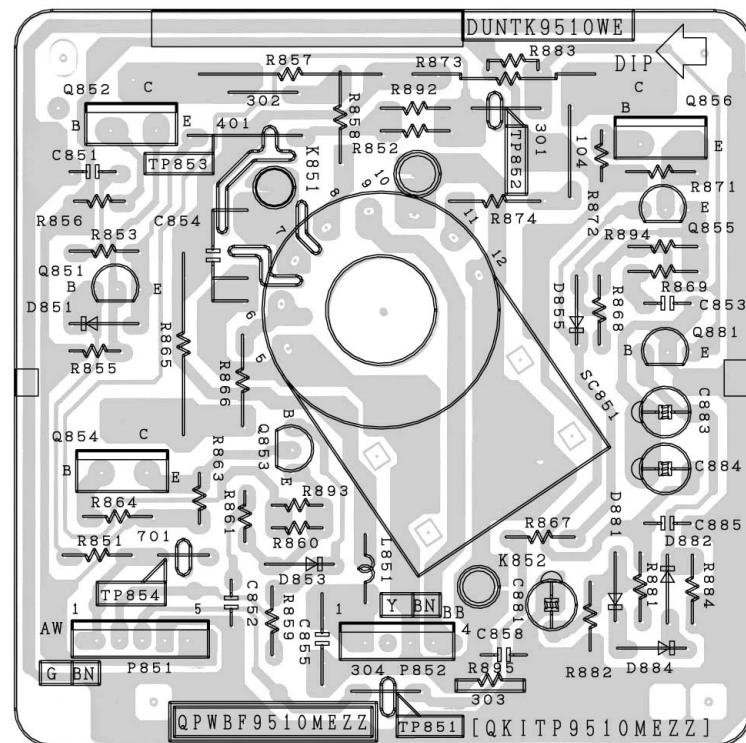
E

D

C

B

A



PWB-B: CRT Unit (Wiring Side)

H

G

F

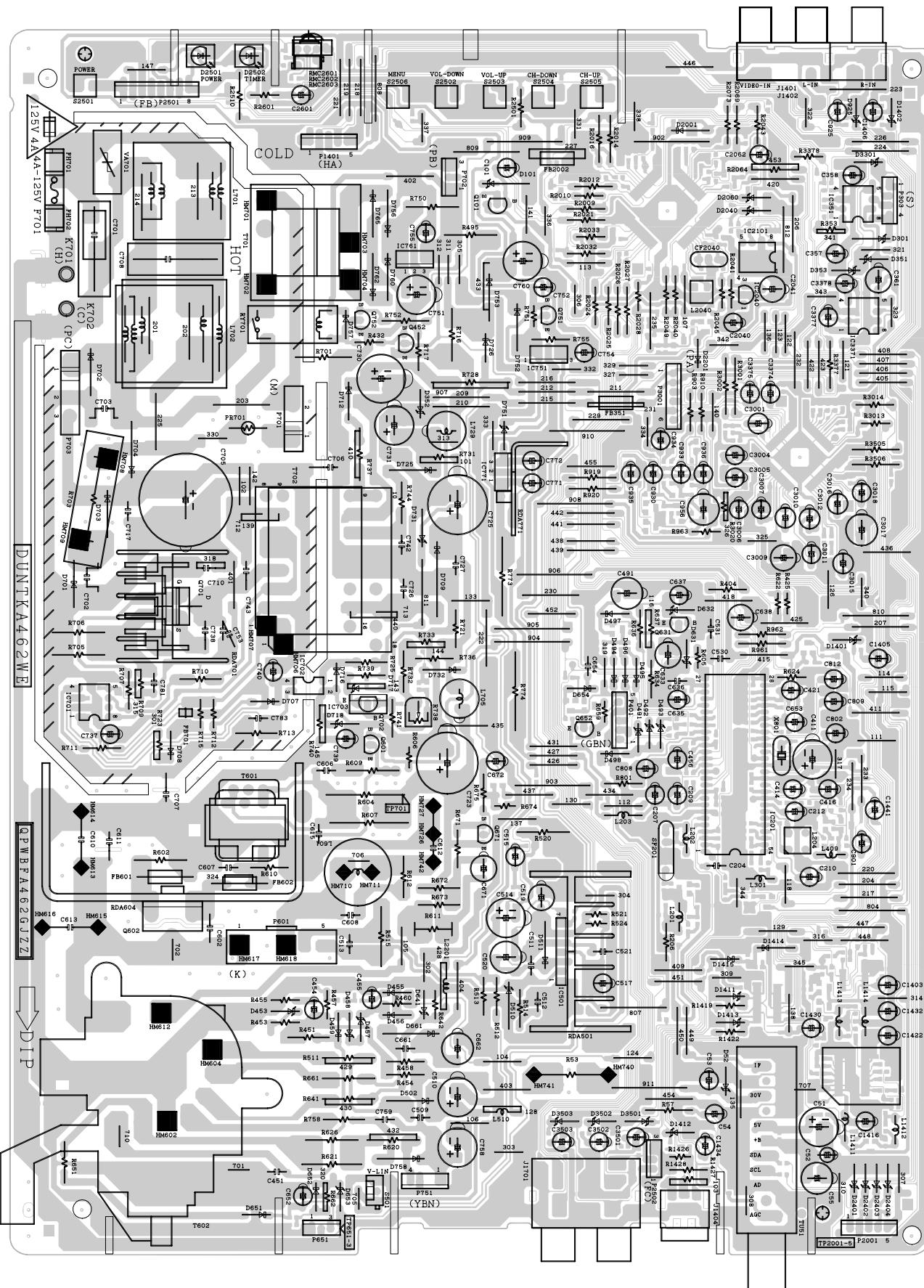
E

D

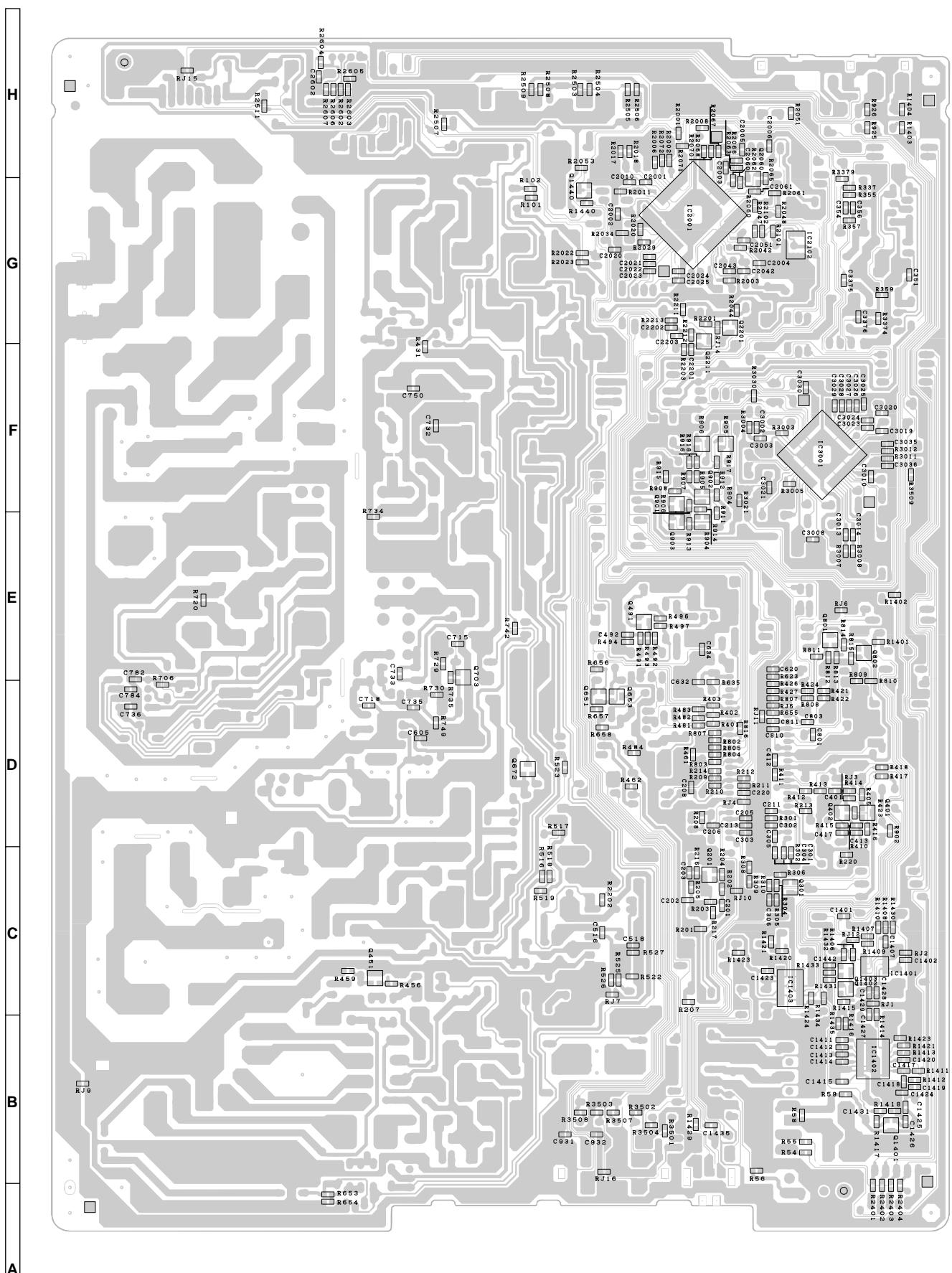
6

B

A



PWB-A: MAIN Unit (Wiring Side)



PWB-A: MAIN Unit (Chip Parts Side)

1	2	3	4	5	6
---	---	---	---	---	---

PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual; electrical components having such features are identified by Δ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristic as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

- | | |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO. |
| 3. PART NO. | 4. DESCRIPTION |

in USA: Contact your nearest SHARP Parts Distributor to order. For location of SHARP Parts Distributor, Please call Toll-Free; 1-800-BE-SHARP

★ MARK: SPARE PARTS-DELIVERY SECTION

▲ MARK: X- RAY RELATED PARTS

Ref. No.	Part No.	★	Description	Code
----------	----------	---	-------------	------

PICTURE TUBE

▲ Δ V101	VB63AFW32X/*S	X	CRT (DY601: CiLH0109GJ)	CC
	or VB63AHC26X/*S		CRT (DY601: CiLH0110GJ)	
	or VB63QD891X/*S		CRT (DY601: CiLH0111GJ)	
	or VB63AFW36X/*S		CRT (DY601: CiLH0109GJ)	
	or VB63AFW36031E		CRT (I.T.C.)	
▲ Δ DY601	RCiLH0109GJZZ	X	DY (V101: A63AFW32X or A63AFW36X)	BB
	RCiLH0110GJZZ		DY (V101: A63AHC26X)	
	RCiLH0111GJZZ		DY (V101: A63QDB891X)	
▲ L703	RCiLG0036MEZZ	X	Degaussing Coil	AN
	or RCiLG0038MEZZ			
	MSPRT0002MEZZ	X	Spring	AE
	PMAGF3046CEZZ	J	Purity Magnet	AF
	QEARC2508MEZZ	X	Grounding Strap	AG

	CRT	DY	R626	R621
COMBI-NATION	A63AFW36X	CiLH0109GJ	2.7/1W	-
	A63AFW32X			
	A63AHC26X	CiLH0110GJ	-	1.2/2W
	A63QDB891X	CiLH0111GJ	2.7/1W	-
	A63AFW36X03	ITC	2.7/1W	-

Ref. No.	Part No.	★	Description	Code
----------	----------	---	-------------	------

PRINTED WIRING BOARD ASSEMBLIES (NOT REPLACEMENT ITEM)

PWB-A DUNTKA462WEV1	- MAIN Unit	—
PWB-B DUNTK9510WEW2	- CRT Unit	—

PWB-A: DUNTKA462WEV1 MAIN UNIT

TUNER

NOTE: THE PARTS HERES SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT NOT INDEPENDENTLY.

Δ TU51	VTUVTST5UF740	X Tuner	AX
	or VTUENV56DA1G3		

	TU51	R57
COMBI-NATION	ENV56DA1G3	56K / 1/8W
	VTST5UF740	56K / 1/8W

INTEGRATED CIRCUITS

▲ Δ IC201	RH-iX3354CEN1	X I.C.	AS
IC351	VHiAN7511//1	J AN7511	AK
▲ IC501	VHiLA7840//1	J LA7840	AR
▲ IC701	VHiTEA1507//1	J TEA1507P/N1	AL
▲ IC702	RH-FX0034CEZZ	J PC817	AE

or
RH-FX0002GEZZ

or
RH-FX0029CEZZ

▲ IC751	VHiKA7809AP-1	J KA7809API	AE
▲ IC771	VHiKA7805AP-1	J KA7805API	AE
	or VHiTA7805S/-1		
IC1401	VHiMM1111XF1E	J MM1111XFBE	AE
IC2001	RH-iX3528CEZZQ	X I.C.	AT
IC2040	VHiPST994C/-1	J PST994C	AD
IC2102	VHiBR2416E2-1	J BR2416F	AK
	or VHiSLA24C16-1		
IC3001	VHiCXA2074Q-1	J CXA2074Q	AY
IC3371	VHiAN7511//1	J AN7511	AK

TRANSISTORS

Q101	VS2SC3198-Y-1	J 2SC3198-Y	AA
	or VS2SC945AQ/-1		
Q201	VS2SC2735//1E	J 2SC2735	AC
Q301	VS2SC3928R/-1	J 2SC3928R	AB
	or VS2PD601AR/-1		
Q451	VS2SB709AR/-1	J 2SB709AR	AC
Q452	VS2SA1266-Y-1	J 2SA1266-Y	AA
Q491	VS2SB709AR/-1	J 2SB709AR	AC
Q601	VS2SC2482/-1	J 2SC2482	AD
▲ Q602	VS2SD2539//1E	J 2SD2539	AP
	or VS2SD2634++-1		
Q631	VS2SC3198-Y-1	J 2SC3198-Y	AA
	or VS2SC945AQ/-1		
Q651	VS2SB709AR/-1	J 2SB709AR	AC
Q652	VS2SA1266-Y-1	J 2SA1266-Y	AA
Q653	VS2SC3928R/-1	J 2SC3928R	AB
	or VS2PD601AR/-1		

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
PWB-A: DUNTKA462WEV1 MAIN UNIT (Continued)									
△ Q701	VSSPP07N60C-1 or VSSPP07N60S-1 or VSSPP04N60C-1 or VS2SK2708//1E or VS2SK2645//G or VSSTP6NC60+-1 or VSSTP6NC60F-1 or VSSTP7NB60F-1	X	FET	AF	△ D703	RH-DX0154CEZZ or RH-DX0490CEZZ or RH-DX0279CEZZ	J	Diode	AC
Q702	VS2SC3198-Y-1 or VS2SC945AQ/-1	J	2SC3198-Y	AA	△ D704	RH-DX0154CEZZ or RH-DX0490CEZZ or RH-DX0279CEZZ	J	Diode	AC
Q703	VS2SB709AR/-1	J	2SB709AR	AC	D707	VHD1SS119//1-1 or VHD1SS244//1-1	J	Diode	AB
Q752	VS2SC3198-Y-1 or VS2SC945AQ/-1	J	2SC3198-Y	AA	D708	VHD1SS119//1-1 or VHD1SS244//1-1	J	Diode	AB
Q2201	VS2SC3928R/-1 or VS2PD601AR/-1	J	2SC3928R	AB	△ D709	RH-DX0229CEZZ	J	Diode	AF
Q2211	VS2SC3928R/-1	J	2SC3928R	AB	△ D712	VHDD1NS4///-1 or RH-DX0302CEZZ	J	Diode	AE
DIODES									
D52	RH-EX0676GEZZ	J	Zener Diode, 32V	AA	D726	VHD1SS119//1-1 or RH-DX0468CEZZ	J	Diode	AB
D101	RH-EX0616GEZZ	J	Zener Diode, 5.6V	AA	D732	RH-DX0475CEZZ or VHD1SS119//1-1	J	Diode	AB
D453	RH-EX0616GEZZ	J	Zener Diode, 5.1V	AA	D753	RH-DX0441CEZZ or RH-DX0475CEZZ	J	Diode	AC
D455	VHD1SS119//1-1 or RH-DX0475CEZZ	J	Diode	AB	D758	RH-DX0110CEZZ or RH-DX0475CEZZ	J	Diode	AC
D494	VHD1SS119//1-1 or RH-DX0475CEZZ	J	Diode	AB	D2201	RH-DX0131CEZZ or VHD1SS119//1-1	J	Diode	AB
D495	VHD1SS119//1-1 or RH-DX0475CEZZ	J	Diode	AB	△ VA701	RH-VX0048CEZZ or RH-DX0475CEZZ	J	Varistor	AE
D496	VHD1SS119//1-1 or RH-DX0475CEZZ	J	Diode	AB		RH-VX0035CEZZ or RH-VX0019CEZZ			
D497	VHD1SS119//1-1 or RH-DX0475CEZZ	J	Diode	AB		RH-VX0074CEZZ			
△ D502	RH-DX0131CEZZ	J	Diode	AC	PACKAGED CIRCUITS				
D511	RH-DX0441CEZZ	J	Diode	AC	△ PR701	RMPTP0092CEZZ	J	Packaged Circuit	AH
D632	RH-EX0630GEZZ	J	Zener Diode, 9.1V	AA	X801	RCRSB0001PEZZ or RCRSB0205CEZZ	R	Crystal	AL
D641	RH-EX0630GEZZ	J	Zener Diode, 9.1V	AA					
▲ D651	VHD1SS244//1-1	J	Diode	AB	△ L701	RCILF0078PEZZ or RCILF0025PEZZ	R	Coil	AF
▲ D653	RH-EX0666GEZZ	J	Zener Diode, 2.7V	AB					
D654	VHD1SS119//1-1 or RH-DX0475CEZZ	J	Diode	AB	L705	RCILP0179CEZZ	J	Coil	AD
△ D661	RH-DX0468CEZZ or RH-DX0229CEZZ	J	Diode	AE	L2040	RCILB0131CEZZ	J	Oscillation Coil	AE
△ D701	RH-DX0154CEZZ or RH-DX0490CEZZ	J	Diode	AC					
△ D702	RH-DX0154CEZZ or RH-DX0490CEZZ or RH-DX0279CEZZ	J	Diode	AC					

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
PWB-A: DUNTKA462WEV1 MAIN UNIT (Continued)									
TRANSFORMERS									
▲ T601	RTRNZ0057PEZZ	R	Transformer or RTRNZ0731CEZZ	AK	C653	VCEA0A1HW105M	J 1.0	50V EL.	AB
▲ ▲ T602	RTRNF0049MEZZ	X	H-Volt Transformer	AY	C654	VCFYSA1HB184J	J 0.18	50V Mylar	AB
▲ T702	RTRNW0001GJZZ	X	Transformer	AN	C662	VCEA0A1CW477M	J 470	16V EL.	AC
CONTROLS									
▲ ▲ R738	RVR-M4588CEZZ+	X	22k (B) 130V Adj. or RVR-M4628GEZZ or RVR-M4336CEZZ	AE	△ C701	RC-FZ037SCEZZ	J 0.22	AC250V Plastic	AD
CAPACITORS									
[EL. ... Electrolytic, M-Poly... Metallized Polypro Film]									
C51	VCEA0A1AW108M	J 1000	10V EL.	AC	C653	VCEA0A1HW105M	J 1.0	50V EL.	AB
C53	VCEA0A1HW105M	J 1.0	50V EL.	AB	C654	VCFYSA1HB184J	J 0.18	50V Mylar	AB
C54	VCEA0A1HW475M	J 4.7	50V EL.	AB	C662	VCEA0A1CW477M	J 470	16V EL.	AC
C101	VCEA0A1CW476M	J 47	16V EL.	AB	△ C701	RC-FZ037SCEZZ	J 0.22	AC250V Plastic	AD
C201	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	or		RC-FZ012SGEZZ		
C202	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	or		RC-FZ017SGEZZ		
C203	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	or		RC-FZ029SGEZZ		
C204	VCQYTA1HM223K	J 0.022	50V Mylar	AB	C702	RC-KZ0029CEZZ	J 0.01	AC250V Ceramic	AC
C205	VCKYCY1HB103K	J 0.01	50V Ceramic	AA	or		RC-KZ0016CEZZ		
C206	VCKYCY1HB102K	J 1000p	50V Ceramic	AA	C703	RC-KZ0029CEZZ	J 0.01	AC250V Ceramic	AC
C207	VCEA0A1CW476M	J 47	16V EL.	AB	or		RC-KZ016CEZZ		
C208	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	△ C705	RC-EZ1336CEZZ	J 560	200V EL.	AQ
C209	VCEA0A1HW105M	J 1.0	50V EL.	AB	or		RC-EZ0800CEZZ		
C210	VCEA0A1HW474M	J 0.47	50V EL.	AB	△ C706	RC-KZ0092GEZZ	J 0.0033	AC250V Ceramic	AC
C212	VCEA0A1HW474M	J 0.47	50V EL.	AB	or		RC-KZ021SCEZZ		
C220	VCKYCY1EF104Z	J 0.1	25V Ceramic	AA	C717	VCKYPA2HB472K	J 4700p	500V Ceramic	AB
C301	VCCCCY1HH220J	J 22p	50V Ceramic	AA	C723	RC-EZ0724CEZZ	J 100	160V EL.	AG
C302	VCKYCY1HB102K	J 1000p	50V Ceramic	AA	△ C725	RC-EZ0809CEZZ	J 220	160V EL.	AL
C303	VCCCCY1HH331J	J 330p	50V Ceramic	AA	C726	VCKYPH3DB561K	J 560p	2kV Ceramic	AC
C304	VCCCCY1HH220J	J 22p	50V Ceramic	AA	or		RC-KZ0338CEZZ		
C305	VCKYCY1HB103K	J 0.01	50V Ceramic	AA	C727	VCKYPA2HB472K	J 4700p	500V Ceramic	AB
C356	VCKYCY1HB332K	J 3300p	50V Ceramic	AA	△ C730	VCEA0A1CW108M	J 1000	16V EL.	AD
C357	VCEA0A1HW106M	J 10	50V EL.	AB	△ C731	VCEA0A1EW337M	J 330	25V EL.	AC
C358	VCEA0A1HW106M	J 10	50V EL.	AB	C732	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C361	VCEA0A1CW227M	J 220	16V EL.	AC	C735	VCCCCY1HH680J	J 68p	50V Ceramic	AA
C411	VCEA0A1AW108M	J 1000	10V EL.	AC	C736	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C412	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	C737	VCEA0A1EW226M	J 22	25V EL.	AB
C414	VCEA0A1HW225M	J 2.2	50V EL.	AB	C738	RC-KZ0040CEZZ	J 820p	2kV Ceramic	AD
C416	VCEA0A1HW105M	J 1.0	50V EL.	AB	or		RC-KZ0340CEZZ		
C451	VCQYTA1HM104K	J 0.1	50V Mylar	AC	C739	VCEA0A1HW104M	J 0.1	50V EL.	AB
C454	VCEA0A1HW475M	J 4.7	50V EL.	AB	C740	VCEA0A1EW476M	J 47	25V EL.	AB
C456	VCEA0A1HW106M	J 10	50V EL.	AB	C742	VCKYPA2HB102K	J 1000p	500V Ceramic	AA
C491	VCEA0A1CW107M	J 100	16V EL.	AC	C743	VCKYPH3DB561K	J 560p	2kV Ceramic	AC
C492	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	or		RC-KZ0338CEZZ		
C510	VCEA0A1VW477M	J 470	35V EL.	AB	C750	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C511	VCCSPA2HL180K	J 18p	500V Ceramic	AA	C753	VCKYPH3DB561K	J 560p	2kV Ceramic	AC
C512	VCFYSA1JB224J+	X 0.22	63V Mylar	AF	or		RC-KZ0338CEZZ		
C513	VCFYSA1JB473J	J 0.047	63V Mylar	AC	C754	VCEA0A1CW476M	J 47	16V EL.	AB
C514	VCEA0A1VW477M	J 470	35V EL.	AB	C758	VCEA0A2EW106M	J 10	250V EL.	AD
C515	VCEA0A1HW475M	J 4.7	50V EL.	AB	C760	VCEA0A1CW108M	J 1000	16V EL.	AD
C516	VCKYCY1HB222K	J 2200p	50V Ceramic	AA	C771	VCEA0A1CW476M	J 47	16V EL.	AB
C517	VCEA0A1CW226M	J 22	16V EL.	AB	C772	VCEA0A1CW476M	J 47	16V EL.	AB
C520	VCEA0A1HW107M	J 100	50V EL.	AB	C783	VCQYTA1HM103K	J 0.01	50V Mylar	AB
C530	VCFYFA1HA334J	J 0.33	50V Mylar	AB	C784	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA
C531	VCFYFA1HA564J	J 0.56	50V Mylar	AB	C801	VCCCCY1HH180J	J 18p	50V Ceramic	AA
C606	VCKYPA2HB561K	J 560p	500V Ceramic	AA	C807	VCKYCY1EF104Z	J 0.1	25V Ceramic	AA
C607	VCKYPA1HB472K	J 4700p	50V Ceramic	AA	C808	VCEA0A1HW106M	J 10	50V EL.	AB
▲ ▲ C610	RC-FZ1018CEZZ	X 12600p	1.8kV Plastic	AG	C809	VCEA0A1HW105M	J 1.0	50V EL.	AB
C612	VCFPVC2DB514J	X 0.51	200V M-Poly.	AF	C811	VCKYCY1CB473K	J 0.047	16V Ceramic	AA
C632	VCKYCY1EB153K	J 0.015	25V Ceramic	AA	C812	VCEA0A1HW474M	J 0.47	50V EL.	AB
C633	VCEA0A1AW337M+	X 330	10V EL.	AE	C901	VCEA0A1HW105M	J 1.0	50V EL.	AB
C634	VCKYCY1HF103Z	J 0.01	50V Ceramic	AA	C925	VCEA0A1HW106M	J 10	50V EL.	AB
C635	VCEA0A1HW105M	J 1.0	50V EL.	AB	C1401	VCKYCY1EF104Z	J 0.1	25V Ceramic	AA
C637	VCEA0A1CW476M	J 47	16V EL.	AB	C1402	VCKYCY1EF104Z	J 0.1	25V Ceramic	AA
C652	VCEA0A1HW475M	J 4.7	50V EL.	AB	C1403	VCEA0A1CW476M	J 47	16V EL.	AB
					C1405	VCEA0A1HW106M	J 10	50V EL.	AB
					C1406	VCEA0A1HW106M	J 10	50V EL.	AB

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
PWB-A: DUNTKA462WEV1									
MAIN UNIT (Continued)									
C2001	VCCCCY1HH101J	J	100p 50V Ceramic	AA	R211	VRS-CY1JF104J	J	100k 1/16W M-Ox.	AA
C2002	VCCCCY1HH101J	J	100p 50V Ceramic	AA	R212	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
C2003	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	R220	VRS-CY1JF331J	J	330 1/16W M-Ox.	AA
C2004	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	R301	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
C2006	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R302	VRS-CY1JF152J	J	1.5k 1/16W M-Ox.	AA
C2040	VCEA0A1AW107M	J	100 10V EL.	AB	R304	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
C2041	VCEA0A1HW105M	J	1.0 50V EL.	AB	R305	VRS-CY1JF152J	J	1.5k 1/16W M-Ox.	AA
C2060	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA	R306	VRS-CY1JF333J	J	33k 1/16W M-Ox.	AA
C2061	VCKYCY1HB222K	J	2200p 50V Ceramic	AA	R308	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
C2062	VCEA0A1AW107M	J	100 10V EL.	AB	R354	VRS-CY1JF103J	J	10k 1/16W M-Ox.	AA
C2201	VCKYCY1HB682K	J	6800p 50V Ceramic	AA	R355	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
C2202	VCCCCY1HH151J	J	150p 50V Ceramic	AA	R357	VRS-CY1JF822J	J	8.2k 1/16W M-Ox.	AA
C2203	VCCCCY1HH331J	J	330p 50V Ceramic	AA	R359	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
C2601	VCEA0A1CW476M	J	47 16V EL.	AB	R401	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
C2602	VCCCCY1HH101J	J	100p 50V Ceramic	AA	R402	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
C3001	VCEA0A1HW475M	J	4.7 50V EL.	AB	R403	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
C3002	VCKYCY1HB562K	J	5600p 50V Ceramic	AA	R404	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
C3003	VCKYCY1EB123K	J	0.012 25V Ceramic	AA	R405	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
C3004	VCEA0A1HW105M	J	1.0 50V EL.	AB	R411	VRS-CY1JF684J	J	680k 1/16W M-Ox.	AA
C3005	VCEA0A1HW475M	J	4.7 50V EL.	AB	R412	VRS-CY1JF391J	J	390 1/16W M-Ox.	AA
C3006	VCEA0A1HW106M	J	10 50V EL.	AB	R413	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
C3007	VCEA0A1HW475M	J	4.7 50V EL.	AB	R414	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
C3008	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA	R426	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
C3009	VCEA0A1CW227M	J	220 16V EL.	AC	R427	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
C3010	VCEA0A1HW475M	J	4.7 50V EL.	AB	R431	VRS-CY1JF272J	J	2.7k 1/16W M-Ox.	AA
C3011	VCEA0A1HW475M	J	4.7 50V EL.	AB	R432	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA
C3012	VCEA0A1HW475M	J	4.7 50V EL.	AB	▲ R451	VRS-RG2HC103J	J	10k 1/2W M-Ox.	AA
C3013	VCKYCY1HB272K	J	2700p 50V Ceramic	AA	R453	VRD-RA2BE152J	J	1.5k 1/8W Carbon	AA
C3014	VCKYCY1CB473K	J	0.047 16V Ceramic	AA	R454	VRD-RM2HD184J	J	180k 1/2W Carbon	AA
C3015	VCEACA1HC335K	X	3.3 50V EL.	AF	R455	VRD-RA2BE392J	J	3.9k 1/8W Carbon	AA
C3016	VCEA0A1HW475M	J	4.7 50V EL.	AB	R456	VRS-CY1JF103J	J	10k 1/16W M-Ox.	AA
C3017	VCEACA1CC106K	J	10 16V EL.	AC	R457	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
C3018	VCEA0A1HW105M	J	1.0 50V EL.	AB	R458	VRD-RA2EE564J	J	560k 1/4W Carbon	AA
C3374	VCEA0A1HW225M	J	2.2 50V EL.	AB	R461	VRS-CY1JF274J	J	270k 1/16W M-Ox.	AA
C3375	VCEA0A1HW225M	J	2.2 50V EL.	AB	R462	VRS-CY1JF563J	J	56k 1/16W M-Ox.	AA
C3376	VCKYCY1HB332K	J	3300p 50V Ceramic	AA	R491	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
C3501	VCEA0A1HW106M	J	10 50V EL.	AB	R492	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
C3502	VCEA0A1HW475M	J	4.7 50V EL.	AB	R493	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
C3503	VCEA0A1HW475M	J	4.7 50V EL.	AB	R494	VRS-CY1JF472J	J	4.7k 1/16W M-Ox.	AA
RESISTORS									
[M-Ox... Metal Oxide, M-Film... Metal Film]									
RJ1	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R516	VRS-CY1JF333J	J	33k 1/16W M-Ox.	AA
RJ2	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R517	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
RJ3	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R518	VRS-CY1JF333J	J	33k 1/16W M-Ox.	AA
RJ4	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R519	VRS-CY1JF103J	J	10k 1/16W M-Ox.	AA
RJ5	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R520	VRN-RL3AB1R0J+	X	1.0 1W M-Film	AE
RJ6	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R522	VRS-CY1JF122J	J	1.2k 1/16W M-Ox.	AA
RJ10	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R523	VRS-CY1JF392J	J	3.9k 1/16W M-Ox.	AA
RJ11	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R525	VRS-CY1JF272J	J	2.7k 1/16W M-Ox.	AA
RJ14	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R527	VRS-CY1JF472J	J	4.7k 1/16W M-Ox.	AA
RJ15	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	▲ R604	VRS-RG3LB472J+	X	4.7k 3W M-Ox.	AF
RJ16	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	R605	VRD-RA2BE121J	J	120 1/8W Carbon	AA
▲ R53	VRS-RG3LB223J+	X	22k 3.0W M-Ox.	AE	R606	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
R54	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA	▲ R607	VRS-RG3LB472J+	X	4.7k 3W M-Ox.	AF
R55	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA	▲ R609	VRS-RG3AB562J+	X	5.6k 1W M-Ox.	AE
R56	VRS-CY1JF823J	J	82k 1/16W M-Ox.	AA	R610	VRD-RM2HD220J	J	22 1/2W Carbon	AA
R57	VRD-RA2BE563J	J	56k 1/8W Carbon	AA	R611	VRS-KA3NG3R3K	J	3.3 7W M-Ox.	AD
R58	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	▲ R620	VRN-RL3ABR33J+	X	0.33 1W M-Film	AE
R59	VRS-CY1JF1R0J	J	1.0 1/16W M-Ox.	AA	R622	VRD-RA2BE222J	J	2.2k 1/8W Carbon	AA
R101	VRS-CY1JF152J	J	1.5k 1/16W M-Ox.	AA	R623	VRS-CY1JF103J	J	10k 1/16W M-Ox.	AA
R102	VRS-CY1JF100J	J	10 1/16W M-Ox.	AA	R624	VRN-RA2BK472F	J	4.7k 1/8W M-Film	AA
R201	VRS-CY1JF151J	J	150 1/16W M-Ox.	AA	▲ R626	VRN-RL3AB2R7J+	X	2.7 1W M-Film	AE
R202	VRS-CY1JF122J	J	1.2k 1/16W M-Ox.	AA	R634	VRD-RM2HD121J	J	120 1/2W Carbon	AA
R203	VRS-CY1JF682J	J	6.8k 1/16W M-Ox.	AA	R635	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R204	VRS-CY1JF270J	J	27 1/16W M-Ox.	AA	R636	VRD-RA2EE221J	J	220 1/4W Carbon	AA
R205	VRS-CY1JF331J	J	330 1/16W M-Ox.	AA	▲ R641	VRS-RG3AB682J+	X	6.8k 1W M-Ox.	AE
R206	VRD-RA2EE151J	J	150 1/4W Carbon	AA	▲ ▲ R651	VRS-RG2HC270J+	X	27 1/2W M-Ox.	AE
R207	VRS-CY1JF123J	J	12k 1/16W M-Ox.	AA	▲ ▲ R653	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
R209	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA	▲ ▲ R654	VRS-CY1JF154J	J	150k 1/16W M-Ox.	AA
R210	VRS-CY1JF104J	J	100k 1/16W M-Ox.	AA	▲ ▲ R655	VRS-CY1JF103J	J	10k 1/16W M-Ox.	AA
					▲ ▲ R656	VRS-CY1JF273J	J	27k 1/16W M-Ox.	AA

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code		
PWB-A: DUNTKA462WEV1 MAIN UNIT (Continued)											
R657	VRS-CY1JF273J	J 27k	1/16W	M-Ox.	AA	R2041	VRD-RA2BE333J	J 33k	1/8W	Carbon	AA
R658	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA	R2042	VRS-CY1JF101J	J 100	1/16W	M-Ox.	AA
R659	VRD-RA2BE332J	J 3.3k	1/8W	Carbon	AA	R2043	VRD-RA2BE101J	J 100	1/8W	Carbon	AB
▲ R661	VRN-RL3ABR47J+	X 0.47	1W	M-Film	AE	R2044	VRS-CY1JF683J	J 68k	1/16W	M-Ox.	AA
▲ R701	RR-DZ0049CEZZ	J 3.9M	1/2W	Solid	AB	R2045	VRD-RA2BE101J	J 100	1/8W	Carbon	AB
or RR-HZ0048CEZZ											
▲ R703	VRW-KQ3NC1R2K	J 1.2	7W	Cement	AE	R2047	VRS-CY1JF221J	J 220	1/16W	M-Ox.	AA
▲ R705	VRN-RL3ABR33J+	X 0.33	1W	M-Film	AE	R2048	VRS-CY1JF562J	J 5.6k	1/16W	M-Ox.	AA
▲ R706	VRN-RL3ABR22J+	X 0.22	1W	M-Film	AE	R2049	VRD-RA2BE333J	J 33k	1/8W	Carbon	AA
R707	VRD-RM2HD270J	J 27	1/2W	Carbon	AA	R2050	VRS-CY1JF221J	J 220	1/16W	M-Ox.	AA
R708	VRS-CY1JF102J	J 1.0k	1/16W	M-Ox.	AA	R2051	VRS-CY1JF562J	J 5.6k	1/16W	M-Ox.	AA
R710	VRS-RG2HC103J	J 10k	1/2W	M-Ox.	AA	R2052	VRS-CY1JF183J	J 18k	1/16W	M-Ox.	AA
R711	VRS-RA2BE334J	J 330k	1/8W	Carbon	AA	R2053	VRS-CY1JF222J	J 2.2k	1/16W	M-Ox.	AA
R712	VRD-RA2BE100J	J 10	1/8W	Carbon	AA	R2054	VRD-RA2BE391J	J 390	1/8W	Carbon	AA
R713	VRS-RG2HC122J+	X 1.2k	1/2W	M-Ox.	AE	R2055	VRS-CY1JF000J	J 0	1/16W	M-Ox.	AA
R715	VRD-RA2BE150J	J 15	1/8W	Carbon	AA	R2056	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R716	VRS-RG3AB121J+	X 120	1W	M-Ox.	AE	R2057	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R717	VRD-RA2EE102J	J 1.0k	1/4W	Carbon	AA	R2058	VRS-CY1JF473J	J 47k	1/16W	M-Ox.	AA
R721	VRD-RM2HD104J	J 100k	1/2W	Carbon	AA	R2059	VRS-CY1JF332J	J 3.3k	1/16W	M-Ox.	AA
R725	VRS-RG2HC821J+	X 820	1/2W	M-Ox.	AE	R2060	VRS-CY1JF222J	J 2.2k	1/16W	M-Ox.	AA
R729	VRS-CY1JF000J	J 0	1/16W	M-Ox.	AA	R2061	VRS-CY1JF682J	J 6.8k	1/16W	M-Ox.	AA
R733	VRD-RA2EE394J	J 390k	1/4W	Carbon	AA	R2062	VRS-CY1JF223J	J 22k	1/16W	M-Ox.	AA
R735	VRS-CY1JF332J	J 3.3k	1/16W	M-Ox.	AA	R2063	VRS-CY1JF273J	J 27k	1/16W	M-Ox.	AA
R736	VRD-RM2HD184J	J 180k	1/2W	Carbon	AA	R2064	VRS-CY1JF101J	J 100	1/16W	M-Ox.	AA
R737	VRN-RL3ABR39J	X 0.39	1W	M-Film	AE	R2065	VRS-CY1JF101J	J 100	1/16W	M-Ox.	AA
R739	VRD-RM2HD332J	J 3.3k	1/2W	Carbon	AA	R2066	VRS-CY1JF101J	J 100	1/16W	M-Ox.	AA
R740	VRD-RM2HD470J	J 47	1/2W	Carbon	AA	R2067	VRS-CY1JF101J	J 10k	1/16W	M-Ox.	AA
R741	VRN-RA2BK682F	J 6.8k	1/8W	M-Film	AA	R2068	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R742	VRS-CY1JF000J	J 0	1/16W	M-Ox.	AA	R2069	VRD-RA2BE102J	J 1.0k	1/8W	Carbon	AA
R744	VRN-RL2HCR68J+	X 0.68	1/2W	M-Film	AE	R2070	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R752	VRD-RA2BE562J	J 5.6k	1/8W	Carbon	AA	R2071	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
▲ R758	VRS-RG2HC100J+	X 10	1/2W	M-Ox.	AE	R2072	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
▲ R773	VRS-RG3LB270J+	X 27	3W	M-Ox.	AE	R2073	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
▲ R774	VRS-RG3LB680J+	X 68	3W	M-Ox.	AE	R2074	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R801	VRD-RM2HD470J	J 47	1/2W	Carbon	AA	R2075	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R807	VRS-CY1JF332J	J 3.3k	1/16W	M-Ox.	AA	R2076	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R808	VRS-CY1JF272J	J 2.7k	1/16W	M-Ox.	AA	R2077	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R809	VRS-CY1JF223J	J 22k	1/16W	M-Ox.	AA	R2078	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R810	VRS-CY1JF223J	J 22k	1/16W	M-Ox.	AA	R2079	VRS-CY1JF272J	J 2.7k	1/16W	M-Ox.	AA
R925	VRS-CY1JF102J	J 1.0k	1/16W	M-Ox.	AA	R2080	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R926	VRS-CY1JF104J	J 100k	1/16W	M-Ox.	AA	R2081	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R961	VRD-RA2BE101J	J 100	1/8W	Carbon	AB	R2082	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R962	VRD-RA2BE101J	J 100	1/8W	Carbon	AB	R2083	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R1401	VRS-CY1JF101J	J 100	1/16W	M-Ox.	AA	R2084	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R1402	VRS-CY1JF750J	J 75	1/16W	M-Ox.	AA	R2085	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R1403	VRS-CY1JF102J	J 1.0k	1/16W	M-Ox.	AA	R2086	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R1404	VRS-CY1JF104J	J 100k	1/16W	M-Ox.	AA	R2087	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R1410	VRS-CY1JF000J	J 0	1/16W	M-Ox.	AA	R2088	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2001	VRS-CY1JF102J	J 1.0k	1/16W	M-Ox.	AA	R2089	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2002	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA	R2090	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2006	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA	R2091	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2008	VRS-CY1JF472J	J 4.7k	1/16W	M-Ox.	AA	R2092	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2009	VRD-RA2BE102J	J 1.0k	1/8W	Carbon	AA	R2093	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2010	VRD-RA2BE102J	J 1.0k	1/8W	Carbon	AA	R2094	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2011	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA	R2095	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2016	VRD-RA2BE223J	J 22k	1/8W	Carbon	AA	R2096	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2018	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA	R2097	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2020	VRS-CY1JF223J	J 22k	1/16W	M-Ox.	AA	R2098	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2022	VRS-CY1JF333J	J 33k	1/16W	M-Ox.	AA	R2099	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2023	VRS-CY1JF223J	J 22k	1/16W	M-Ox.	AA	R2100	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2024	VRD-RA2BE682J	J 6.8k	1/8W	Carbon	AA	R2101	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2025	VRD-RA2BE682J	J 6.8k	1/8W	Carbon	AA	R2102	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2026	VRD-RA2BE682J	J 6.8k	1/8W	Carbon	AA	R2103	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2027	VRD-RA2BE682J	J 6.8k	1/8W	Carbon	AA	R2104	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2028	VRD-RA2BE102J	J 1.0k	1/8W	Carbon	AA	R2105	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2029	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA	R2106	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2032	VRD-RA2BE471J	J 470	1/8W	Carbon	AA	R2107	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2033	VRD-RA2BE684J	J 680k	1/8W	Carbon	AA	R2108	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2034	VRS-CY1JF684J	J 680k	1/16W	M-Ox.	AA	R2109	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA
R2040	VRD-RA2BE102J	J 1.0k	1/8W	Carbon	AA	R2110	VRS-CY1JF103J	J 10k	1/16W	M-Ox.	AA

SWITCHES

S2501	QSW-K0202PEZZ	R Power	AC
	or	QSW-K0079GEZZ	
S2502	QSW-K0202PEZZ	R VOL-Down	AC
	or	QSW-K0079GEZZ	

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code										
PWB-A: DUNTKA462WEV1																			
MAIN UNIT (Continued)																			
S2503	QSW-K0202PEZZ	R	VOL-Up or QSW-K0079GEZZ	AC	Q851	VS2SC3198-Y-1	J	2SC3198-Y	AA										
S2504	QSW-K0202PEZZ	R	CH-Down or QSW-K0079GEZZ	AC	Q852	VS2SC3789//2E	J	2SC3789	AF										
S2505	QSW-K0202PEZZ	R	CH-Up or QSW-K0079GEZZ	AC	Q853	VS2SC3198-Y-1	J	2SC3198-Y	AA										
S2506	QSW-K0202PEZZ	R	Menu or QSW-K0079GEZZ	AC	Q854	VS2SC3789//2E	J	2SC3789	AF										
MISCELLANEOUS PARTS																			
△ F701	QFS-B4023CEZZ	J	Fuse 4A/125V or QFS-B4021GEZZ	AC	Q855	VS2SC3198-Y-1	J	2SC3198-Y	AA										
FB601	RBLN-0047CEZZ	J	Ferrite Bead	AB	Q856	VS2SC3789//2E	J	2SC3789	AF										
FB2002RBLN-0037CEZZ	J	Ferrite Bead	AB	Q881	VS2SC3619LB1E or VS2SC3619LB	J	2SA1266-Y	AA											
FH701	QFSHD1013CEZZ	J	Fuse Holder	AC	TRANSISTORS														
FH702	QFSHD1014CEZZ	J	Fuse Holder	AC	D881	VHD1SS119//1	J	Diode	AB										
J1401	QJAKG0074CEZZ	J	Jack, Video/Audio-in-2 (Front)	AF	D882	VHD1SS119//1	J	Diode	AB										
J1701	QTANJ0340CEZZ	X	Terminal, Video/Audio-in-1 (Rear)	AG	D884	VHD1SS119//1	J	Diode	AB										
P303	QPLGN0461CEZZ	J	Plug, 4-pin(S)	AB	L851	VP-MK820K0000	J	Peaking 82μH	AB										
P401	QPLGN0561CEZZ	J	Plug, 5-pin(GBN)	AB	DIODES														
P601	QPLGN0160FJZZ	J	Plug, 5-pin(K)	AD	D881	VHD1SS119//1	J	Diode	AB										
P651	QPLGN0361CEZZ	J	Plug, 3-pin(TP651-3)	AB	D882	VHD1SS119//1	J	Diode	AB										
P701	QPLGN0260CEZZ	J	Plug, 2-pin(M)	AC	D884	VHD1SS119//1	J	Diode	AB										
P751	QPLGN0461CEZZ	J	Plug, 4-pin(YBN)	AB	COIL														
P2001	QPLGN0561CEZZ	J	Plug, 5-pin(TP2001-5)	AB	C851	VCCSPA1HL391J	J	390p 50V	Ceramic	AA									
RMC2601	RRMCU0222CEZZ	J	R/C Receiver	AL	C852	VCCSPA1HL331J	J	330p 50V	Ceramic	AA									
or										C853	VCCSPA1HL391J	J	390p 50V	Ceramic	AA				
RRMCU0227CEZZ										C854	RC-KZ0024CEZZ	J	0.001 2kV	Ceramic	AC				
or										CAPACITORS									
RRMCU0235CEZZ										<i>[EL... Electrolytic]</i>									
*I										C883	VCEA0A1HW106M	J	10 50V	EL.	AB				
COMBI-NATION										RESISTORS									
R2602										R851	VRD-RA2BE470J	J	47 1/8W	Carbon	AA				
R2603										R852	VRD-RA2BE181J	J	180 1/8W	Carbon	AA				
R2604										R853	VRD-RA2BE121J	J	120 1/8W	Carbon	AA				
R2605										R855	VRD-RA2BE471J	J	470 1/8W	Carbon	AA				
R2606										R856	VRD-RA2BE221J	J	220 1/8W	Carbon	AA				
R2607										△ R857	VRS-VV3LB123J	J	12k 3W	M-Ox.	AB				
R2601										R858	VRD-RM2HD222J	J	2.2k 1/2W	Carbon	AA				
C2601										R859	VRD-RA2BE470J	J	47 1/8W	Carbon	AA				
RDA501										R860	VRD-RA2BE181J	J	180 1/8W	Carbon	AA				
RDA604										R861	VRD-RA2BE121J	J	120 1/8W	Carbon	AA				
RDA701										R863	VRD-RA2BE471J	J	470 1/8W	Carbon	AA				
TLABN0101GJZZ										R864	VRD-RA2BE221J	J	220 1/8W	Carbon	AA				
LX-BZ3049GEFD										△ R865	VRS-VV3LB123J	J	12k 3W	M-Ox.	AB				
LX-BZ3100CEFD										R866	VRD-RM2HD222J	J	2.2k 1/2W	Carbon	AA				
LX-TZ3004CEFD										R867	VRD-RA2BE470J	J	47 1/8W	Carbon	AA				
RDA501										R868	VRD-RA2BE181J	J	180 1/8W	Carbon	AA				
RDA604										R869	VRD-RA2BE121J	J	120 1/8W	Carbon	AA				
RDA701										R871	VRD-RA2BE471J	J	470 1/8W	Carbon	AA				
LX-BZ3049GEFD										R872	VRD-RA2BE221J	J	220 1/8W	Carbon	AA				
LX-BZ3100CEFD										△ R873	VRS-VV3LB123J	J	12k 3W	M-Ox.	AB				
LX-TZ3004CEFD										R874	VRD-RM2HD222J	J	2.2k 1/2W	Carbon	AA				
RDA501										R881	VRD-RA2BE102J	J	1.0k 1/8W	Carbon	AA				
RDA604										R882	VRD-RA2BE331J	J	330 1/8W	Carbon	AA				
RDA701										R883	VRD-RA2BE561J	J	560 1/8W	Carbon	AA				
LX-BZ3049GEFD										R884	VRD-RA2BE152J	J	1.5k 1/8W	Carbon	AA				
LX-BZ3100CEFD										R895	VRD-RA2BE470J	J	47 1/8W	Carbon	AA				
LX-TZ3004CEFD										MISCELLANEOUS PARTS									
P851										P851	QPLGN0541CEZZ	J	Plug, 5-pin (GBN)	AB					
P852										P852	QPLGN0441CEZZ	J	Plug, 4-pin (YBN)	AB					
SC851										SC851	QSOCV0937CEZZ	J	CRT Socket	AL					

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
----------	----------	---	-------------	------	----------	----------	---	-------------	------

MISCELLANEOUS PARTS

▲ ACC701	QACCD3064CESA	J	AC Cord or QACCD3090CESA	AM
VSP0080PBQ4YA	X	Speaker x2, 32 ohm	AH	
QCNW-0134MEZZ	X	Connecting Cord	AF	
QCNW-0166MEZZ	X	Connecting Cord	AE	
QCNW-0167MEZZ	J	Connecting Cord	AE	

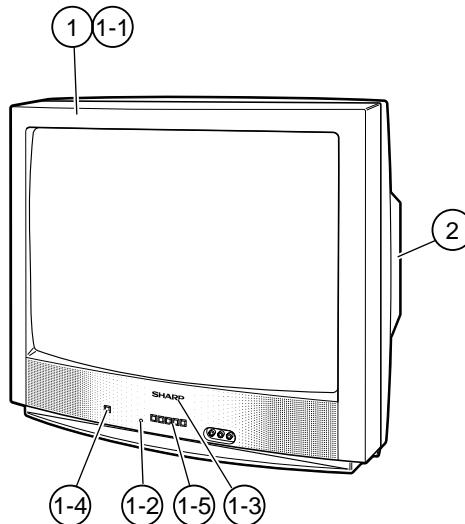
CABINET PARTS

1	CCABA0120WEH0	X	Front Cabinet Ass'y <i>Not Available</i>	BB
1-1		-	Front Cabinet	—
1-2	GCOVA0109GJKA	X	Cover for R/C	AF
1-3	HBDGB1008MESB	X	Badge, "SHARP"	AG
1-4	JBTN-0109GJKA	X	Button (Power)	AE
1-5	JBTN-0110GJKA	X	Button (Vol-up/down, CH-up/down)	AE
2	GCABB0114GJKA	X	Rear Cabinet	AZ

SUPPLIED ACCESSORIES

RRMCG1626CESA	X	Infrared R/C Unit	AV
TGAN-0001GJZZ	X	Guarantee Card	AB
TINS-7290GJZZ	X	Operation Manual	AG

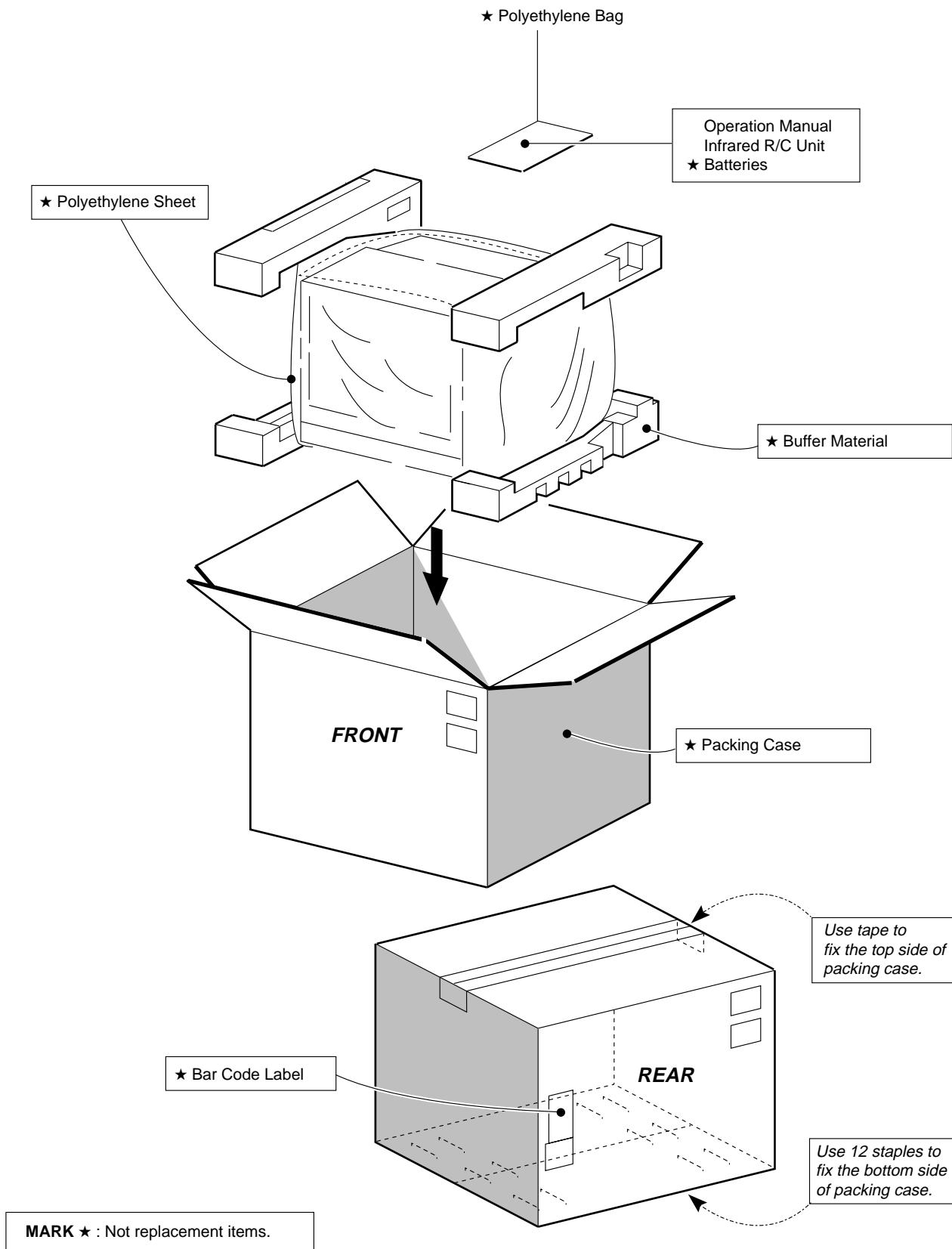
CABINET PARTS LOCATION



PACKING PARTS (NOT REPLACEMENT ITEM)

SPAKC0155GJZZ	—	Packing Case	—
SPAKP0108GJZZ	—	Wrapping Paper	—
SPAKX0122GJZZ	—	Buffer Material	—
SSAKA0101GJZZ	—	Polyethylene Bag	—

PACKING OF THE SET



SHARP

COPYRIGHT © 2001 BY SHARP CORPORATION

ALL RIGHTS RESERVED.

No part of this publication may be reproduced,
stored in a retrieval system, or transmitted in
any form or by any means, electronic, mechanical,
photocopying, recording, or otherwise, without
prior written permission of the publisher.