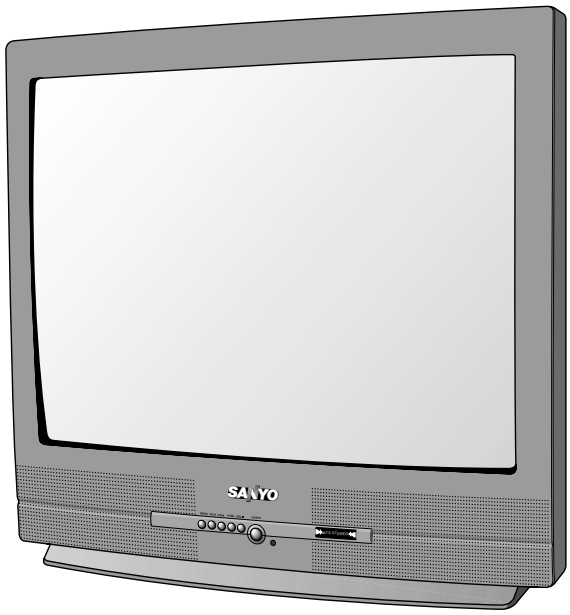
FILE NO.

SERVICE MANUAL

Remote Control Color Television

DS31520 (U.S.A.)

ORIGINAL VERSION



Chassis No. 31520-00

NOTE: Match the Chassis No. on the unit's back cover with the Chassis No. in the Service Manual.

If the Original Version Service Manual Chassis No. does not match the unit's, additional Service Literature is required. You **must** refer to "Notices" to the Original Service Manual prior to servicing the unit.

Contents

Specifications

Power Rating 120V, 60Hz
89W (Avg), 2.5A (Max)
Antenna Input Impedance 75Ω
UHF/VHF/CATV
Receiving Channel . . . . . 2 - 13 (VHF),
14 - 69 (UHF),
01, 14-94, 95-125 (CATV)
Remote Ready . . . . . 37 Key Remote Control
Sound Output . . . . . 1.0 W/CH
Intermediate Frequency
Picture IF Carrier 45.75MHz
Sound IF Carrier 41.25MHz
Color Sub Carrier 42.17MHz
Picture Tube M78JUA361X72
Semiconductors
Integrated Circuits 10
Transistors 22
Except within Tuner and RC Pre-Amp.
Cabinet Dimensions
Width . . . . . 754 mm
Height . . . . . 732 mm
Depth . . . . . 538 mm

SAFETY INSTRUCTIONS

SAFETY PRECAUTIONS

WARNING: The chassis of this receiver has a floating ground with the potential of one half the AC line voltage in respect to earth ground. Service should not be attempted by anyone not familiar with the precautions necessary when working on this type of equipment.

The following precautions must be observed:

1. An isolation transformer must be connected in the power line between the receiver and the AC line before any service is performed on the receiver.

2. Comply with all caution and safety-related notes provided on the side of the cabinet, inside the cabinet, on the chassis, and the picture tube.

3. When replacing a chassis in the cabinet, always be certain that all the protective devices are installed properly, such as control knobs, adjustment covers, shields and barriers.

   DO NOT OPERATE THIS TELEVISION RECEIVER WITHOUT THE PROTECTIVE SHIELD IN POSITION AND PROPERLY SECURED.

4. Before replacing the back cover of the set, thoroughly inspect the inside of the cabinet to see that no stray parts or tools have been left inside.
   Before returning any television to the customer, the service technician must perform the following safety checks to be sure that the unit is completely safe to operate without danger of electrical shock.

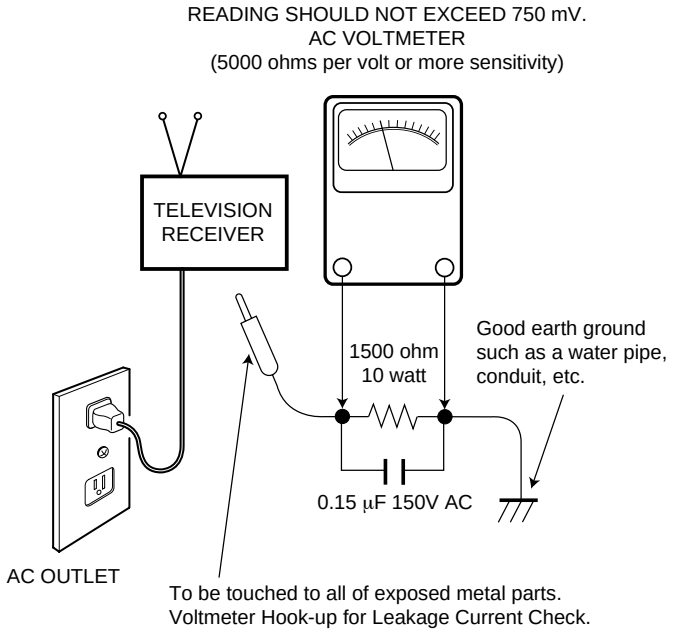
ANTENNA COLD CHECK

Remove AC plug from the 120 VAC outlet and place a jumper across the two blades. Connect one lead of an ohmmeter to the jumpered AC plug, and touch the other lead to each exposed antenna terminal (UHF and VHF antenna terminals). The resistance must measure between 1M ohm and 5.2M ohm. Any resistance value below or above this range indicates an abnormality which requires corrective action.

LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120 VAC outlet. (Do not use an isolation transformer for this check.) Use an AC voltmeter, that has 5000 ohms per volt or more sensitivity. Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 µF 150 VAC capacitor, between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of the cabinet (antennas, handle bracket, metal cabinet, screw heads, metal overlays, control shafts, etc.). Measure the AC voltage across the 1500 ohm resistor. The AC voltage should not exceed 750 mV. A reading exceeding 750 mV indicates that a dangerous potential exists. The fault must be located and corrected. Repeat the above test with the receiver power plug reversed.

NEVER RETURN A RECEIVER TO THE CUSTOMER WITHOUT TAKING THE NECESSARY CORRECTIVE ACTION.



X-RADIATION PRECAUTION

The primary source of X-RADIATION in solid-state receivers is the picture tube. The picture tube is specially constructed to limit X-Ray emission. For continued X-RADIATION protection, the replacement tube must be the same type as the original (including the suffix letter in the part numbers). Excessive high voltage may produce potentially hazardous X-RADIATION. To avoid such hazards, the high voltage must be maintained within specific limits. Refer to the X-RADIATION WARNING NOTE on the CHASSIS SCHEMATIC in this service manual for specific high voltage limits. If the high voltage exceeds specified limits, check the components specified on the chassis schematic diagram and take the necessary corrective action. Carefully follow the instructions for the +B Voltage Check and the High Voltage Check to maintain the high voltage within the specified limits.

HIGH VOLTAGE HOLD-DOWN TEST

To prevent X-RADIATION from the picture tube due to excessive high voltage, a HOLD-DOWN circuit is provided in the high voltage circuit. Every time the receiver is serviced, the high voltage HOLD-DOWN circuit must be tested for proper operation. Refer to the HIGH VOLTAGE HOLD-DOWN TEST in service adjustments.

PRODUCT SAFETY NOTICE

When replacing components in a receiver, always keep in mind the necessary product safety precautions. Pay special attention to the replacement of components marked with a star (★) in the parts list and in the schematic diagrams. To ensure safe product operation, it is necessary to replace those components with the exact same PARTS.

SERVICE ADJUSTMENTS

GENERAL

This set has an On-screen Service Menu system included in the CPU that allows remote operation for most of the service adjustments.

IC802 (EEPROM) REPLACEMENT

When IC802 (EEPROM) is replaced, IC801 (CPU) will automatically write the initial reference data into IC802 for basic TV operation. However, the bus data should be checked and some bus data should be set up before attempting the service adjustments. (See pages 4 – 6 for detailed information.)

INITIAL BUS DATA SETUP

Note: When IC802 (EEPROM) is replaced, the Service Menu NO. 03 HP (H Phase), NO. 05 VPO (V Position), NO. 07 VLN (V Lin), NO. 23 POS (Preshoot Overshoot Switch), NO. 28 PRE (Preshoot Adj), NO. 29 WP (White Peak Limiter), NO. 32 BSG (Black Str Gain), NO. 34 DCR (DC Reset), NO. 37 AF (Auto Flesh), NO. 41 RYA (R-Y/B-Y Angle), NO 48 EWA (E/W Amp), NO. 49 EWT (E/W Tilt), NO. 50 EWP (E/W Corner Top), NO. 51 EWB (E/W Corner Bottom), NO. 52 HSC (Horz Size Comp), NO. 55 STI (Sub Tint), NO. 57 OPT (SA Option), and NO. 58 OP2 (SA Option 2) should be set up for proper TV operation before attempting the service adjustments.

1. Disconnect the AC power cord (AC 120V line).
2. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
3. Select NO. 03 HP (H Phase) with ▲ or ▼ key. Adjust the data with + or – key for 13.
4. Select NO. 05 VPO (V Position) with ▲ or ▼ key. Adjust the data with + or – key for 20.
5. Select NO. 07 VLN (V Lin) with ▲ or ▼ key. Adjust the data with + or – key for 20.
6. Select NO. 23 POS (Pre/Over Switch) with ▲ or ▼ key. Adjust the data with + or – key for 1.
7. Select NO. 28 PRE (Preshoot Adj) with ▲ or ▼ key. Adjust the data with + or – key for 3.
8. Select NO. 29 WP (White Peak Limiter) with ▲ or ▼ key. Adjust the data with + or – key for 1.
9. Select NO. 32 BSG (Black Str Gain) with ▲ or ▼ key. Adjust the data with + or – key for 2.
10. Select NO. 34 DCR (DC Reset) with ▲ or ▼ key. Adjust the data with + or – key for 1.
11. Select NO. 37 AF (Auto Flesh) with ▲ or ▼ key. Adjust the data with + or – key for 1.
12. Select NO. 41 RYA (R-Y/B-Y Angle) with ▲ or ▼ key. Adjust the data with + or – key for 2.
13. Select NO. 48 EWA (EW Amp) with ▲ or ▼ key. Adjust the data with + or – key for 26.
14. Select NO. 49 EWT (EW Tilt) with ▲ or ▼ key. Adjust the data with + or – key for 33.
15. Select NO. 50 EWP (EW Corner Top) with ▲ or ▼ key. Adjust the data with + or – key for 9.
16. Select NO. 51 EWB (EW Corner Bottom) with ▲ or ▼ key. Adjust the data with + or – key for 10.
17. Select NO. 52 HSC (Horz Size Comp) with ▲ or ▼ key. Adjust data with + or – key for 5.
18. Select NO. 55 STI (Sub Tint) with ▲ or ▼ key. Adjust the data with + or – key for 14.
19. Select NO. 57 OPT (SA Option) with ▲ or ▼ key. Adjust the data with + or – key for 16.
20. Select NO. 58 OP2 (SA Option 2) with ▲ or ▼ key. Adjust the data with + or – key for 66.
21. Press the MENU key to turn off the Service Menu display.

ON-SCREEN SERVICE MENU SYSTEM

1. Enter the Service Menu:

- While pressing the MENU key, reconnect the AC power cord. The Service Menu Display will now appear. (See Figure 1.)

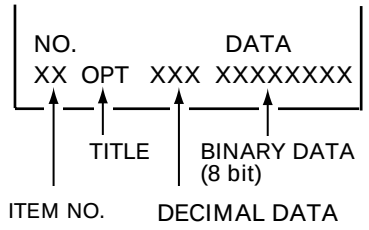


Figure 1. Service Menu Display

2. Service Adjustments:

- Press the ▲ or ▼ key to select the desired service menu you want to adjust. (See page 4 for On-screen Service Menu.)
- Use the + or – key to adjust the data.

3. Exit from the Service Menu:

- Press the MENU key to turn off the Service Menu display.

Table 1. ON-SCREEN SERVICE MENU

When IC802 (EEPROM) is replaced, check the bus data to confirm they are the same as below. The shaded menu should be checked and be set up or readjusted according to the procedures described in the following pages. Initial Setup Data marked with an * should be changed from Initial Reference Data. (See page 3 for Initial Bus Data Setup.)

NO.	TITLE	INITIAL REFERENCE DATA	INITIAL SETUP DATA	RANGE OF DATA	FUNCTION
01	HFR	29	29	0~63	Horizontal Frequency
02	AFC	0	0	0, 1	AFC Gain & Gate
03	HP	11	13*	0~31	Horizontal Phase (Horizontal Centering)
04	VS	64	64	0~127	Vertical Size
05	VPO	32	20*	0~63	Vertical Position
06	VSP	0	0	0, 1	Vertical Set Up (Sync Sensitivity)
07	VLN	17	20*	0~31	Vertical Linearity
08	CRS	0	0	0~3	Cross B/W
09	GRY	1	1	0, 1	Gray Mode
10	VSC	10	10	0~31	Vertical S Correction
11	HBR	3	3	0~7	H BLK R
12	HBL	4	4	0~7	H BLK L
13	CDM	0	0	0, 1	C D Mode
14	VC	5	5	0~7	Vertical Compression
15	RB	0	0	0~255	Red Bias
16	GB	0	0	0~255	Green Bias
17	BB	0	0	0~255	Blue Bias
18	RD	64	64	0~127	Red Drive
19	GD	8	8	0~15	Green Drive
20	BD	64	64	0~127	Blue Drive
21	SBI	64	64	0~127	Sub Bias
22	OSD	2	2	0~3	OSD Contrast
23	POS	0	1*	0, 1	Pre/Over SW
24	FLS	2	2	0~7	Filter System
25	CKO	3	3	0~7	Color Killer Operation
26	GYA	0	0	0, 1	G-Y Angle
27	CRG	2	2	0~3	Coring Gain
28	PRE	1	3*	0~3	Pre Shoot Adjust
29	WP	0	1*	0, 1	White Peak Limiter
30	FSW	0	0	0, 1	FBP Blanking Switch
31	VBL	0	0	0, 1	Vertical Blanking Switch
32	BSG	1	2*	0~3	Black Str Gain
33	BSS	1	1	0~3	Black Str Start
34	DCR	0	1*	0~3	DC Reset
35	YGM	1	1	0~3	Y Gamma
36	CBP	0	0	0, 1	C Bypass
37	AF	0	1*	0, 1	Auto Flesh
38	BAT	4	4	0~7	Bright ABL Threshold
39	MSD	0	0	0, 1	Mid Stop Def
40	ABL	0	0	0, 1	Auto Bright Limit
41	RYA	4	2*	0~15	R-Y/B-Y Angle
42	RAD	20	20	0~63	RF AGC Delay
43	IAS	0	0	0, 1	IF AGC
44	FMM	0	0	0, 1	FM Mute
45	FL	15	15	0~31	FM Level

Table 1. ON-SCREEN SERVICE MENU (Continued)

When IC802 (EEPROM) is replaced, check the bus data to confirm they are the same as below. The shaded menu should be checked and be set up or readjusted according to the procedures described in the following pages. Initial Setup Data marked with an * should be changed from Initial Reference Data. (See page 3 for Initial Bus Data Setup.)

NO.	TITLE	INITIAL REFERENCE DATA	INITIAL SETUP DATA	RANGE OF DATA	FUNCTION
46	VL	4	4	0~7	Video Level
47	EWD	39	39	0~63	EW DC
48	EWA	30	26*	0~63	EW Amp
49	EWT	34	33*	0~63	EW Tilt
50	EWP	7	9*	0~7	EW Corner Top
51	EWB	8	10*		EW Corner Bottom
52	HSC	4	5*		Horz Size Comp
53	SB	32	32	0~63	Sub Bright
54	SCO	7	7	0~31	Sub Color
55	STI	20	14*	0~31	Sub Tint
56	SSH	12	12	0~31	Sub Sharpness
57	OPT	0	16*	0~255	Option (See Note 1 page 6.)
58	OP2	0	66*	0~255	Option 2 (See Note 2 page 6.)
59	HR	24	24	0~63	OSD Horizontal Position
60	ATT	10	10	0~63	Input Level
61	WDB	32	32	0~63	Wideband
62	SPC	32	32	0~63	Spectral
63	SBO	5	5	0~255	Sub Bright Offset
64	PCO	40	40	0~63	PIP Color
65	PTI	40	40	0~63	PIP Tint
66	PUV	24	24	0~63	PIP Top Position
67	PDV	147	147	0~255	PIP Bottom Position
68	PLH	10	10	0~63	PIP Left Position
69	PRH	101	101	0~255	PIP Right Position
70	PCN	42	42	0~63	PIP Y Level
71	PBS	15	15	0~63	PIP BGP Phase
72	DRV	64	64	0~127	Red Drive Adjustment (See Note 3 page 6.)
		64	64	0~127	Blue Drive Adjustment (See Note 3 page 6.)
73	–	0	0	0~255	Red Bias Adjustment (See Note 4 page 6.)
	–	0	0	0~255	Green Bias Adjustment (See Note 4 page 6.)
	–	0	0	0~255	Blue Bias Adjustment (See Note 4 page 6.)

SERVICE ADJUSTMENTS (Continued)

PROGRAM CODES

The microprossesor used in this model is a multi-purpose type and is used in several different models. To ensure proper operation and the correct features for your particular model, the Program Codes must be correct.

Note 1. Option Data 1 (NO. 57 OPT) should be decimal 16 (00010000 binary). See page 3 INITIAL DATA SETUP, step 19, for set up procedure. If this program code is wrong the TV will not operate properly.

BIT	FUNCTION	DATA	
		0	1
0 ~ 2	NOT USED	—	—
3	CLOCK	NONE	YES
4	COMB FILTER	NONE	YES
5	NOT USED	—	—
6, 7	SURROUND	00: NONE 01: YES 10: — 11: —	

Note 2. Option Data 2 (NO. 58 OP2) should be decimal 66 (01000010 binary). See page 3 INITIAL DATA SETUP, step 20, for set up procedure. If this program code is wrong the TV will not operate properly.

BIT	FUNCTION	DATA	
		0	1
0	SHIPPING CONDITION OF COLOR ENHANCER	NORMAL	COOL
1	COLOR ENHANCER	NONE	YES
2	INITIAL CH & XDS	NONE	YES
3	AUDIO OUT & SP MENU	NONE	YES
4	PIP	NONE	YES
5	AV INPUTS	1 SET	2 SETS
6	BASS & TREBLE / TONE	BASS & TR	TONE
7	NOT USED	—	—

DRIVE / BIAS ADJUSTMENTS

Note 3. Red/Blue Drive Adjustments in Service Menu NO. 72 DRV: Adjust Red and Blue Drive Levels alternately with 1, 3, 7, and 9 keys on the remote control. (See Figure 2.) The Drive Level adjustment data will be written in the Service Menu No. 18 and 20 automatically.

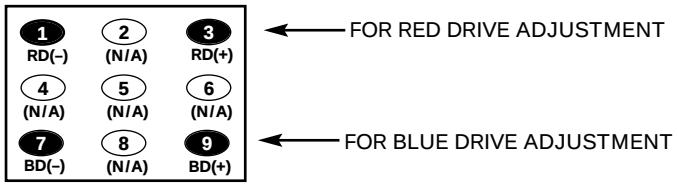


Figure 2.

Note 4. Red/Green/Blue Bias Adjustments in Service Menu NO. 73: Adjust each Bias Level with 1, 3, 4, 6, 7, or 9 key on the remote control. (See Figure 3.) The Bias Level adjustment data will be written in the Service Menu No. 15 ~ 17 automatically.

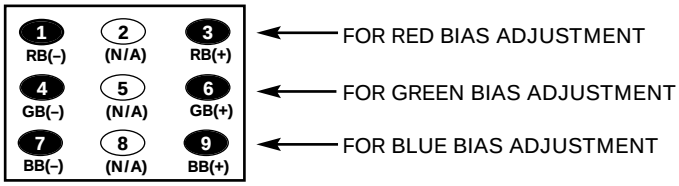


Figure 3.

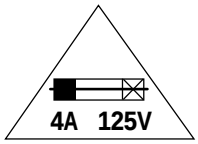
ANTENNA CONNECTIONS

This receiver is designed for UHF/VHF reception. A 75 ohm terminal is provided for UHF and VHF receptions. When connecting a CATV antenna system, connect the 75 ohm coaxial cable directly to the 75 ohm terminal. For 300 ohm VHF antenna, use an adapter (not included with the TV set).

CIRCUIT PROTECTION

Fuse F601 (4A) is included in the AC line. This fuse must be replaced with the proper fuse (see Parts List).

CAUTION



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

ATTENTION : POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.

+B VOLTAGE CHECK

Connect Voltmeter + lead to TJ1 130V and – lead to ground (TE7). Connect receiver to AC 120V line. Tune receiver to an active channel. Reset the picture controls to the FACTORY PRESET levels (press remote control RESET key twice). Voltage must measure between +128.0V and +132.0V. If the voltage is out of this range, the power circuit must be checked. No +B adjustment is provided on this chassis.

HORIZONTAL WIDTH ADJUSTMENT

1. Tune receiver to an active channel.
2. Check the picture for proper width. If width is not correct, perform steps 3 ~ 6.
3. Turn off the receiver and disconnect the AC power cord (120V AC line).
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 47 EWD (EW DC) with ▲ or ▼ key.
6. Adjust the data with + or – key for proper width.To turn off the Service Menu display, press the MENU key.

HORIZONTAL CENTERING ADJUSTMENT

1. Tune receiver to an active channel.
2. Check that picture is in the horizontal center of TV screen. If picture is not centered horizontally, perform steps 3 ~ 6.
3. Turn off the receiver and disconnect the AC power cord.
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 03 HP (Horizontal Phase) with ▲ or ▼ key.
6. Adjust the data with + or – key for horizontal center. To turn off the Service Menu display, press the MENU key.

VERTICAL SIZE ADJUSTMENT

1. Tune receiver to an active channel.
2. Check the vertical size of the picture. If the vertical size is too large or small, perform steps 3 ~ 6.
3. Turn off the receiver and disconnect the AC power cord.
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 04 VS (Vertical Size) with ▲ or ▼ key.
6. Adjust the data with + or – key for full scan. To turn off the Service Menu display, press the MENU key.

VERTICAL CENTERING ADJUSTMENT

1. Tune receiver to an active channel.
2. Check that picture is in the center of TV screen. If picture center is too low, change resistor R513 from 1K ohm 1/2W to 470 ohm 1W. If picture center is too high, remove resistor R513 (1K ohm, 1/2W).

VCO ADJUSTMENT

Note: VCO must be adjusted after IC101 (Signal Processor), IC802 (EEPROM) or T151 (VCO Coil) is replaced.

1. Tune receiver to an active channel.
2. Set the picture controls to the Sports level.
3. Connect digital voltmeter + lead to pin 58 of IC101 and – lead to ground (TE 7).
4. Confirm a reading of 3.6 ± 0.2 VDC.
5. If voltage is out of specifications adjust T151 for 3.6 ± 0.2 VDC.

RF AGC ADJUSTMENT

1. Tune receiver to strongest VHF station in your area.
2. Set contrast and brightness controls for maximum.
3. Turn off the receiver and disconnect the AC power cord (120V AC line).
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 42 RAD (RF AGC Delay) with ▲ or ▼ key.
6. Adjust the data with + or – key in the direction which causes snow to appear; then in the opposite direction until the snow just disappears.
7. To turn off the Service Menu display, press the MENU key.

VIDEO LEVEL

1. Connect color-bar generator to antenna terminals.
2. Turn off the receiver and disconnect the AC power cord (AC 120V line).
3. Connect oscilloscope to TP16 (Q202 emitter) and ground.
4. While pressing the Menu key, reconnect the AC power cord. The Service Menu will now appear.
5. Select NO. 46 VL (Video Level) with the ▲ or ▼ key.
6. Adjust the + or – key for an oscilloscope reading of 1.0 ± 0.1 VP-P at TP16. Press the MENU key to turn off the Service Menu display.

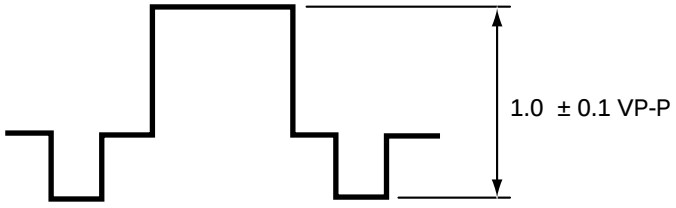


Figure 4.

SERVICE ADJUSTMENTS (Continued)

GRAYSCALE ADJUSTMENT

1. Set the picture controls to the Sports levels or Reset (use MENU key and ▲ or ▼ key or RESET key).
2. Turn off the receiver and disconnect the AC power cord (120V AC line).
3. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
4. Select NO. 15 RB (Red Bias), NO. 16 GB (Green Bias), and NO. 17 BB (Blue Bias) with ▲ or ▼ key and set each data to 0 with + or – key.
5. Select NO. 18 RD (Red Drive) and NO. 20 BD (Blue Drive) with ▲ or ▼ key and set each data to 64 with + or – key.
6. Set NO. 19 GD (Green Drive Reduction) data to 8, NO. 53 SB (Sub-Brightness) data to 32, NO. 54 SCO (Sub Color) data to 7, NO. 55 STI (Sub Tint) to 14, and NO. 56 SSH (Sub Sharpness) data to 12 with ▲ or ▼, and + or – keys.
7. Turn Screen Control (T402) to minimum (fully counter-clockwise).
8. Select the Service Menu NO. 73 (Bias Adjustments) with ▲ or ▼ key.
9. Advance Screen Control (T402) clockwise to obtain just visible one color line. If line does not appear, place this control to maximum (fully clockwise).
10. Raise each Bias Level with 3, 6, and 9 keys to obtain just visible white line. (See Figure 5.)

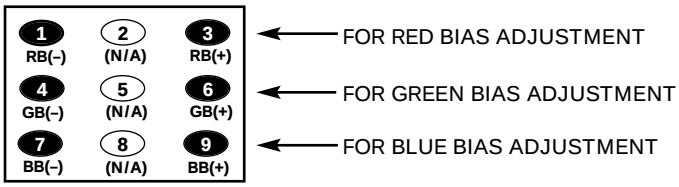


Figure 5. Remote Control Number keys' functions in Service Menu NO. 73

11. Select the Service Menu NO. 72 DRV (Drive Adjustments) with ▲ or ▼ key.
12. Adjust Red and Blue Drive Levels alternately with 1, 3, 7, or 9 key to produce normal black and white picture in highlight areas. (See Figure 6.)

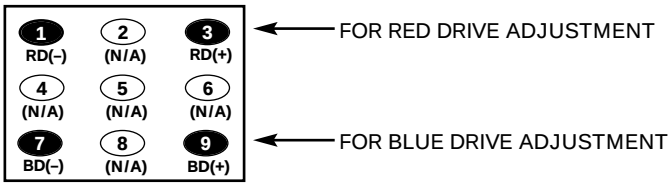


Figure 6. Remote Control Number keys' functions in Service Menu NO. 72 DRV

13. Check for proper grayscale at all brightness levels. To turn off the Service Menu display, press the MENU key.

Note: If Grayscale Adjustment is made after picture tube replacement, check Brightness Level Adjustment.

FOCUS ADJUSTMENT

Adjust focus control (T402) for well defined scanning lines.

BRIGHTNESS LEVEL ADJUSTMENT

Note: Grayscale, RF AGC, Video Level, and High Voltage Check must be adjusted before attempting Brightness Level Adjustment.

1. Connect a color-bar generator to the antenna terminals.
2. Switch the generator to the crosshatch pattern.
3. Reset the picture controls to the Sports levels.
4. Connect voltmeter (high impedance) + lead to terminal TP51 and – lead to terminal TP50 on main board. Set voltmeter for 1.5V ~ 3V range.
5. Turn off the receiver and disconnect the AC power cord.
6. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
7. Select NO. 53 SB (Sub Brightness) with ▲ or ▼ key.
8. Adjust the data with + or – key for 820mVDC.
9. Press the MENU key to turn off the Service Menu display.
10. Check brightness level on every active channel, readjust (repeat steps 5 ~ 9), if necessary.

Note: Do not set to excessive brightness level, otherwise the contrast level will be suppressed.

HIGH VOLTAGE HOLD-DOWN TEST

Every time the receiver is serviced, the HIGH VOLTAGE HOLD-DOWN circuit must be tested for proper operation by following these steps:

1. Connect receiver to 120V AC line. Tune receiver to active channel. Reset the picture controls to the Sports levels.
2. Check that the voltage measured between TP7 and TE7 (ground side) is within 16.5 VDC to 21 VDC. If the voltage is out of this range, the Hold-Down Circuit must be checked.
3. Connect a DC Voltage supply to TP7 and TE7 through a 100 ohm 1/4W resistor. Adjust the DC voltage to 23 VDC. The receiver should shutdown, losing raster and sound. Then the receiver should turn off automatically. This reaction indicates that the Hold-Down circuit is functioning properly. If the receiver does not shutdown, a malfunction is indicated and its cause **must** be found and corrected.
4. To obtain picture again, remove the DC Supply and wait a few minutes. Now turn on the receiver.

HIGH VOLTAGE CHECK

Note: +B (+130V) Voltage Check and Grayscale Adjustment must be completed before attempting High Voltage Check.

1. Connect high voltage voltmeter – lead to ground, and connect + lead to anode of picture tube.
2. Tune receiver to an active channel and confirm TV is operating properly.
3. Eliminate the beam current by adjusting the contrast and brightness controls to minimum.
4. Confirm high voltage is within 28.0 KV and 30.0 KV. If reading is not within range, check horizontal circuit.

No high voltage adjustment is provided on this chassis.

SOUND ADJUSTMENT

1. Connect a color-bar generator to the antenna terminals with audio signal of 1KHz at 100% modulation.
2. Set the picture controls to the Sports levels
3. Connect oscilloscope + lead to TP21 (pin 75 of IC101) and – lead to ground.
4. Turn off the receiver and disconnect the AC power cord (AC 120V line).
5. While pressing the Menu key, reconnect the AC power cord. The Service Menu will now appear.
6. Select NO. 45 FL (FM Level) with the ▲ or ▼ key.
7. Adjust the data with the + or – key for an oscilloscope reading of 0.693 ± 10% VP-P at TP21.
8. Press the MENU key to turn off the Service Menu display and disconnect the oscilloscope from the chassis.

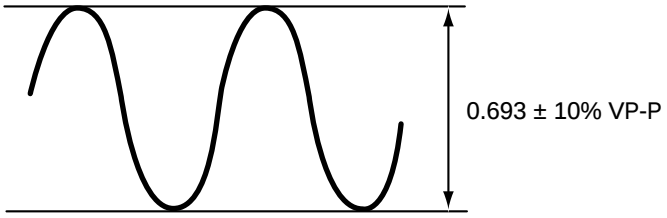


Figure 7.

MULTI-SOUND SECTION ADJUSTMENTS

Note: Multi-Sound Section must be adjusted after IC101 (Signal Processor), IC3401 (MTS Decoder), or IC802 (EEPROM) is replaced.

INPUT LEVEL ADJUSTMENT

1. Connect a signal to the antenna terminals with audio of 1 KHz 100% modulation.
2. Turn off the receiver and disconnect the AC power cord (AC 120V line).
3. Connect voltmeter (RMS) to TP317 and ground.
4. While pressing the Menu key, reconnect the AC power cord. The Service Menu will now appear.
5. Select NO. 60 ATT (Attenuation) with the ▲ or ▼ key.
6. Adjust the + or – key for a voltmeter reading of 400 ± 20 mVrms at TP317.

SEPARATION ADJUSTMENT

7. Turn off the receiver and disconnect the AC power cord (AC 120V line).
8. Connect oscilloscope CH1 to TP317 and CH2 to TP318 and ground.
9. Connect an MTS TV/Stereo generator to antenna terminal.
10. While pressing the Menu key, reconnect the AC power cord. The Service Menu will now appear.
11. Select pilot, 300Hz audio frequency and Left modulating signal.
12. Select NO. 61 WDB (Wideband) with the ▲ or ▼ key.
13. Adjust the + or – key for minimum low frequencies at TP317. (See Figure 8.)
14. Select 4 KHz audio frequency and Right modulating signal.
15. Select NO. 62 SPC (Spectral) with the ▲ or ▼ key.
16. Adjust the + or – key for minimum high frequencies at TP318. (See Figure 8.)

Repeat adjustments (steps 11–16) until no further decreases in amplitude can be obtained. Press the MENU key to turn off the Service Menu display.

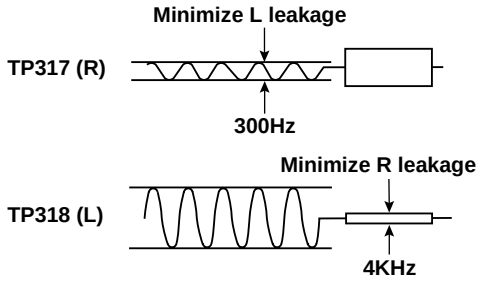


Figure 8. Separation Adjustments

PURITY AND CONVERGENCE ADJUSTMENTS

Purity and Convergence have been aligned at the factory. No re-alignment is necessary.

SERVICE HINTS

POWER FAILURE DETECTOR

This unit is equipped with a Power Failure Detector function included in the CPU which checks for an abnormal condition in the chassis power supplies, including the power supply derived from the Horizontal Output Transformer.

If, while the power is on, a failure is caused by any of the following that results in a low voltage supply, the CPU will turn the unit off in 1.5 seconds to prevent unnecessary damage:

- Failure within the power supply circuits.
- A short circuit in the load side from the supply.
- Stoppage of the Horizontal Output Oscillator caused by the X-Radiation protection Hold-Down Circuit.

If, while the power is off, the power is switched on and any of these failures remains uncorrected, the CPU will shut off the power within 3 seconds.

Check the following if the unit is turned off by the power failure detector.

1. Disconnect the AC power cord (120V AC line) for at least 10 seconds.
2. Connect a DC Voltmeter to the following TEST POINTS.

TJ4	**26V**
TJ6	**5V**
D429 Cathode	**5V**

3. Press the Power key and check for the proper voltage supplies.
4. If any of these voltages is low, the power failure detector should turn the unit off within 3 seconds.
5. Check all circuits listed above.

Note: This unit is equipped with a Power Surge Protection feature included in the CPU. If power failure occurs three times within 15 minutes, the CPU will automatically stop functioning to help prevent secondary damage. (TV will not turn on by pressing the power key.) To reset the operating programs within the CPU, disconnect the AC power cord for at least 10 seconds.

MECHANICAL DISASSEMBLIES

CABINET BACK REMOVAL

1. Refer to Figure 1, remove 10 screws.
2. Pull off cabinet back and remove.

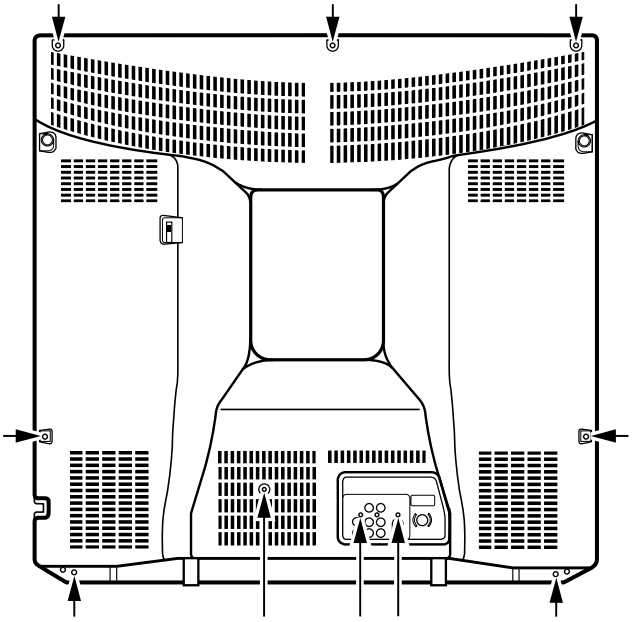


Figure 1. Cabinet Back Removal

CHASSIS REMOVAL

1. Remove cabinet back.
2. Discharge the picture tube anode (2nd anode lead) to the dag coating (picture tube grounding lead).
3. Disconnect degaussing coil socket (KD), picture tube socket, deflection yoke connector (KX), speakers connector (KSP), picture tube ground lead, and 2nd anode lead.
4. Remove chassis completely by sliding it straight back.

PICTURE TUBE REMOVAL

CAUTION: Do not disturb the deflection yoke or magnet assembly on the picture tube neck. Care must be taken to keep these assemblies intact, unless picture tube is being replaced. Discharge the picture tube to the coating before handling the tube.

1. Remove chassis, referring to Chassis Removal instructions.
2. Place cabinet's front face down on a soft surface.
3. Remove the screw on each corner of the picture tube and GENTLY lift the picture tube out of the cabinet.
4. Install a replacement picture tube in reverse order. Properly install the degaussing coil and picture tube grounding lead on the picture tube. See Figure 2.

Note: If Picture Tube is being replaced, mount the Degaussing Coil properly on the tube. See Figure 2.

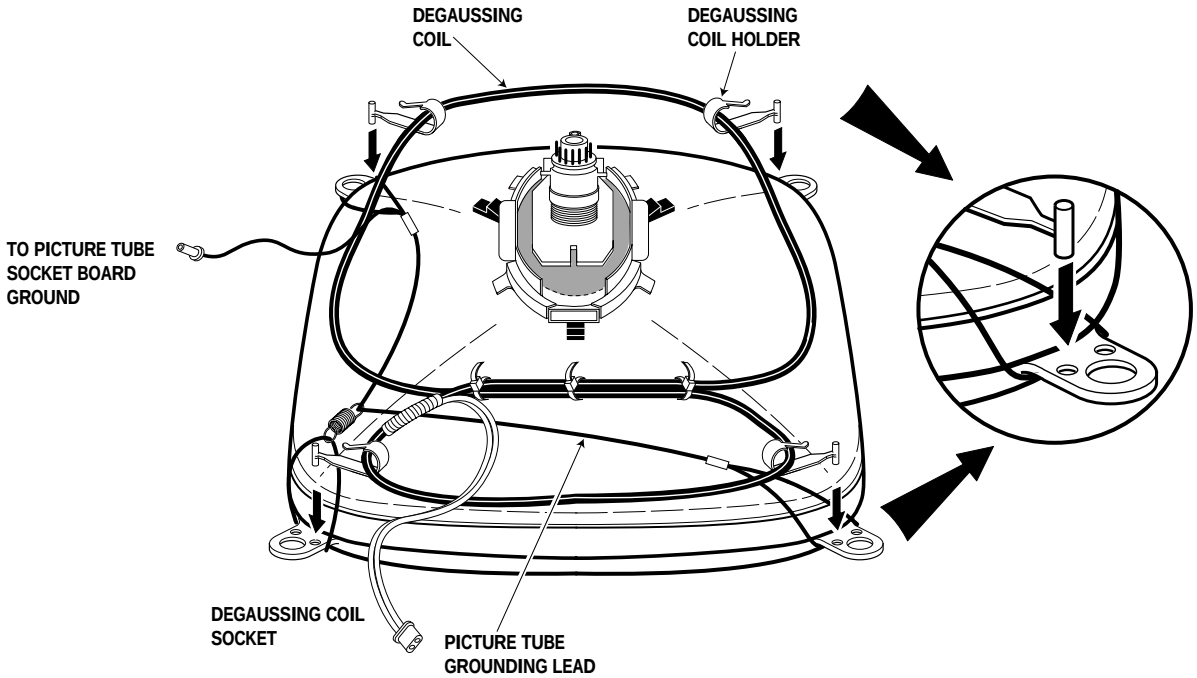


Figure 2. Picture Tube Removal

CHASSIS ELECTRICAL PARTS LIST

CAUTION: To Protect against electrical shock and for continued product safety, refer to SAFETY PRECAUTIONS, X-RADIATION PRECAUTIONS, HIGH VOLTAGE HOLD-DOWN TEST, and PRODUCT SAFETY NOTICE on Page 2.

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A REPLACEMENT IS MADE IN ANY AREA OF A RECEIVER. COMPONENTS INDICATED BY A STAR (★) IN THIS PARTS LIST AND THE SCHEMATIC DIAGRAM DESIGNATE COMPONENTS IN WHICH SAFETY CAN BE OF SPECIAL SIGNIFICANCE. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS DESIGNATED ON THE FOLLOWING PARTS LIST BE USED FOR COMPONENT REPLACEMENT DESIGNATED BY A STAR. NO DEVIATIONS FROM RESISTANCE, WATTAGE, AND VOLTAGE RATINGS MAY BE MADE FOR REPLACEMENT ITEMS DESIGNATED BY A STAR.

Notes: Parts having Location Number are located on the following boards.
Numbers 700 Series . . . . . .On the Picture Tube Socket Board.
Numbers 900 Series . . . . . .Out of Board.
All Other Numbers . . . . . .On the Main Board

Note: Schematic part location numbers may not always match with the part descriptions.
The part descriptions are correct and should be used.

Schematic Location	Part No.	Description

CAPACITORS

NOTES:
Read description of the Capacitor as follows:

(Example)

CERAMIC 100P K 50V

- 50V — Rated Voltage
- K — Tolerance Symbols:

  less than 10PF
  - A . .Not specified
  - B . .±0.1PF
  - C . .±0.25PF
  - D . .±0.5PF
  - F . .±1PF
  - G . .±2PF
  - R . .+0.25 - 0PF
  - S . .+0 - 0.25PF
  - E . .+0 - 1PF

  more than 10PF
  - A . .Not specified
  - B . .±0.1%
  - C . .±0.25%
  - D . .±0.5%
  - F . .±1%
  - G . .±2%
  - H . .±3%
  - J . .±5%
  - K . .±10%
  - L . .±15%
  - M . .±20%
  - N . .±30%
  - P . .+100 - 0%
  - Q . .+30 - 10%
  - T . .+50 - 10%
  - U . .+75 - 10%
  - V . .+20 - 10%
  - W .+100 - 10%
  - X . .+40 - 20%
  - Y . .+150 - 10%
  - Z . .+80 - 20%
- 100P — Rated Value: P...Pico Farad U...Micro Farad
- CERAMIC — Material:
  - CERAMIC . . . . . .Ceramic
  - MT-PAPER . . . . .Metalized Paper
  - POLYESTER . . .Polyester
  - MT-POLYEST . .Metalized Polyester
  - POLYPRO . . . . .Polypropylene
  - MT-POLYPRO . .Metalized Polypropylene
  - COMPO-FILM . .Composite Film
  - MT-COMPO . . . .Metalized Composite
  - STYRENE . . . . . .Styrene
  - TA-SOLID . . . . .Tantalum Solid
  - AL-SOLID . . . . . .Aluminum Solid
  - ELECT . . . . . .Electrolytic
  - NP-ELECT . . . . .Non-Polarized Electrolytic
  - OS-SOLID . . . . .Aluminum Solid with Organic Semiconductive Electrolytic

Schematic Location	Part No.	Description		
C001	403 049 0008	ELECT	1U M	50V
C002	403 049 0008	ELECT	1U M	50V
C003	403 224 6009	CERAMIC	4700P K	50V
C004	403 224 6009	CERAMIC	4700P K	50V
C010	403 043 0202	ELECT	220U M	16V
C011	403 043 0202	ELECT	220U M	16V
C015	403 044 1703	ELECT	470U M	16V
C101	403 038 6301	ELECT	220U M	6.3V
C103	403 224 6108	CERAMIC	0.01U K	50V
C106	403 050 6600	ELECT	3.3U M	50V
C131	403 049 0008	ELECT	1U M	50V
C133	403 224 6108	CERAMIC	0.01U K	50V
C134	403 224 5705	CERAMIC	1000P K	50V
C136	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
C137	403 364 7508	CERAMIC	10P J	50V
C141	403 224 6108	CERAMIC	0.01U K	50V
C142	403 343 4603	CERAMIC	0.022U K	50V
C143	403 224 6108	CERAMIC	0.01U K	50V
C146	403 224 6108	CERAMIC	0.01U K	50V
C147	403 038 1603	ELECT	100U M	6.3V
C151	403 048 6308	ELECT	0.47U M	50V
C153	403 048 6308	ELECT	0.47U M	50V
C161	403 357 9601	CERAMIC	0.1U Z	50V
C211	403 086 2607	NP-ELECT	1U M	50V
C212	403 049 9803	ELECT	2.2U M	50V
C221	403 086 2607	NP-ELECT	1U M	50V
C251	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
C252	403 062 0504	POLYESTER	0.047U K	50V
	403 312 2203	POLYESTER	0.047U K	50V
C253	403 086 1808	NP-ELECT	0.47U M	50V
C256	403 049 0008	ELECT	1U M	50V
C257	403 224 6108	CERAMIC	0.01U K	50V
C258	403 043 9106	ELECT	47U M	16V
C272	403 050 6600	ELECT	3.3U M	50V

Schematic Location	Part No.	Description
C274	403 041 8804	ELECT 10U M 16V
C284	403 041 8804	ELECT 10U M 16V
C285	403 224 6108	CERAMIC 0.01U K 50V
C301	403 041 8804	ELECT 10U M 16V
C302	403 041 8804	ELECT 10U M 16V
C303	403 357 9601	CERAMIC 0.1U Z 50V
C306	403 357 9601	CERAMIC 0.1U Z 50V
C311	403 043 9106	ELECT 47U M 16V
C313	403 357 9601	CERAMIC 0.1U Z 50V
C314	403 357 9601	CERAMIC 0.1U Z 50V
C316	403 357 9601	CERAMIC 0.1U Z 50V
C317	403 357 9601	CERAMIC 0.1U Z 50V
C322	403 357 9601	CERAMIC 0.1U Z 50V
C323	403 357 9601	CERAMIC 0.1U Z 50V
C401	403 044 1703	ELECT 470U M 16V
C402	403 224 6108	CERAMIC 0.01U K 50V
C403	403 063 0206	POLYESTER 6800P K 50V
	403 312 2807	POLYESTER 6800P K 50V
C405	403 086 2607	NP-ELECT 1U M 50V
C406	403 076 3607	CERAMIC 470P K 500V
C407	403 076 0507	CERAMIC 2200P K 500V
C408	403 103 0005	ELECT 4.7U M 160V
★ C411	404 077 5003	MT-POLYPRO 8600P H 1.5K
	403 343 8502	MT-POLYPRO 8600P H 1 .5KV
★ C412	404 077 4600	MT-POLYPRO 7800P H 1.5K
	403 343 8205	MT-POLYPRO 7800P H 1 .5KV
★ C413	403 083 4307	POLYPRO 0.022U J 400V
★ C414	403 083 4307	POLYPRO 0.022U J 400V
★ C416	404 081 2609	MT-POLYPRO 0.27U M 200V
	403 346 7126	MT-POLYPRO 0.27U J 250V
	403 372 6807	MT-POLYPRO 0.27U J 250V
★ C417	404 081 2302	MT-POLYPRO 0.2U M 200V
	403 346 6822	MT-POLYPRO 0.2U J 250V
	403 372 6500	MT-POLYPRO 0.2 U J 250V
C419	403 158 9107	MT-POLYEST 2.2U K 100V
C421	403 038 6301	ELECT 220U M 6.3V
C422	403 066 6106	MT-POLYEST 0.47U J 250V
C427	403 224 6108	CERAMIC 0.01U K 50V
C441	403 224 6108	CERAMIC 0.01U K 50V
C462	403 235 0607	CERAMIC 100P J 50V
C463	403 058 3403	POLYESTER 0.015U K 50V
	403 311 9708	POLYESTER 0.015U K 50V
C466	403 051 0607	ELECT 4.7U M 50V
C482	403 115 0703	ELECT 47U M 100V
C484	403 051 0607	ELECT 4.7U M 50V
C486	403 076 3607	CERAMIC 470P K 500V
C487	403 052 8503	ELECT 1000U M 35V
C489	403 044 1703	ELECT 470U M 16V
C493	404 056 5307	NP-ELECT 2.2U M 100V
C497	403 038 1603	ELECT 100U M 6.3V
C502	403 053 2104	ELECT 220U M 35V
C503	403 204 1802	ELECT 3.3U K 50V
C504	403 045 9807	ELECT 2200U M 25V
C505	403 166 7706	MT-POLYEST 0.47U J 63V
	403 067 7805	MT-COMPO 0.47U J 50V
C506	403 059 0104	POLYESTER 0.018U K 50V

Schematic Location	Part No.	Description
	403 312 0100	POLYESTER 0.018U K 50V
C508	403 235 0300	CERAMIC 56P J 50V
C509	403 166 7706	MT-POLYEST 0.47U J 63V
C509	403 067 7805	MT-COMPO 0.47U J 50V
★ C511	403 141 5802	POLYESTER 0.15U J 50V
	403 058 5407	POLYESTER 0.15U K 50V
C516	403 051 0607	ELECT 4.7U M 50V
★ C601	404 071 2404	MT-POLYEST 0.22U M 250V
	404 066 2204	MT-POLYEST 0.22U M 275V
★ C608	403 271 9701	CERAMIC 3300P K 1K
★ C609	404 075 5005	ELECT 470U M 200V
C612	403 166 8208	MT-POLYEST 0.18U J 63V
	403 067 6501	MT-COMPO 0.18U J 50V
C613	403 214 5203	POLYESTER 0.012U J 50V
	403 311 9203	POLYESTER 0.012U J 50V
C620	403 214 5203	POLYESTER 0.012U J 50V
	403 311 9203	POLYESTER 0.012U J 50V
C622	403 044 1703	ELECT 470U M 16V
★ C625	403 266 5008	CERAMIC 2700P K 1K
C626	403 043 1902	ELECT 2200U M 16V
C628A	404 037 0703	ELECT 470U M 160V
C629	403 043 0202	ELECT 220U M 16V
C630	403 049 0008	ELECT 1U M 50V
★ C631	404 088 2909	CERAMIC 1000P M 250V
	404 088 7102	CERAMIC 1000P M 250V
★ C632	404 088 3005	CERAMIC 2200P M 250V
	404 088 7201	CERAMIC 2200P M 250V
C634	403 043 9106	ELECT 47U M 16V
C683	403 038 6301	ELECT 220U M 6.3V
C688	403 042 2405	ELECT 100U M 16V
C689	403 357 9601	CERAMIC 0.1U Z 50V
C693	403 049 0008	ELECT 1U M 50V
C701	403 224 5705	CERAMIC 1000P K 50V
C711	403 224 5705	CERAMIC 1000P K 50V
C721	403 224 5705	CERAMIC 1000P K 50V
C741	403 049 0008	ELECT 1U M 50V
★ C742	403 077 2807	CERAMIC 1000P Z 2K
C801	403 224 6108	CERAMIC 0.01U K 50V
C806	403 039 3507	ELECT 470U M 6.3V
C811	403 049 0008	ELECT 1U M 50V
C822	403 041 8804	ELECT 10U M 16V
C829	403 049 0008	ELECT 1U M 50V
C835	403 224 6108	CERAMIC 0.01U K 50V
C841	403 357 9601	CERAMIC 0.1U Z 50V
C842	403 357 9601	CERAMIC 0.1U Z 50V
C843	403 357 9601	CERAMIC 0.1U Z 50V
C853	403 047 8402	ELECT 0.1U M 50V
C854	403 235 0706	CERAMIC 120P J 50V
C856	403 049 0008	ELECT 1U M 50V
C857	403 235 1000	CERAMIC 220P J 50V
C858	403 224 5705	CERAMIC 1000P K 50V
C862	403 224 6108	CERAMIC 0.01U K 50V
C1004	403 224 6108	CERAMIC 0.01U K 50V
C1021	403 041 8804	ELECT 10U M 16V
C1022	403 042 7707	ELECT 22U M 16V
C1026	403 041 8804	ELECT 10U M 16V

Schematic Location	Part No.	Description		
C1031	403 224 6108	CERAMIC	0.01U K	50V
C1081	403 043 9106	ELECT	47U M	16V
C1902	403 041 8804	ELECT	10U M	16V
C3401	403 047 8402	ELECT	0.1U M	50V
C3404	403 086 0108	NP-ELECT	4.7U M	25V
C3406	403 325 2504	CERAMIC	0.012U K	50V
C3407	403 235 5701	CERAMIC	5600P K	50V
C3408	403 048 6308	ELECT	0.47U M	50V
C3411	403 048 6308	ELECT	0.47U M	50V
C3412	403 043 9106	ELECT	47U M	16V
C3413	403 046 9905	ELECT	4.7U M	25V
C3414	403 042 2405	ELECT	100U M	16V
C3416	403 086 0108	NP-ELECT	4.7U M	25V
C3417	403 046 9905	ELECT	4.7U M	25V
C3418	403 086 0108	NP-ELECT	4.7U M	25V
C3421	403 224 5606	CERAMIC	2700P K	50V
C3422	403 323 3602	CERAMIC	0.047U K	50V
C3423	403 342 9203	TA-SOLID	3.3U K	10V
C3424	403 086 0108	NP-ELECT	4.7U M	25V
C3426	403 299 1820	TA-SOLID	10U K	10V
C3427	403 049 0008	ELECT	1U M	50V
C3431	403 224 6009	CERAMIC	4700P K	50V
C3432	403 047 8402	ELECT	0.1U M	50V
C3433	403 224 6009	CERAMIC	4700P K	50V
C3434	403 343 4603	CERAMIC	0.022U K	50V
C3435	403 046 9905	ELECT	4.7U M	25V
C3436	403 086 0108	NP-ELECT	4.7U M	25V
C3437	403 046 9905	ELECT	4.7U M	25V
C3439	403 086 0108	NP-ELECT	4.7U M	25V
C3442	403 046 9905	ELECT	4.7U M	25V
C3444	403 046 9905	ELECT	4.7U M	25V

DIODES

D101	407 100 0204	ZENER DIODE MTZJ36A (36V)
	407 056 2307	ZENER DIODE RD36EB1 (36V)
D351	407 063 8606	ZENER DIODE MTZJ5.1A (5.1V)
	407 056 8002	ZENER DIODE RD5.1EB2 (5.1V)
D406	407 006 4108	DIODE ERB44-04
D407	407 095 8001	DIODE ERD07-15L
★ D421	407 158 1307	ZENER DIODE HZ11B2L (11V)
★ D422	407 158 1307	ZENER DIODE HZ11B2L (11V)
D428	407 099 6904	ZENER DIODE MTZJ15A (15V)
	407 054 5706	ZENER DIODE RD15EB1 (15V)
D429	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D461	407 078 2705	DIODE 1SS244
	407 013 4207	DIODE 1S2076
	407 013 4306	DIODE 1S2076A
D481	407 124 6404	DIODE ERA18-04
	407 007 6606	DIODE ES1
	407 124 5506	DIODE RMPG06G
D482	407 011 4407	DIODE TVR1G
D483	407 124 6404	DIODE ERA18-04
	407 007 6606	DIODE ES1
	407 124 5506	DIODE RMPG06G

Schematic Location	Part No.	Description
D486	407 099 6102	ZENER DIODE MTZJ10B (10V)
	407 054 0008	ZENER DIODE RD10EB2 (10V)
D487	407 005 8602	DIODE ERA15-02
	407 088 6502	DIODE MPG06D
	407 011 3004	DIODE S5277B
	408 009 9404	DIODE 1N4002ID
D490	407 063 8903	ZENER DIODE MTZJ5.6C (5.6V)
	407 057 0104	ZENER DIODE RD5.6EB3 (5.6V)
D501	407 005 8602	DIODE ERA15-02
	407 088 6502	DIODE MPG06D
	407 011 3004	DIODE S5277B
	408 009 9404	DIODE 1N4002ID
D502	407 118 2207	ZENER DIODE 1Z75
D503	407 100 0204	ZENER DIODE MTZJ36A (36V)
	407 056 2307	ZENER DIODE RD36EB1 (36V)
D508	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
★ D601	407 005 7605	DIODE EM2B
	408 008 8606	DIODE GP15G
	407 013 3200	DIODE 1S1887A
★ D602	407 005 7605	DIODE EM2B
	408 008 8606	DIODE GP15G
	407 013 3200	DIODE 1S1887A
★ D603	407 005 7605	DIODE EM2B
	408 008 8606	DIODE GP15G
	407 013 3200	DIODE 1S1887A
★ D604	407 005 7605	DIODE EM2B
	408 008 8606	DIODE GP15G
	407 013 3200	DIODE 1S1887A
D609	407 124 6503	DIODE ERA18-02
	407 007 6903	DIODE ES1Z
	407 124 5605	DIODE RMPG06D
	408 009 9008	DIODE BYD33D
D610	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D611	407 099 5808	ZENER DIODE MTZJ7.5A (7.5V)
	407 057 6304	ZENER DIODE RD7.5EB1 (7.5V)
★ D612	407 147 5705	PHOTO COUPLE ON3131S
	407 104 2402	PHOTO COUPLE PC817C
	407 106 6101	PHOTO COUPLE PC817D
	407 175 9904	PHOTO COUPLE TLP621-1-BL
D614	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
★ D621	407 007 7603	DIODE EU2
★ D624	407 211 6102	DIODE FE301-1L43
	407 129 6706	DIODE RU4YX LF-L1
★ D625	407 211 5808	DIODE FE201-6L43
	407 129 7000	DIODE RU4AM LF-L1
D627	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D629	407 099 7208	ZENER DIODE MTZJ16A (16V)
	407 054 7007	ZENER DIODE RD16EB1 (16V)

Schematic Location	Part No.	Description
D680	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D683	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D687	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D693	407 099 5402	ZENER DIODE MTZJ6.2B (6.2V)
	407 057 2702	ZENER DIODE RD6.2EB2 (6.2V)
D694	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D801	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D831	407 222 5903	ZD UDZS-TE-173.6B (3.6V)
D834	407 099 6904	ZENER DIODE MTZJ15A (15V)
	407 054 5706	ZENER DIODE RD15EB1 (15V)
D836	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D843	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D1021	407 099 6102	ZENER DIODE MTZJ10B (10V)
	407 054 0008	ZENER DIODE RD10EB2 (10V)
D1022	407 099 6102	ZENER DIODE MTZJ10B (10V)
	407 054 0008	ZENER DIODE RD10EB2 (10V)
D1026	407 099 6102	ZENER DIODE MTZJ10B (10V)
	407 054 0008	ZENER DIODE RD10EB2 (10V)
D1031	407 099 6102	ZENER DIODE MTZJ10B (10V)
	407 054 0008	ZENER DIODE RD10EB2 (10V)
D1901	407 063 9306	ZENER DIODE MTZJ7.5C (7.5V)
	407 057 6502	ZENER DIODE RD7.5EB3 (7.5V)
		INTEGRATED CIRCUITS
IC002	409 275 7903	IC LA4525
★ IC101	409 491 4809	IC LA76834NM-TBM
IC301	409 491 5608	IC TDA9183T/N1
★ IC501P	409 492 9704	IC LA7847
★ IC601	409 172 8102	IC SE130NH
IC681	409 241 8309	IC TA78L05S
	409 066 7303	IC UPC78L05J
IC801	410 388 2006	IC M37272M8-XXXFP T4
IC802	409 495 6908	IC CAT24WC02P
	409 440 8902	IC M24C02-BN6
	409 376 1503	IC ST24C02B6
	409 497 0706	IC S524C20D21-DCB0
	409 333 3700	IC 24LC02B/P
IC1001	409 051 3006	IC TC4053BP
IC3401	409 467 1108	IC CXA2134Q-T6

Schematic Location	Part No.	Description
		COILS
★ LF601	645 042 7510	LINE FILTER
L164	645 003 9713	INDUCTOR, 15U K
	645 016 2657	INDUCTOR, 15U K
L301	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L302	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L303	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L304	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L401	645 036 4327	INDUCTOR, 1.0U, FILTER
L402	610 031 9998	PIPE CORE
L403	610 078 6820	PIPE CORE
★ L413	645 029 8035	COIL, LINEARITY
L414	610 031 1367	INDUCTOR 202J
	610 211 3488	INDUCTOR
	645 005 5645	INDUCTOR, 2200U K
	645 007 8361	INDUCTOR, 2000U
L416	645 013 8676	INDUCTOR, 350U
L601	610 078 6820	PIPE CORE
L621	610 078 5946	PIPE CORE
	652 000 1725	CORE, PIPE
L623	610 078 5946	PIPE CORE
	652 000 1725	CORE, PIPE
L625	610 078 5946	PIPE CORE
	652 000 1725	CORE, PIPE
L628	610 078 5946	PIPE CORE
	652 000 1725	CORE, PIPE
L801	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L821	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L851	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L881	645 006 2490	INDUCTOR, 1U K
	645 016 2411	INDUCTOR, 1U K
L882	645 006 2490	INDUCTOR, 1U K
	645 016 2411	INDUCTOR, 1U K
★ L901	645 039 2559	COIL, DEGAUSSING
	645 041 1830	COIL, DEGAUSSING
	645 051 9215	COIL, DEGAUSSING
L1901	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
		TRANSISTORS
Q001	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA

Schematic Location	Part No.	Description
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q005	405 008 4805	TR 2SB764-E
	405 008 4904	TR 2SB764-F
Q135	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q202	406 000 6804	TR 2SA1015-GR(SAN)
	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 151 3304	TR 2SA608NF-NPA
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
Q208	406 000 6804	TR 2SA1015-GR(SAN)
	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 151 3304	TR 2SA608NF-NPA
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
Q401	405 029 7106	TR 2SC2271-D
	405 013 6207	TR 2SC2271-D-CTV
	405 029 7205	TR 2SC2271-E
	405 013 6306	TR 2SC2271-E-CTV
★ Q402	405 157 1304	TR 2SD2634-YB
Q486	405 023 5009	TR 2SD400-E-MP
	405 023 5306	TR 2SD400-F-MP
Q490	405 023 5009	TR 2SD400-E-MP
	405 023 5306	TR 2SD400-F-MP
★ Q601	405 095 9004	TR 2SC4423-CTV
Q604	405 058 0208	TR 2SC3807-R-CTV-YA
Q605	406 000 6804	TR 2SA1015-GR(SAN)
	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 151 3304	TR 2SA608NF-NPA
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
Q627	405 089 0000	TR 2SA1707-S
	405 089 0109	TR 2SA1707-T
	405 009 6907	TR 2SB985-S
	405 009 7003	TR 2SB985-T
Q635	405 011 8401	TR 2SC1740S-Q

Schematic Location	Part No.	Description
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q681	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q688	406 000 6804	TR 2SA1015-GR(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3208	TR 2SA564A-R(CU)
	405 151 3304	TR 2SA608NF-NPA
	405 006 1806	TR 2SA933S-R
Q693	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q695	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3208	TR 2SA564A-R(CU)
	405 151 3324	TR 2SA608NF-NPA-AT
Q701	406 000 3605	TR 2SC3620(LB-SAN-1)
	405 066 4304	TR 2SC2621-C-RA
	405 041 6507	TR 2SC2621-D-RA
	405 041 6705	TR 2SC2621-E-RA
	405 066 9903	TR 2SC2688(1)-K
	405 067 0008	TR 2SC2688(1)-L
	405 067 0107	TR 2SC2688(1)-M
Q711	406 000 3605	TR 2SC3620(LB-SAN-1)
	405 066 4304	TR 2SC2621-C-RA
	405 041 6507	TR 2SC2621-D-RA
	405 041 6705	TR 2SC2621-E-RA
	405 066 9903	TR 2SC2688(1)-K
	405 067 0008	TR 2SC2688(1)-L
	405 067 0107	TR 2SC2688(1)-M
Q721	406 000 3605	TR 2SC3620(LB-SAN-1)
	405 066 4304	TR 2SC2621-C-RA

Schematic Location	Part No.	Description
	405 041 6507	TR 2SC2621-D-RA
	405 041 6705	TR 2SC2621-E-RA
	405 066 9903	TR 2SC2688(1)-K
	405 067 0008	TR 2SC2688(1)-L
	405 067 0107	TR 2SC2688(1)-M
Q831	406 000 6804	TR 2SA1015-GR(SAN)
	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 151 3304	TR 2SA608NF-NPA
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R

NOTES:
Read description of the Resistor as follows:

(Example)

CARBON 4.7K J A 1/4W

- 1/4W — Rated Wattage
- A — Performance Symbols:
  A...General B...Non-flammable
  Z...Low noise
  Other... Temperature coefficient
- J — Tolerance Symbols:
  A...0.05% B...0.1% C...25%
  D...0.5% F...1% G...2%
  J...5% K...10% M...20%
  P...+5 -15%
- 4.7K — Rated Value, ohms:
  K...1,000 M...1,000,000
- CARBON — Material:
  CARBON ..... Carbon
  MT-FILM ..... Metal Film
  OXIDE-MT ..... Oxide Metal Film
  SOLID .....Composition
  MT-GLAZE .....Metal Glaze
  WIRE WOUND .....Wire Wound
  CERAMIC RES ....Ceramic
  FUSIBLE RES ..... Fusible

Schematic Location	Part No.	Description
R001	401 027 8602	CARBON 8.2K JA 1/6W
R002	401 027 8602	CARBON 8.2K JA 1/6W
R003	401 162 2800	MT-GLAZE 1.8K JA 1/10W
R004	401 162 2800	MT-GLAZE 1.8K JA 1/10W
R005	401 150 5905	MT-GLAZE 10K JA 1/10W
R006	401 023 1706	CARBON 820 JA 1/4W
R012	401 027 2600	CARBON 5.6K JA 1/6W
★ R106	401 009 2000	CARBON 27K JA 1/2W
R131	401 256 1702	MT-GLAZE 33K JA 1/10W
R133	401 255 6401	MT-GLAZE 3K JA 1/10W
R135	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R137	401 150 6209	MT-GLAZE 1K JA 1/10W
R142	401 256 1702	MT-GLAZE 33K JA 1/10W
R143	401 150 6209	MT-GLAZE 1K JA 1/10W
R151	401 152 3206	MT-GLAZE 330 JA 1/10W
R161	401 150 5806	MT-GLAZE 100K JA 1/10W
R162	401 150 5806	MT-GLAZE 100K JA 1/10W
R163	401 256 0002	MT-GLAZE 120 JA 1/10W
R164	401 150 6209	MT-GLAZE 1K JA 1/10W
R166	401 256 7506	MT-GLAZE 390 JA 1/10W
R167	401 162 2701	MT-GLAZE 180 JA 1/10W
R201	401 026 9600	CARBON 470 JA 1/6W
R208	401 150 6209	MT-GLAZE 1K JA 1/10W
R212	401 256 7100	MT-GLAZE 680K JA 1/10W
R251	401 256 5304	MT-GLAZE 56K JA 1/10W
R252	401 256 3607	MT-GLAZE 15K JA 1/10W
R271	401 162 3401	MT-GLAZE 39K JA 1/10W
R272	401 027 5502	CARBON 6.8K JA 1/6W
R273	401 024 7400	CARBON 10K JA 1/6W
R274	401 162 4101	MT-GLAZE 5.6K JA 1/10W
R275	401 256 6608	MT-GLAZE 68K JA 1/10W
R276	401 024 9701	CARBON 12K JA 1/6W
R280	401 026 4902	CARBON 330K JA 1/6W
R281	401 150 5905	MT-GLAZE 10K JA 1/10W
R284	401 026 9303	CARBON 47 JA 1/6W
R287	401 255 6500	MT-GLAZE 100 JA 1/10W
R288	401 255 6500	MT-GLAZE 100 JA 1/10W
R289	401 255 6500	MT-GLAZE 100 JA 1/10W
R301	401 150 6001	MT-GLAZE 0.000 ZA 1/10W
R311	401 024 6700	CARBON 100 JA 1/6W
R312	401 162 4101	MT-GLAZE 5.6K JA 1/10W
R321	401 150 5905	MT-GLAZE 10K JA 1/10W
R323	401 256 4109	MT-GLAZE 56 JA 1/10W
R324	401 162 4101	MT-GLAZE 5.6K JA 1/10W
R326	401 256 4109	MT-GLAZE 56 JA 1/10W
R353	401 024 7400	CARBON 10K JA 1/6W
★ R401	401 012 4503	CARBON 100 JA 1/4W
★ R402	401 013 4205	CARBON 120 JA 1/4W
R404	401 024 6700	CARBON 100 JA 1/6W
R405	401 162 4101	MT-GLAZE 5.6K JA 1/10W
★ R406	401 010 8305	CARBON 5.6K JA 1/2W
★ R407	401 068 4700	OXIDE-MT 4.7K JA 2W
★ R413	402 067 3305	WIRE WOUND 4.7 KA 5W
	402 075 5704	WIRE WOUND 4.7 KA 5W
★ R418	401 009 1607	CARBON 2.7K JB 1/2W
★ R421	401 148 7201	MT-FILM 1.8K FA 1/6W
★ R422	401 052 6802	MT-FILM 10K FA 1/6W
★ R423	401 264 9301	MT-GLAZE 3.3K FA 1/10W
R426	401 256 6905	MT-GLAZE 680 JA 1/10W
R428	401 025 1902	CARBON 15K JA 1/6W
R441	401 024 7004	CARBON 1K JA 1/6W
R442	401 150 5905	MT-GLAZE 10K JA 1/10W
R443	401 026 9907	CARBON 4.7K JA 1/6W
R444	401 025 4606	CARBON 18K JA 1/6W
R449	401 053 3206	MT-FILM 4.7K FA 1/6W
R461	401 026 4902	CARBON 330K JA 1/6W
R462	401 025 8208	CARBON 22K JA 1/6W
★ R463	401 006 8807	CARBON 1.8 JA 1/2W
R464	401 025 4606	CARBON 18K JA 1/6W
★ R465	401 006 8401	CARBON 1.5 JA 1/2W
R466	401 026 7408	CARBON 39K JA 1/6W
★ R467	401 065 3706	OXIDE-MT 1.2K JA 2W

Schematic Location	Part No.	Description		
R469	401 024 7004	CARBON	1K JA	1/6W
★ R481	401 006 7701	CARBON	1 JB	1/2W
★ R482	401 011 9004	CARBON	1 JB	1/4W
★ R483	401 006 7701	CARBON	1 JB	1/2W
R485	401 025 4606	CARBON	18K JA	1/6W
★ R486	401 068 6209	OXIDE-MT	5.6 JA	2W
★ R487	401 025 3807	CARBON	180 JA	1/6W
★ R488	401 059 1602	OXIDE-MT	15 JA	1W
★ R489	401 059 5907	OXIDE-MT	18 JA	1W
R491	401 012 5708	CARBON	1K JA	1/4W
R492	401 156 8504	MT-FILM	33K FA	1/6W
R493	401 020 3901	CARBON	470K JA	1/4W
R494	401 018 5801	CARBON	330K JA	1/4W
★ R495	401 066 5204	OXIDE-MT	22 JA	2W
★ R497	401 064 5305	OXIDE-MT	1.5 JA	2W
R499	401 026 6609	CARBON	390 JA	1/6W
R503	401 026 9907	CARBON	4.7K JA	1/6W
R504	401 027 8602	CARBON	8.2K JA	1/6W
R505	401 006 8401	CARBON	1.5 JA	1/2W
R506	401 027 5205	CARBON	680 JA	1/6W
R507	401 006 8807	CARBON	1.8 JA	1/2W
R508	401 027 5502	CARBON	6.8K JA	1/6W
R509	401 025 4606	CARBON	18K JA	1/6W
★ R511	401 065 6707	OXIDE-MT	150 JA	2W
R512	401 007 1104	CARBON	1K JA	1/2W
R517	401 026 7408	CARBON	39K JA	1/6W
R518	401 256 7209	MT-GLAZE	18K JA	1/10W
★ R601	402 083 6106	WIRE WOUND	1 KA	7W
★ R602	402 000 1603	SOLID	3.3M MA	1/2W
	402 088 1502	RESISTER	3.3M JA	1/2W
R603	401 007 2309	CARBON	100K JA	1/2W
★ R604	401 064 6302	OXIDE-MT	10 JA	2W
★ R613	401 068 6902	OXIDE-MT	56 JA	2W
R614	401 011 1107	CARBON	68 JA	1/2W
R615	401 014 5201	CARBON	15K JA	1/4W
R616	401 026 2809	CARBON	3K GA	1/6W
R617	401 099 1501	CARBON	680 GA	1/6W
★ R618	401 068 6902	OXIDE-MT	56 JA	2W
R619	401 025 8208	CARBON	22K JA	1/6W
R620	401 027 2600	CARBON	5.6K JA	1/6W
R621	401 162 3708	MT-GLAZE	4.7K JA	1/10W
R622	401 026 2809	CARBON	3K GA	1/6W
R627	401 024 7400	CARBON	10K JA	1/6W
R628	401 013 5301	CARBON	1.2K JA	1/4W
R629	401 150 6209	MT-GLAZE	1K JA	1/10W
★ R630	401 060 5002	OXIDE-MT	22K JA	1W
R631	401 022 3107	CARBON	6.8K JA	1/4W
R632	401 150 6209	MT-GLAZE	1K JA	1/10W
R634	401 256 6301	MT-GLAZE	47K JA	1/10W
R683	401 027 2600	CARBON	5.6K JA	1/6W
R687	401 162 3005	MT-GLAZE	22K JA	1/10W
R688	401 256 0408	MT-GLAZE	12K JA	1/10W
R691	401 024 7400	CARBON	10K JA	1/6W
R692	401 027 5908	CARBON	68K JA	1/6W
R693	401 027 3201	CARBON	560K JA	1/6W
R694	401 024 7400	CARBON	10K JA	1/6W

Schematic Location	Part No.	Description		
R695	401 025 8208	CARBON	22K JA	1/6W
R701	401 025 3807	CARBON	180 JA	1/6W
R703	401 256 0309	MT-GLAZE	820 JA	1/10W
R704	401 027 8107	CARBON	82 JA	1/6W
R706	401 009 1508	CARBON	2.7K JA	1/2W
★ R707	401 065 4604	OXIDE-MT	12K JA	2W
R711	401 025 3807	CARBON	180 JA	1/6W
R713	401 256 0309	MT-GLAZE	820 JA	1/10W
R714	401 255 9006	MT-GLAZE	82 JA	1/10W
R716	401 009 1508	CARBON	2.7K JA	1/2W
★ R717	401 065 4604	OXIDE-MT	12K JA	2W
R721	401 025 3807	CARBON	180 JA	1/6W
R723	401 256 0309	MT-GLAZE	820 JA	1/10W
R724	401 027 8107	CARBON	82 JA	1/6W
R726	401 009 1508	CARBON	2.7K JA	1/2W
★ R727	401 065 4604	OXIDE-MT	12K JA	2W
R803	401 024 6700	CARBON	100 JA	1/6W
R804	401 024 6700	CARBON	100 JA	1/6W
R806	401 162 3708	MT-GLAZE	4.7K JA	1/10W
R807	401 150 5905	MT-GLAZE	10K JA	1/10W
R808	401 150 5905	MT-GLAZE	10K JA	1/10W
R809	401 162 3708	MT-GLAZE	4.7K JA	1/10W
R810	401 024 7400	CARBON	10K JA	1/6W
R813	401 150 5905	MT-GLAZE	10K JA	1/10W
R814	401 150 5905	MT-GLAZE	10K JA	1/10W
R816	401 152 3206	MT-GLAZE	330 JA	1/10W
R824	401 255 6500	MT-GLAZE	100 JA	1/10W
R829	401 255 6500	MT-GLAZE	100 JA	1/10W
R831	401 150 5806	MT-GLAZE	100K JA	1/10W
R833	401 150 5905	MT-GLAZE	10K JA	1/10W
R835	401 026 1000	CARBON	2.7K JA	1/6W
R841	401 150 6209	MT-GLAZE	1K JA	1/10W
R842	401 256 0309	MT-GLAZE	820 JA	1/10W
R843	401 256 0309	MT-GLAZE	820 JA	1/10W
R844	401 256 0309	MT-GLAZE	820 JA	1/10W
R846	401 150 6209	MT-GLAZE	1K JA	1/10W
R847	401 162 4101	MT-GLAZE	5.6K JA	1/10W
R848	401 162 4101	MT-GLAZE	5.6K JA	1/10W
R849	401 162 4101	MT-GLAZE	5.6K JA	1/10W
R851	401 150 6209	MT-GLAZE	1K JA	1/10W
R852	401 026 7408	CARBON	39K JA	1/6W
R853	401 255 6005	MT-GLAZE	1M JA	1/10W
R854	401 150 6100	MT-GLAZE	2.2K JA	1/10W
R856	401 255 6500	MT-GLAZE	100 JA	1/10W
R857	401 255 6500	MT-GLAZE	100 JA	1/10W
R862	401 255 6500	MT-GLAZE	100 JA	1/10W
R864	401 256 0200	MT-GLAZE	120K JA	1/10W
R872	401 256 3607	MT-GLAZE	15K JA	1/10W
R873	401 162 3005	MT-GLAZE	22K JA	1/10W
R881	401 255 6500	MT-GLAZE	100 JA	1/10W
R882	401 255 6500	MT-GLAZE	100 JA	1/10W
R883	401 255 6500	MT-GLAZE	100 JA	1/10W
R884	401 255 6500	MT-GLAZE	100 JA	1/10W
R886	401 150 5905	MT-GLAZE	10K JA	1/10W
R1021	401 256 2709	MT-GLAZE	75 JA	1/10W
R1022	401 256 2709	MT-GLAZE	75 JA	1/10W

Schematic Location	Part No.	Description
R1026	401 026 9600	CARBON 470 JA 1/6W
R1027	401 162 3708	MT-GLAZE 4.7K JA 1/10W
R1031	401 256 2709	MT-GLAZE 75 JA 1/10W
R1032	401 256 6004	MT-GLAZE 27K JA 1/10W
R1033	401 256 0408	MT-GLAZE 12K JA 1/10W
R1046	401 150 5905	MT-GLAZE 10K JA 1/10W
R1047	401 256 6004	MT-GLAZE 27K JA 1/10W
R1901	401 150 5905	MT-GLAZE 10K JA 1/10W
R1902	401 150 6209	MT-GLAZE 1K JA 1/10W
R1903	401 162 2800	MT-GLAZE 1.8K JA 1/10W
R1904	401 150 6100	MT-GLAZE 2.2K JA 1/10W
R1905	401 256 7605	MT-GLAZE 3.9K JA 1/10W
R1906	401 162 4101	MT-GLAZE 5.6K JA 1/10W
R1907	401 256 0408	MT-GLAZE 12K JA 1/10W
R1909	401 024 7004	CARBON 1K JA 1/6W
R1910	401 024 7004	CARBON 1K JA 1/6W
R3401	401 025 7409	CARBON 220 JA 1/6W
R3402	401 025 7409	CARBON 220 JA 1/6W
R3406	401 150 5806	MT-GLAZE 100K JA 1/10W
R3407	401 255 6005	MT-GLAZE 1M JA 1/10W
R3411	401 265 4008	MT-GLAZE 62K JA 1/10W
R3421	401 162 3104	MT-GLAZE 3.3K JA 1/10W
R3422	401 255 6401	MT-GLAZE 3K JA 1/10W
R3426	401 256 7605	MT-GLAZE 3.9K JA 1/10W
R3432	401 150 5905	MT-GLAZE 10K JA 1/10W
R3433	401 150 5905	MT-GLAZE 10K JA 1/10W
R3434	401 162 4002	MT-GLAZE 560 JA 1/10W
R3435	401 150 5806	MT-GLAZE 100K JA 1/10W
R3436	401 162 4002	MT-GLAZE 560 JA 1/10W
R3437	401 150 5806	MT-GLAZE 100K JA 1/10W
R3441	401 256 1405	MT-GLAZE 330K JA 1/10W
R3442	401 255 6500	MT-GLAZE 100 JA 1/10W
R3443	401 256 1405	MT-GLAZE 330K JA 1/10W
R3444	401 255 6500	MT-GLAZE 100 JA 1/10W

TRANSFORMERS

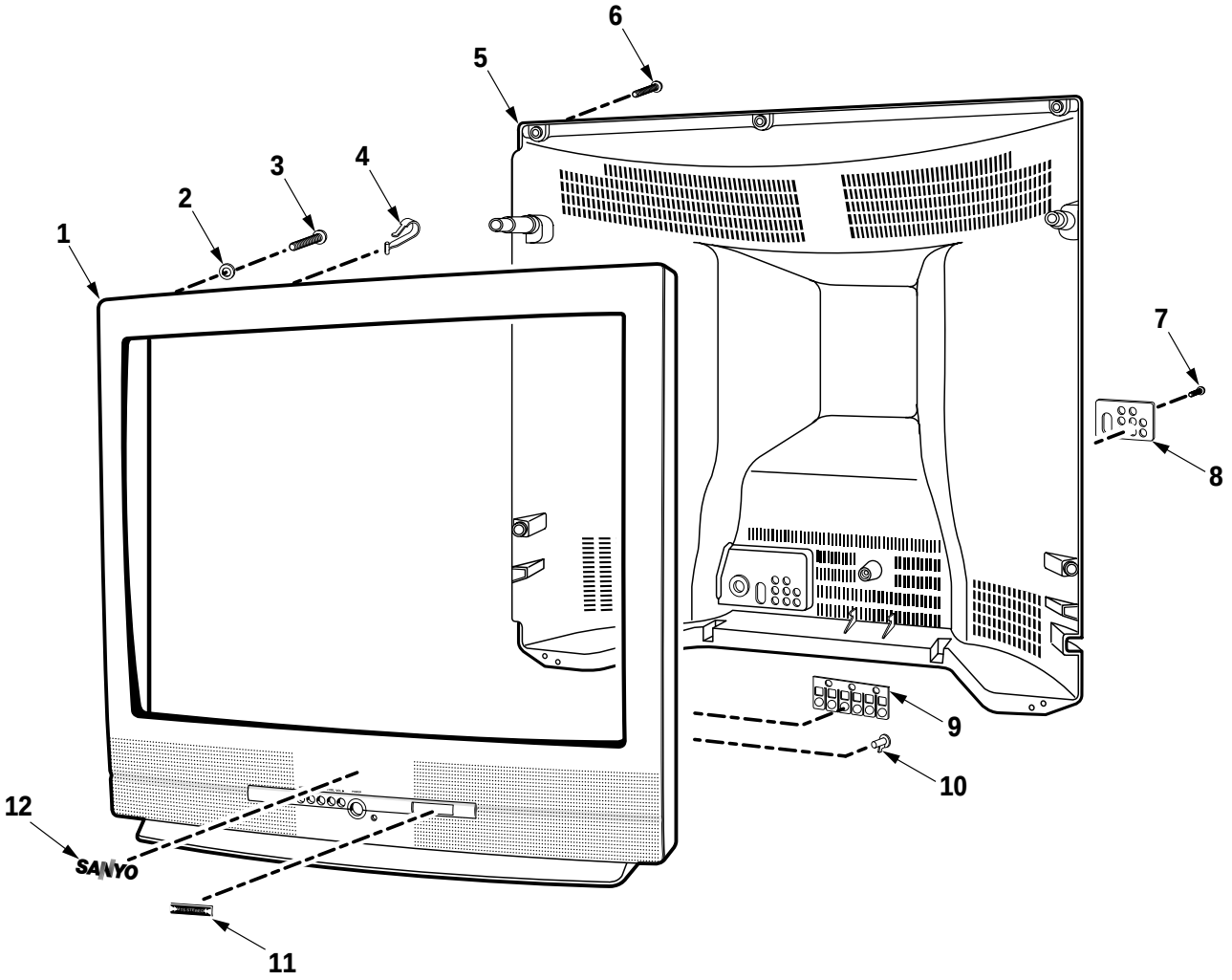
T151	645 049 3775	TRANS, OSC 45.75MHZ
T401	610 000 1138	DRIVE TRANS
	610 223 1663	DRIVE TRANS
★ T402	645 032 8978	TRANS, FLYBACK
	645 018 9579	TRANS, FLYBACK
★ T601	645 035 9910	TRANS, POWER, PULSE
	645 045 6169	TRANS, POWER, PULSE
	645 041 5944	TRANS, POWER, PULSE
X141	421 008 9008	SAW F TSF5235P
X161	610 015 3059	TRAP, CERAMIC 4.5MHZ
	645 041 1618	TRAP CERAMIC 4.5MHZ
X251	610 204 4195	CRYSTAL OSCILLATOR
	610 245 9746	CRYSTAL OSCILLATOR
	610 012 0655	CRYSTAL OSCILLATOR
X801	645 000 6692	OSC, CERAMIC 8.00MHZ
	645 021 5483	OSC, CERAMIC 8.00MHZ

Schematic Location	Part No.	Description

MISCELLANEOUS

A001	610 295 6849	ASSY, PWB,MAIN
★ A101	645 052 6084	TUNER, U/V
A701	610 289 6183	ASSY, PWB, SOCKET
A1901	645 047 6228	UNIT, REMOCON RECEIVER
★ F601	423 029 8008	FUSE 125V 4A
	423 018 8101	FUSE 125V 4A
	423 007 1601	FUSE 125V 4A
	423 007 1809	FUSE 125V 4A
F601A	645 000 5077	HOLDER, FUSE
	645 016 0479	HOLDER, FUSE
F601B	645 000 5077	HOLDER, FUSE
	645 016 0479	HOLDER, FUSE
★ K701	645 025 6103	SOCKET, CRT 8P
	645 028 0306	SOCKET, CRT 8P
K1002	645 038 1898	JACK, RCA-5
★ PS601	408 046 5209	TH PTDAA1BF3R0Q100
★ Q900	414 010 6905	CRT M78JUA361X72
★ RL601	645 000 4155	RELAY
	645 011 2713	RELAY
	645 024 7828	RELAY
	645 015 8629	RELAY
	645 024 7767	RELAY
	645 052 5933	RELAY
SP901	645 013 6306	SPEAKER,8
SP902	645 013 6306	SPEAKER,8
★ W601	645 030 5306	CORD, POWER-2.0MK
★ W901	610 264 8362	ASSY, WIRE GND CONNECTOR
	610 267 0325	(MEX) GND CONNECTOR

CABINET PARTS LIST



CABINET PARTS LIST

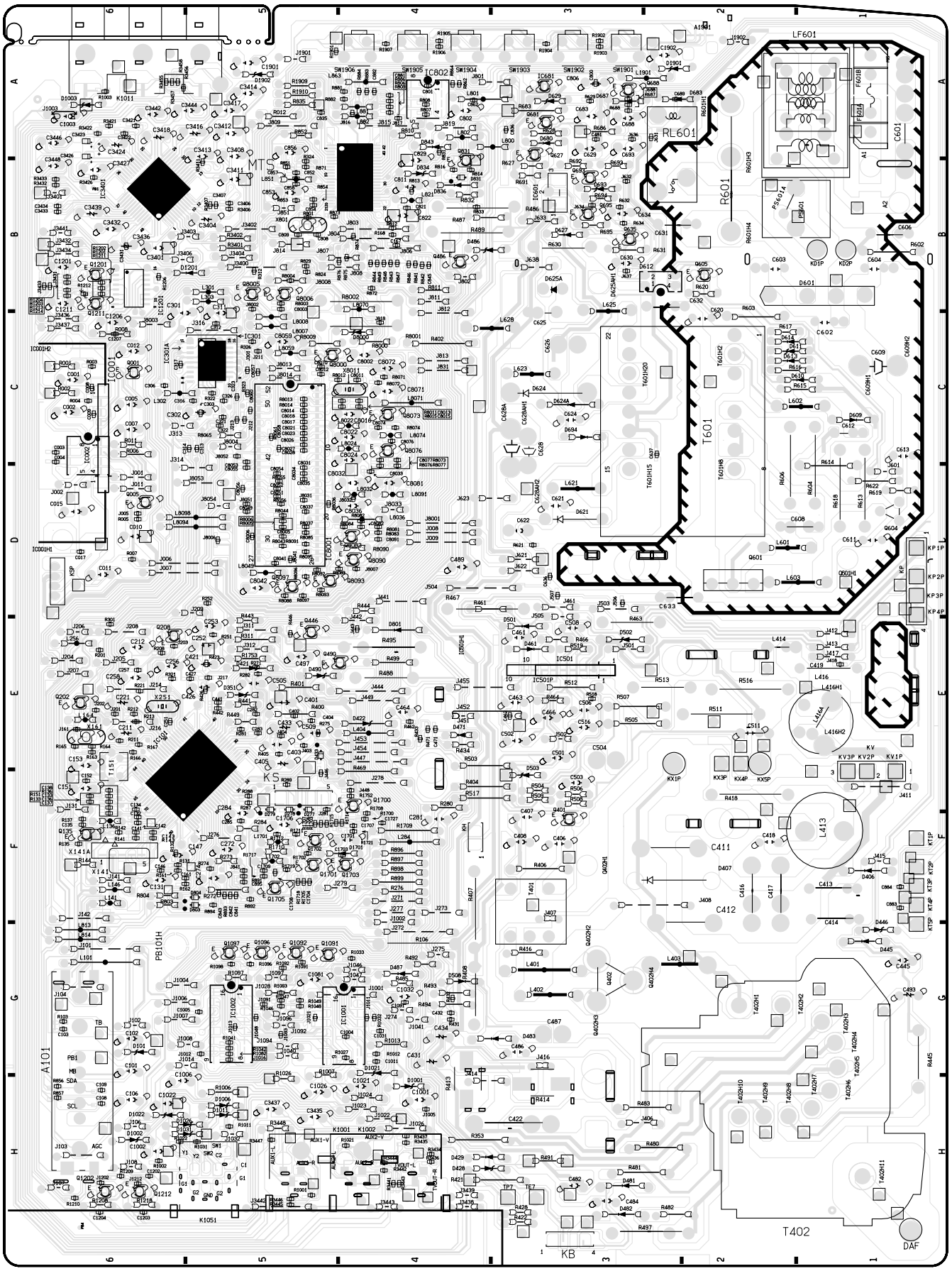
KEY NO.		PARTS NO.	DESCRIPTION
1		610 294 6420	CABINET FRONT ASSY
	OR	610 295 9031	CABINET FRONT ASSY
2		610 268 9648	CRT MTG WASHER BTM (2 USED)
		610 268 9662	CRT MTG WASHER TOP (2 USED)
3		412 053 3905	CRT MTG SCREW 6X35 (4 USED)
	OR	412 054 0002	CRT MTG SCREW 6X35 (4 USED)
4		610 102 7151	DC HOLDER (4 USED)
5		610 294 7595	CABINET BACK
	OR	610 296 6794	CABINET BACK
6		412 036 1805	SCREW 4X14 (8 USED)
	OR	411 078 1101	SCREW 4X14 (8 USED)
7		411 O26 2303	SCREW 3X10 (2 USED)
8		610 297 6113	DEC AV SHEET
9		610 295 7860	BUTTON UNIT
10		610 267 0851	CAP RC
11		610 296 4318	DEC SHEET
12		610 293 2560	SANYO BADGE-LARGE (SILVER)

ACCESSORY PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
	610 297 8940	OWNER'S MANUAL
	645 052 5025	RC TRANSMITTER
	610 298 2398	RC BATTERY COVER

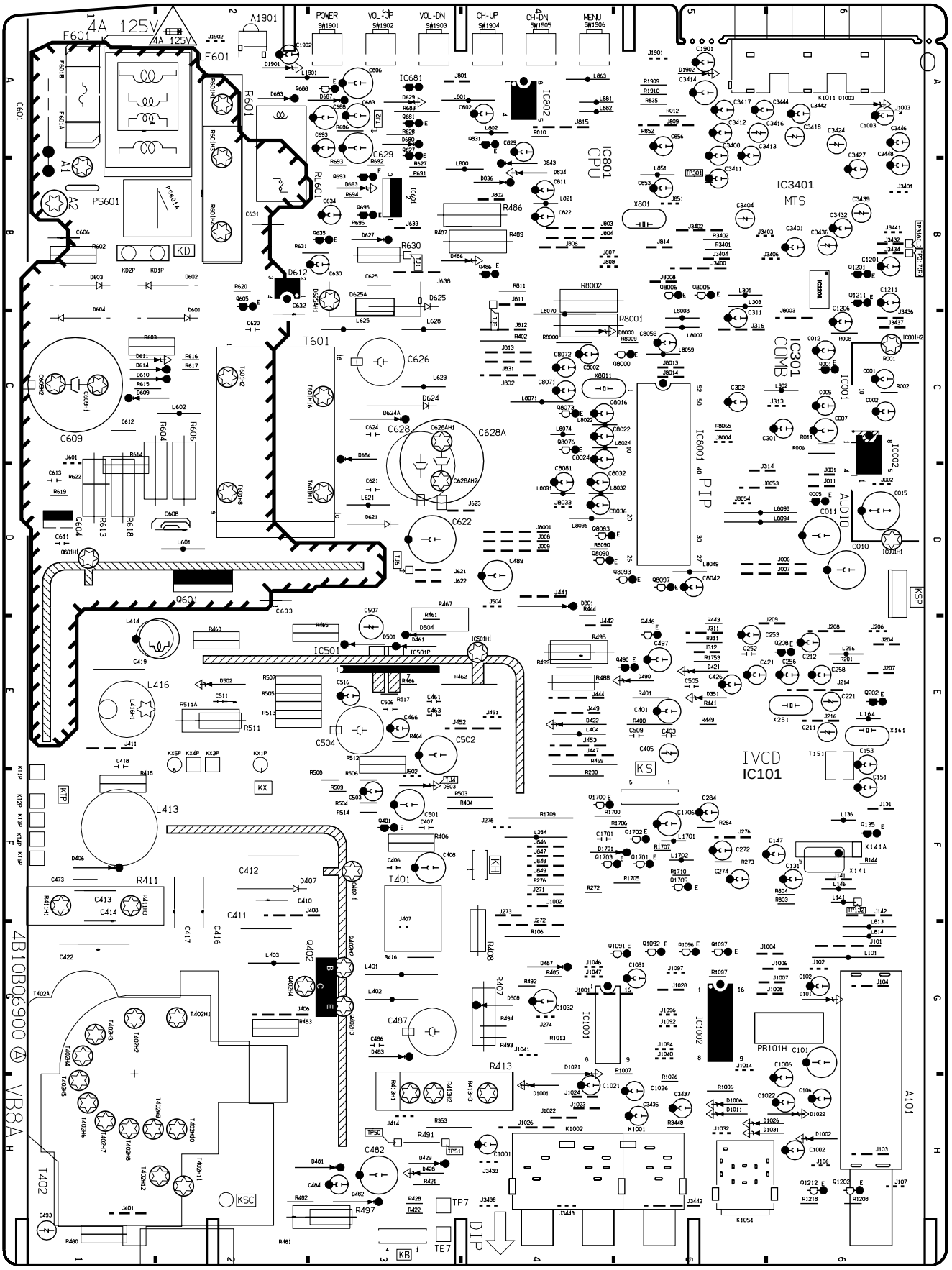
COMPONENT AND TESTPOINT LOCATIONS

MAIN BOARD FOIL SIDE

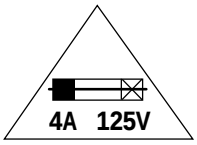


COMPONENT AND TESTPOINT LOCATIONS (Cont.)

MAIN BOARD PARTS SIDE



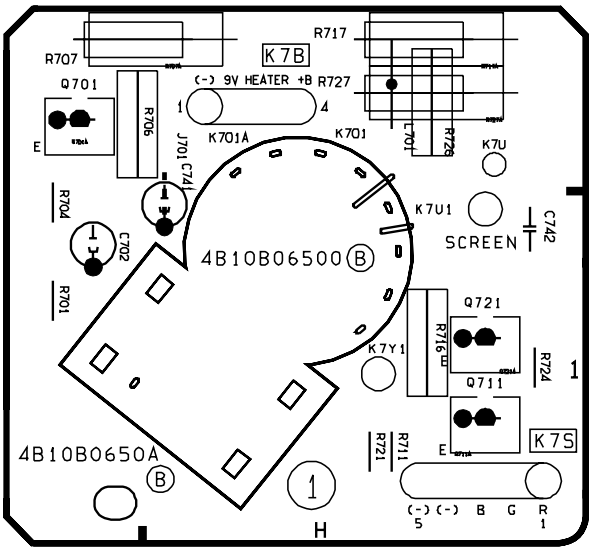
CAUTION



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

ATTENTION : POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.

PICTURE TUBE SOCKET BOARD



MAIN BOARD COMPONENTS AND TEST POINTS GRID LOCATIONS

Part	Loc.	Part	Loc.	Part	Loc.
D429	H3	Q202	E6	R513	E3
D612	B2	Q208	E6	TE7	H3
D801	D4	Q401	F3	TP7	H3
IC002	C6	Q402	G3	TJ1	B3
IC101	E6	Q486	B4	TJ4	F3
IC501	E3	Q490	E5	TJ5	B4
IC601	B3	Q601	D2	TP16	E6
IC681	A3	Q604	D1	TP21	F6
IC801	B4	Q605	C2	TP50	H3
IC802	A4	Q627	A3	TP51	H3
IC1001	G4	Q635	B3	TP317	B6
IC3401	B6	Q681	A3	TP318	B6
Q001	C6	Q693	B3	T151	E6
Q005	D6	Q695	B3		
Q135	F6	Q831	A4		

PIC TUBE SOCKET BOARD COMPONENTS

Part	Loc.
Q701	N/A
Q711	N/A
Q721	N/A

For parts or service contact

SANYO Fisher Service Corporation
21605 Plummer Street
Chatsworth, CA 91311 (U.S.A.)

300 Applewood Crescent,
Concord, Ontario L4K 5C7 (CANADA)

April / 2002 / 2000 SMC

Printed in U.S.A.

MODEL DS31520 Chassis No. 31520-00

SCHEMATIC DIAGRAMS

NOTES ON SCHEMATIC DIAGRAMS

1. All resistance values in ohms K=1,000 M=1,000,000.
2. Unless otherwise noted on schematic, all capacitor values less than 1 are expressed in µF (Micro Farad), and the values more than 1 are in pF.
3. Unless otherwise noted on schematic, voltage reading taken with VOM from point indicated to chassis ground. Voltage reading taken using color-bar signal VHF channel 5, all controls at normal. Line voltage at 120 volts. Some voltages may vary with signal strength.
4. Waveforms were taken with color-bar signal and controls adjusted for normal picture. Waveforms marked with an ✻ may vary with signal strength.
5. The Symbol (5W) indicates a fusible resistor, which protects the circuit from possible short circuits.

SERVICE NOTES:

1. When replacing parts on circuit boards, clamp the lead wires to terminals before soldering.
2. When replacing high wattage resistors on circuit board, keep the resistor body 10 mm (3/8) from circuit board.
3. Keep wires away from high voltage and high temperature components.

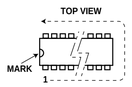
PRODUCT SAFETY NOTICE

THE COMPONENTS DESIGNATED BY A STAR (✻) ON THIS SCHEMATIC DIAGRAM DESIGNATE COMPONENTS WHOSE VALUES ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A STAR NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

X-RADIATION WARNING NOTE

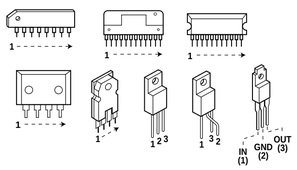
THIS TV CONTAINS CRITICAL PARTS TO PROTECT AGAINST X-RADIATION. NOMINAL 2ND ANODE VOLTAGE IS 29.0KV AT ZERO BEAM CURRENT AT 120 VOLTS AC LINE, AND MUST NOT EXCEED 30.0KV UNDER ANY OPERATING CONDITION. SEE HIGH VOLTAGE CHECK ON PAGE 8.

INTEGRATED CIRCUITS

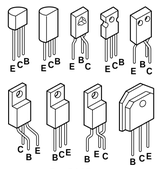


COUNT TERMINALS IN ARROW DIRECTION

SIDE VIEW

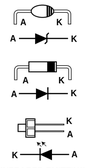


TRANSISTORS



B ... BASE
C ... COLLECTOR
E ... EMITTER

DIODES



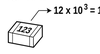
CHIP TRANSISTORS

TOP VIEW

B ... BASE
C ... COLLECTOR
E ... EMITTER

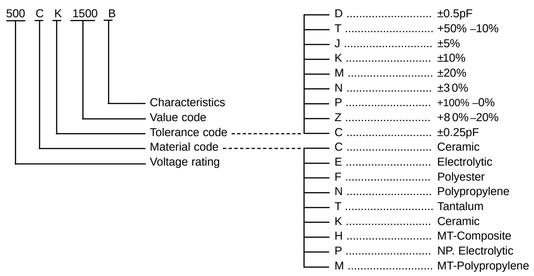
CHIP RESISTORS

TOP VIEW

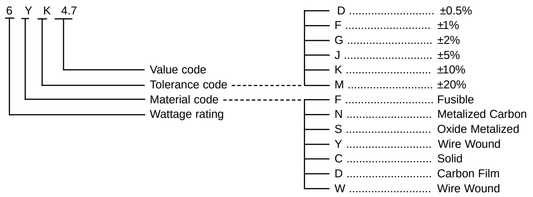


CAPACITOR AND RESISTOR CODE CHART

CAPACITOR (Example)

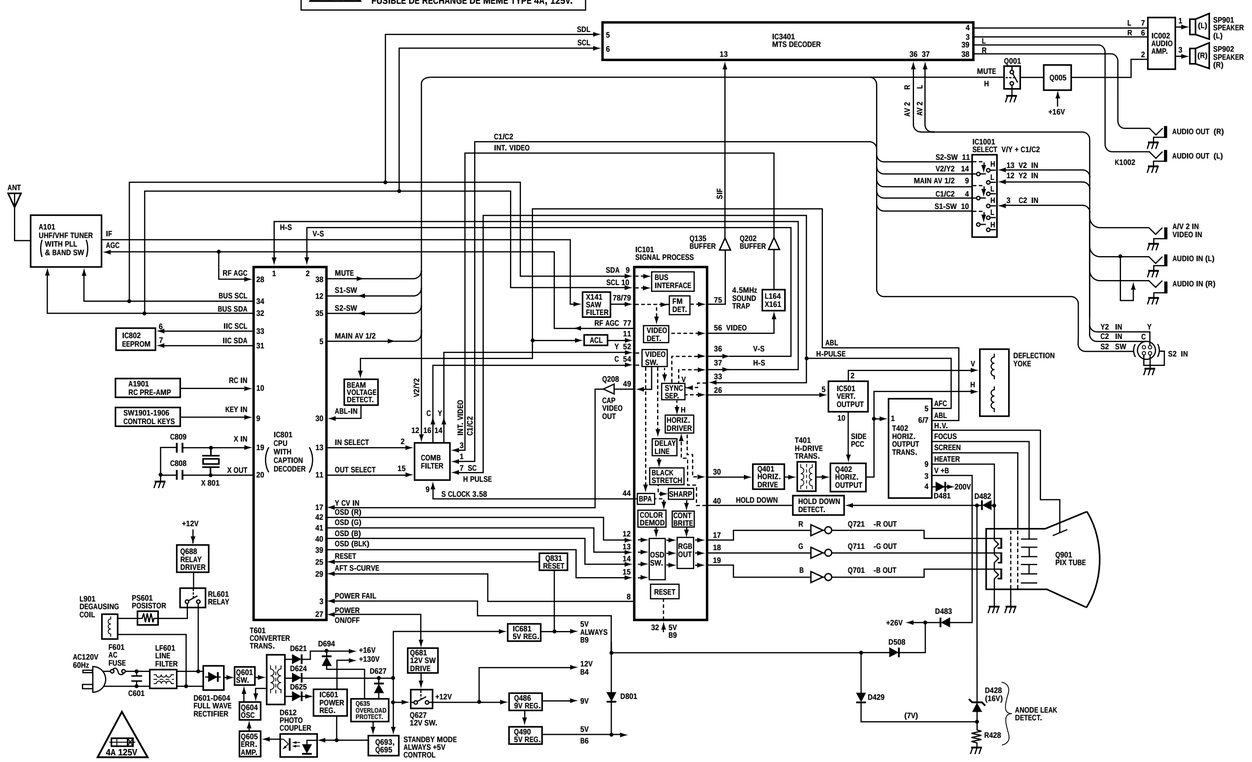


RESISTOR (Example)



BLOCK DIAGRAM

CAUTION FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.
ATTENTION: POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.



VOLTAGE CHARTS

NOTE: Voltages were measured using color-bar signal and the controls adjusted for normal picture.

Device/Pin #	Volts/Mode	
D612-1	POWER ON: 31.9	POWER OFF: 10.9
D612-2	POWER ON: 31.0	POWER OFF: 9.8
D612-3	POWER ON: –.3	POWER OFF: 0.6
D612-4	POWER ON: 13.3	POWER OFF: 1.4
IC002-1	4.5	
IC002-2	10.3	
IC002-3	4.6	
IC002-4	GND	
IC002-5	0	
IC002-6	1.4	
IC002-7	1.4	
IC002-8	GND	
IC101-1	GND	
IC101-2	GND	
IC101-3	GND	
IC101-4	GND	
IC101-5	GND	
IC101-6	5.1	
IC101-7	2.0	
IC101-8	2.6	
IC101-9	3.6	
IC101-10	3.7	
IC101-11	4.0	
IC101-12	1.5	
IC101-13	1.5	
IC101-14	1.5	
IC101-15	0	
IC101-16	8.3	
IC101-17	2.5	
IC101-18	2.5	
IC101-19	2.5	
IC101-20	2.25	
IC101-21	GND	
IC101-22	GND	
IC101-23	GND	
IC101-24	GND	
IC101-25	2.0	
IC101-26	2.4	
IC101-27	2.6	
IC101-28	5.3	
IC101-29	2.8	
IC101-30	0.6	
IC101-31	GND	
IC101-32	4.9	
IC101-33	1.0	
IC101-34	1.8	
IC101-35	4.8	
IC101-36	3.9	
IC101-37	4.0	
IC101-38	4.7	
IC101-39	GND	
IC101-40	0	
IC101-41	GND	
IC101-42	GND	

Device/Pin #	Volts/Mode	
IC101-43	GND	
IC101-44	2.2	
IC101-45	3.7	
IC101-46	2.0	
IC101-47	3.0	
IC101-48	0	
IC101-49	2.5	
IC101-50	GND	
IC101-51	GND	
IC101-52	2.8	
IC101-53	5.2	
IC101-54	2.7	
IC101-55	2.7	
IC101-56	2.3	
IC101-57	GND	
IC101-58	3.6	
IC101-59	4.4	
IC101-60	4.4	
IC101-61	GND	
IC101-62	GND	
IC101-63	GND	
IC101-64	GND	
IC101-65	2.5	
IC101-66	2.3	
IC101-67	1.9	
IC101-68	2.5	
IC101-69	3.2	
IC101-70	GND	
IC101-71	GND	
IC101-72	GND	
IC101-73	2.3	
IC101-74	0	
IC101-75	2.3	
IC101-76	2.7	
IC101-77	2.3	
IC101-78	2.9	
IC101-79	2.9	
IC101-80	GND	
IC301-1	0.9	
IC301-2	4.8	
IC301-3	2.0	
IC301-4	0	
IC301-5	5.1	
IC301-6	5.1	
IC301-7	0.3	
IC301-8	–0.3	
IC301-9	0.6	
IC301-10	0	
IC301-11	0	
IC301-12	1.5	
IC301-13	GND	
IC301-14	1.9	
IC301-15	0	
IC301-16	1.5	
IC501-1	GND	
IC501-2	13.7	
IC501-3	27.1	
IC501-4	2.9	
IC501-5	2.9	

Device/Pin #	Volts/Mode	
IC501-6	26.2	
IC501-7	3.0	
IC501-8	2.9	
IC501-9	2.9	
IC501-10	13.3	
IC601-1	POWER ON: 129.2	POWER OFF: 92.5
IC601-2	POWER ON: 31.1	POWER OFF: 9.8
IC601-3	GND	
IC681-1 (IN)	POWER ON: 11.6	POWER OFF: 7.3
IC681-2	GND	
IC681-3 (OUT)	POWER ON: 5.0	POWER OFF: 5.0
IC801-1	4.0	
IC801-2	3.9	
IC801-3	4.9	
IC801-4	9.1	
IC801-5	0	
IC801-6	0	
IC801-7	0	
IC801-8	0.3	
IC801-9	0	
IC801-10	4.9	
IC801-11	0	
IC801-12	4.8	
IC801-13	4.9	
IC801-14	4.9	
IC801-15	1.9	
IC801-16	0.2	
IC801-17	2.1	
IC801-18	GND	
IC801-19	2.2	
IC801-20	2.0	
IC801-21	GND	
IC801-22	4.9	
IC801-23	0.2	
IC801-24	0.2	
IC801-25	4.8	
IC801-26	0.3	
IC801-27	POWER ON: 4.9	POWER OFF: 0
IC801-28	2.3	
IC801-29	2.6	
IC801-30	0	
IC801-31	4.9	
IC801-32	3.6	
IC801-33	4.9	
IC801-34	3.7	
IC801-35	4.8	
IC801-36	4.9	
IC801-37	4.9	
IC801-38	0	
IC801-39	0	
IC801-40	0	
IC801-41	0	
IC801-42	0	

Device/Pin #	Volts/Mode
IC802-1	GND
IC802-2	GND
IC802-3	GND
IC802-4	GND
IC802-5	4.9
IC802-6	4.9
IC802-7	GND
IC802-8	4.9
IC1001-1	0
IC1001-2	0
IC1001-3	6.5
IC1001-4	6.5
IC1001-5	6.5
IC1001-6	GND
IC1001-7	GND
IC1001-8	GND
IC1001-9	0
IC1001-10	0
IC1001-11	9.3
IC1001-12	0.7
IC1001-13	2.5
IC1001-14	2.5
IC1001-15	0
IC1001-16	9.3
IC3401-1	4.1
IC3401-2	4.1
IC3401-3	4.1
IC3401-4	4.1
IC3401-5	3.6
IC3401-6	3.7
IC3401-7	GND
IC3401-8	4.1
IC3401-9	4.1
IC3401-10	4.1
IC3401-11	4.1
IC3401-12	4.9
IC3401-13	4.1
IC3401-14	1.3
IC3401-15	1.3
IC3401-16	0
IC3401-17	GND
IC3401-18	3.2
IC3401-19	9.1
IC3401-20	0
IC3401-21	4.1
IC3401-22	4.1
IC3401-23	3.7
IC3401-24	3.9
IC3401-25	4.1
IC3401-26	4.1
IC3401-27	4.1
IC3401-28	1.9
IC3401-29	4.1
IC3401-30	4.1
IC3401-31	2.0
IC3401-32	4.1
IC3401-33	4.1
IC3401-34	4.1

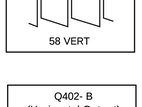
Device/Pin #	Volts/Mode	
IC3401-35	0	
IC3401-36	4.1	
IC3401-37	4.1	
IC3401-38	4.1	
IC3401-39	4.1	
IC3401-40	4.1	
IC3401-41	4.1	
IC3401-42	GND	
IC3401-43	4.1	
IC3401-44	4.1	
IC3401-45	4.2	
IC3401-46	GND	
IC3401-47	4.1	
IC3401-48	4.1	
Q001-B	POWER ON: 0.7	POWER OFF: 0
Q001-C	POWER ON: 0	POWER OFF: 6.3
Q001-E	GND	
Q005-B	9.6	
Q005-C	10.3	
Q005-E	10.3	
Q135-B	2.3	
Q135-C	5.2	
Q135-E	1.7	
Q202-B	2.7	
Q202-C	GND	
Q202-E	3.4	
Q208-B	2.8	
Q208-C	GND	
Q208-E	3.5	
Q401-B	0.3	
Q401-C	43.6	
Q401-E	GND	
Q402-B	-0.1	
Q402-C	125.26	
Q402-E	GND	
Q486-B	9.9	
Q486-C	11.6	
Q486-E	9.1	
Q490-B	5.9	
Q490-C	6.9	
Q490-E	5.2	
Q601-B	POWER ON: –0.3	POWER OFF: 0
Q601-C	POWER ON: 155.0	POWER OFF: 169.6
Q601-E	GND	
Q604-B	POWER ON: –0.4	POWER OFF: 0.6
Q604-C	POWER ON: –0.3	POWER OFF: 0
Q604-E	GND	

Device/Pin #	Volts/Mode	
Q605-B	POWER ON: 13.1	POWER OFF: 1.4
Q605-C	POWER ON: –0.4	POWER OFF: 0.6
Q605-E	POWER ON: 13.0	POWER OFF: 2.0
Q627-B	POWER ON: 11.1	POWER OFF: 7.3
Q627-C	POWER ON: 11.6	POWER OFF: 1.0
Q627-E	POWER ON: 11.9	POWER OFF: 7.3
Q635-B	POWER ON: 4.2	POWER OFF: 1.4
Q635-C	POWER ON: 31.1	POWER OFF: 9.8
Q635-E	POWER ON: 4.2	POWER OFF: 1.4
Q681-B	POWER ON: 0.7	POWER OFF: 0
Q681-C	POWER ON: 0	POWER OFF: 7.3
Q681-E	GND	
Q688-B	POWER ON: 11.6	POWER OFF: 1.0
Q688-C	POWER ON: 0	POWER OFF: 0
Q688-E	POWER ON: 11.5	POWER OFF: 1.0
Q693-B	POWER ON: 0.5	POWER OFF: 6.2
Q693-C	POWER ON: 30.9	POWER OFF: 8.9
Q693-E	POWER ON: 0.4	POWER OFF: 5.7
Q695-B	POWER ON: 30.9	POWER OFF: 9.6
Q695-C	GND	
Q695-E	POWER ON: 31.0	POWER OFF: 9.8
Q701-B	2.6	
Q701-C	141.9	
Q701-E	2.5	
Q711-B	2.6	
Q711-C	143.1	
Q711-E	2.5	
Q721-B	2.6	
Q721-C	146.1	
Q721-E	2.5	
Q831-B	4.9	
Q831-C	4.9	
Q831-E	4.9	

WAVEFORMS

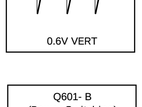
NOTE: Waveforms were taken with color-bar signal and the controls adjusted for normal picture.

IC101- (17) (R-Output)



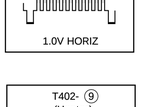
2.0V HORIZ

IC101- (18) (G-Output)



2.0V HORIZ

IC101- (19) (B-Output)



2.0V HORIZ

IC101- (52) (Selected Video)

1.0V HORIZ

IC501- (2) (Vertical Output)

58 VERT

IC501- (5) (Inverting Input)

0.6V VERT

Q202-E (TP16) (Internal Video)

1.0V HORIZ

Q401- B (Horizontal Drive)

0.7V HORZ

Q402- B (Horizontal Output)

13V HORZ

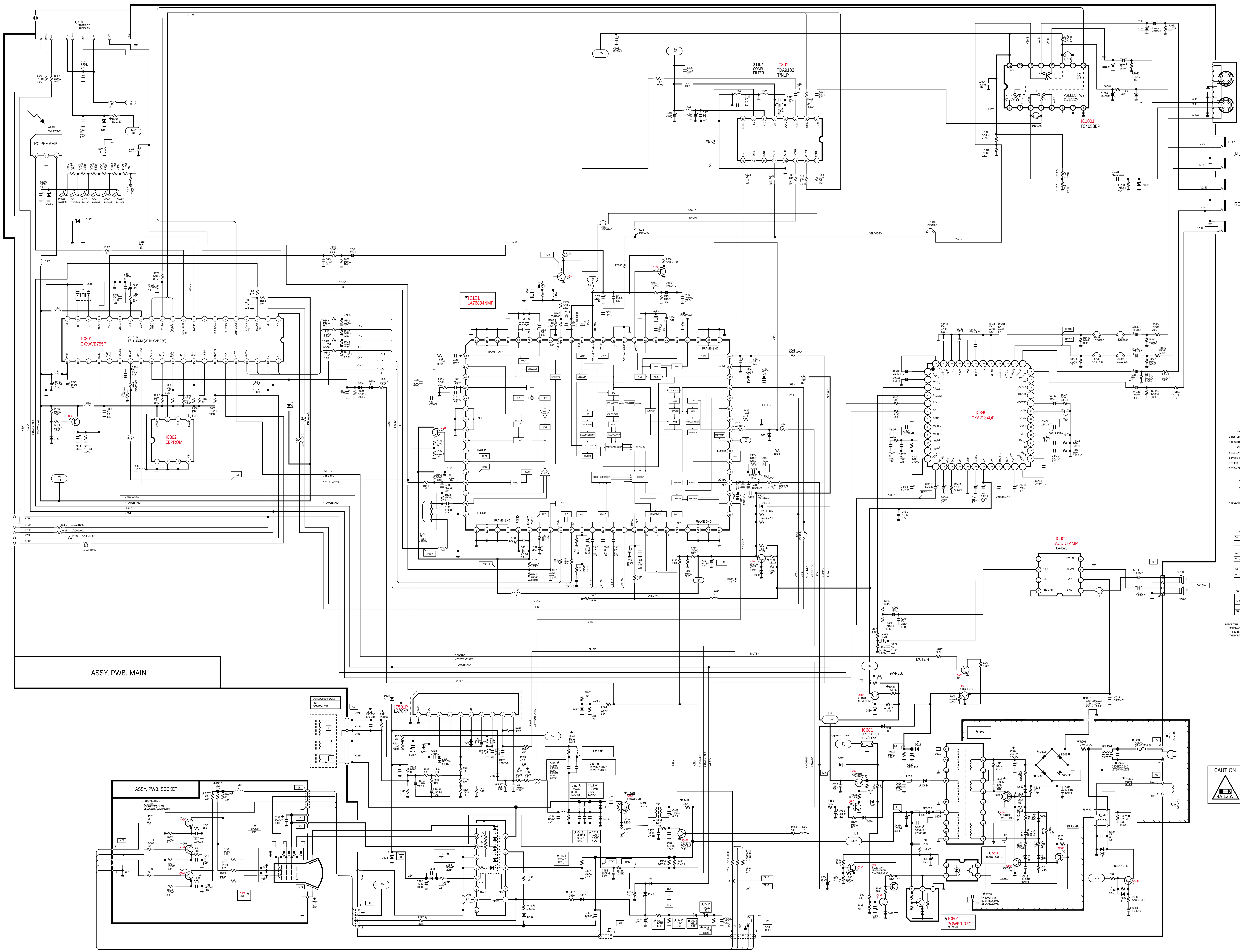
Q601- B (Power Switching)

6.0V 50KHz

T402- (9) (Heater)

28V HORIZ

MODEL DS31520 Chassis No. 31520-00



NOTES;

1. RESISTORS SPECIFIED WITH RESISTANCE VALUE ARE "1/6DJ".
2. RESISTORS SPECIFIED WITH TYPE OF RESISTOR, TOLERANCE AND RESISTANCE VALUE ARE "1/4".
3. ALL CAPACITORS ARE 50WV RATING UNLESS OTHERWISE NOTED.
4. PARTS MARKED WITH ▭ ARE RELATED WITH X-RADIATION.
5. THICK LINES ARE 15WATTS SUPPLY LINE.
6. VIEW OF TR & FET & IC.

TOP VIEW N; E C B; E C B; LETTER\SIDE; B C E IN CASE\ OF TR; 1 2 3 IN CASE\ OF IC; G D S IN CASE\ OF FET

7. ISOLATION BORDER LINE.

COLD SIDE | HOT SIDE

8. LIST OF REPLACEABLE DIODES.

R (7DD00019)	1S2076A, 1S2473, 1N4148
AA (7DD00192)	1S2076A, 1S2473, 1N4148, 1SS133

9. LIST OF REPLACEABLE TRANSISTORS.

	2SC1740S	2SC945A	2SC1815	2SC536N
AD (7T200183)	Q,R,S	Q,P	Y,GR	F,G
AE (7QT00202)	Q,R,S	R,Q,P	O,Y,GR	F,G
	2SA933S	2SA564A	2SA1015	2SA608N
AB (7T200181)	R	R	Y,GR	F
AC (7T200182)	Q,R	Q,R	O,Y,GR	F

10. "J" : JUMPER WIRE.
"X" : PART NOT USED.

CHIP

	2SA1037AK	2SA1037K	2SA1179
AJ (7T200221)	R,S	R,S	M6,M7
	2SC2412K	2SC2812	
AH (7T200220)	R,S	L6,L7	

IMPORTANT:
SCHEMATIC PART LOCATION NUMBERS MAY NOT ALWAYS MATCH THE SCHEMATIC SYMBOLS.
THE SCHEMATIC SYMBOLS AND PART DESCRIPTIONS ARE CORRECT AND SHOULD BE USED.
THE PART DESCRIPTIONS WILL BE LISTED UNDER THE LOCATION NUMBER IN THE PARTS LIST.

CAUTION 4A 125V
FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.
ATTENTION: POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.