

FCC ID: M9U9801DJ81MD

Notes on the enclosed manuals

- 1- The manuals (user and service) carry the manufacturer's name and model numbers of a previously approved equipment.
Appropriate name (Siemens Nixdorf) will be used on the final version of the manuals.
- 2- User manual carries a Declaration of Conformity statement. This statement will be deleted from the final version.
- 3- The timing chart in the enclosed service manual is identical to that of Model CM 812ET.
Please note that replacement sheets are added for pages 5 and 6 in the service manual. These are numbered P.5 & P.6. A note has been stapled to page 5 of the service manual to this effect.

HITACHI

SERVICE MANUAL

FCC ID: M9U9801DJ81MD

YK

No. 0046E

CM811
CM812

DJ81 Chassis

(V1.2)

FCC APPROVED

AUG 31 1998

CAUTION: Before servicing this chassis, it is important that the service personnel must read the "Safety Precautions" and "Product Safety Notice" in this Service Manual.

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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

HIGH RESOLUTION COLOR DISPLAY MONITOR

(MAY 1998)

PRODUCT SAFETY NOTICE

Many electrical mechanical parts in the color monitor units have special safety related characteristics.

These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with  on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the manufacturer recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, X-radiation, or other hazards.

Productions are issued from time to time. For the latest information, always consult this Service Manual.

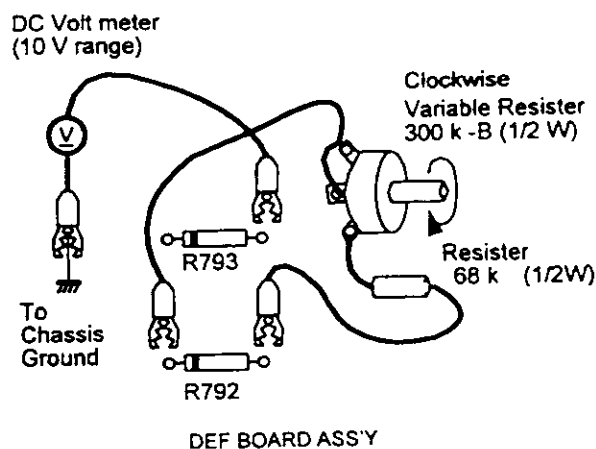


Fig. 2 Checking Circuit using jig

SPECIFICATIONS

Model Name	CM811*	CM812*		
Destination	North America (*="U") Europe (*="ET")	North America (*="U") Europe (*="ET")		
Rated Voltage	AC 100-120 / 200-240 V, Automatically select. Provided with Power Circuit.			
Power Consumption	125 W nominal			
Color Display Tube (CDT)	21inch inches diagonal, 0.22 mm horizontal dot pitch Invar shadow mask, Black matrix, Anti-Reflection coat, Short persistence phosphors.			
Rated Frequency	Horizontal	31 - 96 kHz	31 - 107 kHz	
	Vertical	50 - 160 Hz		
Resolution	Horizontal	Up to 1600		
	Vertical	Up to 1280		
Signal Inputs	Red, Green and Blue analog video H/V separate, H/V composite or Sync on Green sync.			
User Controls	Power Switch Degauss Language select Contrast Brightness Horizontal Position, Size Vertical Position, Size Right Side Pincushion Right Trapezoid Side Pincushion Trapezoid Red, Green, Blue intensity Color Select Rotation H Moire Reduction V Moire Reduction			
Environmental Condition	Temperature : Humidity : Operation 5 °C to 40 °C 10% to 80% Storage -20 °C to 60 °C 10% to 90 %			
Dimensions	488 (W) × 482 (H) × 470 (D) mm Including Tilt & Swivel base.			
Weight	27.5 kg			

SIGNAL TIMING CHART

	Signal		V 640
1	Video	Type	R/G/B
		Voltage	0.7
		Set Up	N
2	Sync	Type	H/V S
		Amp.	TTL Level
3	Video frequency		25.1
4	Character (Letter)		640dots
5	Horizontal	Frequency	31.4
		Front porch	0.636 μ
		Sync. width	3.813 μ
		Back porch	1.907 μ
		Blanking width	6.356 μ
		Display time	25.422 μ
		H.period (1H)	31.778 μ
6	Vertical	Frequency	70.
		Front porch	0.381 μ
		Sync. width	0.064 μ
		Back porch	1.112
		Blanking width	1.557
		Display time	12.711
		H.period (1H)	14.268
7	Scan System		(Non-
8	Remark		
9	Signal name		

NOTE

These pages 5 & 6 will be replaced with the following pages
P.5 & P.6 in the final version of this manual

ESA 640 × 480 (55Hz)	VGSA 1280 × 1024 (85Hz)
Analog	R/G/B Analog
Vp-p	0.7 Vp-p
one	None
Separate	H/V Separate
(Posi./Posi.)	TTL Level (Posi./Posi.)
60 MHz	157.500 MHz
640 × 480 lines	1280 dots × 1024 lines
31.5 kHz	91.146 kHz
0.406 μ s (48cl)	0.406 μ s (64cl)
1.016 μ s (96cl)	1.016 μ s (160cl)
1.422 μ s (208cl)	1.422 μ s (224cl)
2.844 μ s (352cl)	2.844 μ s (448cl)
8.127 μ s (1024cl)	8.127 μ s (280cl)
10.971 μ s (1376cl)	10.971 μ s (1728cl)
85.000Hz	85.024 Hz
0.011ms (1H)	0.011ms (1H)
0.033 ms (3H)	0.033 ms (3H)
0.483 ms (44H)	0.483 ms (44H)
0.527 ms (48H)	0.527 ms (48H)
11.235 ms (768H)	11.235 ms (1024H)
11.761 ms (808H)	11.761 ms (1072H)
(Non-interlaced)	(Non-interlaced)
68A	91A

- * VGA is a registered trademark of International Business Machined Corporation.
- * VESA is a trademark of a nonprofit organization, Video Electronics Standard Association.

Addition of
SNI model. Add

SYM.	REVISIONS	DATA	REV'D.	CHK'D.	APP'D.
1					
2					

CM812ET-SNI (MCM212V) Preset Timing (1/2)

	0.29 M Pixel	0.307 M Pixel	0.48 M Pixel	0.79 M Pixel	0.79 M Pixel
Signal Name	31A (Mode 1)	30C (Mode 2)	64B (Mode 3)	68A (Mode 4)	81D (Mode 5)
	720 X 400	840 X 480	800 X 600	1024 X 768	1024 X 768
Pixel Frequency	28.325 MHz	25.175 MHz	67.500 MHz	94.500 MHz	111.200 MHz
	35.305 ns	39.722 ns	14.815 ns	10.582 ns	8.993 ns
Video	R/G/B Analog	R/G/B Analog	R/G/B Analog	R/G/B Analog	R/G/B Analog
Amplitude	0.7 Vpp	0.7 Vpp	0.7 Vpp	0.7 Vpp	0.7 Vpp
Set-up	Non	Non	Non	Non	Non
H. Frequency	31.472 kHz	31.469 kHz	63.920 kHz	68.677 kHz	80.814 kHz
Front Porch	0.635 us (18 cl)	0.838 us (16 cl)	0.474 us (32 cl)	0.508 us (48 cl)	0.288 us (32 cl)
Sync. Width	3.813 us (108 cl)	3.813 us (86 cl)	0.948 us (64 cl)	1.016 us (96 cl)	1.151 us (128 cl)
Back Porch	1.906 us (54 cl)	1.907 us (48 cl)	2.370 us (160 cl)	2.201 us (208 cl)	1.727 us (192 cl)
Blank Time	6.355 us (180 cl)	6.356 us (160 cl)	3.793 us (256 cl)	3.725 us (352 cl)	3.165 us (352 cl)
Display Time	25.419 us (720 cl)	25.422 us (840 cl)	11.852 us (800 cl)	10.838 us (1024 cl)	9.209 us (1024 cl)
Period	31.774 us (900 cl)	31.778 us (800 cl)	15.644 us (1056 cl)	14.561 us (1376 cl)	12.374 us (1376 cl)
H. Display rate	80%	80%	76%	74%	74%
V. Frequency	70.09 Hz (NON-INT)	59.94 Hz (NON-INT)	100.03 Hz (NON-INT)	85.00 Hz (NON-INT)	99.89 Hz (NON-INT)
Front Porch	0.413 ms (13 H)	0.318 ms (10 H)	0.016 ms (1 H)	0.015 ms (1 H)	0.025 ms (2 H)
Sync. Width	0.064 ms (2 H)	0.064 ms (2 H)	0.047 ms (3 H)	0.044 ms (3 H)	0.037 ms (3 H)
Back Porch	1.080 ms (34 H)	1.049 ms (33 H)	0.548 ms (35 H)	0.524 ms (36 H)	0.445 ms (36 H)
Blank Time	1.557 ms (49 H)	1.430 ms (45 H)	0.810 ms (39 H)	0.582 ms (40 H)	0.507 ms (41 H)
Display Time	12.710 ms (400 H)	15.253 ms (480 H)	9.387 ms (600 H)	11.183 ms (768 H)	9.503 ms (768 H)
Period	14.267 ms (449 H)	16.683 ms (525 H)	9.997 ms (639 H)	11.765 ms (808 H)	10.011 ms (809 H)
V. Display rate	89%	91%	94%	85%	85%
H. Sync. Polarity	N	N	P	P	N
V. Sync. Polarity	P	N	P	P	N
	HV Separate	HV Separate	HV Separate	HV Separate	HV Separate
	VGA	VGA	SNI-100Hz	VESA	SNI-100Hz

(18/27)
R406301



REGD.	DWN.	CHKD.	APPD.	TITLE	HITACHI, Ltd.	YOKOHAMA WORKS DWG. NO.	SIC
				DJ81 Chassis Design Specifications	Tokyo Japan	327 W 102458	61

Addition of
SNI timing.

Add

SYN	REVISIONS	DATA	REVD.	CHKD.	APPD.
①					
②					

CM812ET-SNI (MCM212V) Preset Timing (2/2)

	0.995 M Pixel 100F (Mode 6)	1.31 M Pixel 80A (Mode 7)	1.31 M Pixel 91A (Mode 8)	1.31 M Pixel 107A (Mode 9)	1.92 M Pixel 108B Mode 10
Signal Name	1152 X 864 157.000 MHz 6.369 ns	1280 X 1024 135.000 MHz 7.407 ns	1280 X 1024 157.500 MHz 6.349 ns	1280 X 1024 184.900 MHz 5.408 ns	1600 X 1200 229.500 MHz 4.357 ns
Pixel Frequency	R/G/B Analog 0.7 Vpp Non	R/G/B Analog 0.7 Vpp Non	R/G/B Analog 0.7 Vpp Non	R/G/B Analog 0.7 Vpp Non	R/G/B Analog 0.7 Vpp Non
Video Amplitude	100.128 kHz	79.976 kHz	91.146 kHz	107.002 kHz	106.250 kHz
Set-up	0.204 us (32 cl)	0.119 us (16 cl)	0.408 us (64 cl)	0.173 us (32 cl)	0.278 us (64 cl)
H. Frequency	0.816 us (128 cl)	1.087 us (144 cl)	1.016 us (160 cl)	0.892 us (128 cl)	0.837 us (192 cl)
Front Porch	1.631 us (256 cl)	1.837 us (248 cl)	1.422 us (224 cl)	1.558 us (288 cl)	1.325 us (304 cl)
Sync. Width	2.850 us (416 cl)	3.022 us (408 cl)	2.844 us (448 cl)	2.423 us (448 cl)	2.440 us (580 cl)
Back Porch	7.338 us (1152 cl)	9.481 us (1280 cl)	8.127 us (1280 cl)	6.823 us (1280 cl)	6.972 us (1600 cl)
Blank Time	9.987 us (1568 cl)	12.504 us (1688 cl)	10.971 us (1728 cl)	9.346 us (1728 cl)	9.412 us (2160 cl)
Display Time	73%	76%	74%	74%	74%
Period	110.03 Hz (NON-INT)	75.02 Hz (NON-INT)	85.02 Hz (NON-INT)	99.91 Hz (NON-INT)	85.00 Hz (NON-INT)
H. Display rate	0.020 ms (2 H)	0.013 ms (1 H)	0.011 ms (1 H)	0.019 ms (2 H)	0.008 ms (1 H)
V. Frequency	0.030 ms (3 H)	0.038 ms (3 H)	0.033 ms (3 H)	0.028 ms (3 H)	0.028 ms (3 H)
Front Porch	0.409 ms (41 H)	0.475 ms (38 H)	0.483 ms (44 H)	0.393 ms (42 H)	0.433 ms (46 H)
Sync. Width	0.459 ms (46 H)	0.525 ms (42 H)	0.627 ms (48 H)	0.439 ms (47 H)	0.471 ms (50 H)
Back Porch	8.629 ms (864 H)	12.804 ms (1024 H)	11.235 ms (1024 H)	9.570 ms (1024 H)	11.294 ms (1200 H)
Blank Time	9.088 ms (910 H)	13.329 ms (1066 H)	11.761 ms (1072 H)	10.009 ms (1071 H)	11.765 ms (1250 H)
Display Time	95%	96%	96%	96%	96%
Period	V. Display rate	N	P	P	P
H. Sync. Polarity	N	P	P	P	P
V. Sync. Polarity	HV Separate	HV Separate	HV Separate	HV Separate	HV Separate
	VESA	VESA	VESA	SNI-100Hz	VESA

(17/27)
R406301

DESCRIPTION OF CIRCUIT

1. Power Supply Circuit

This model incorporates a wide range universal power supply utilizing a switching regulator (see block diagram in Figure 1).

1.1 AC input

AC input consists of AC inlet, EMI filter (C901~C903, C906~C909) and rectifier D901. Rectifier circuits adapt to full-wave method. Inrush current limiting circuit (R901) protects from excessive inrush current at initial stage of power on.

1.2 Circuit #1 :

Circuit 1 consists of chopper inductor (L910), chopper component (Q910), rectifier component (D910, C911) and control IC (I911). R911, R912 and R913 detect input voltage and provide signal to I911 pin 3 which adjusts the pulse width based on the pin 3 voltage level to provide constant voltage output. Switching operation is performed by frequency synchronization with circuit #2, to control I911 pin 14 from circuit #2.

1.3 Switching Regulator circuit

Switching Regulator circuit is designed to handle variations of two conditions to ensure constant +B voltage to secondary circuit : (Circuit 2) varying load conditions of video, (Circuit 3) varying horizontal frequencies and varying load conditions.

1.3.1 Circuit #2 :

Circuit 2 consists of chopper transformer (T930), chopper component (Q930) and control IC (I931). T930 detects output voltage and provides signal to I931 pin 1 which adjusts the pulse width based on the pin 1 voltage level to provide constant voltage output. If the secondary circuit becomes overloaded, primary current through T930 is detected at R931, R932 and stops the switching operation. Once the circuit has overloaded, the power switch must be turned off for a short period and then turned on to re-establish power.

Switching frequency is determined by time constant of C934.

1.3.2 Circuit #3 :

Circuit 3 consists of chopper transformer (T920) and chopper component (Q920) mainly providing +B voltage for horizontal deflection. Regulator method is to detect secondary voltage at I971 and feed through photocoupler I923, providing constant voltage by controlling I921 pin 2 at primary circuit. Switching operation is performed by frequency synchronization with circuit #2, to control I921 pin 7 from circuit #2.

As mentioned above, while detecting secondary voltage at I971, I971 simultaneously receives voltage information from microprocessor which is proportional to the horizontal frequency. Therefore, output of circuit #3 is additionally regulated by the horizontal frequency. In this circuit, gate circuit (Q972, Q973) controls the switching operation at power control (I921) through photocoupler (I922).

This circuit is designed to receive power off command from the microprocessor, resulting in stopping chopper operation at the power supply.

2. Sync Determination Circuit

Depending on the combination of Sync signal inputs and its polarity, Sync signal is fed to Sync Processing chip I304 which produces H/V sync. sep at its output.

3. Video Processing Circuit

3.1 Video Processor

The video input signal of 0.7 Vp-p is amplified to approximately 50 Vp-p by the video processing circuit and is fed to the cathode to drive the beam current.

This chassis incorporates a single chip video processor, I201, with three channels, one for each of R/G/B, which functions as the pre-amp of the inputs, OSD mixer and also gain control. A control signal from the microprocessor changes the amplifier gain of the video channels (R/G/B) together with white balance control.

Video Output circuit I202 amplifies R/G/B signals controlled by I201 to the enough level to drive Cathode of CRT. DC voltage of Cathode is determined by DC Cut off voltage from Cathode Clamp Circuit. DC Cut off voltage is generated at Level Shift Circuit which consists of I203, whose R/G/B channels are also controlled by microprocessor.

3.2 ACL Circuit

The current at the secondary winding of the flyback transformer is used to represent the CRT beam current. The current is measured and fed to the contrast control I204, D273 to limit the maximum beam current with negative feedback.

3.3 Blanking Circuit

Video blanking during the beam retrace period is achieved by applying both horizontal and vertical blanking pulses to I201.

3.4 Precedence of Clamp Pulse Circuit

Clamp signal in Video Processor I201 receives pulses from I306, Precedence of Clamp pulse circuit. When the monitor receives signals, the input of I306 is Sync pulse from Sync Processing Circuit, I304. Without signals, I306' input is the pulse from Deflection Circuit controlled by microprocessor.

3.5 OSD Circuit

I301, receives H/V pulses from Deflection Circuit and control signal from microprocessor, whose output feeds Clock signals (20MHz ~ 90MHz) synchronized with H pulse and control signals from microprocessor, whose output feeds OSD display signals in R/G/B and OSD blanking signal to OSD Mixer Circuit in I201.

4. Horizontal Deflection and High Voltage Regulation Circuit

4.1 Horizontal Deflection Circuit

The purpose of the horizontal deflection circuit is to cause the CRT electron beam to be scanned horizontally by driving a current through the deflection yoke, synchronized by the H sync pulse. The circuit consists of an AFC circuit, made up of an H phase detector and VCO (voltage controlled oscillator), and the deflection output.

The H.sync signal is input to I701 where it is delayed and then input to a phase detector. The phase detector (I701) also accepts input from a sawtooth waveform which is provided by the deflection feedback (flyback pulse) through the Q704. The output of the phase detector creates an error voltage between the feedback pulse and the input pulse and is then fed to the VCO after processing by an AFC Filter.

The AFC circuit also receives controller voltage from the microprocessor's output of the $f_{H.V}$ signal, to center the free-run frequency within the pull-in range of 31 ~ 130kHz, achieving a wide pull-in range. The output pulse from the VCO is fed to the pre-drive and then output from I701 to the drive buffer Q701/Q702. The pre-drive circuit within I701 is duty cycle controlled by the $f_{H.VP}$ signal from the microprocessor through a level shifter R719, R721, R722 and R725.

In the case of no Sync signals supplied or excessive frequency change, such as a signal timing change, the microprocessor provides a +B shutdown signal to the power supply and also provides a control signal which determines the +B shutdown period after receiving an input signal again.

The deflection circuit of the DJ81 chassis has been separated from the high voltage regulation circuit to provide improved H linearity performance by utilizing the consonant conditions of the horizontal beam current characteristics. The S-consonant capacitors, C771~C779, are changed by Q774~Q787, which provide 12~10 stages of consonant conditions. The horizontal linearity coils L770~L771 are changed by S77R to provide two stages of H Linearity conditions.

The power supply parabolically modulates the H.DEF +B voltage of the deflection circuit, based on the horizontal frequency, to provide a frequency - dependent voltage of between 53.5V and 174V to the deflection circuit.

4.2 High Voltage Regulation Circuit

The output pulse from I504 is also fed to the high voltage regulation circuit with the same design of consonant circuit as the horizontal deflection circuit. High voltage of 27.5kV is obtained by the step-up windings of the flyback transformer to drive the CRT anode. The high voltage is monitored by the E_{HV} error detection circuit. The error detection circuit functions by stepping the high voltage down and comparing it with the reference voltage of inside I750 whose output controls Q741, the E_{HV} switching transistor.

4.3 Parabolic Waveform Generator Circuit

This circuit generates the parabolic waveform for the purpose of dynamic focus compensation.

4.4 Dynamic focus compensation waveform

Vertical saw tooth signal are input to I505 pin2. Output of pin 4 generates a parabolic waveform with an amplitude proportional to the vertical line frequency, after processing by I505. Vertical parabolic waveform output (I505 pin 4) pulse to feed to the dynamic focus drive circuit.

Horizontal trigger pulses are input to the PLL (I503, pin 14), the stabilized output of which is then fed to I505 pin 17, through Gate I504. The output of I505 (pin 7) feeds the parabolic waveform, with an amplitude proportional to the horizontal line frequency (after processing by I505), to I501. I501 is a processor which combines horizontal parabolic output pulse to feed to the dynamic focus drive circuit.

4.5 Dynamic focus drive circuit

This monitor's CRT includes a dynamic focusing electron gun to achieve sharp and uniform focus throughout the display area. The CRT's Focus anode receives a DC component of approximately 27% of the CRT anode voltage, combined with the AC voltage parabolic waveform of magnitude of 550Vp-p horizontal, and 200Vp-p vertical. DC focus voltage is obtained from a tap of the flyback transformer's bleeder resistor, and fed to G3 focus electrode. Horizontal and vertical parabolic output pulses are amplified at Q560~Q564, T560 and fed to the flyback transformer where they are combined with the DC component (27% of anode voltage). The potentiometers (focus 1, focus 2) at the flyback adjust the DC focus voltage. The focus 1 potentiometer mainly adjusts horizontal beam shape (vertical line width), and the focus 2 potentiometer mainly adjusts the vertical beam shape (horizontal line width) by optimizing the DC component of the parabolic waveform.

Left and right horizontal focus adjustment is achieved by changing the amplitude of the horizontal parabolic waveform at I505 via horizontal gain at R544. Top and bottom vertical focus adjustment is achieved by changing the amplitude of the vertical parabolic waveform via vertical gain at R543.

5. Vertical Deflection Circuit

The purpose of the vertical deflection circuit is to cause the CRT electron beam to be scanned vertically by driving a current through the deflection yoke, synchronized by the V sync pulse. V sync is input to the V oscillator circuit, I701, generating the vertical sawtooth wave. The vertical sawtooth wave is fed to I630 to be amplified of I630 to drive the vertical deflection yoke.

The vertical output stage consist of a DC feed back loop, with feedback of the DC component via the low pass filter, and an AC feedback loop with feedback of the AC component. The AC feedback current gose through feedback circuit where it is used to adjust the time constant.

The vertical linerty after signal timing change is constant by fv-v voltage whitch is from microprocessor circuit.

The vertical size control signal from the microprocessor controls the voltage of I701 8pin through a level shifter R618,R619 and R606.

The output stage of I630 includes a ramp-up circuit with D630 and C635 achieving near doubling of the retrace pulse to minimize retrace time.

The vertical position control signal from the microprocessor is fed to the vertical deflection yoke through a vertical centering circuit of I631 to center the raster.

6. Microprocessor Circuit

The microprocessor circuit consists of the following four detailed circuits as shown in Figure.

1. Sync detect circuit
2. Front panel key data Input / Output (I/O)
3. Processing and memory
4. Control output

6.1 Sync detect circuit

The sync detect outside the microprocessor determines sync polarity, and feeds the polarity signal, STATE signal and H/V sync to the sync processing circuit within the microprocessor. The sync processing circuit detects these inputs, counts frequency, and feeds the polarity signal and frequency count to the Central Processing Unit (CPU).

6.2 Front panel key data Input / Output (I/O)

User input is received by the front panel keys which consists of : six select keys, four data keys (two pairs of +/- key), one Store key.

Select keys :

- | | |
|--------------------------|-------------------------------------|
| 1) H. Position / H. Size | 4) Right Side Pin / Right Trapezoid |
| 2) V. Position / V. Size | 5) Color Select / Rotation |
| 3) Side Pin / Trapezoid | 6) Contrast / Brightness |

The H.moire control feature requires the user to press Right Side Pin / Right Trapezoid and Contrast / Brightness front panel keys simultaneously to enter the control mode. Adjustment is then made with +/- keys.

The V.moire control feature requires the user to press Color Select / Rotation and Contrast / Brightness front panel keys simultaneously to enter the control mode. Adjustment is then made with +/- keys.

Red, Green, and Blue color gain control feature requires that the user press the contrast / Brightness button and one of H. Position / H. Size (Red adjust), V. Position / V. Size (Green adjust), or side Pin / Trapezoid (Blue adjust) keys simultaneously to enter the control mode. Adjustment for the selected color is then made with +/- keys.

The language select feature requires the user to press V.Position / V.Size and Side Pin / Trapezoid front panel keys simultaneously to enter the control mode. Adjustment is then made with +/- keys.

When OSD display is disappeared, current settings (including picture size, geometry, and color setting) were stored to non-volatile memory. The maximum memory capacity is for 26 presets including factory standard settings.

6.3 Processing and memory

I102 is an 8 bit microprocessor which equips with ROM and RAM for system program, and sync processing circuit. Data memory consists of 2 EEPROM chips, I104, I105 for preset data.

6.4 Control output

The microprocessor output controls the DAC, the OSD On/Off controls, mute circuit, and limit circuit. The input control signal to the DAC, I001, I002 I051, is fed to video control (Contrast, Brightness, R/G/B color gain, R/G/B color BKG, sub Contrast, Sub Brightness and ACL), Size control (H/V size, H/V position, side pin correction, trapezoidal correction, rotation, right sidepin correction, right trapezoidal correction, H/V moire control, V.Linearity(S), V.Linearity(C) and Side pin Corner correction), and fH-V selection (+B control and H size control and horizontal drive correction, H. Osc. control with VCO control). The input control signal to the OSD, I301, provides the function that the monitor shows guidance for adjustment on the screen by generating video signal as character pattern and feeding it to the video amplifier. On/Off control provides 2 power saving modes by stopping +B output if one of H sync and V sync is not supplied (Standby mode) and by stopping main power supply if both H and V sync are not supplied. The mute circuit brings video output to black level when timing signal changes or the monitor goes into the power saving mode. The limit circuit consists of a gate, I704 and I706. In case that the frequency is normal, CPU opens the gate and H/V sync is fed to the deflection circuit via the gate. If not, CPU closes the gate to prevent the deflection circuit oscillating at illegal frequency.

This chassis is capable of communicating with a PC through an RS-232C serial communication port for factory adjustments, by making access to the microprocessor through the RS-232C I/O driver, I107.

7. Power Save Function

The C98 chassis is capable of power savings by sensing of the sync input conditions by the microprocessor. The microprocessor can identify two sync conditions, (1) No detection of H.sync, (2) No detection of V sync.

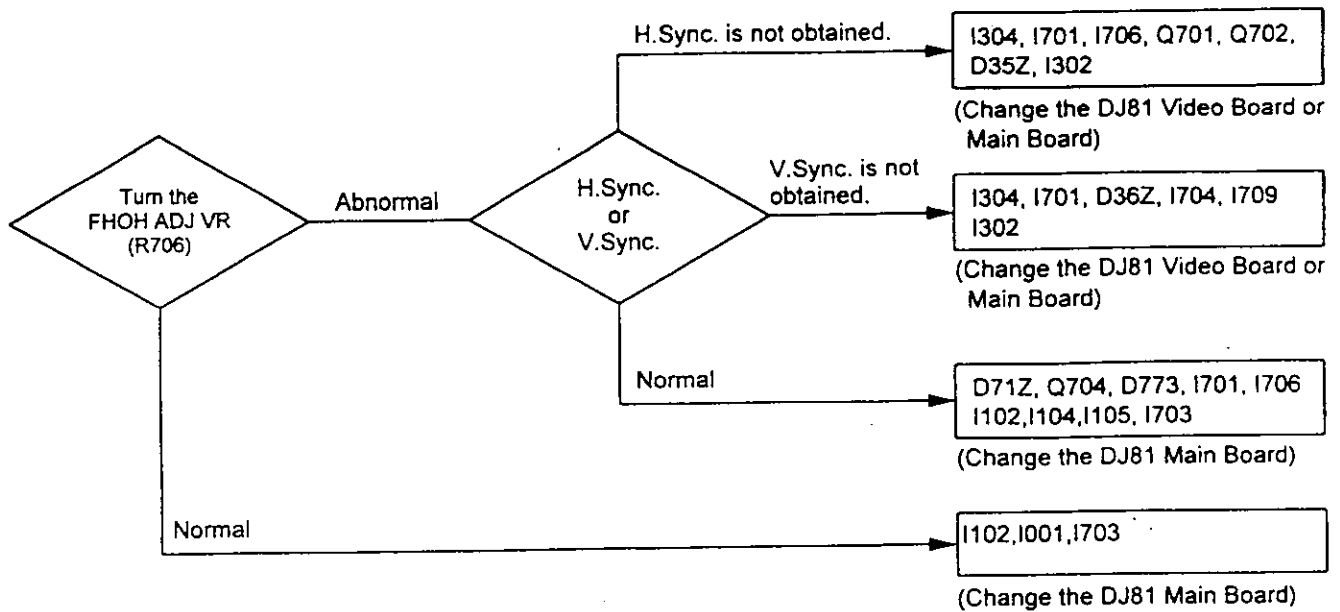
The following table shows the details of the Power save mode.

Table : Power Save Function

Sync	H Sync	Yes	No	Yes	No
	V Sync	Yes	Yes	No	No
VESA Standard	Name	Normal	Standby	Suspend	Off
	Recovery Time	N/A	Short	Short	System Dependent
	Recovery Time	None	Minimam	Minimam	Maximum
Circuit Operation	H. Deflection	Normal operation	Stop	Stop	Stop
	V. Deflection	Normal operation	Stop	Stop	Stop
	Video	Normal operation	Mute	Mute	Mute
Power LED		Lighting Green	Flashing quickly	Flashing quickly	Flashing slowly
Power consumption (Typical) : AC (120V)		All White : 125W All Black : 90W	less than 15W	less than 15W	less than 5W

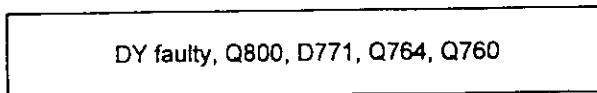
2. SYNCHRONIZATION IS NOT OBTAINED

Relevant circuit : Sync. input circuit, Deflection circuit



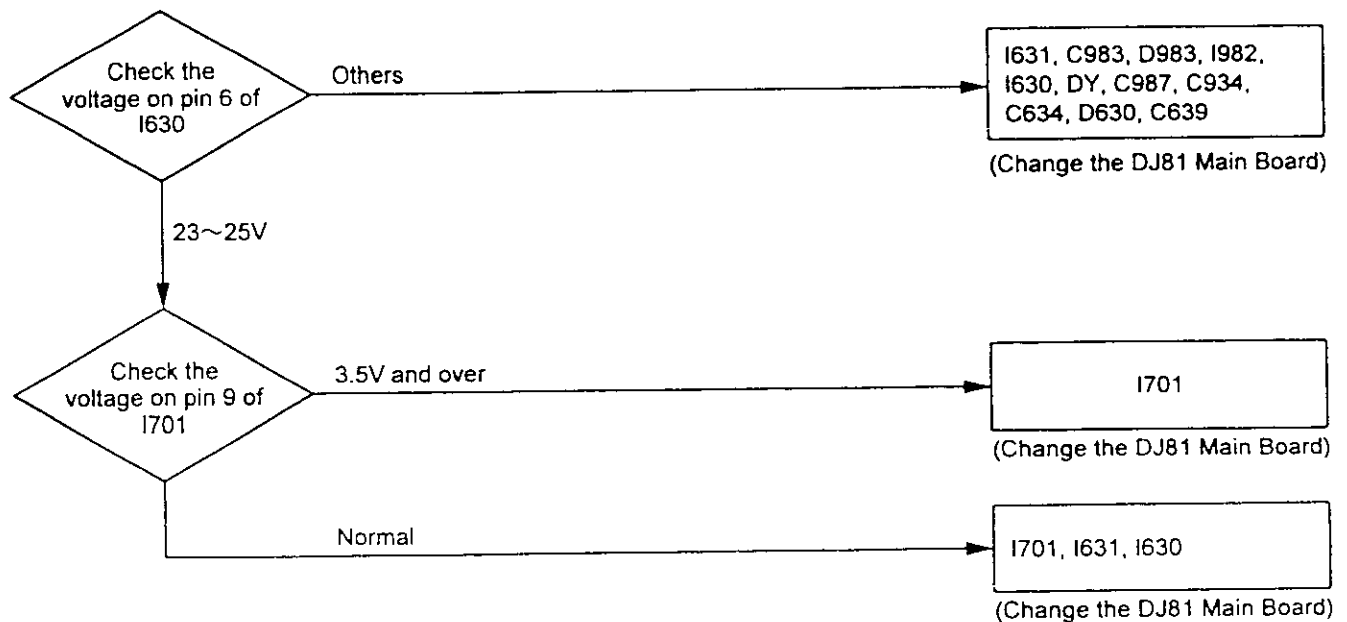
3. HORIZONTAL SINGLE LINE

Relevant circuit : Horizontal output circuit



4. VERTICAL SINGLE LINE

Relevant circuit : Vertical deflection circuit



ADJUSTMENTS

1. Power supply

1.1 PFC output voltage adjustment.

- (1) Turn the switch of the unit off.
- (2) Place a jumper wire across C922 and R98P on main-p.w.b to disable + B output voltage.
- (3) Turn the switch of the unit on.
- (4) Receive normal cross hatch pattern of signal 94A.
- (5) Connect a Digital multimeter between + and - of C911.
- (6) Adjust R916 to $373 \pm 2V$.
- (7) Turn the switch of the unit off.
- (8) Remove the jumper wire from C922 and R98P.

1.2 Main power supply voltage adjustment for color display tube.

- (1) Turn the switch of the unit off.
- (2) Place a jumper wire across C922 and R98P on main-p.w.b to disable + B output voltage.
- (3) Turn the switch of the unit on.
- (4) Receive reverse cross hatch pattern of signal 94A.
- (5) Connect a Digital multimeter across C984.
- (6) Adjust Main power supply voltage to $13.0 \pm 0.3V$ using R942.
- (7) Turn the switch of the unit off.
- (8) Remove the jumper wire from C922 and R98P.

1.3 +B voltage adjustment

- (1) Turn the switch of the unit off.
- (2) Adjusting horizontal free running frequency must be finished before this adjustment.
- (3) Receive a normal cross hatch signal.(See table 1.for proper signal timing)
- (4) Connect a Digital volt meter across C971.
- (5) Turn the switch of the unit on.
- (6) Adjust H.Size to maximum.
- (7) Adjust R973 to the proper +B voltage value as outlined in table 1.
- (8) Receive reverse cross hatch pattern of signal 30C and check the +B voltage is at $50.0 \pm 2.0V$.

Table 1

Model	signal	+B voltage
CM81*	94A	$135 \pm 1.0V$

3. Video Circuit

Prior to the video circuit adjustment, all Sync.And Deflection circuit adjustment must be completed. The monitor must have been warmed up for more than 60 minutes. Video signal must be terminated with 75Ω and should provide the correct voltage at the monitor end.

[Pre-setting before adjustment]

* Output voltages of DAC

Function	Pin No.	Output Voltage
R Color	#9 pin (I051)	5V (FF)
G Color	#6 pin (I051)	5V (FF)
B.Color	#8 pin (I051)	5V (FF)
Contrast	#7 pin (I051)	5V (FF)
Brightness	#4 pin (I051)	0V (FF)
Sub Brightness	#8 pin (I002)	2.5V (7F)
Sub Contrast	#5 pin (I051)	2.5V (7F)
R.BKG	#15 pin (I051)	5V (00)
G.BKG	#14 pin (I051)	2.5V (7F)
B.BKG	#16 pin (I051)	5V (00)
ACL	#17 pin (I051)	2.5V (7F)

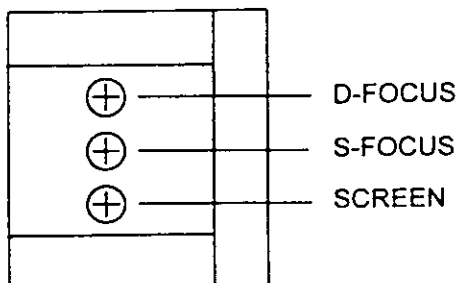
Note 1) Color Analyzer : Minolta CA 100 or equivalent.

3.1 Cut off adjustment

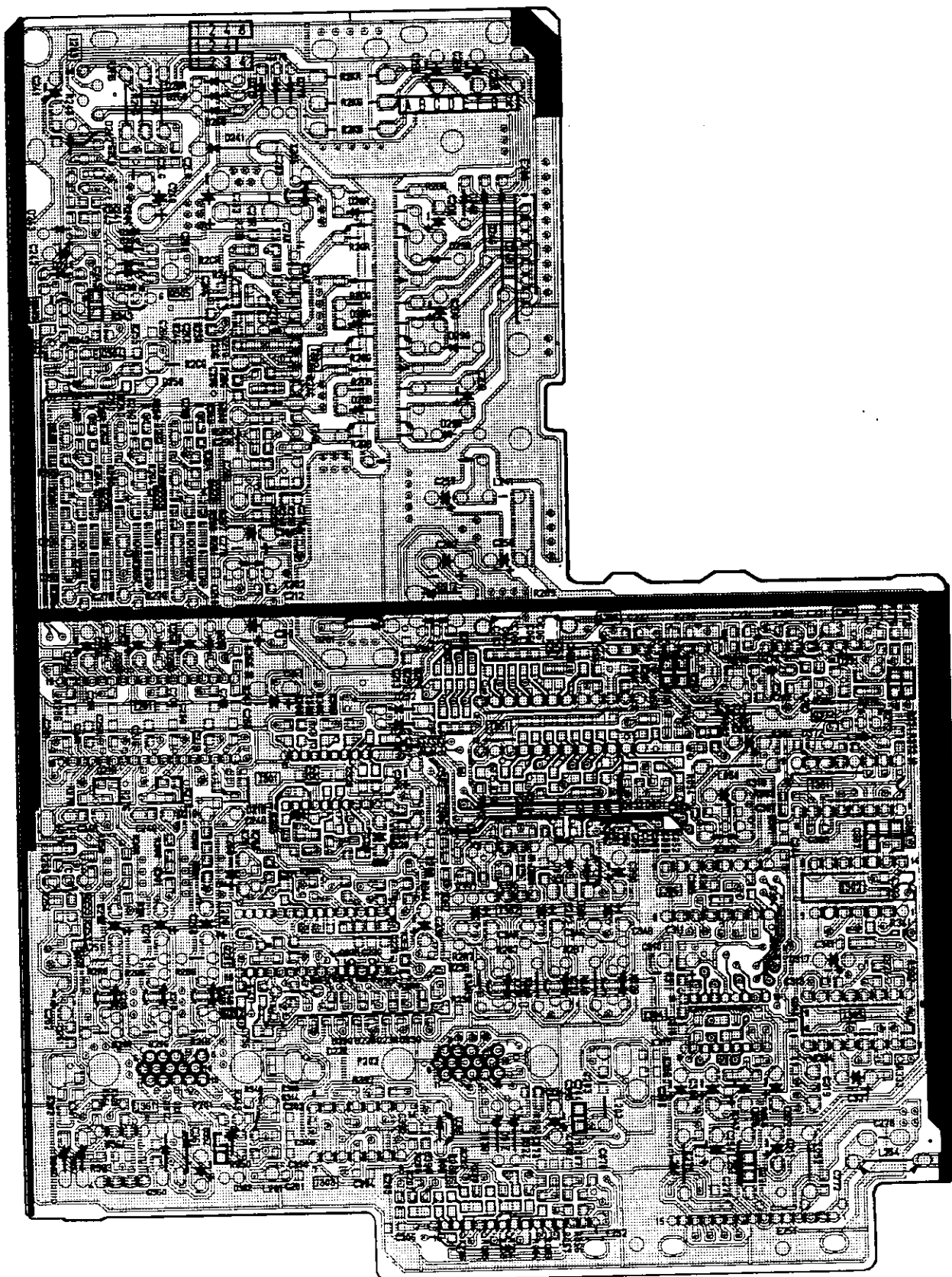
- (1) Receive a signal of 94A with a blank signal pattern.(Black video)
- (2) Connect a high impedance voltmeter (more than $1000M\Omega$) to the Screen terminal (G2) on the CRT neck board.
Adjust the Screen voltage pot on FBT to see $600 \pm 5V$.
- (3) Adjust R,G & B,BKG to show the CIE coordinate of
 $X=0.313 \pm 0.03$, $Y=0.329 \pm 0.03$ at 1.5 cd/m^2 (0.44ft-L).
 If it looks difficult to obtain X and Y readings mentioned above, do the followings to obtain these numbers.
 - 1) Reset Sub Brightness to 1.9V (9F) or 3.1V (60).
 - 2) Reset Sub Brightness to 0.93V (CF) or 4.1V (30).
 - 3) Reset G2 to 550V or 650V

4.1 Focus adjustment

- (1) Receive signal 94A with a full screen "E" characters.
- (2) Set user Contrast control to its maximum.
- (3) Set user Brightness control so that the back ground raster is just diminished.
- (4) Adjust S-Focus control on the FBT so that focus at the middle points between the center of the screen to its best.
- (5) Adjust D-Focus control on the FBT so that focus at four corners of the screen to its best.



VIDEO P.W.B.



REPLACEMENT PARTS LIST

PRODUCT SAFETY NOTE : Components marked with a Δ have special characteristics important to safety.
Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual.
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ABBREVIATIONS	Capacitors-----CD: Ceramic Disk, PF: Polyester Film, EL: Electrolytic, PP: Polypropylene,
	PR: Paper, TA: Tantalum, TM: Trimer.
	Resistors-----CF: Carbon film, WW: Wire Wound, FR: Fuse Resistor, MG: Metal Glazed,
	VR: Variable resistor, CC: Carbon Composition, MF: Metal Oxide Film.
	Semiconductors-----TR: Transistor, DI: Diode, ZD: Zener Diode, VA: Varistor, TH: Thermistor.

SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
C001	0244171	CD 0.01MF +80-20% 50V	C107	0880053	PF 0.047MF +10% 50V
C002	0244171	CD 0.01MF +80-20% 50V	C10P	0890035	CD 1000PF +-10% 50V
C003	0244171	CD 0.01MF +80-20% 50V	C111	0244171	CD 0.01MF +80-20% 50V
C004	0244171	CD 0.01MF +80-20% 50V	C112	0244171	CD 0.01MF +80-20% 50V
C005	0244171	CD 0.01MF +80-20% 50V	C113	0244171	CD 0.01MF +80-20% 50V
C006	0244171	CD 0.01MF +80-20% 50V	C114	0244171	CD 0.01MF +80-20% 50V
C007	0244171	CD 0.01MF +80-20% 50V	C115	0244171	CD 0.01MF +80-20% 50V
C008	0244171	CD 0.01MF +80-20% 50V	C116	0244171	CD 0.01MF +80-20% 50V
C009	0244171	CD 0.01MF +80-20% 50V	C117	0244171	CD 0.01MF +80-20% 50V
C010	0244171	CD 0.01MF +80-20% 50V	C118	0244171	CD 0.01MF +80-20% 50V
C011	0244171	CD 0.01MF +80-20% 50V	C119	0244171	CD 0.01MF +80-20% 50V
C012	0244171	CD 0.01MF +80-20% 50V	C120	0244171	CD 0.01MF +80-20% 50V
C015	0800325	EL 100MF 10V	C121	0244171	CD 0.01MF +80-20% 50V
C016	0244171	CD 0.01MF +80-20% 50V	C124	0244171	CD 0.01MF +80-20% 50V
C017	0244171	CD 0.01MF +80-20% 50V	C125	0244171	CD 0.01MF +80-20% 50V
C020	0800325	EL 100MF 10V	C130	0800316R	EL 47MF 10V
C021	0244171	CD 0.01MF +80-20% 50V	C131	0244171	CD 0.01MF +80-20% 50V
C022	0244171	CD 0.01MF +80-20% 50V	C141	0880053	PF 0.047MF +10% 50V
C023	0244171	CD 0.01MF +80-20% 50V	C142	0880053	PF 0.047MF +10% 50V
C024	0244171	CD 0.01MF +80-20% 50V	C143	0880053	PF 0.047MF +10% 50V
C025	0244171	CD 0.01MF +80-20% 50V	C144	0890087	CD 1000PF +10% 50V
C027	0244171	CD 0.01MF +80-20% 50V	C145	0880195R	PF 0.12MF +-5% 50V
C028	0244171	CD 0.01MF +80-20% 50V	C171	0800284R	EL 3.3MF 50V
C045	0244171	CD 0.01MF +80-20% 50V	C172	0800284R	EL 3.3MF 50V
C046	0244171	CD 0.01MF +80-20% 50V	C173	0800284R	EL 3.3MF 50V
C047	0244171	CD 0.01MF +80-20% 50V	C174	0800284R	EL 3.3MF 50V
C048	0244171	CD 0.01MF +80-20% 50V	C195	0244107	CD 3300PF +10% 50V
C050	0244171	CD 0.01MF +80-20% 50V	C201	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V
C053	0800325	EL 100MF 10V	C202	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V
C055	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C210	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V
C056	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C211	0800326	EL 100MF 16V
C057	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C21B	0284621R	EL 0.47MF 50V
C058	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C21G	0284621R	EL 0.47MF 50V
C059	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C21R	0284621R	EL 0.47MF 50V
C05A	0890022	CD 100PF +-10% 50V	C221	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V
C05B	0890005	CD 4.7PF +-10% 50V	C222	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V
C060	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C223	0284638	EL 10MF 16V
C061	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C224	0893027R	CAPACITOR,CHIP 0.1MF 25V
C062	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C240	0258128	EL 100MF 100V
C063	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C241	0800317	EL 47MF 16V
C064	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C242	0800279R	EL 1MF 50V
C065	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C243	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V
C066	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C251	0893067	CAPACITOR,CHIP 0.1MF +80 -20% 25V
C067	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C252	0800334R	EL 220MF 10V
C068	0893044R	CAPACITOR,CHIP 0.01MF +-10% 50V	C253	0258128	EL 100MF 100V
C101	0246448	CD 22PF +-5% 50V	C254	0800317	EL 47MF 16V
C102	0246448	CD 22PF +-5% 50V	C256	0800305R	EL 22MF 100V
C104	0880053	PF 0.047MF +-10% 50V	C25B	0893072R	CAPACITOR,CHIP 0.47MF +80 -20% 25V
C105	0880053	PF 0.047MF +-10% 50V	C25G	0893072R	CAPACITOR,CHIP 0.47MF +80 -20% 25V

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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
C550	0244171	CD 0.01MF +80-20% 50V	C713	0800361	EL 1000MF 16V
C551	0800294	EL 10MF 50V	C714	0244171	CD 0.01MF +80-20% 50V
C552	0800294	EL 10MF 50V	C715	0800277R	EL 0.47MF 50V
C553	0800277R	EL 0.47MF 50V	C717	0800279R	EL 1MF 50V
C561	0890033	CD 680PF +10% 50V	C718	0800299R	EL 22MF 16V
C562	AN01161F	PP 0.1MF +5% 250V	C719	0890035	CD 1000PF +10% 50V
C563	0244501	CD 1000PF +10% 500V	C71B	0800335R	EL 220MF 16V
C564	0800014	EL 4.7MF 100V	C71D	0890022	CD 100PF +10% 50V
C565	0800294	EL 10MF 50V	C720	0890022	CD 100PF +10% 50V
C566	0800305R	EL 22MF 100V	C721	0244171	CD 0.01MF +80-20% 50V
C571	0800325	EL 100MF 10V	C722	0800299R	EL 22MF 16V
C601	0244171	CD 0.01MF +80-20% 50V	C741	0800335R	EL 220MF 16V
C602	0244171	CD 0.01MF +80-20% 50V	C742	0800351	EL 470MF 6.3V
C603	0244171	CD 0.01MF +80-20% 50V	C746	AN01341F	PP 330PF +5% 1.6KV
C604	0800279R	EL 1MF 50V	C752	0244507	CD 3300PF +10% 500V
C605	0244171	CD 0.01MF +80-20% 50V	C754	0244171	CD 0.01MF +80-20% 50V
C606	0880201R	PF 0.33MF +5% 50V	C755	0258124R	EL 10MF 100V
C607	0800317	EL 47MF 16V	C757	0800294	EL 10MF 50V
C608	0800326	EL 100MF 16V	C758	0800294	EL 10MF 50V
C609	0244171	CD 0.01MF +80-20% 50V	C759	0800288	EL 4.7MF 50V
C610	0244171	CD 0.01MF +80-20% 50V	C760	0880053	PF 0.047MF +10% 50V
C611	0244171	CD 0.01MF +80-20% 50V	C761	0880053	PF 0.047MF +10% 50V
C612	0800294	EL 10MF 50V	C763	0255003R	EL 22MF 31.5V
C620	0800294	EL 10MF 50V	C767	AN01125F	PP 3600PF +5% 1.8KV
C630	0880059	PF 0.15MF 50V	C76B	0800279R	EL 1MF 50V
C631	0880057	PF 0.1MF +10% 50V	C770	0247842	CD 33PF +5% 500V
C632	0254516	EL 22MF 25V	C771	AN01163F	PP 0.12MF +5% 250V
C634	0800363	EL 1000MF 35V	C772	AN00896F	PP 0.091MF +5% 250V
C635	0800328	EL 100MF 35V	C773	AN00902F	PP 0.15MF +5% 250V
C636	0880051	PF 0.033MF +10% 50V	C775	AN00906F	PP 0.22MF +5% 250V
C637	0255011F	2200MF 35V	C776	AN01181F	PP 0.56MF +5% 250V
C638	0800317	EL 47MF 16V	C777	AN01174F	PP 0.33MF +5% 250V
C639	0244171	CD 0.01MF +80-20% 50V	C778	AN01161F	PP 0.1MF +5% 250V
C640	0800279R	EL 1MF 50V	C779	AN01187F	PP 1MF +5% 250V
C641	0800294	EL 10MF 50V	C77A	0244206	CD 330PF +10% 2KV
C645	0244171	CD 0.01MF +80-20% 50V	C77B	0244206	CD 330PF +10% 2KV
C651	0890022	CD 100PF +10% 50V	C77C	0245608	CD 1000PF +10% 1000V
C702	0880057	PF 0.1MF +10% 50V	C781	0244505	CD 2200PF +10% 500V
C703	0236389R	CD 470PF +5% 50V	C782	0244505	CD 2200PF +10% 500V
C704	0890026	CD 220PF +10% 50V	C79A	0245610	CD 2200PF +10% 1KV
C705	0800282	EL 2.2MF 50V	C801	0800296R	EL 10MF 100V
C706	0800294	EL 10MF 50V	C802	0800296R	EL 10MF 100V
C707	0800294	EL 10MF 50V	C803	0880035	PF 2200PF +10% 50V
C708	0880042	PF 6800PF +10% 50V	C820	AL00029R	EL 22MF 250V
C709	0800279R	EL 1MF 50V	C821	0244171	CD 0.01MF +80-20% 50V
C70A	0890035	CD 1000PF +10% 50V	C822	0800353	EL 470MF 16V
C70B	0890035	CD 1000PF +10% 50V	C823	0800294	EL 10MF 50V
C70C	0800294	EL 10MF 50V	C840	0880044	PF 0.01MF +10% 50V
C70D	0800279R	EL 1MF 50V	C850	0245611	CD 3300PF +10% 1KV
C70E	0800325	EL 100MF 10V	C851	0893044R	CAPACITOR,CHIP 0.01MF +10% 50V
C70G	0800294	EL 10MF 50V	C853	0245604R	PP 330PF +10% 1KV
C70H	0890026	CD 220PF +10% 50V	C854	0244505	CD 2200PF +10% 500V
C70L	0890022	CD 100PF +10% 50V	C855	0244507	CD 3300PF +10% 500V
C70P	0890031	CD 470PF +10% 50V	C870	0800326	EL 100MF 16V
C710	0880046	PF 0.015MF +10% 50V	C871	0800326	EL 100MF 16V
C711	0800325	EL 100MF 10V	C872	0890035	CD 1000PF +10% 50V
C712	0800366N	EL 2200MF 10V	C873	0890035	CD 1000PF +10% 50V

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SYMBOL			SYMBOL		
NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
R118	0700027	CF 100 OHM $\pm$ 5% 1/16W	R242	0195900R	RESISTOR,CHIP 1K OHM $\pm$ 5% 1/10W
R119	0700027	CF 100 OHM $\pm$ 5% 1/16W	R243	0195947R	RESISTOR,CHIP 82K OHM $\pm$ 5% 1/10W
R11P	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R244	0195947R	RESISTOR,CHIP 82K OHM $\pm$ 5% 1/10W
R120	0700027	CF 100 OHM $\pm$ 5% 1/16W	R24G	0195891R	RESISTOR,CHIP 470 OHM $\pm$ 5% 1/10W
R121	0700027	CF 100 OHM $\pm$ 5% 1/16W	R24R	0195891R	RESISTOR,CHIP 470 OHM $\pm$ 5% 1/10W
R124	0700054	CF 10K OHM $\pm$ 5% 1/16W	R251	0195941R	RESISTOR,CHIP 47K OHM $\pm$ 5% 1/10W
R125	0700054	CF 10K OHM $\pm$ 5% 1/16W	R252	0195900R	RESISTOR,CHIP 1K OHM $\pm$ 5% 1/10W
R126	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R253	0195875R	RESISTOR,CHIP 100 OHM $\pm$ 5% 1/10W
R127	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R254	0195939R	RESISTOR,CHIP 39K OHM $\pm$ 5% 1/10W
R131	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R255	0195904R	RESISTOR,CHIP 1.5K OHM $\pm$ 5% 1/10W
R132	0700027	CF 100 OHM $\pm$ 5% 1/16W	R256	0195912R	RESISTOR,CHIP 3.3K OHM $\pm$ 5% 1/10W
R133	0700027	CF 100 OHM $\pm$ 5% 1/16W	R257	0195922R	RESISTOR,CHIP 8.2K OHM $\pm$ 5% 1/10W
R134	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R258	0195866R	RESISTOR,CHIP 47 OHM $\pm$ 5% 1/16W
R139	0700027	CF 100 OHM $\pm$ 5% 1/16W	R259	0195891R	RESISTOR,CHIP 470 OHM $\pm$ 5% 1/10W
R13A	0700027	CF 100 OHM $\pm$ 5% 1/16W	R261	0195947R	RESISTOR,CHIP 82K OHM $\pm$ 5% 1/10W
R141	0700054	CF 10K OHM $\pm$ 5% 1/16W	R263	0195935R	RESISTOR,CHIP 27K OHM $\pm$ 5% 1/10W
R142	0700054	CF 10K OHM $\pm$ 5% 1/16W	R264	0195891R	RESISTOR,CHIP 470 OHM $\pm$ 5% 1/10W
R143	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R266	0195947R	RESISTOR,CHIP 82K OHM $\pm$ 5% 1/10W
R144	0700027	CF 100 OHM $\pm$ 5% 1/16W	R267	0195925R	RESISTOR,CHIP 10K OHM $\pm$ 5% 1/10W
R145	0700027	CF 100 OHM $\pm$ 5% 1/16W	R271	0195935R	RESISTOR,CHIP 27K OHM $\pm$ 5% 1/10W
R146	0700027	CF 100 OHM $\pm$ 5% 1/16W	R272	0195937R	RESISTOR,CHIP 33K OHM $\pm$ 5% 1/10W
R147	0700027	CF 100 OHM $\pm$ 5% 1/16W	R273	0195929R	RESISTOR,CHIP 15K OHM $\pm$ 5% 1/10W
R148	0700045	CF 2.2K OHM $\pm$ 5% 1/16W	R274	0195922R	RESISTOR,CHIP 8.2K OHM $\pm$ 5% 1/10W
R149	0700041	CF 1K OHM $\pm$ 5% 1/16W	R275	0195912R	RESISTOR,CHIP 3.3K OHM $\pm$ 5% 1/10W
R150	0700027	CF 100 OHM $\pm$ 5% 1/16W	R276	0195925R	RESISTOR,CHIP 10K OHM $\pm$ 5% 1/10W
R157	0700054	CF 10K OHM $\pm$ 5% 1/16W	R277	0195927R	RESISTOR,CHIP 12K OHM $\pm$ 5% 1/10W
R158	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R278	0195933R	RESISTOR,CHIP 22K OHM $\pm$ 5% 1/10W
R159	0700036	CF 470 OHM $\pm$ 5% 1/16W	R279	0195922R	RESISTOR,CHIP 8.2K OHM $\pm$ 5% 1/10W
R160	0700036	CF 470 OHM $\pm$ 5% 1/16W	R27B	0195887R	RESISTOR,CHIP 330 OHM $\pm$ 5% 1/10W
R162	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R27G	0195887R	RESISTOR,CHIP 330 OHM $\pm$ 5% 1/10W
R168	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R27R	0195887R	RESISTOR,CHIP 330 OHM $\pm$ 5% 1/10W
R169	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R280	0195914R	RESISTOR,CHIP 3.9K OHM $\pm$ 5% 1/10W
R171	0700027	CF 100 OHM $\pm$ 5% 1/16W	R281	0195937R	RESISTOR,CHIP 33K OHM $\pm$ 5% 1/10W
R172	0700027	CF 100 OHM $\pm$ 5% 1/16W	R282	0195920R	RESISTOR,CHIP 6.8K OHM $\pm$ 5% 1/10W
R173	0700027	CF 100 OHM $\pm$ 5% 1/16W	R283	0195943R	RESISTOR,CHIP 56K OHM $\pm$ 5% 1/10W
R174	0700027	CF 100 OHM $\pm$ 5% 1/16W	R284	0195943R	RESISTOR,CHIP 56K OHM $\pm$ 5% 1/10W
R175	0700027	CF 100 OHM $\pm$ 5% 1/16W	R285	0195937R	RESISTOR,CHIP 33K OHM $\pm$ 5% 1/10W
R176	0700027	CF 100 OHM $\pm$ 5% 1/16W	R286	0195929R	RESISTOR,CHIP 15K OHM $\pm$ 5% 1/10W
R180	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R289	0110125	MF 150 OHM $\pm$ 5% 1W
R181	0700027	CF 100 OHM $\pm$ 5% 1/16W	R28B	0195872R	RESISTOR,CHIP 82 OHM $\pm$ 5% 1/10W
R182	0700027	CF 100 OHM $\pm$ 5% 1/16W	R28G	0195872R	RESISTOR,CHIP 82 OHM $\pm$ 5% 1/10W
R183	0700027	CF 100 OHM $\pm$ 5% 1/16W	R28R	0195872R	RESISTOR,CHIP 82 OHM $\pm$ 5% 1/10W
R185	0700027	CF 100 OHM $\pm$ 5% 1/16W	R2AB	0195875R	RESISTOR,CHIP 100 OHM $\pm$ 5% 1/10W
R186	0700027	CF 100 OHM $\pm$ 5% 1/16W	R2AG	0195875R	RESISTOR,CHIP 100 OHM $\pm$ 5% 1/10W
R187	0700027	CF 100 OHM $\pm$ 5% 1/16W	R2AR	0195868R	RESISTOR,CHIP 56 OHM $\pm$ 5% 1/10W
R188	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R2B1	0195891R	RESISTOR,CHIP 470 OHM $\pm$ 5% 1/10W
R189	0700027	CF 100 OHM $\pm$ 5% 1/16W	R2B2	0195891R	RESISTOR,CHIP 470 OHM $\pm$ 5% 1/10W
R192	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R2B4	0195250R	RESISTOR,CHIP 0 OHM 1/16W
R193	0700027	CF 100 OHM $\pm$ 5% 1/16W	R2BB	0195920R	RESISTOR,CHIP 6.8K OHM $\pm$ 5% 1/10W
R194	0700027	CF 100 OHM $\pm$ 5% 1/16W	R2BG	0195920R	RESISTOR,CHIP 6.8K OHM $\pm$ 5% 1/10W
R195	0700054	CF 10K OHM $\pm$ 5% 1/16W	R2BR	0195920R	RESISTOR,CHIP 6.8K OHM $\pm$ 5% 1/10W
R198	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R2CB	0188131M	CF 1K OHM $\pm$ 5% 1/2W
R21B	AT00614M	CF 75 OHM $\pm$ 2% 1/16W	R2CG	0188131M	CF 1K OHM $\pm$ 5% 1/2W
R21G	AT00614M	CF 75 OHM $\pm$ 2% 1/16W	R2CR	0188131M	CF 1K OHM $\pm$ 5% 1/2W
R21R	AT00614M	CF 75 OHM $\pm$ 2% 1/16W	R2DB	0100121	CF 220K OHM $\pm$ 5% 1/8W
R231	0700054	CF 10K OHM $\pm$ 5% 1/16W	R2DG	0100121	CF 220K OHM $\pm$ 5% 1/8W
R241	0195902R	RESISTOR,CHIP 1.2K OHM $\pm$ 5% 1/10W	R2DR	0100121	CF 220K OHM $\pm$ 5% 1/8W

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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
R555	0187074	CF 2.4K OHM +5% 1/16W	R621	0700054	CF 10K OHM +5% 1/16W
R556	0700041	CF 1K OHM +5% 1/16W	R622	0187074	CF 2.4K OHM +5% 1/16W
R557	0700051	CF 5.6K OHM +5% 1/16W	R623	0700043	CF 1.5K OHM +5% 1/16W
R558	0700053	CF 8.2K OHM +5% 1/16W	R624	0700042	CF 1.2K OHM +5% 1/16W
R559	0700054	CF 10K OHM +5% 1/16W	R625	0700054	CF 10K OHM +5% 1/16W
R55A	0700054	CF 10K OHM +5% 1/16W	R626	0700056	CF 15K OHM +5% 1/16W
R55B	0700054	CF 10K OHM +5% 1/16W	R627	0700065	CF 68K OHM +5% 1/16W
R55C	0700067	CF 100K OHM +5% 1/16W	R628	0700049	CF 4.7K OHM +5% 1/16W
R561	0700041	CF 1K OHM +5% 1/16W	R629	0700054	CF 10K OHM +5% 1/16W
R562	0700041	CF 1K OHM +5% 1/16W	R630	0113731	CF 180 OHM +5% 1/2W
R563	0700046	CF 2.7K OHM +5% 1/16W	R631	01195051	FR 2.2 OHM +5% 1/4W
R564	0100109	CF 68K OHM +5% 1/8W	R632	AT00496S	MF 150 OHM +5% 2W
R565	0700025	CF 68 OHM +5% 1/16W	R633	0700051	CF 5.6K OHM +5% 1/16W
R567	0188105M	CF 120OHM +5% 1/2W	R634	0187070M	CF 1.6K OHM +5% 1/16W
R568	0188105M	CF 120OHM +5% 1/2W	R635	0187070M	CF 1.6K OHM +5% 1/16W
R569	0700045	CF 2.2K OHM +5% 1/16W	R636	AT00438S	MF 1 OHM +5% 2W
R570	0700051	CF 5.6K OHM +5% 1/16W	R637	0700043	CF 1.5K OHM +5% 1/16W
R571	0113750	CF 1K OHM +5% 1/2W	R638	0700041	CF 1K OHM +5% 1/16W
R572	0100065	CF 1K OHM +5% 1/8W	R639	0700038	CF 680 OHM +5% 1/16W
R573	0100115	CF 120K OHM +5% 1/8W	R640	0700041	CF 1K OHM +5% 1/16W
R574	0113787	CF 33K OHM +5% 1/2W	R641	0700064	CF 56K OHM +5% 1/16W
R576	0700041	CF 1K OHM +5% 1/16W	R642	0700047	CF 3.3K OHM +5% 1/16W
R577	0100125	CF 330K OHM +5% 1/8W	R643	0700054	CF 10K OHM +5% 1/16W
R578	0100117	CF 150K OHM +5% 1/8W	R644	0187074	CF 2.4K OHM +5% 1/16W
R579	0700064	CF 56K OHM +5% 1/16W	R651	0700032	CF 220 OHM +5% 1/16W
R601	0700047	CF 3.3K OHM +5% 1/16W	R700	0700041	CF 1K OHM +5% 1/16W
R602	0700041	CF 1K OHM +5% 1/16W	R704	0700047	CF 3.3K OHM +5% 1/16W
R603	0700041	CF 1K OHM +5% 1/16W	R705	01196111	FR 1.5K OHM +1% 1/8W
R604	0700058	CF 22K OHM +5% 1/16W	R706	0150283	VR 1K OHM-B
R605	0700066	CF 82K OHM +5% 1/16W	R707	0700041	CF 1K OHM +5% 1/16W
R606	0700053	CF 8.2K OHM +5% 1/16W	R708	0700036	CF 470 OHM +5% 1/16W
R607	0187074	CF 2.4K OHM +5% 1/16W	R709	0700041	CF 1K OHM +5% 1/16W
R608	0700051	CF 5.6K OHM +5% 1/16W	R70C	0700044	CF 1.8K OHM +5% 1/16W
R609	0700059	CF 27K OHM +5% 1/16W	R70F	0700058	CF 22K OHM +5% 1/16W
R60A	0700054	CF 10K OHM +5% 1/16W	R70G	0700041	CF 1K OHM +5% 1/16W
R60B	0100115	CF 120K OHM +5% 1/8W	R70H	0700049	CF 4.7K OHM +5% 1/16W
R60C	0700041	CF 1K OHM +5% 1/16W	R70J	0700053	CF 8.2K OHM +5% 1/16W
R60D	0700051	CF 5.6K OHM +5% 1/16W	R70K	0700054	CF 10K OHM +5% 1/16W
R60E	0700054	CF 10K OHM +5% 1/16W	R70L	0700054	CF 10K OHM +5% 1/16W
R60F	0700067	CF 100K OHM +5% 1/16W	R70M	0700041	CF 1K OHM +5% 1/16W
R60G	0700043	CF 1.5K OHM +5% 1/16W	R70N	0700042	CF 1.2K OHM +5% 1/16W
R60H	0700054	CF 10K OHM +5% 1/16W	R710	0700054	CF 10K OHM +5% 1/16W
R60K	0187088	CF 9.1K OHM +5% 1/16W	R711	0700053	CF 8.2K OHM +5% 1/16W
R610	0700049	CF 4.7K OHM +5% 1/16W	R712	0700058	CF 22K OHM +5% 1/16W
R611	0700054	CF 10K OHM +5% 1/16W	R715	01196271	MF 6.8K OHM +1% 1/8W
R612	0700054	CF 10K OHM +5% 1/16W	R716	0119632	FR 11K OHM +1% 1/8W
R613	0700054	CF 10K OHM +5% 1/16W	R717	0119635	MF 15K OHM +1% 1/8W
R614	0700054	CF 10K OHM +5% 1/16W	R718	0119636	MG 16KOHM +1% 1/8W
R615	0700054	CF 10K OHM +5% 1/16W	R719	0700033	CF 270 OHM +5% 1/16W
R616	0700054	CF 10K OHM +5% 1/16W	R71A	0700041	CF 1K OHM +5% 1/16W
R617	0187088	CF 9.1K OHM +5% 1/16W	R71B	0700049	CF 4.7K OHM +5% 1/16W
R618	0700043	CF 1.5K OHM +5% 1/16W	R720	0700037	CF 560 OHM +5% 1/16W
R619	0700044	CF 1.8K OHM +5% 1/16W	R721	0700067	CF 100K OHM +5% 1/16W
R61A	0187074	CF 2.4K OHM +5% 1/16W	R722	0700046	CF 2.7K OHM +5% 1/16W
R61C	0700052	CF 6.8K OHM +5% 1/16W	R723	0700053	CF 8.2K OHM +5% 1/16W
R61E	0700052	CF 6.8K OHM +5% 1/16W	R725	0150280	VR 200 OHM-B
R620	0700062	CF 39K OHM +5% 1/16W	R726	0700041	CF 1K OHM +5% 1/16W

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SYMBOL			SYMBOL		
NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
R92C	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	I002	CP05261U	ICM62392P
R92E	0700067	CF 100K OHM $\pm$ 5% 1/16W	I051	CP05261U	ICM62392P
R92H	0700054	CF 10K OHM $\pm$ 5% 1/16W	I102	CP05381U	ICHD6433217WA08P
R92K	0700014	CF 10 OHM $\pm$ 5% 1/16W	I104	CP03941U	ICBR9040
R92R	0700058	CF 22K OHM $\pm$ 5% 1/16W	I105	CP03941U	ICBR9040
R930	0140955M	MF 220K OHM $\pm$ 5% 1/2W	I107	CP04001U	ICDS14C23CN
Δ R931	0119688	MF 0.22 OHM $\pm$ 5% 1W	I109	CP00511U	ICMM1096BD
Δ R932	0119690	MF 0.27 OHM $\pm$ 5% 1W	I201	CP02811U	ICM52722SP
R933	0187096	CF 20K OHM $\pm$ 5% 1/16W	I202	CP05461	ICFA4111
R934	0700029	CF 150 OHM $\pm$ 5% 1/16W	I203	CP01931	ICTDA6103
R935	0188123M	CF 270 OHM $\pm$ 5% 1/2W	I204	2388304	ICBA4558N
R937	0700056	CF 15K OHM $\pm$ 5% 1/16W	I205	2388304	ICBA4558N
R938	0150282	VR 500 OHM(B)	I301	CP05611U	ICM35071-051SP
R939	0700043	CF 1.5K OHM $\pm$ 5% 1/16W	I302	2915402	ICHD74HC04P
R93A	0700054	CF 10K OHM $\pm$ 5% 1/16W	I303	2362051	ICHD74LS08P
R93C	0700067	CF 100K OHM $\pm$ 5% 1/16W	I304	CP05451U	ICBA7078S
R93D	0700021	CF 33 OHM $\pm$ 5% 1/16W	I305	2916901	ICHD74HC123AP
R93E	0700014	CF 10 OHM $\pm$ 5% 1/16W	I306	CP01751	ICHD74HC157P
R93F	0700067	CF 100K OHM $\pm$ 5% 1/16W	I361	CP01042U	IC24LC21A-/P
R93K	0700054	CF 10K OHM $\pm$ 5% 1/16W	I381	2916901	ICHD74HC123AP
R970	0100071	CF 1.8K OHM $\pm$ 5% 1/8W	I501	2003621	ICNJM072D
Δ R971	0100109	CF 68K OHM $\pm$ 5% 1/8W	I502	2388304	ICBA4558N
Δ R972	0119651	MG 68KOHM $\pm$ 1% 1/8W	I503	2364631	ICHD14046BP
R973	0150282	VR 500 OHM(B)	I504	2916901	ICHD74HC123AP
R974	0119618M	MF 3K OHM $\pm$ 1% 1/8W	I505	CP04172	ICM52723ASP
R975	0700061	CF 33K OHM $\pm$ 5% 1/16W	I506	2020591	ICM5207L05
R977	0700067	CF 100K OHM $\pm$ 5% 1/16W	I507	2388304	ICBA4558N
R978	0700054	CF 10K OHM $\pm$ 5% 1/16W	I508	2388304	ICBA4558N
R979	0700043	CF 1.5K OHM $\pm$ 5% 1/16W	I620	2388304	ICBA4558N
R97A	0700047	CF 3.3K OHM $\pm$ 5% 1/16W	I630	CP04181	ICLA7841L
R97B	0700054	CF 10K OHM $\pm$ 5% 1/16W	I631	2003283	ICLA6510
R97C	0700054	CF 10K OHM $\pm$ 5% 1/16W	I701	CP04161	ICUPC1883CT(MS)
R981	0100072	CF 2K OHM $\pm$ 5% 1/8W	I703	2388304	ICBA4558N
R982	0700054	CF 10K OHM $\pm$ 5% 1/16W	I704	2005491	ICHD74HC221P (CMOS)
R983	0700063	CF 47K OHM $\pm$ 5% 1/16W	I706	2910815	ICHD74HC00P
R984	0700041	CF 1K OHM $\pm$ 5% 1/16W	I708	CZ00711	ICAN5767K
R985	0700054	CF 10K OHM $\pm$ 5% 1/16W	I709	2388304	ICBA4558N
R986	0700054	CF 10K OHM $\pm$ 5% 1/16W	I710	2004561R	ICHA178L09A(TA)
R987	0700054	CF 10K OHM $\pm$ 5% 1/16W	Δ I750	CW00232	IC (HEV CONTROL PWM)
R988	0700041	CF 1K OHM $\pm$ 5% 1/16W	Δ I911	CP04331	ICFA5331P
R989	0700041	CF 1K OHM $\pm$ 5% 1/16W	Δ I912	CP05431	IC TLP621F(D4-GRL)
R98A	0700041	CF 1K OHM $\pm$ 5% 1/16W	Δ I921	CP01141	ICFA5304AP
R98B	0700041	CF 1K OHM $\pm$ 5% 1/16W	Δ I922	CP05431	IC TLP621F(D4-GRL)
R98C	0700053	CF 8.2K OHM $\pm$ 5% 1/16W	Δ I923	CP05431	IC TLP621F(D4-GRL)
R98D	0100109	CF 68K OHM $\pm$ 5% 1/8W	Δ I931	CP01141	ICFA5304AP
R98E	0700054	CF 10K OHM $\pm$ 5% 1/16W	I971	2362606	ICNJM4558D
R98F	0700054	CF 10K OHM $\pm$ 5% 1/16W	I981	CP05161F	ICS1-3120F
R98G	0700061	CF 33K OHM $\pm$ 5% 1/16W	I982	2000642	ICSI-3240CA
R98H	0700059	CF 27K OHM $\pm$ 5% 1/16W	I983	CP05571	ICBA17805
R98P	0700061	CF 33K OHM $\pm$ 5% 1/16W	Q10P	2325713	TR 2SA933S (R)
R98Q	0100111	CF 82K OHM $\pm$ 5% 1/8W	Q22B	CA00801R	CHIP TRANSISTOR 2SA1462-T2B
R98R	0140959M	MF 470K OHM $\pm$ 5% 1/2W	Q22G	CA00801R	CHIP TRANSISTOR 2SA1462-T2B
R98T	0140955M	MF 220K OHM $\pm$ 5% 1/2W	Q22R	CA00801R	CHIP TRANSISTOR 2SA1462-T2B
R997	0700066	CF 82K OHM $\pm$ 5% 1/16W	Q253	2325721	TR2SC1740S
R998	0100049	CF 220 OHM $\pm$ 5% 1/8W	Q303	2326872	TR DTC114ES SI
R999	0700053	CF 8.2K OHM $\pm$ 5% 1/16W	Q304	2321872	TR 2SD655E
I001	CP05261U	ICM62392P	Q305	2326872	TR DTC114ES SI

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SYMBOL	NO.	PART NO.	DESCRIPTION	SYMBOL	NO.	PART NO.	DESCRIPTION
	D51Z	2339952	ZD HZS27-2		D984	CH01721	DI5DLZ47A
	D522	23373411	DI1SS270A		D985	CH00651M	DI SS1J6TP(T)
	D523	23373411	DI1SS270A		D986	23385611	DI ERA32-02
	D562	23373411	DI1SS270A		D987	23373411	DI1SS270A
	D564	2343051	DI1SS145		D988	23373411	DI1SS270A
	D565	23373411	DI1SS270A		D989	2343051	DI1SS145
	D57Z	2339837	ZD HZS-5C1		D98A	23373411	DI1SS270A
	D60Z	2339837	ZD HZS-5C1		D997	23373411	DI1SS270A
	D618	23373411	DI1SS270A		D998	23373411	DI1SS270A
	D630	CH00151M	DI DSM1SD2		D99Z	2339837	ZD HZS-5C1
	D64Z	2339837	ZD HZS-5C1		T560	BT01101	SWICHING TRANSFORMER
	D701	23373411	DI1SS270A	Δ T750	BW00941		FBT HFL1327YD-PWM (only CM81*U)
	D702	CH00151M	DI DSM1SD2	Δ T750	BW00861		FBT HFL1327YD-PWM (only CM81*ET)
	D703	23373411	DI1SS270A	Δ T770	BZ01961		DRIVE TRANSFORMER
	D71Z	2339867	ZD HZS9C1	Δ T780	BZ01971		CHOKE TARNSTORMER
Δ D741	2359313G	DI RU3C LF-A5		Δ T920	BT01122		SWICHING TRANSFORMER
Δ D742	2359313G	DI RU3C LF-A5		Δ T930	BT01111		SWICHING TRANSFORMER
	D761	2348432M	DI RMPG06G	Δ F901	2722446		FUSE 4A
	D770	CH01071M	DI 2FWJ42	L02F	2123469M		FERRITE BEADS CORE READ 2.3
	D771	CH00661	DI 5TUZ47C	L03F	2123469M		FERRITE BEADS CORE READ 2.3
	D773	23385611	DI ERA32-02	L050	2123468		FERRITE BEADS CORE LEAD 0.8
	D775	23373411	DI1SS270A	L051	2123468		FERRITE BEADS CORE LEAD 0.8
	D77Z	2339192M	ZENER DIODE HZS20-2L TA	L201	2123469M		FERRITE BEADS CORE READ 2.3
	D790	23385611	DI ERA32-02	L241	2123781		FILTER COIL
	D803	23373411	DI1SS270A	L251	2123468		FERRITE BEADS CORE LEAD 0.8
	D821	23373411	DI1SS270A	L252	2123468		FERRITE BEADS CORE LEAD 0.8
	D822	23373411	DI1SS270A	L255	2123468		FERRITE BEADS CORE LEAD 0.8
	D823	CH01542M	DI 1GU42(TPA2)	L40F	2123468		FERRITE BEADS CORE LEAD 0.8
	D824	23373411	DI1SS270A	L41F	2123468		FERRITE BEADS CORE LEAD 0.8
	D82Z	2339851	ZD HZS7A1	L540	2122956		LA AXIAL COIL 100 MICRO H +-10%
	D840	CH00031M	DI AU02V1	L605	2122242		LA AXIAL COIL 15 MICRO H
	D870	23385611	DI ERA32-02	L63F	2123469M		FERRITE BEADS CORE READ 2.3
	D871	23385611	DI ERA32-02	L70F	2123468		FERRITE BEADS CORE LEAD 0.8
	D87Z	2339811	ZD HZS3A1	L710	2122239		LA AXIAL COIL 10 MICRO H
	D901	2349721	DI D5SBA60	L71F	2123468		FERRITE BEADS CORE LEAD 0.8
	D910	CH01731	DI 5JLZ47	L72A	2125794N		CHOKE COIL 3.3MH
	D911	CH01701M	DI SS1J4	L72F	2123469M		FERRITE BEADS CORE READ 2.3
	D912	23373411	DI1SS270A	L74F	2123469M		FERRITE BEADS CORE READ 2.3
	D913	23373411	DI1SS270A	L750	2125796N		CHOKE COIL 6.8MH
	D920	CH01711M	DI 05NU42	L761	2122253		LA AXIAL COIL 100 MICRO H
	D921	2349571M	DI SM-1XP2TP	L770	BZ02412		HORIZONTAL LINEARITY COIL
	D92Z	2339952	ZD HZS27-2	L771	BZ02411		HORIZONTAL LINEARITY COIL
	D930	CH01711M	DI 05NU42	L791	2122949		LA AXIAL COIL 33 MICRO H +-10%
	D931	2349571M	DI SM-1XP2TP	L84B	2123404M		LAL AXIAL COIL
	D932	2343051	DI1SS145	L84G	2123404M		LAL AXIAL COIL
	D933	2349571M	DI SM-1XP2TP	L84R	2123403M		LAL AXIAL COIL
	D934	2343051	DI1SS145	L851	2123468		FERRITE BEADS CORE LEAD 0.8
	D935	2343051	DI1SS145	L85F	2123468		FERRITE BEADS CORE LEAD 0.8
	D93Z	2339952	ZD HZS27-2	L875	2125815N		CHOKE COIL 220MH
	D94Z	2339952	ZD HZS27-2	L900	BZ02471		DEGAUSSING COIL
	D95Z	2339837	ZD HZS-5C1	Δ L901	BZ02361		COIL LINE FILTER 5.6MH 2.5A
	D96Z	2339902M	DI HZS16-2 TA	Δ L902	BZ02361		COIL LINE FILTER 5.6MH 2.5A
Δ D971	CH01081	DI FMC-G28S		Δ L910	BV00761		CHOKE COIL 700MH
	D972	23373411	DI1SS270A	L91F	2123469M		FERRITE BEADS CORE READ 2.3
	D981	23385311	DI EG01C	L931	2122944		LA AXIAL COIL 12 MICRO H
	D982	2338532	DI EG-01A	L93F	2123469M		FERRITE BEADS CORE READ 2.3
	D983	CH01091M	DI EL1	L94F	2123469M		FERRITE BEADS CORE READ 2.3

MEMO

HITACHI

CM811 YK No. 0046E
CM812

Image & Information Systems Division
Image & Media Systems Operation

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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
L95F	2123469M	FERRITE BEADS CORE READ 2.3	K312	0195250R	RESISTOR,CHIP 0 OHM 1/16W
L96F	2123469M	FERRITE BEADS CORE READ 2.3	K313	0195250R	RESISTOR,CHIP 0 OHM 1/16W
L97F	2123469M	FERRITE BEADS CORE READ 2.3	K314	0195250R	RESISTOR,CHIP 0 OHM 1/16W
L981	2122253	LA AXIAL COIL 100 MICRO H	K346	0195250R	RESISTOR,CHIP 0 OHM 1/16W
L982	2220577	HIGH FREQUENCY COIL	K351	0195250R	RESISTOR,CHIP 0 OHM 1/16W
L98F	2123469M	FERRITE BEADS CORE READ 2.3	N562	4520889	SCREW M3X10
L99F	2123469M	FERRITE BEADS CORE READ 2.3	N563	4520889	SCREW M3X10
L9AF	2123469M	FERRITE BEADS CORE READ 2.3	N630	4520889	SCREW M3X10
S001	2632851	TACTO SWITCH	N741	4520889	SCREW M3X10
S002	2632851	TACTO SWITCH	N764	4520889	SCREW M3X10
S003	2632851	TACTO SWITCH	N764A	2786281	MICA SHEET
S77R	2640576	RELAY	N764B	2786301	TRS SHEET
Δ S901	2634732	POWER SWITCH	N771	4520889	SCREW M3X10
Δ S91R	2640576	RELAY	N800	4520889	SCREW M3X10
	PC02701	POWER BUTTON	N870	4520889	SCREW M3X10
	3332452	90 KNOB SPRING	N910	4520889	SCREW M3X10
	QD05651	BEZEL ASS'Y	N920	4520889	SCREW M3X10
	QD05371	REAR COVER	N930	4520889	SCREW M3X10
	QJ00511	TILT BASE ASS'Y	N971	4520889	SCREW M3X10
	4519521	5X20 WASHER BASED SCREW	N983	4520889	SCREW M3X10
	3705233	ANODE CLAMPER	P201	EY00852	D-SUB SOCKET
	4528931	3X16 B PAN-HEAD TAPPING SCREW	X101	BP00901	CLYSTAL 9.8304MHZ
	4319361	M4X12 CE KNURL TAPPING SCREW	X305	2791761R	DIGITAL FILTER 2200PF
	ME01541	TCO PLATE (only CM81*ET)			
	PC02121	POWER RELAY BUTTON			
	4519512	TAPPING SCREW 4X16 MM			
	4522881	3X8 CE KNURL SCREW			
	4528451	M4 SCREW WITH WASHER			
	8711608	4X8 PAN HEAD SCREW			
	8815126	LOCKING WASHER 4			
A10	UE04651	PWB ASS'Y MAIN CHASSIS			
Δ A20	UX04941	CDT ASS'Y			
A20	JT08251	PWB ASS'Y VIDEO			
E01	2776317	CF MAGNET			
E011	EY00861	D-SUB SOCKET			
E05	2771461	MAGNET PEACE			
E06	4615641	WEDGE			
E091	ED01273	15PIN PLUG			
E092	ED01273	15PIN PLUG			
E10	BZ02341	FERRITE CORE			
E251	ED01293	15PIN CONNECTOR			
E252	ED01293	15PIN CONNECTOR			
E853	EY00631	JACK			
Δ E901	2676371	AC INLET			
E90F	2721351	FUSE HOLDER			
EP	EV00152	POWER SUPPLY CORD 125V10A UL/CSA (only CM81*U)			
EP	EV00482	POWER SUPPLY CORD CEE (only CM81*ET)			
G560	CJ00071R	SPARK GAP			
G851	2340741M	SPARK GAP			
G852	2340741M	SPARK GAP			
G853	2340741M	SPARK GAP			
G854	2340741M	SPARK GAP			
K231	0195250R	RESISTOR,CHIP 0 OHM 1/16W			
K301	0195250R	RESISTOR,CHIP 0 OHM 1/16W			
K311	0195250R	RESISTOR,CHIP 0 OHM 1/16W			

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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
Q372	2326872	TR DTC114ES SI	Q986	2326871	TR DTC124ES
Q560	2325713	TR 2SA933S (R)	Q987	2325721	TR2SC1740S
Q561	2324321	TR 2SC2610-05	Q988	2325721	TR2SC1740S
Q562	2315391	TR 2SC4793	Q989	2326871	TR DTC124ES
Q563	2315381	TR 2SA1837	Q98A	2324321	TR 2SC2610-05
Q564	CF02091R	TR 2SA1972	Q999	2325713	TR 2SA933S (R)
Q601	CF02111R	TR 2SK2961	D049	CH01761R	LED D505#2UK
Q602	2326871	TR DTC124ES	D051	CC10721R	CHIP DIODE DA204K-TPTX
Q701	2325721	TR 2SC1740S	D052	CC10721R	CHIP DIODE DA204K-TPTX
Q702	2325713	TR 2SA933S (R)	D102	23373411	DI1SS270A
Q703	2325713	TR 2SA933S (R)	D103	23373411	DI1SS270A
Q704	2325721	TR 2SC1740S	D104	23373411	DI1SS270A
Δ Q741	CF00921F	TR FS7KM-18A-AT	D105	23373411	DI1SS270A
Q760	CF02101	TR 2SK2201	D111	23373411	DI1SS270A
Q761	2312173	TR 2SD2375(Q)	D112	23373411	DI1SS270A
Q762	2325721	TR 2SC1740S	D113	23373411	DI1SS270A
Q763	2325721	TR 2SC1740S	D114	23373411	DI1SS270A
Q764	CF02031F	TR 2SC5445	D1FZ	2339851	ZD HZS7A1
Q766	2326871	TR DTC124ES	D201	23373411	DI1SS270A
Q769	CF02111R	TR 2SK2961	D21B	CC10721R	CHIP DIODE DA204K-TPTX
Q771	2325721	TR 2SC1740S	D21G	CC10721R	CHIP DIODE DA204K-TPTX
Q774	2326871	TR DTC124ES	D21R	CC10721R	CHIP DIODE DA204K-TPTX
Q775	CF00931U	TR 2SK2382(S4HITTO)	D21Z	2339837	ZD HZS-5C1
Q776	2326871	TR DTC124ES	D241	CH00151M	DI DSM1SD2
Q777	CF00931U	TR 2SK2382(S4HITTO)	D242	23373411	DI1SS270A
Q778	2326871	TR DTC124ES	D243	23373411	DI1SS270A
Q781	CF00931U	TR 2SK2382(S4HITTO)	D244	23373411	DI1SS270A
Q782	2326871	TR DTC124ES	D24B	2331912	DI1SS82 SI
Q783	CF00931U	TR 2SK2382(S4HITTO)	D24G	2331912	DI1SS82 SI
Q784	2326871	TR DTC124ES	D24R	2331912	DI1SS82 SI
Q785	CF00931U	TR 2SK2382(S4HITTO)	D251	23373411	DI1SS270A
Q786	2326871	TR DTC124ES	D252	23373411	DI1SS270A
Q787	CF00931U	TR 2SK2382(S4HITTO)	D253	23373411	DI1SS270A
Q800	2328102F	TR FN521	D255	23373411	DI1SS270A
Q801	2324321	TR 2SC2610-05	D256	23373411	DI1SS270A
Q804	2324321	TR 2SC2610-05	D25B	23373411	DI1SS270A
Q820	2327881	TR 2SA1207S	D25G	23373411	DI1SS270A
Q821	2327881	TR 2SA1207S	D25R	23373411	DI1SS270A
Q822	2327881	TR 2SA1207S	D271	23373411	DI1SS270A
Q823	2326871	TR DTC124ES	D273	23373411	DI1SS270A
Q824	2326871	TR DTC124ES	D29B	2331912	DI1SS82 SI
Q870	2312173	TR 2SD2375(Q)	D29G	2331912	DI1SS82 SI
Q871	2315931	TR 2SB1548A-P	D29R	2331912	DI1SS82 SI
Δ Q910	CF01581F	TR 2SK2223-01R-F168R	D2AB	23373411	DI1SS270A
Δ Q920	CF01591F	TR 2SK2717	D2AG	23373411	DI1SS270A
Q921	2325713	TR 2SA933S (R)	D2AR	23373411	DI1SS270A
Q922	2325721	TR 2SC1740S	D2BB	23373411	DI1SS270A
Δ Q930	CF01591F	TR 2SK2717	D2BG	23373411	DI1SS270A
Q932	2325713	TR 2SA933S (R)	D2BR	23373411	DI1SS270A
Q971	2325721	TR 2SC1740S	D33Z	2331805	ZD HZ6 (B2)
Δ Q972	2325721	TR 2SC1740S	D34Z	2331805	ZD HZ6 (B2)
Q973	2326871	TR DTC124ES	D35Z	2331805	ZD HZ6 (B2)
Q981	CF00931U	TR 2SK2382(S4HITTO)	D361	23373411	DI1SS270A
Q982	CF02111R	TR 2SK2961	D36Z	2331805	ZD HZ6 (B2)
Q983	CF02191U	TR 2SJ306	D372	23373411	DI1SS270A
Q984	CF02191U	TR 2SJ306	D37Z	2331805	ZD HZ6 (B2)
Q985	2325713	TR 2SA933S (R)	D38Z	2339851	ZD HZS7A1

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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
R727	0700053	CF 8.2K OHM $\pm 5\%$ 1/16W	R827	0700054	CF 10K OHM $\pm 5\%$ 1/16W
R728	0700055	CF 12K OHM $\pm 5\%$ 1/16W	R828	0700061	CF 33K OHM $\pm 5\%$ 1/16W
R730	0700027	CF 100 OHM $\pm 5\%$ 1/16W	R829	0187082	CF 5.1K OHM $\pm 5\%$ 1/16W
Δ R741	0119731	FR 0.68 OHM 1W	R830	01195051	FR 2.2 OHM $\pm 5\%$ 1/4W
R750	0147646	WW 33 OHM $\pm 5\%$ 7W	R831	0100117	CF 150K OHM $\pm 5\%$ 1/8W
Δ R753	0119655	MF 100K OHM 1/8W	R84B	0188128M	CF 680 OHM $\pm 5\%$ 1/2W
Δ R754	0160502U	VR 50K OHM	R84G	0188129M	CF 820 OHM $\pm 5\%$ 1/2W
Δ R755	0119654	FR 91K OHM $\pm 1\%$ 1/8W	R84R	0188124M	CF 330 OHM $\pm 5\%$ 1/2W
R756	0700036	CF 470 OHM $\pm 5\%$ 1/16W	R850	0113815	CF 470K OHM $\pm 5\%$ 1/2W
R757	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R85B	0113701	CF 10 OHM $\pm 5\%$ 1/2W
R75A	0100113	CF 100K OHM $\pm 5\%$ 1/8W	R85G	0113701	CF 10 OHM $\pm 5\%$ 1/2W
R75B	0100111	CF 82K OHM $\pm 5\%$ 1/8W	R85R	0113701	CF 10 OHM $\pm 5\%$ 1/2W
R760	0100035	CF 56 OHM $\pm 5\%$ 1/8W	R870	0100069	CF 1.5K OHM $\pm 5\%$ 1/8W
R761	0700053	CF 8.2K OHM $\pm 5\%$ 1/16W	R872	0150305	VR 10K OHM B
R762	0187086	CF 7.5K OHM $\pm 5\%$ 1/16W	R874	0100069	CF 1.5K OHM $\pm 5\%$ 1/8W
R763	0700052	CF 6.8K OHM $\pm 5\%$ 1/16W	R875	0119838	FR 0.5 OHM $\pm 5\%$ 1/4W
R764	0700049	CF 4.7K OHM $\pm 5\%$ 1/16W	Δ R901	CJ00141	TH
R765	0700048	CF 3.9K OHM $\pm 5\%$ 1/16W	R902	CJ00111	THZPK68BL9ROB
R766	0700051	CF 5.6K OHM $\pm 5\%$ 1/16W	R903	0140959M	MF 470K OHM $\pm 5\%$ 1/2W
R767	AT00296S	MF 4.7 OHM $\pm 5\%$ 3W	R904	0140959M	MF 470K OHM $\pm 5\%$ 1/2W
R768	AT00494S	MF 120 OHM $\pm 5\%$ 2W	R905	0113785	CF 27K OHM $\pm 5\%$ 1/2W
R769	0113772	CF 8.2K OHM $\pm 5\%$ 1/2W	R906	0113785	CF 27K OHM $\pm 5\%$ 1/2W
R76A	0100041	CF 100 OHM $\pm 5\%$ 1/8W	R911	0140959M	MF 470K OHM $\pm 5\%$ 1/2W
R76C	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R912	0140959M	MF 470K OHM $\pm 5\%$ 1/2W
R76D	0188144M	CF 10K OHM $\pm 5\%$ 1/2W	R913	0700049	CF 4.7K OHM $\pm 5\%$ 1/16W
R770	0700067	CF 100K OHM $\pm 5\%$ 1/16W	R914	0140959M	MF 470K OHM $\pm 5\%$ 1/2W
R771	0700052	CF 6.8K OHM $\pm 5\%$ 1/16W	R915	0140959M	MF 470K OHM $\pm 5\%$ 1/2W
R772	0700052	CF 6.8K OHM $\pm 5\%$ 1/16W	R916	0150283	VR 1K OHM-B
R773	0700054	CF 10K OHM $\pm 5\%$ 1/16W	Δ R917	0700047	CF 3.3K OHM $\pm 5\%$ 1/16W
R775	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R918	0140959M	MF 470K OHM $\pm 5\%$ 1/2W
R777	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R919	0140959M	MF 470K OHM $\pm 5\%$ 1/2W
R77A	AT00429S	MF 0.47 OHM $\pm 5\%$ 2W	Δ R91A	AT00658M	CF 3.6K OHM $\pm 2\%$ 1/16W
R77C	0119722	MF 1 OHM $\pm 5\%$ 1W	R91B	0188105M	CF 120 OHM $\pm 5\%$ 1/2W
R781	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R91C	0187096	CF 20K OHM $\pm 5\%$ 1/16W
R782	0113729	CF 150 OHM $\pm 5\%$ 1/2W	R91F	0700067	CF 100K OHM $\pm 5\%$ 1/16W
R783	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R91G	0700049	CF 4.7K OHM $\pm 5\%$ 1/16W
R784	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R91H	0700043	CF 1.5K OHM $\pm 5\%$ 1/16W
R785	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R91J	0700056	CF 15K OHM $\pm 5\%$ 1/16W
R78F	0110129	MF 220 OHM $\pm 5\%$ 1W	R91K	0700014	CF 10 OHM $\pm 5\%$ 1/16W
R791	0700051	CF 5.6K OHM $\pm 5\%$ 1/16W	R91L	0700053	CF 8.2K OHM $\pm 5\%$ 1/16W
Δ R792	0119643	MF 33K OHM $\pm 1\%$ 1/8W	R91M	0100133	CF 680K OHM $\pm 5\%$ 1/8W
Δ R793	0119617	RN1/6PQ2701F MF 2.7K OHM $\pm 1\%$ 1/8W	R91N	0700067	CF 100K OHM $\pm 5\%$ 1/16W
R801	0700049	CF 4.7K OHM $\pm 5\%$ 1/16W	R91P	0100045	CF 150 OHM $\pm 5\%$ 1/8W
R803	0700048	CF 3.9K OHM $\pm 5\%$ 1/16W	R91S	0700055	CF 12K OHM $\pm 5\%$ 1/16W
R804	0700038	CF 680 OHM $\pm 5\%$ 1/16W	R91T	AT00432S	MF 0.56 OHM $\pm 5\%$ 2W
R805	0113768	CF 5.6K OHM $\pm 5\%$ 1/2W	R91U	AT00429S	MF 0.47 OHM $\pm 5\%$ 2W
R806	0113778	CF 15K OHM $\pm 5\%$ 1/2W	R920	0140955M	MF 220K OHM $\pm 5\%$ 1/2W
R807	0188135M	CF 2.2K OHM $\pm 5\%$ 1/2W	Δ R921	0119693	MF 0.39 OHM $\pm 5\%$ 1W
R808	0700025	CF 68 OHM $\pm 5\%$ 1/16W	Δ R922	0119691	MG 0.33 OHM $\pm 5\%$ 1W
R815	0700032	CF 220 OHM $\pm 5\%$ 1/16W	R923	0700054	CF 10K OHM $\pm 5\%$ 1/16W
R820	0100125	CF 330K OHM $\pm 5\%$ 1/8W	Δ R924	0700029	CF 150 OHM $\pm 5\%$ 1/16W
R821	0100085	CF 6.8K OHM $\pm 5\%$ 1/8W	R925	0188123M	CF 270 OHM $\pm 5\%$ 1/2W
R822	0700061	CF 33K OHM $\pm 5\%$ 1/16W	R926	0187084	CF 6.2K OHM $\pm 5\%$ 1/16W
R823	0100123	CF 270K OHM $\pm 5\%$ 1/8W	R927	0187078	CF 3.6K OHM $\pm 5\%$ 1/16W
R824	0700027	CF 100 OHM $\pm 5\%$ 1/16W	R929	0700053	CF 8.2K OHM $\pm 5\%$ 1/16W
R825	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R92A	0700018	CF 22 OHM $\pm 5\%$ 1/16W
R826	0700054	CF 10K OHM $\pm 5\%$ 1/16W	R92B	0700032	CF 220 OHM $\pm 5\%$ 1/16W

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SYMBOL			SYMBOL		
NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
R2EB	0195866R	RESISTOR,CHIP 47 OHM +5% 1/16W	R34A	0195912R	RESISTOR,CHIP 3.3K OHM +5% 1/10W
R2EG	0195866R	RESISTOR,CHIP 47 OHM +5% 1/16W	R350	0195875R	RESISTOR,CHIP 100 OHM +5% 1/10W
R2ER	0195866R	RESISTOR,CHIP 47 OHM +5% 1/16W	R351	0195250R	RESISTOR,CHIP 0 OHM 1/16W
R2FB	0195938R	RESISTOR,CHIP 36K OHM +5% 1/16W	R361	0195941R	RESISTOR,CHIP 47K OHM +5% 1/10W
R2FG	0195937R	RESISTOR,CHIP 33K OHM +5% 1/10W	R363	0195868R	RESISTOR,CHIP 56 OHM +5% 1/10W
R2FR	0195936R	RESISTOR,CHIP 30K OHM +5% 1/16W	R364	0195868R	RESISTOR,CHIP 56 OHM +5% 1/10W
R2G1	0195891R	RESISTOR,CHIP 470 OHM +5% 1/10W	R365	0195868R	RESISTOR,CHIP 56 OHM +5% 1/10W
R2G2	0195891R	RESISTOR,CHIP 470 OHM +5% 1/10W	R372	0195900R	RESISTOR,CHIP 1K OHM +5% 1/10W
R2G4	0195250R	RESISTOR,CHIP 0 OHM 1/16W	R381	0195925R	RESISTOR,CHIP 10K OHM +5% 1/10W
R2GB	0113713	CF 33 OHM +5% 1/2W	R383	0195947R	RESISTOR,CHIP 82K OHM +5% 1/10W
R2GG	0113713	CF 33 OHM +5% 1/2W	R384	0195914R	RESISTOR,CHIP 3.9K OHM +5% 1/10W
R2GR	0113713	CF 33 OHM +5% 1/2W	R3GB	0195250R	RESISTOR,CHIP 0 OHM 1/16W
R2HB	0100111	CF 82K OHM +5% 1/8W	R3GG	0195250R	RESISTOR,CHIP 0 OHM 1/16W
R2HG	0100111	CF 82K OHM +5% 1/8W	R3GR	0195250R	RESISTOR,CHIP 0 OHM 1/16W
R2HR	0100111	CF 82K OHM +5% 1/8W	R401	0100065	CF 1K OHM +5% 1/8W
R2KB	0188122M	CF 220 OHM +5% 1/2W	R402	0187088	CF 9.1K OHM +5% 1/16W
R2KG	0188122M	CF 220 OHM +5% 1/2W	R403	0110123	MF 120 OHM +5% 1W
R2KR	0188122M	CF 220 OHM +5% 1/2W	R404	0700047	CF 3.3K OHM +5% 1/16W
R2PB	0195922R	RESISTOR,CHIP 8.2K OHM +5% 1/10W	R405	0700046	CF 2.7K OHM +5% 1/16W
R2PG	0195922R	RESISTOR,CHIP 8.2K OHM +5% 1/10W	R406	0700059	CF 27K OHM +5% 1/16W
R2PR	0195922R	RESISTOR,CHIP 8.2K OHM +5% 1/10W	R501	0700044	CF 1.8K OHM +5% 1/16W
R2QB	0195910R	RESISTOR,CHIP 2.7K OHM +5% 1/10W	R502	0700065	CF 68K OHM +5% 1/16W
R2QG	0195910R	RESISTOR,CHIP 2.7K OHM +5% 1/10W	R503	0700054	CF 10K OHM +5% 1/16W
R2QR	0195910R	RESISTOR,CHIP 2.7K OHM +5% 1/10W	R504	0700043	CF 1.5K OHM +5% 1/16W
R2R1	0195891R	RESISTOR,CHIP 470 OHM +5% 1/10W	R505	0150301	VR 1K OHM-B
R2R2	0195891R	RESISTOR,CHIP 470 OHM +5% 1/10W	R506	0700034	CF 330 OHM +5% 1/16W
R2R4	0195250R	RESISTOR,CHIP 0 OHM 1/16W	R507	0700041	CF 1K OHM +5% 1/16W
R2RB	0195925R	RESISTOR,CHIP 10K OHM +5% 1/10W	R510	AT00671M	CF 10K OHM +2% 1/16W
R2RG	0195910R	RESISTOR,CHIP 2.7K OHM +5% 1/10W	R521	AT00695M	CF 82K OHM +2% 1/16W
R2RR	0195910R	RESISTOR,CHIP 2.7K OHM +5% 1/10W	R522	AT00671M	CF 10K OHM +2% 1/16W
R2SG	0195908R	RESISTOR,CHIP 2.2K OHM +5% 1/10W	R523	0700052	CF 6.8K OHM +5% 1/16W
R2SR	0195908R	RESISTOR,CHIP 2.2K OHM +5% 1/10W	R524	0700054	CF 10K OHM +5% 1/16W
R2TB	0195879R	RESISTOR,CHIP 150 OHM +5% 1/10W	R525	0700054	CF 10K OHM +5% 1/16W
R2TG	0195879R	RESISTOR,CHIP 150 OHM +5% 1/10W	R527	0700054	CF 10K OHM +5% 1/16W
R2TR	0195879R	RESISTOR,CHIP 150 OHM +5% 1/10W	R528	0700049	CF 4.7K OHM +5% 1/16W
R301	0196888R	RESISTOR,CHIP 1K OHM +1% 1/10W	R529	0700054	CF 10K OHM +5% 1/16W
R302	0195250R	RESISTOR,CHIP 0 OHM 1/16W	R52F	0187086	CF 7.5K OHM +5% 1/16W
R303	0195875R	RESISTOR,CHIP 100 OHM +5% 1/10W	R52H	0700053	CF 8.2K OHM +5% 1/16W
R304	0195875R	RESISTOR,CHIP 100 OHM +5% 1/10W	R530	0700038	CF 680 OHM +5% 1/16W
R305	0195925R	RESISTOR,CHIP 10K OHM +5% 1/10W	R531	0700041	CF 1K OHM +5% 1/16W
R306	0195925R	RESISTOR,CHIP 10K OHM +5% 1/10W	R532	0700044	CF 1.8K OHM +5% 1/16W
R307	0195250R	RESISTOR,CHIP 0 OHM 1/16W	R533	0700045	CF 2.2K OHM +5% 1/16W
R308	0195872R	RESISTOR,CHIP 82 OHM +5% 1/10W	R542	0700052	CF 6.8K OHM +5% 1/16W
R30B	0195891R	RESISTOR,CHIP 470 OHM +5% 1/10W	R543	0150302	VR 2K OHM B
R30G	0195891R	RESISTOR,CHIP 470 OHM +5% 1/10W	R544	0150301	VR 1K OHM-B
R30R	0195891R	RESISTOR,CHIP 470 OHM +5% 1/10W	R545	0700056	CF 15K OHM +5% 1/16W
R311	0195919R	RESISTOR,CHIP 6.2K OHM +5% 1/10W	R546	0700052	CF 6.8K OHM +5% 1/16W
R314	0195875R	RESISTOR,CHIP 100 OHM +5% 1/10W	R547	0700054	CF 10K OHM +5% 1/16W
R332	0195947R	RESISTOR,CHIP 82K OHM +5% 1/10W	R548	0700055	CF 12K OHM +5% 1/16W
R333	0195947R	RESISTOR,CHIP 82K OHM +5% 1/10W	R549	0700047	CF 3.3K OHM +5% 1/16W
R341	0195900R	RESISTOR,CHIP 1K OHM +5% 1/10W	R54A	0700053	CF 8.2K OHM +5% 1/16W
R342	0195916R	RESISTOR,CHIP 4.7K OHM +5% 1/10W	R54C	0700049	CF 4.7K OHM +5% 1/16W
R343	0195908R	RESISTOR,CHIP 2.2K OHM +5% 1/10W	R550	0700059	CF 27K OHM +5% 1/16W
R345	0195908R	RESISTOR,CHIP 2.2K OHM +5% 1/10W	R551	0700054	CF 10K OHM +5% 1/16W
R346	0195250R	RESISTOR,CHIP 0 OHM 1/16W	R552	0700054	CF 10K OHM +5% 1/16W
R348	0195875R	RESISTOR,CHIP 100 OHM +5% 1/10W	R553	0700054	CF 10K OHM +5% 1/16W
R349	0195908R	RESISTOR,CHIP 2.2K OHM +5% 1/10W	R554	0700054	CF 10K OHM +5% 1/16W

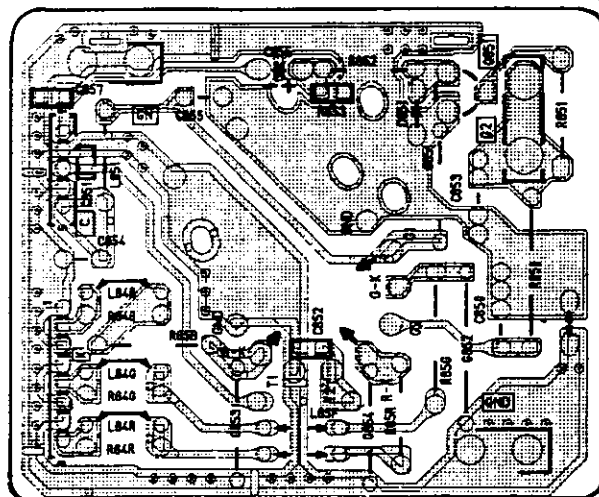
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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
C901	AN00144S	PF 0.1MF +20% 250V	C98B	0245603	CD 220PF +10% 1KV
Δ C902	AN00154S	PF 0.56MF +20% 250V	C98C	0244501	CD 1000PF +10% 500V
Δ C903	AN00153S	PF 0.47MF +20% 250V	C98D	0244507	CD 3300PF +10% 500V
Δ C906	AJ00585F	CD 4700PF +20% 250V	C98E	0244509	CD 4700PF +10% 500V
Δ C907	AJ00585F	CD 4700PF +20% 250V	C98F	0244501	CD 1000PF +10% 500V
Δ C908	AJ00585F	CD 4700PF +20% 250V	C98G	0244171	CD 0.01MF +80-20% 50V
Δ C909	AJ00585F	CD 4700PF +20% 250V	C98H	0800326	EL 100MF 16V
C90C	AJ00585F	CD 4700PF +20% 250V	C98K	0800366N	EL 2200MF 10V
C910	AN00153S	PF 0.47MF +20% 250V	C98L	AL00011R	EL 100MF 160V
Δ C911	AL00801	EL 220MF 450V	C98M	0800336R	EL 220MF 25V
C912	0800328	EL 100MF 35V	C998	0800353	EL 470MF 16V
C913	0800277R	EL 0.47MF 50V	C999	0800335R	EL 220MF 16V
C914	0890019	CD 68PF +5% 50V	R001	0700054	CF 10K OHM +5% 1/16W
Δ C915	0236394R	CD 0.001MF +5% 50V	R002	0700054	CF 10K OHM +5% 1/16W
C916	0244102	CD 1200PF +10% 50V	R003	0700054	CF 10K OHM +5% 1/16W
C917	0890022	CD 100PF +10% 50V	R004	0700054	CF 10K OHM +5% 1/16W
C918	0890035	CD 1000PF +10% 50V	R005	0700054	CF 10K OHM +5% 1/16W
C919	0880195R	PF 0.12MF +5% 50V	R006	0700054	CF 10K OHM +5% 1/16W
C91A	0880048	PF 0.022MF +10% 50V	R007	0700041	CF 1K OHM +5% 1/16W
C920	0244507	CD 3300PF +10% 500V	R009	0700027	CF 100 OHM +5% 1/16W
C921	0800336R	EL 220MF 25V	R010	0700054	CF 10K OHM +5% 1/16W
C922	0800279R	EL 1MF 50V	R014	0700054	CF 10K OHM +5% 1/16W
Δ C923	AJ00023R	CD 820PF +2% 50V	R015	0700054	CF 10K OHM +5% 1/16W
C924	0244107	CD 3300PF +10% 50V	R016	0700027	CF 100 OHM +5% 1/16W
C925	0890031	CD 470PF +10% 50V	R017	0700027	CF 100 OHM +5% 1/16W
C928	0244171	CD 0.01MF +80-20% 50V	R030	0700041	CF 1K OHM +5% 1/16W
C92A	0890035	CD 1000PF +10% 50V	R031	0700041	CF 1K OHM +5% 1/16W
C92C	0880044	PF 0.01MF +10% 50V	R032	0700041	CF 1K OHM +5% 1/16W
C930	0244507	CD 3300PF +10% 500V	R033	0700041	CF 1K OHM +5% 1/16W
C931	0284446R	EL 1MF 50V	R034	0700041	CF 1K OHM +5% 1/16W
C932	0800312R	EL 33MF 50V	R035	0700041	CF 1K OHM +5% 1/16W
C933	0800277R	EL 0.47MF 50V	R036	0700041	CF 1K OHM +5% 1/16W
Δ C934	AJ00023R	CD 820PF +2% 50V	R037	0700041	CF 1K OHM +5% 1/16W
C935	0244107	CD 3300PF +10% 50V	R038	0700041	CF 1K OHM +5% 1/16W
C936	0244107	CD 3300PF +10% 50V	R039	0700041	CF 1K OHM +5% 1/16W
C937	0880057	PF 0.1MF +10% 50V	R040	0700041	CF 1K OHM +5% 1/16W
C939	0244171	CD 0.01MF +80-20% 50V	R04A	0700033	CF 270 OHM +5% 1/16W
C93A	0880051	PF 0.033MF +10% 50V	R051	0195925R	RESISTOR,CHIP 10K OHM +5% 1/10W
C93B	0800282	EL 2.2MF 50V	R052	0195925R	RESISTOR,CHIP 10K OHM +5% 1/10W
C970	0245601R	PP 100PF +10% 1KV	R053	0195925R	RESISTOR,CHIP 10K OHM +5% 1/10W
C971	0254905	EL 470MF 200V	R054	0195875R	RESISTOR,CHIP 100 OHM +5% 1/10W
C973	0243510	CD 560PF +10% 500V	R055	0195891R	RESISTOR,CHIP 470 OHM +5% 1/10W
C974	0800317	EL 47MF 16V	R056	0195250R	RESISTOR,CHIP 0 OHM 1/16W
C975	0800317	EL 47MF 16V	R057	0195250R	RESISTOR,CHIP 0 OHM 1/16W
C977	0244107	CD 3300PF +10% 50V	R059	0195875R	RESISTOR,CHIP 100 OHM +5% 1/10W
Δ C978	0880051	PF 0.033MF +10% 50V	R063	0195250R	RESISTOR,CHIP 0 OHM 1/16W
C97A	0800294	EL 10MF 50V	R064	0195250R	RESISTOR,CHIP 0 OHM 1/16W
Δ C981	0255032F	EL 100MF 200V	R068	0195925R	RESISTOR,CHIP 10K OHM +5% 1/10W
C982	0284482N	EL 47MF 100V	R106	0700041	CF 1K OHM +5% 1/16W
C983	0255010	EL 1000MF +20% 31.5V	R10P	0700049	CF 4.7K OHM +5% 1/16W
C984	0254509	EL 1000MF 16V	R111	0700027	CF 100 OHM +5% 1/16W
C985	0800366N	EL 2200MF 10V	R112	0700027	CF 100 OHM +5% 1/16W
C986	0284404R	EL 100MF 16V	R113	0700027	CF 100 OHM +5% 1/16W
C987	0800328	EL 100MF 35V	R114	0700027	CF 100 OHM +5% 1/16W
C988	0800326	EL 100MF 16V	R115	0700027	CF 100 OHM +5% 1/16W
C989	0800353	EL 470MF 16V	R116	0700027	CF 100 OHM +5% 1/16W
C98A	0245601R	PP 100PF +10% 1KV	R117	0700027	CF 100 OHM +5% 1/16W

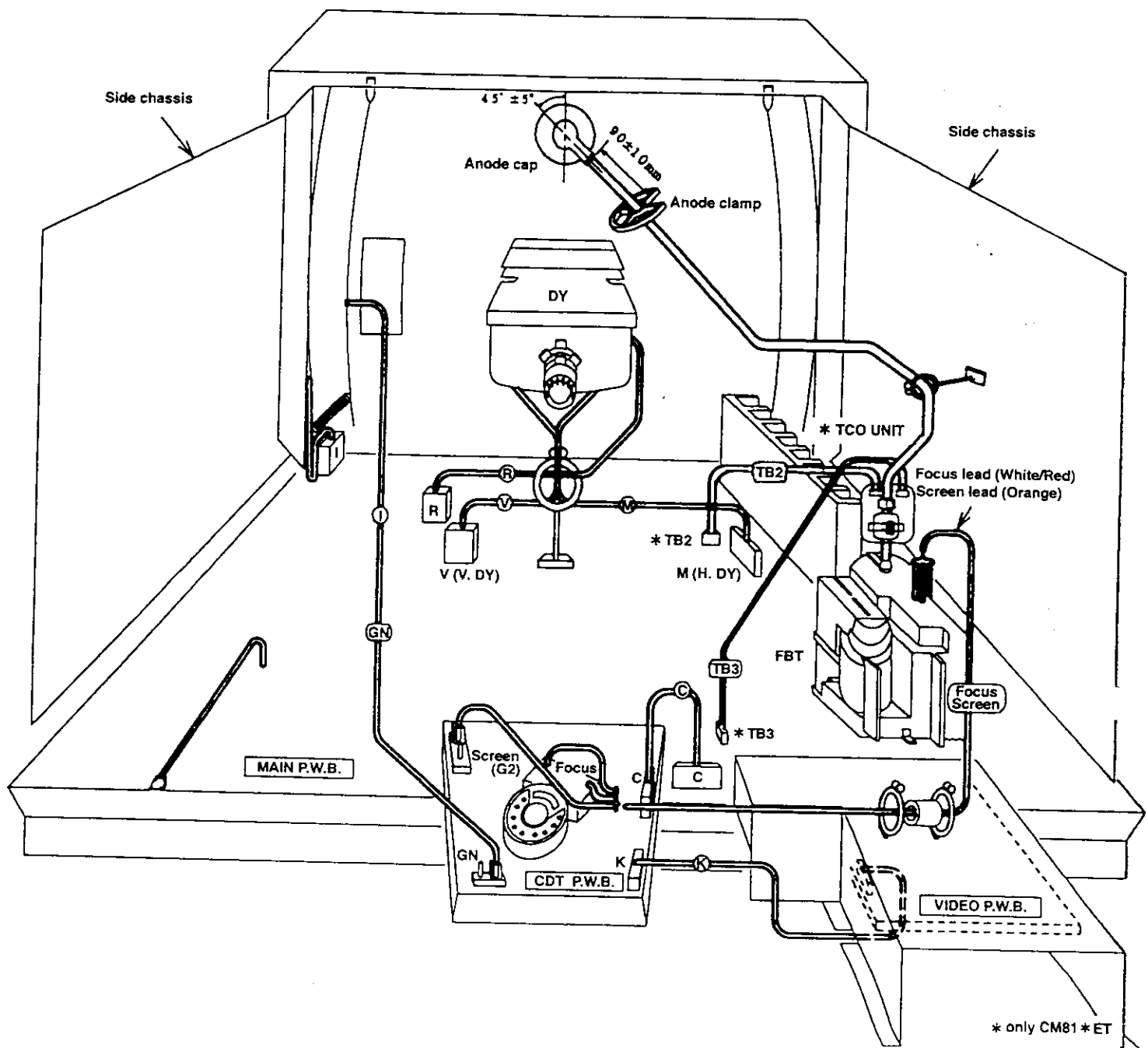
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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
C25K	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C309	0800279R	EL 1MF 50V
C25R	0893072R	CAPACITOR,CHIP 0.47MF $\pm$ 80 -20% 25V	C310	0800325	EL 100MF 10V
C261	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C311	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V
C262	0284667R	EL 47MF 16V	C313	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V
C26B	0800284R	EL 3.3MF 50V	C314	0228754R	CAPACITOR,CHIP 100PF $\pm$ 5% 50V
C26G	0800284R	EL 3.3MF 50V	C315	0228754R	CAPACITOR,CHIP 100PF $\pm$ 5% 50V
C26R	0800284R	EL 3.3MF 50V	C316	0800288	EL 4.7MF 50V
C271	0893031R	CAPACITOR,CHIP 1000PF $\pm$ 10% 50V	C317	0800316R	EL 47MF 10V
C272	0893031R	CAPACITOR,CHIP 1000PF $\pm$ 10% 50V	C318	0800316R	EL 47MF 10V
C275	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C319	0880053	PF 0.047MF $\pm$ 10% 50V
C276	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C321	0893043R	CAPACITOR,CHIP 8200PF $\pm$ 10% 50V
C278	0244505	CD 2200PF $\pm$ 10% 500V	C322	0800279R	EL 1MF 50V
C27B	0893086R	CD 0.1MF $\pm$ 80-20% 50V CHIP	C323	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V
C27G	0893086R	CD 0.1MF $\pm$ 80-20% 50V CHIP	C325	0800279R	EL 1MF 50V
C27R	0893086R	CD 0.1MF $\pm$ 80-20% 50V CHIP	C326	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V
C281	0800353	EL 470MF 16V	C327	0800284R	EL 3.3MF 50V
C282	0800326	EL 100MF 16V	C341	0893031R	CAPACITOR,CHIP 1000PF $\pm$ 10% 50V
C283	0244505	CD 2200PF $\pm$ 10% 500V	C360	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V
C28B	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V	C361	0800316R	EL 47MF 10V
C28G	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V	C381	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V
C28R	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V	C383	0893037R	CAPACITOTOR, CHIP 3300PF $\pm$ 10% 50V
C29B	0228058R	CAPACITOR,CHIP 150PF $\pm$ 5% 50V	C384	0893031R	CAPACITOR,CHIP 1000PF $\pm$ 10% 50V
C29G	0228058R	CAPACITOR,CHIP 150PF $\pm$ 5% 50V	C385	0228754R	CAPACITOR,CHIP 100PF $\pm$ 5% 50V
C29R	0228058R	CAPACITOR,CHIP 150PF $\pm$ 5% 50V	C386	0893031R	CAPACITOR,CHIP 1000PF $\pm$ 10% 50V
C2AB	0228038R	CD 22PF $\pm$ 5% 50V	C387	0228754R	CAPACITOR,CHIP 100PF $\pm$ 5% 50V
C2AG	0228038R	CD 22PF $\pm$ 5% 50V	C395	0800316R	EL 47MF 10V
C2AR	0228038R	CD 22PF $\pm$ 5% 50V	C396	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V
C2BB	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C401	0890035	CD 1000PF $\pm$ 10% 50V
C2BG	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C402	0890035	CD 1000PF $\pm$ 10% 50V
C2BR	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C403	0284638	EL 10MF 16V
C2DB	0258119R	EL 0.47MF 100V	C404	0244171	CD 0.01MF $\pm$ 80-20% 50V
C2DG	0258119R	EL 0.47MF 100V	C501	0244171	CD 0.01MF $\pm$ 80-20% 50V
C2DR	0258119R	EL 0.47MF 100V	C502	0880032	PF 1200PF $\pm$ 10% 50V
C2EB	0258124R	EL 10MF 100V	C503	0800279R	EL 1MF 50V
C2EG	0258124R	EL 10MF 100V	C504	0890035	CD 1000PF $\pm$ 10% 50V
C2ER	0258124R	EL 10MF 100V	C505	0880051	PF 0.033MF $\pm$ 10% 50V
C2F1	0800353	EL 470MF 16V	C507	0800325	EL 100MF 10V
C2GB	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V	C50A	0800294	EL 10MF 50V
C2GG	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V	C50B	0800294	EL 10MF 50V
C2GR	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V	C510	0270444R	PF 0.033MF $\pm$ 5% 50V
C2H1	0800353	EL 470MF 16V	C521	0880037	PF 3300PF $\pm$ 10% 50V
C2JB	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C531	0800282	EL 2.2MF 50V
C2JG	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C532	0800294	EL 10MF 50V
C2JR	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C533	0800294	EL 10MF 50V
C2LB	0893027R	CAPACITOR,CHIP 0.1MF 25V	C534	0800279R	EL 1MF 50V
C2LG	0893027R	CAPACITOR,CHIP 0.1MF 25V	C539	0244171	CD 0.01MF $\pm$ 80-20% 50V
C2LR	0893027R	CAPACITOR,CHIP 0.1MF 25V	C53A	0800294	EL 10MF 50V
C2TG	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V	C53B	0800294	EL 10MF 50V
C2TR	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V	C541	0244171	CD 0.01MF $\pm$ 80-20% 50V
C301	0893067	CAPACITOR,CHIP 0.1MF $\pm$ 80 -20% 25V	C542	0244171	CD 0.01MF $\pm$ 80-20% 50V
C302	0800334R	EL 220MF 10V	C543	0890022	CD 100PF $\pm$ 10% 50V
C303	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C544	0890022	CD 100PF $\pm$ 10% 50V
C304	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C545	0800294	EL 10MF 50V
C305	0228070R	CAPACITOR,CHIP 470PF $\pm$ 5% 50V	C546	0244171	CD 0.01MF $\pm$ 80-20% 50V
C306	0880057	PF 0.1MF $\pm$ 10% 50V	C547	0244171	CD 0.01MF $\pm$ 80-20% 50V
C307	0893044R	CAPACITOR,CHIP 0.01MF $\pm$ 10% 50V	C548	0800279R	EL 1MF 50V
C308	0800282	EL 2.2MF 50V	C549	0890017	CD 47PF 50V $\pm$ 5%

CPT P.W.B.



WIRING DIAGRAM



3.2 White balance adjustment (Color 2)

- (1) Receive a signal of 94A with a 100×100mm window pattern.
- (2) Set Brightness Control to the center (2.5V : 7F).
- (3) Adjust the light output to 80 cd/m²(23ft-L) at the center of screen by adjusting Sub Contrast Control.
- (4) Adjust the white balance of high light output by Green and Blue color adjustments to read CIE coordinate of $X=0.313 \pm 0.008$, $Y=0.329 \pm 0.008$.
- (5) Adjust Contrast Control to read 3 cd/m² (1 ft-L).
- (6) Adjust Red and Blue BKG to read the same CIE coordinate shown in 3.2.(4)
- (7) Adjust Contrast Control to read 80 cd/m²(23ft-L) and then confirm CIE coordinate. If it shown out range, go back to 3.2(4)
- (8) Register the readings of R/G/B BKG and Color data (Color 2) to the microprocessor.

3.3 White balance adjustment (Color 1)

- (1) Receive a signal of 94A with a 100×100mm window pattern.
- (2) Set brightness Control to the center (2.5V : 7F).
- (3) Adjust the light output to 80 cd/m²(23ft-L) at the center of screen by adjusting Sub Contrast Control in Color 2 mode.
- (4) Select "Color Select" to Color 1.
- (5) Adjust the white balance of high light output by Green and Blue color adjustments to read CIE coordinate of $X=0.283 \pm 0.008$, $Y=0.298 \pm 0.008$
- (6) Register the readings of Color data (Color 1) to the microprocessor.

3.4 White balance adjustment (Color 3)

- (1) Receive a signal of 94A with a 100×100mm window pattern.
- (2) Set Brightness Control to the center (2.5V : 7F).
- (3) Adjust the light output to 80 cd/m² (23ft-L) at the center of screen by adjusting Sub Contrast Control in Color 2 mode.
- (4) Select "Color Select" to color 3.
- (5) Set Red color to the maximum (5V ; FF).
- (6) Adjust the white balance of high light output by Green and Blue color adjustments to read CIE coordinate of $X=0.336 \pm 0.008$, $Y=0.352 \pm 0.008$.
- (7) Register the readings of Color data (Color 3) to the microprocessor.

3.5 Brightness adjustment

- (1) White balance adjustment must have been done before Brightness adjustment.
- (2) Receive signal of 94A with a blank signal pattern.(Black video)
- (3) Set Brightness and Contrast Control to their maximums.
- (4) Ambient light on the surface of the CRT should show lower than 50 lux.
- (5) Select "Color Select" to Color 1.
- (6) Adjust the light output to 1.5 cd/m² (0.44 ft-L) at the center of screen by adjusting Sub Brightness Control.
- (7) Receive a signal or 94A with a window pattern (100 × 100 mm)
- (8) Adjust the light output to 125 cd/m² (36 ft-L) at the center of screen by adjusting Sub Contrast Control.
- (9) Receive a signal of or 94A with a full white pattern.
- (10) Set Video signal level to 0.75V
- (11) Adjust the light output to 120 cd/m² (35ft-L) at the center of screen by adjusting ACL adjustment.
- (12) Register the readings of Sub Brightness, Sub Contrast and ACL to the microprocessor.

2. Deflection circuit adjustment

2.1 Horizontal free running frequency and Horizontal drive pulse duty adjustment

- (1) Turn the switch of the unit off.
- (2) Place a jumper wire across C922 and R98P on main-p.w.b to disable +B output voltage.
- (3) Connect a 1 Kohm resistor between R700 (Q701 side) and D71Z's cathode.
- (4) Place a jumper wire between I701 26pin and GND.
- (5) Connect frequency counter between R700 (Q701 side) and GND.
- (6) Turn the switch of the unit on.
- (7) Receive the signal, as indicate on table 2, for frequency Horizontal high(fHH), and adjust R706 to the value indicated on table 2.
- (8) Receive the signal 30W for fHLL and check the fHOL in table 2.
- (9) Connect a oscilloscope's probe (10:1) to Q760's drain.
- (10) Ajust tHD to table 2 using R725
- (11) Turn the switch of the unit off .
- (12) Remove the adjustment jig.



Table 2

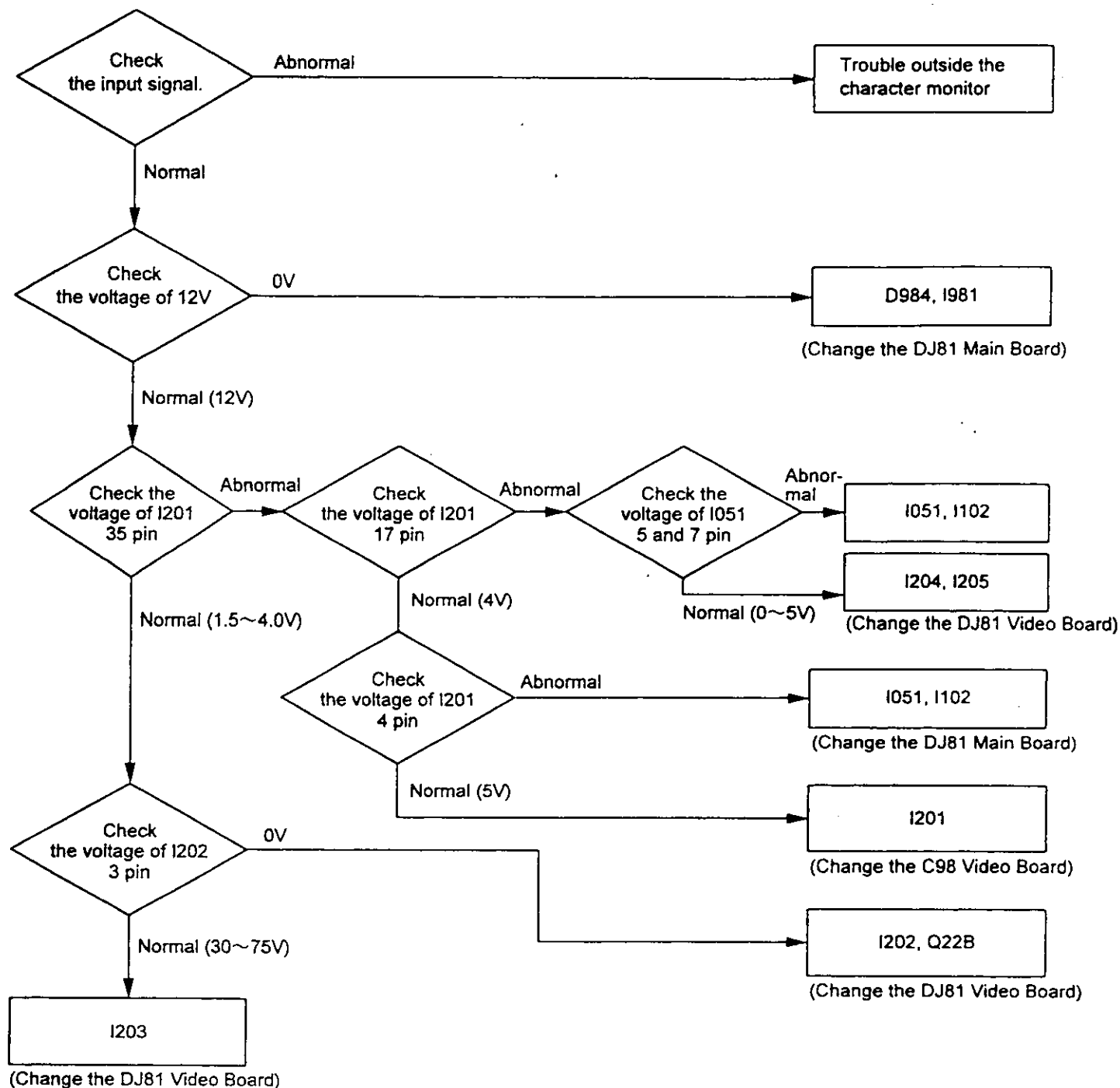
			R725		R706	
	fHLL	fHOL	fHLL	tHD	fHH	fHOH
CM81*	30W	$30.0 \pm 0.7 \text{ kHz}$	30W	$16.6 \pm 0.2 \mu \text{ s}$	94A	$93.75 \pm 0.1 \text{ kHz}$

2.2 High voltage adjustment

- (1) Turn the switch of the unit off.
- (2) Connect a high voltage meter, whitch is capable to measure up to 40kV, between CDT anode and GND.
- (3) Receive normal cross hatch pattern of 94A signal.
- (4) Turn the switch of the unit on.
- (5) Adjust high voltage level to $27.5 \pm 0.3 \text{ kV}$ using R754.
- (6) Turn the switch of the unit off.
- (7) Remove the adjustment jig.

5. COLOR DOES NOT APPEAR

Relevant circuit : Video amplifier circuit

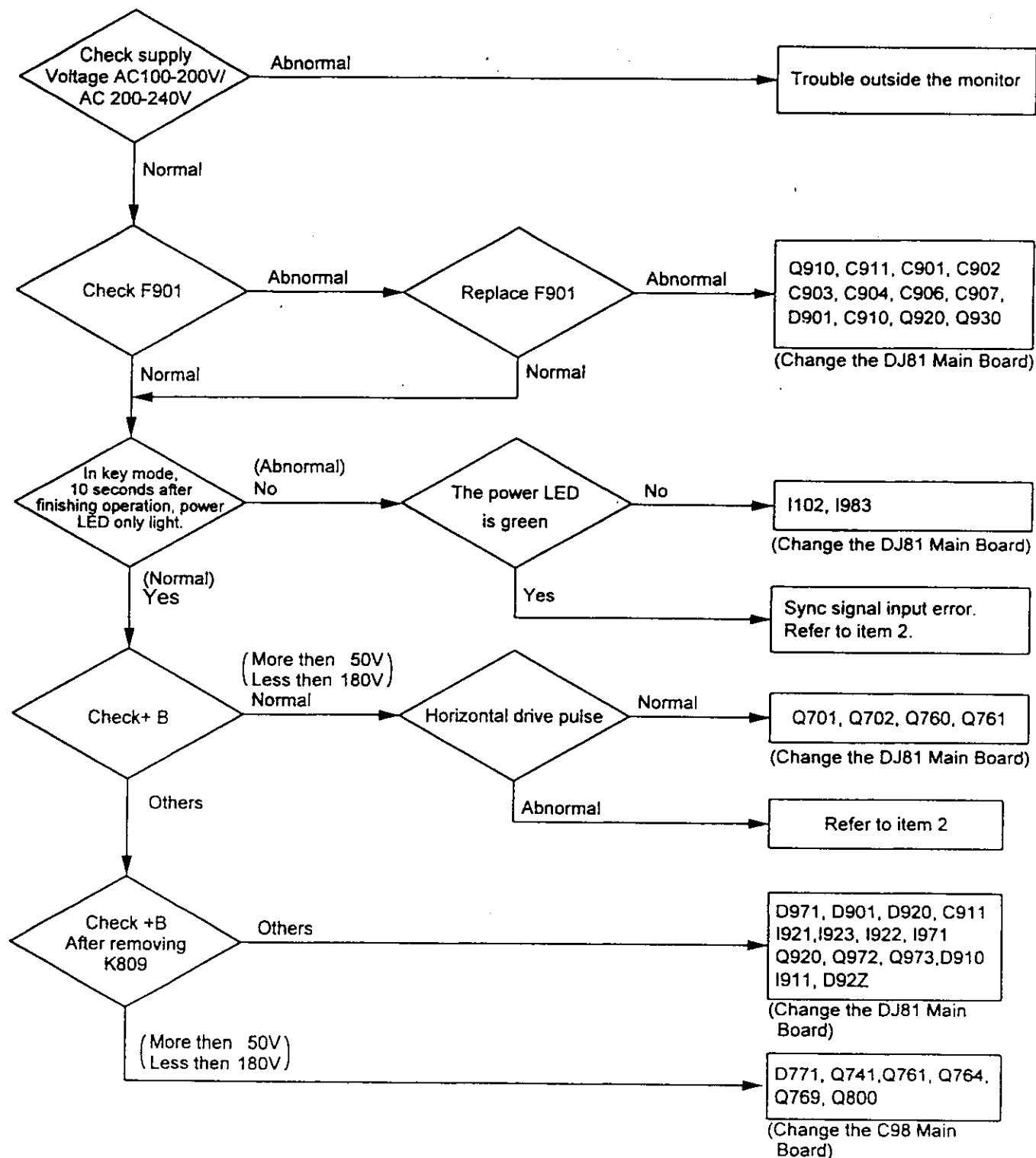


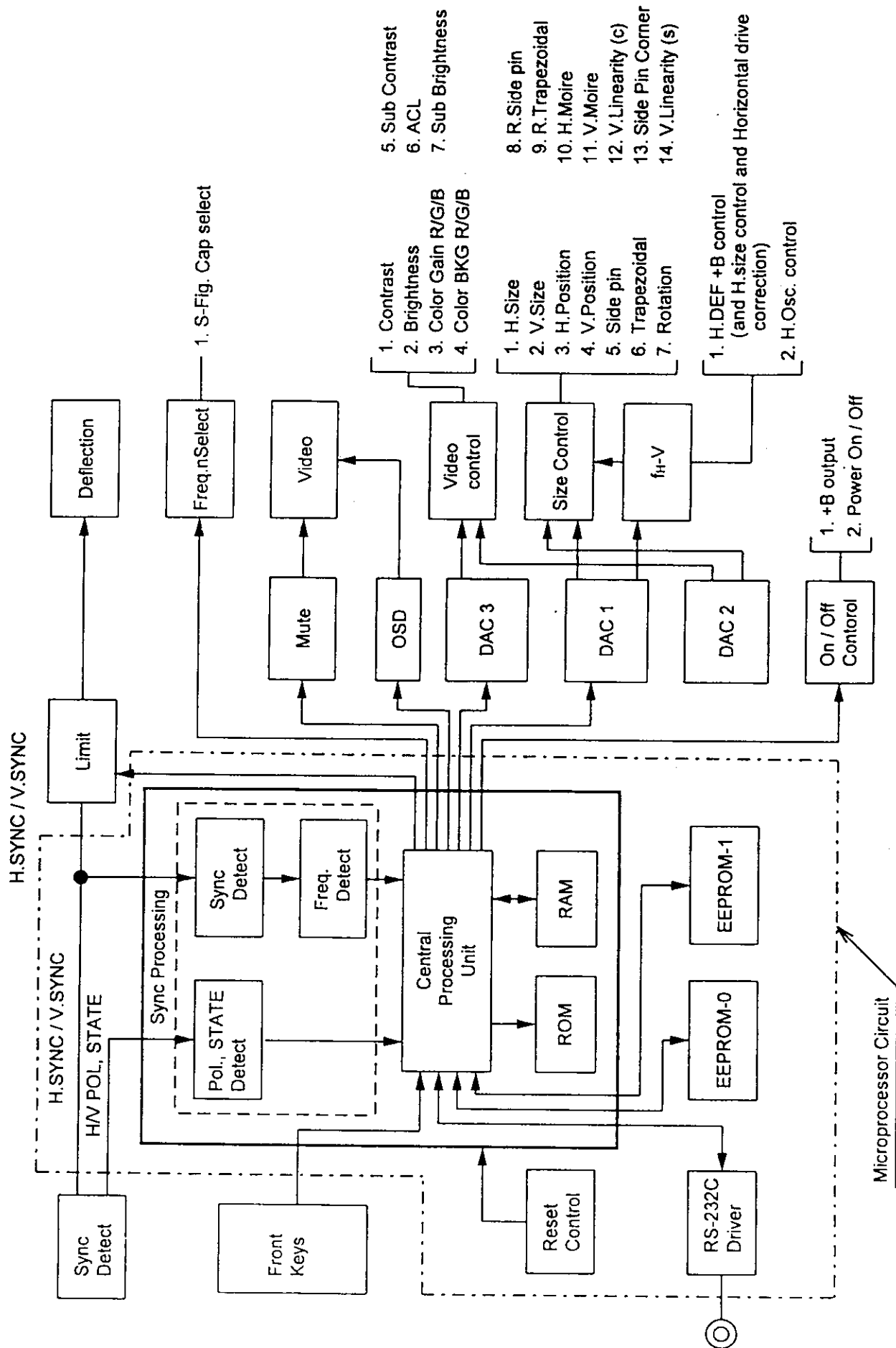
Note : Trouble in the blue circuit is shown in this diagram as representative color.
Refer to : when green does not appear, and when red does not appear.

TROUBLESHOOTING

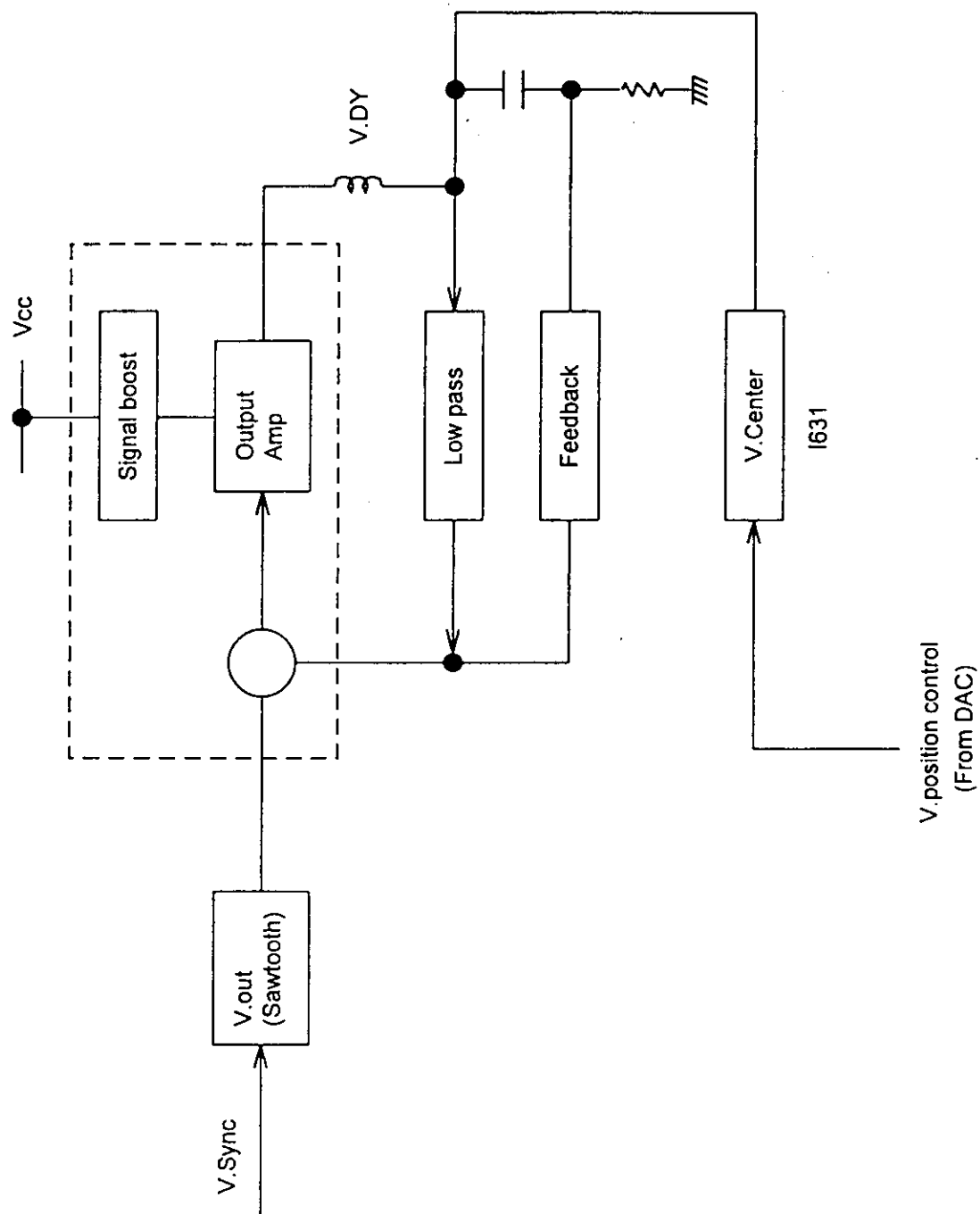
1. RASTER DOES NOT APPEAR

Relevant circuit : Power circuit, Horizontal deflection circuit,
High voltage limiter circuit





Vertical Deflection Circuit

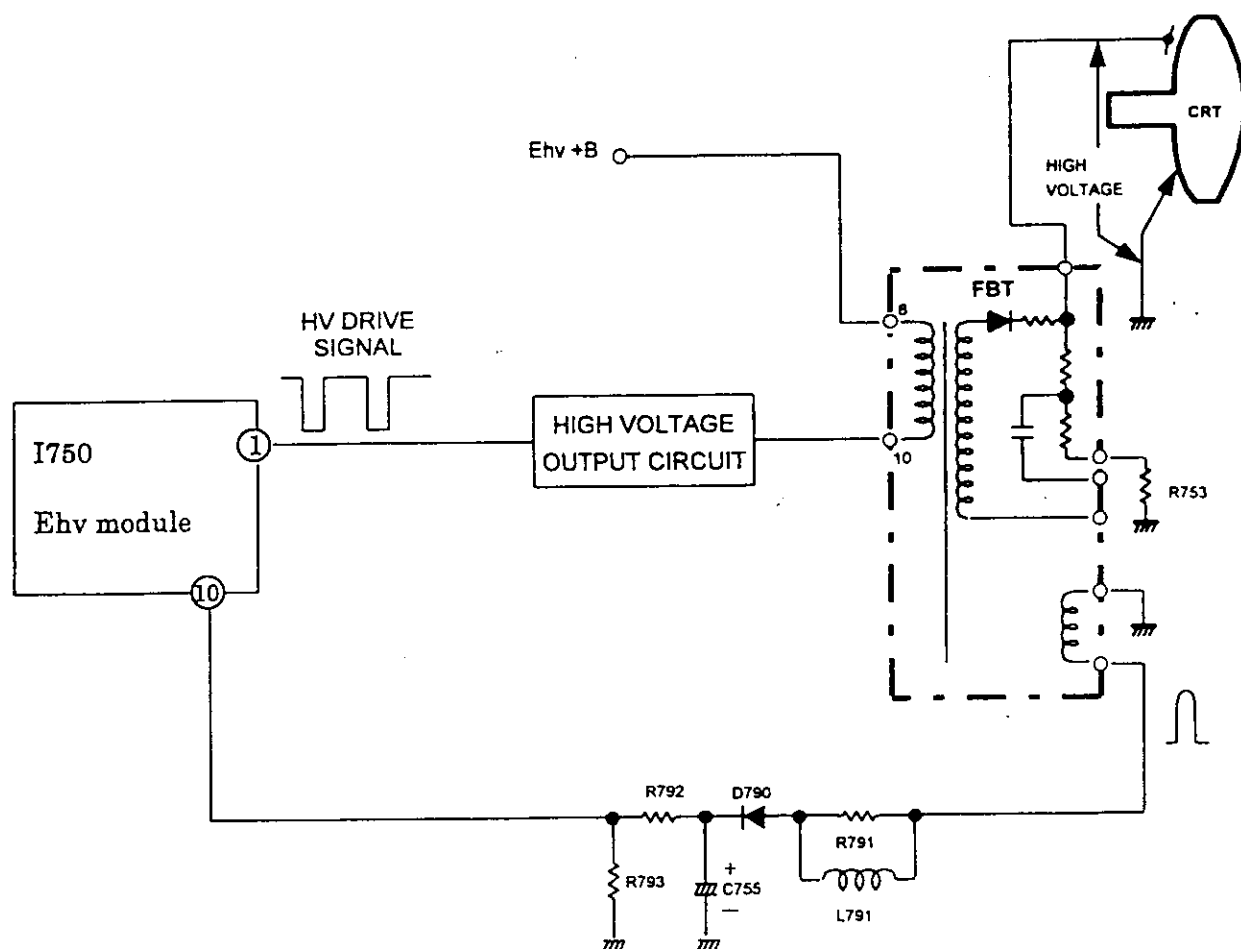


4.6 High Voltage Hold-Down Circuit

DJ81- Chassis uses a system that to stop HV DRIVE SIGNAL output,when abnormal high voltage is detected. So that the high voltage output will be declined to zero. The circuit operation in detail is as follows.

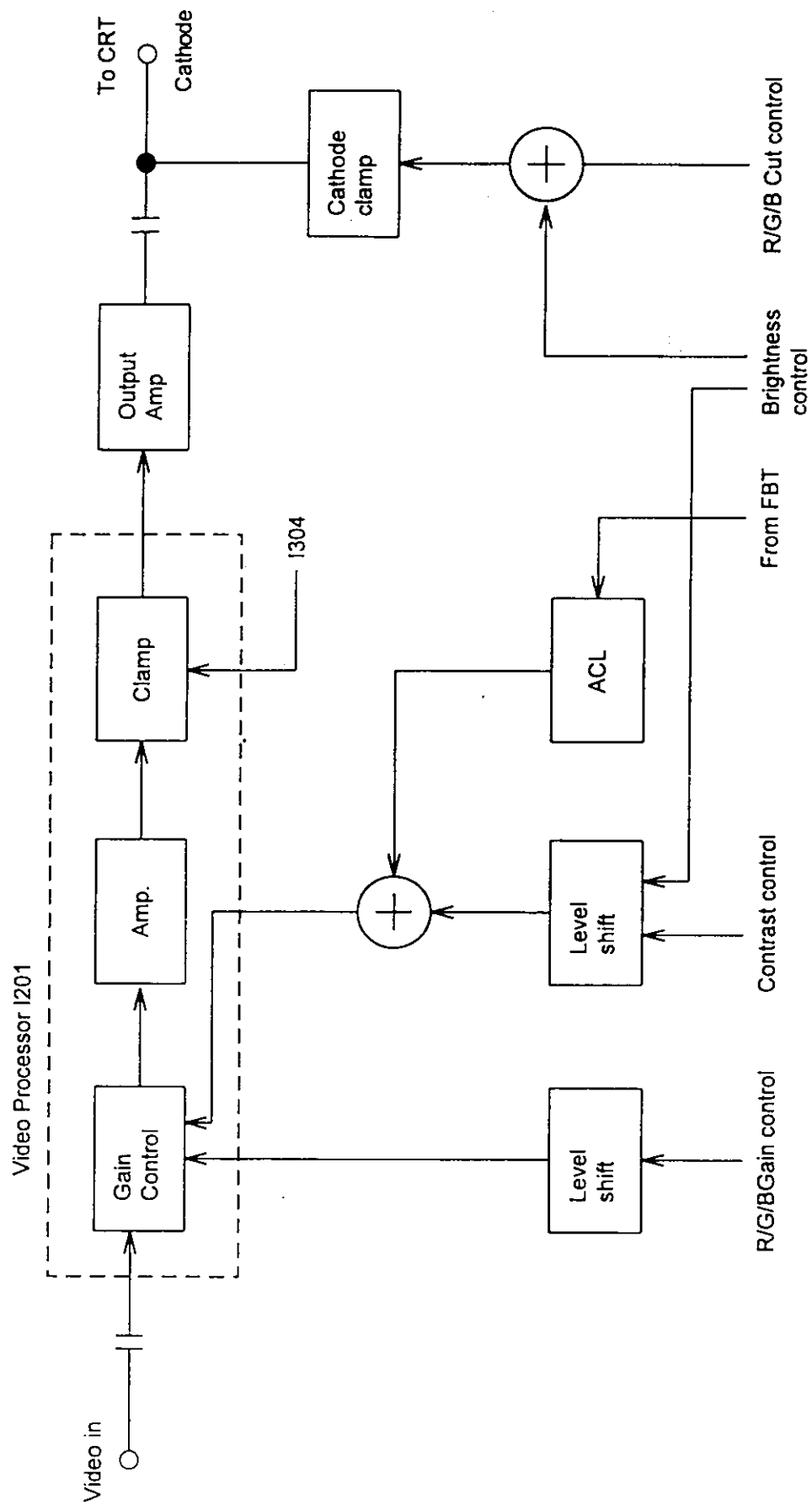
When an input voltage to I750 (pin10,it is determined by R792 and R793) exceeds the specified level HV DRIVE SIGNAL is not output in order to prevent over drive. This cause to high voltage decline to zero.

HIGH VOLTAGE HOLD-DOWN CIRCUIT DIAGRAM





Video Process Circuit

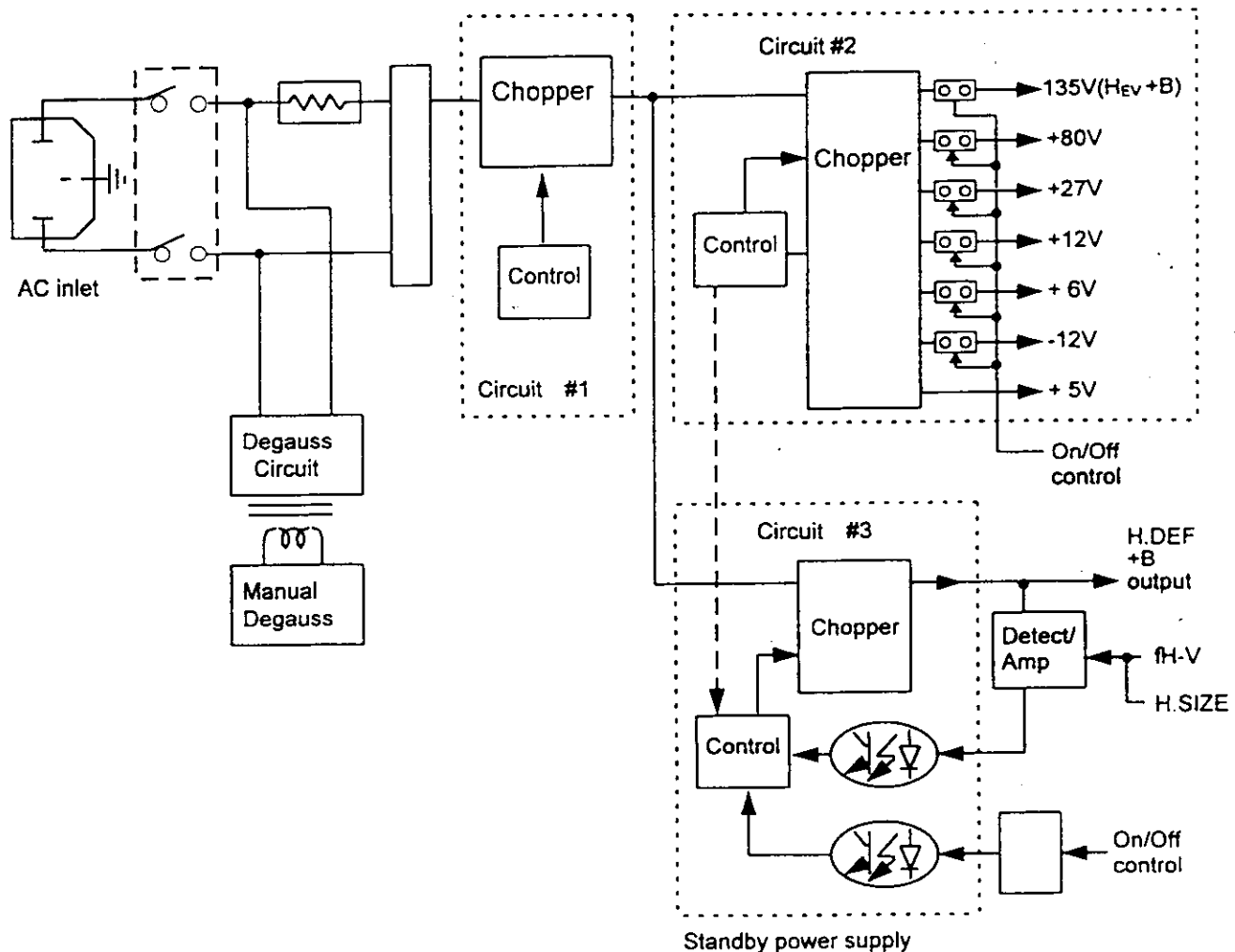


1.4 Degaussing circuit

When the power is switched on, the CRT is degaussed automatically by current flowing through the degauss circuit while the relay (S91R) is closed. Degaussing current flows for approximately 20 seconds and stops after secondary circuit operation is stabilized causing relay (S91R) to be opened.

The circuit also allows for manual degauss by user switch at front panel which closes S91R through Q999, to allow current to flow through the degauss coil.

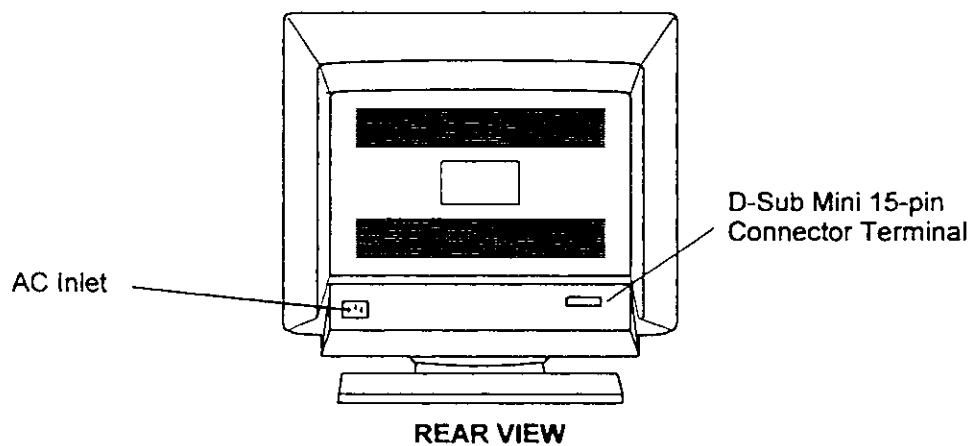
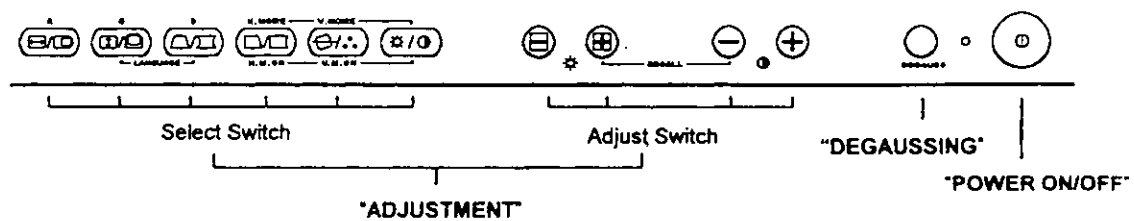
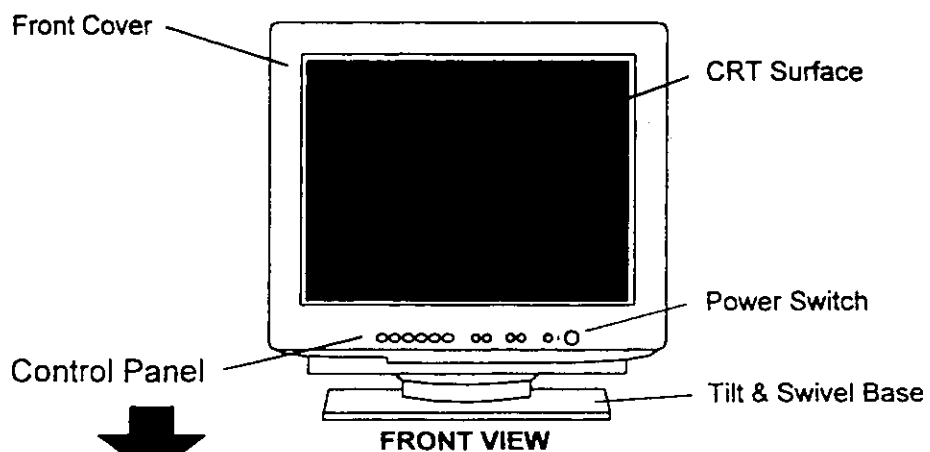
Figure 1 : Block diagram for power supply circuit



	Signal		VESA 1600×1200 (75Hz)	VESA 1600×1200 (85Hz)	Macintosh II 1152×870 (75Hz)	fHLL Adjustment signal
1	Video	Type	R/G/B Analog	R/G/B Analog	R/G/B Analog	R/G/B Analog
		Voltage	0.7 Vp-p	0.7 Vp-p	0.7 Vp-p	0.7 Vp-p
		Set Up	None	None	None	None
2		Type	H/V Separate	H/V Separate	H/V Separate	H/V Separate
		Amp.	TTL Level (Posi./Posi.)	TTL Level (Posi./Posi.)	TTL Level (Nega./Nega.)	TTL Level (Nega./Nega.)
3	Video frequency		202.500 MHz	229.500 MHz	100.000 MHz	24.000 MHz
4	Character (Letter)		1600dots×1200lines	1600dots×1200lines	1152dots×870lines	640dots×410lines
5	Horizontal	Frequency	93.750 kHz	106.250 kHz	68.681 kHz	30.000 kHz
		Front porch	0.316 μs (64cl)	0.279 μs (64cl)	0.320 μs (32cl)	0.417 μs (10cl)
		Sync. width	0.948 μs (192cl)	0.837 μs (192cl)	1.280 μs (128cl)	3.917 μs (94cl)
		Back porch	1.501 μs (304cl)	1.325 μs (304cl)	1.440 μs (144cl)	2.333 μs (56cl)
		Blanking width	2.765 μs (560cl)	2.440 μs (560cl)	3.040 μs (304cl)	6.667 μs (160cl)
		Display time	7.901 μs (1600cl)	6.972 μs (1600cl)	11.520 μs (1152cl)	26.667 μs (640cl)
		H.period (1H)	10.667 μs (2160cl)	9.412 μs (2160cl)	14.560 μs (1456cl)	33.333 μs (800cl)
6	Vertical	Frequency	75.000 Hz	85.000 Hz	75.060 Hz	50.000 Hz
		Front porch	0.011 ms (1H)	0.009 ms (1H)	0.044 ms (3H)	2.967 ms (89H)
		Sync. width	0.032ms (3H)	0.028ms (3H)	0.044ms (3H)	0.133ms (4H)
		Back porch	0.491 ms (46H)	0.433 ms (46H)	0.568 ms (39H)	3.233 ms (97H)
		Blanking width	0.533 ms (50H)	0.471 ms (50H)	0.655 ms (45H)	6.333 ms (190H)
		Display time	12.800 ms (1200H)	11.294 ms (1200H)	12.667 ms (870H)	13.667 ms (410H)
		H.period (1H)	13.333 ms (1250H)	11.765 ms (1250H)	13.322 ms (915H)	20.000 ms (600H)
7	Scan System		(Non-interlaced)	(Non-interlaced)	(Non-interlaced)	(Non-interlaced)
8	Remark		only CM811*	only CM812*	only CM811ET	
9	Signal name		94A	106B	70A	30W

* Macintosh II is a trademark of Apple Computer, Inc

CONTROLS



FEATURES

1. Flat screen CRT with anti-glare, dynamic focus circuit, dark glass, and INVAR shadow mask give the sharpest focus and highest contrast.
2. Automatic scanning and automatic adjustment to conform with a wide range of scanning frequencies and user requirements.
3. Signal input allows D-Sub Min 15pin cable.
4. Power Save Mode automatically puts the monitor into a standby mode (power consumption less than 15W) when the H.sync. signal is not detected, and a power - off mode (less than 5W) when the V.sync. signal is not detected. Normal mode is restored immediately when the H. sync. signal and the V.sync signal are detected. This feature prolongs monitor life and reduces energy consumption by up to about 75 %.

SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis or picture tube.

The following precautions must be observed.

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled.
2. When replacing a chassis in the monitor, all the protective devices must be put back in place, such as, barriers, non-metallic knobs, adjustment and compartment shields, and isolation resistor-capacitor, etc.
3. When service is required, observe the original lead dress. Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area.
4. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacturer's. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
5. Before returning a serviced monitor to the customer, the service personnel must thoroughly test unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the monitor by the manufacturer has become defective, or inadvertently defeated during servicing.
Therefore, the following checks should be performed for continued protection of the customer and service technician.
6. In the case of the micro processor unit, shop adjustment is necessary after exchange of the micro processor unit.

High Voltage

This monitor is provided with a high voltage hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with notes described in this Service Manual regarding this hold down circuit when servicing, so that this hold down circuit may function correctly.

Service Warning

With minimum Brightness and Contrast the operating high voltage in this display is lower than 30 kV.

If any component having influence on the high voltage is replaced, confirm that the high voltage with minimum Brightness and Contrast is lower than 30 kV.

To measure high voltage use a high impedance highvoltage meter. (SENSITIVE RESEARCH Model: ESH or Equivalent)

Connect (—) to chassis earth and (+) to the CDT anode button. (See the following connection diagram Fig. 1.)

NOTE: Turn power switch off without fail before making the connection to the Anode button

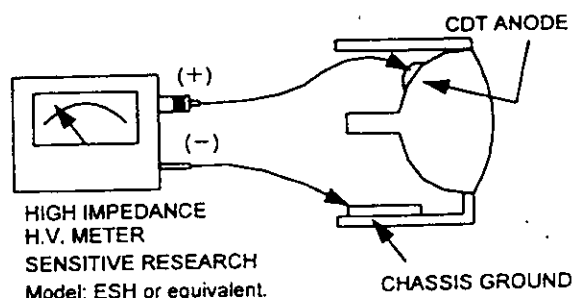


Fig. 1

X-radiation

TUBE: The source of X-radiation in this monitor is the picture tube. The tube utilized in this chassis is specially constructed to limit X-radiation emissions.

For continued X-radiation protection, the replacement tube must be the same type as the original, manufacturer approved type.

When troubleshooting and making test measurements in a monitor with a problem of excessive high voltage, avoid being unnecessarily close to the picture tube and the high voltage components.

Do not operate the chassis longer than is necessary to locate the cause of excessive voltage.

CHECK OF HIGH VOLTAGE HOLD DOWN CIRCUIT

Checking of the high Voltage hold down circuit operation.

1. Turn the switch of the unit ON, and set the Brightness and Contrast controls to max.
2. Turn the switch of the unit OFF.
3. Connect a DC Voltmeter and an adjustment jig as shown in Fig. 2.
4. Set the adjustment VR to fully counterclockwise.
5. Turn the switch of the unit ON and gradually rotate the adjustment VR clockwise.
6. Check that a reading of DC voltage-meter is less than 0.6 ± 0.1 V when picture disappears.
7. Turn the switch of the unit OFF immediately after checking that the picture disappears.
8. Remove the adjusting jig and the DC voltmeter.

NOTE: Reading of 0.6 V is approximately equivalent to 30 kV of CDT Anode High Voltage.

