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DIGITAL EQUIPMENT CORPORATION  
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE June, 1978

TITLE H7834 POWER SUPPLY

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
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ENG	Ralph MacKenzie	APPD	<i>Ralph M. MacKenzie</i> 10/17/78	SIZE	A	CODE	SP	NUMBER	H7834-0-2	REV	
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DRA 107A

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ENGINEERING SPECIFICATION

CONTINUATION SHEET

TITLE H7834 POWER SUPPLY

1.0 Characteristics

1.1 Performance

1.1.1 Inputs

The module shall perform as specified herein when supplied with the inputs described in the following paragraphs.

1.1.1.1 Voltage

The AC input voltage shall be one phase, two wire, switch selectable in two ranges:

87 - 128 VRMS  
174 - 256 VRMS

1.1.1.2 Frequency

The frequency of the AC input voltage shall be 47 - 63 Hz.

1.1.1.3 Current

The input current shall be as follows:

1.3 A RMS maximum at 87 VRMS  
0.7 A RMS maximum at 174 VRMS

1.1.1.4 Inrush Current

The input inrush current shall be as follows:

50A peak for  $\frac{1}{2}$  cycle at 128 VRMS  
50A peak for  $\frac{1}{2}$  cycle at 256 VRMS

1.1.1.5 Power

The input power shall be 65 watts maximum. Apparent input power shall be 110 VA maximum.

1.1.1.6 Power Factor

The power factor shall be 0.6 minimum at full load and 87 VRMS.

1.1.1.7 Leakage Current

When installed in the LA34 terminal the leakage current shall be 0.5 MA RMS max each line to ground at 250V RMS sine, 50 Hz.

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1.1.1.8 Overcurrent		The input overcurrent protection is provided by a user accessible 3A normal blow fuse.		1.1.1.9 Electromagnetic Interference/Susceptibility		When installed in the LA34 the conducted or radiated interference/susceptibility shall be as follows:		1.1.1.9.1 Conducted Transients		System degradation shall not be caused by a single 300V, 0.2 watt sec. maximum voltage transient. Survival level for a single voltage transient shall be 1000V at 2.5 watt-sec max. Survival level for an average power transient shall be 0.5W maximum.		1.1.1.9.2 Conducted CM Noise		Conducted CM noise shall not exceed the following:		10 KHz to 3 MHz 3VRMS max. 3 MHz to 500 MHz 1VRMS max. 500 MHz to 1 GHz 0.5VRMS max.		1.1.1.9.3 RF Field Susceptibility		The following RF fields shall not cause system degradation (with the power supply installed in the terminal)		10 KHz to 30 MHz 1V/M max. 30 MHz to 1 GHz 10V/M max.		1.1.1.10 Power Line Disturbances		With the module installed in the terminal, the performance with power line disturbances shall be as follows:		1.1.1.10.1 Overvoltage		The H7834 power supply shall withstand for one second 117% of the rated maximum input voltages specified in 1.1.1.1 without causing system degradation or damage.	

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1.1.1.10.2 Undervoltage		The H7834 power supply module shall withstand undervoltages and power interruptions without sustaining damage or causing damage to the LA34.		1.1.1.10.3 Ride Through		At 87VRMS input and full load, all outputs shall remain within their specified limits for 20 milliseconds minimum.		1.1.1.11 Electromagnetic Interference		With the module installed in the terminal, the conducted and radiated emissions level shall be as follows:		1.1.1.11.1 Conducted Emission		The conducted emissions shall satisfy the VDE A limit.		1.1.1.11.2 Radiated Emissions		The radiated emissions shall satisfy the VDE A limit.		1.1.1.12 Dielectric Withstanding		With the AC power disconnected the module shall withstand the application of the following high voltage direct current levels without damage or arcing.		1.1.1.12.1 Input to Frame		The module shall withstand 2.5 KV DC from input to frame for one minute.		1.1.1.12.2 Input to Output		The module shall withstand 2.5 KV DC from input to output for one minute.	

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1.1.2 Outputs			
The module shall provide outputs as defined in the following paragraphs. All outputs are defined at the output connector J2.			
1.1.2.1 Currents			
The output currents shall meet the requirements of a single LA00 terminal.			
+5.1 VDC at 0.5A minimum to 3.0A maximum			
+12 VDC at 0.02A minimum to 0.2A maximum			
-12VDC at 0.02A minimum to 0.2A maximum			
+21 VDC at 0A minimum to 1.0A maximum			
-21 VDC at 0.1A minimum to 1.0A maximum			
The total average power from the +21V and -21V outputs is limited to 21 watts.			
1.1.2.2 Voltages			
The output voltages shall have the following tolerances under the specified loads.			
1.1.2.2.1 +5.1 volt Output			
the +5.1 volt output shall have the following characteristics as measured at Pin 3 (Pin 2 return) of J2:			
a) Overall regulation: +5%			
b) Initial tolerance +1%			
c) Static line regulation: +0.5%			
d) Static load regulation: +1.5%			
e) Long term stability: +0.1%/1000 hrs.			
f) Thermal drift: -0.01 + .01%/°C			
g) Ripple: 200 MV p-p for f ≤ 20 KHz			
h) Noise: 200 MV peak to peak at f ≤ 100 KHz			
i) Dynamic load regulation: TBDL			
1.1.2.2.2 +21 Volt Output			
The +21 volt output shall have the following characteristics as measured at Pin 7 (Pin 6 return) of J2:			
a) Overall regulation: +10%			
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1.1.2.2.2 (continued)			
b) Initial tolerance +3%			
c) Static line regulation: +0.5%			
d) Static load regulation: +4%			
e) Long term stability: +0.1%/1000 hrs.			
f) Thermal drift: -0.05 + .05%/°C			
g) Ripple: 200 MV p-p max for f ≤ 20 KHz			
h) Noise: 1% peak at f ≤ 100 KHz			
i) Dynamic load regulation: ±3.5% based upon any one of the following load conditions			
1) 2 + 0.25A load switched at 50% duty cycle at a PRF of 5 to 500 Hz (minimum loading on -21V output during this time).			
2) Triangular pulsed load of 7 + 1A peak amplitude, average value of 3.5 + 0.25A pulse width of 1 + 0.1 msec (msec) at base of triangle), and a PRF of 0 to 140 Hz (identical loading on -21V output during this time).			
3) Triangular pulsed load of 2 + 0.25A peak amplitude, average value of 1 + 0.1A, pulse width of 1 + 0.1msec (at base of triangle), and a PRF of 0 to 500 Hz (identical loading on -21V output during this time).			
1.1.2.2.3 -21 Volt Output			
The -21 volt output shall have the following characteristics as measured at Pin 5 (Pin 6 return) of J2:			
a) Overall regulation: + 10%			
b) Initial tolerance: +3%			
c) Static line regulation: + 0.5%			
d) Static load regulation: + 4%			
e) Long term stability: +0.1%/1000 hrs.			
f) Thermal Drift: -0.05 + 0.5%/°C			
g) Ripple: 200 MV p-p maximum for f ≤ 20 KHz			
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1.1.2.2.5 -12 Volt Output				The -12 volt output shall have the following characteristics as measured at Pin 9 (Pin 1 return) of J2):			
a) Overall regulation: $\pm 5\%$				b) Initial tolerance: $\pm 3.5\%$			
c) Static line regulation: $\pm 0.2\%$				d) Static load regulation: $\pm 0.7\%$			
e) Long term stability: $\pm 0.2\%/1000$ hrs.				f) Thermal drift: $\pm .002\%/^{\circ}\text{C}$			
g) Ripple: 2.0 MV p-p max for $f < 20$ KHz				h) Noise: 1% peak at $f < 100$ KHz			
i) Dynamic load regulation: TBDL				1.1.2.3			
Overload Protection				Overload protection is provided for all outputs.			
1.1.2.3.1 +5V Output				Current limit point: $3.5 \pm 0.3\text{A}$			
Short circuit current ( $R < .050$ ohms) :				2.0A maximum			
1.1.2.3.2 +21V Output				Current limit point: $2.8 \pm 0.3\text{A}$			
Short circuit current ( $R < .050$ ohms) :				6.0A maximum			
1.1.2.3.3 -21V Output				Current limit point: $2.8 \pm 0.3\text{A}$			
Short circuit current ( $R < .050$ ohms) :				6.0A maximum			
1.1.2.3.4 +12V Output				Current limit point: $0.4 \pm 0.1\text{A}$			
Short circuit current: 0.65A maximum				REV			
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1.1.2.2.3 (continued)				h) Noise: 1% peak at $f < 100$ KHz			
i) Dynamic load regulation: $\pm 3.5\%$				based upon any one of the following load conditions			
1) 2 + 0.25A load switched at 50% duty cycle at a PRF of 5 to 500 Hz ( minimum loading on +21V output during this time).				2) Triangular pulse load of 7 + 1A peak amplitude, average value of 3.5 + 0.25A, pulse width of 1 + 0.1 msec (at base of triangle). and a PRF of 0 to 140 Hz. (identical loading on +21V output during this time).			
3) Triangular pulsed load of 2 + 0.25A peak amplitude, average value of 1 + 0.1A, pulse width of 1 + 0.1 msec (at base of triangle) and a PRF of 0 to 500 Hz (identical loading on +21V output during this time).				The +12 volt output shall have the following characteristics as measured at Pin 8 (Pin 1 return) of J2:			
a) Overall regulation: $\pm 5\%$				b) Initial tolerance: $\pm 4\%$			
c) Static line regulation: $\pm 0.25\%$				d) Static load regulation: $\pm 0.25\%$			
e) Long term stability: $\pm 0.2\%/1000$ hrs				f) Thermal drift: $\pm .004\%/^{\circ}\text{C}$			
g) Ripple: 2.0 MV p-p max for $f < 20$ KHz				h) Noise: 1% peak at $f < 100$ KHz			
i) Dynamic load regulation: TBDL				REV			
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# ENGINEERING SPECIFICATION

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CONTINUATION SHEET

TITLE H7834 POWER SUPPLY

## 1.1.2.3.5 -12V Output

Current limit point:  $0.4 \pm 0.1A$

Short circuit current: 0.65A maximum

## 1.1.2.4 Overvoltage Protection

Overvoltage protection is provided for the +5.0V output.

Overvoltage limit point:  $+5.4 \pm 0.1$  VDC

## 1.2 Environmental Conditions

The H7834 power supply module shall perform as specified herein when installed in the LA34 terminal under the following environmental conditions:

### 1.2.1 Ambient Temperature

a) Operating: 0 to 40°C

b) Non-operating: -40 to +85°C

### 1.2.2 Temperature Shock

1°C/sec

### 1.2.3 Humidity

Per DEC Standard 102 Class B and Paragraph 3.1 and 3.2

### 1.2.4 Shock

Per DEC Standard 102 Class B and Paragraph 5.1 and 5.2

### 1.2.5 Vibration

Per DEC Standard 102 Class and Paragraph 6.1 and 6.2

## 1.3 Design and Construction

Design and construction of the power supply module shall be in accordance with drawing E-UA-H7834-0-0 and this specification.

## 1.4 Operational Failure Rate

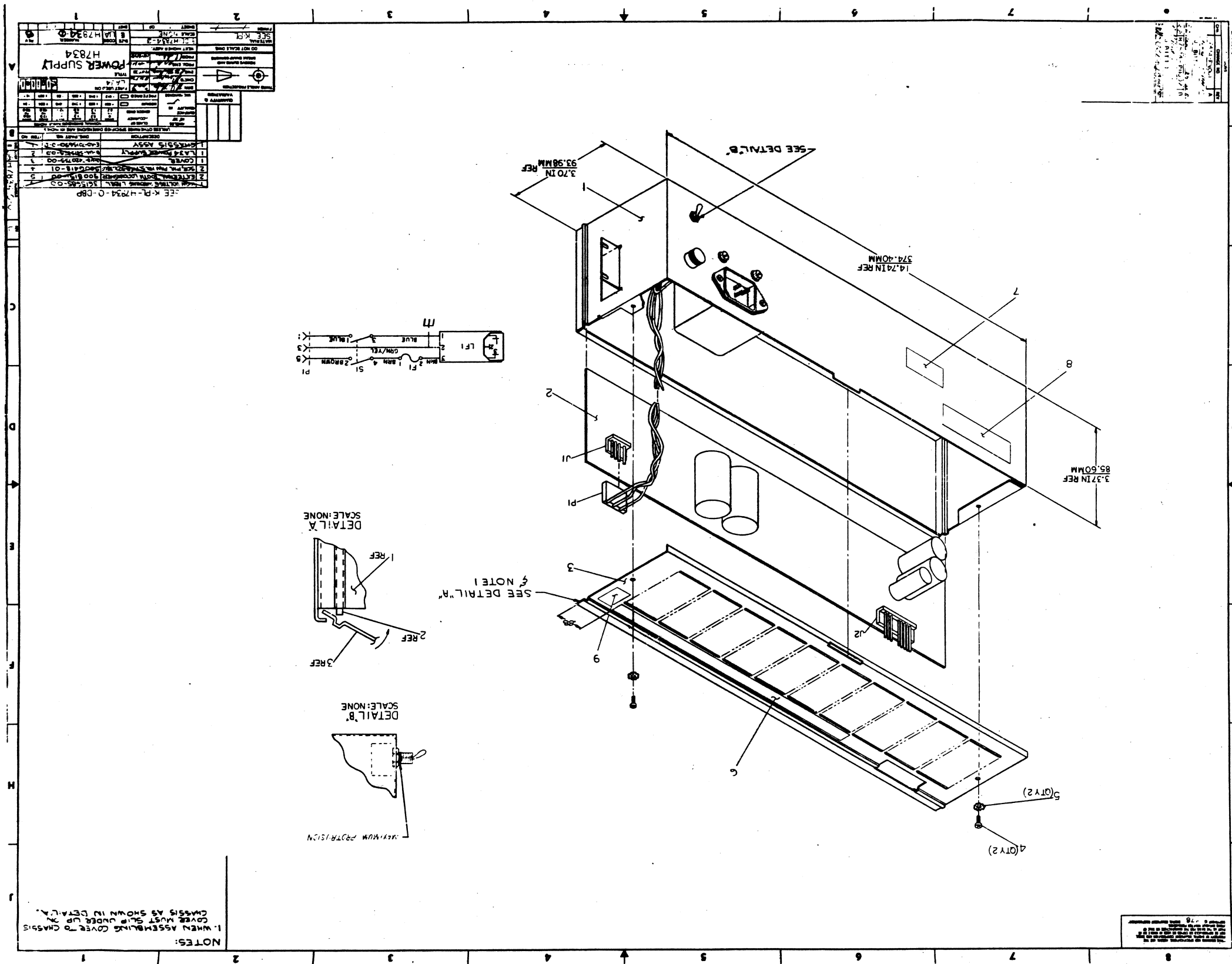
The calculated effective failure rate shall be NCT  $20 \times 10^{-6}$  failures per hour.

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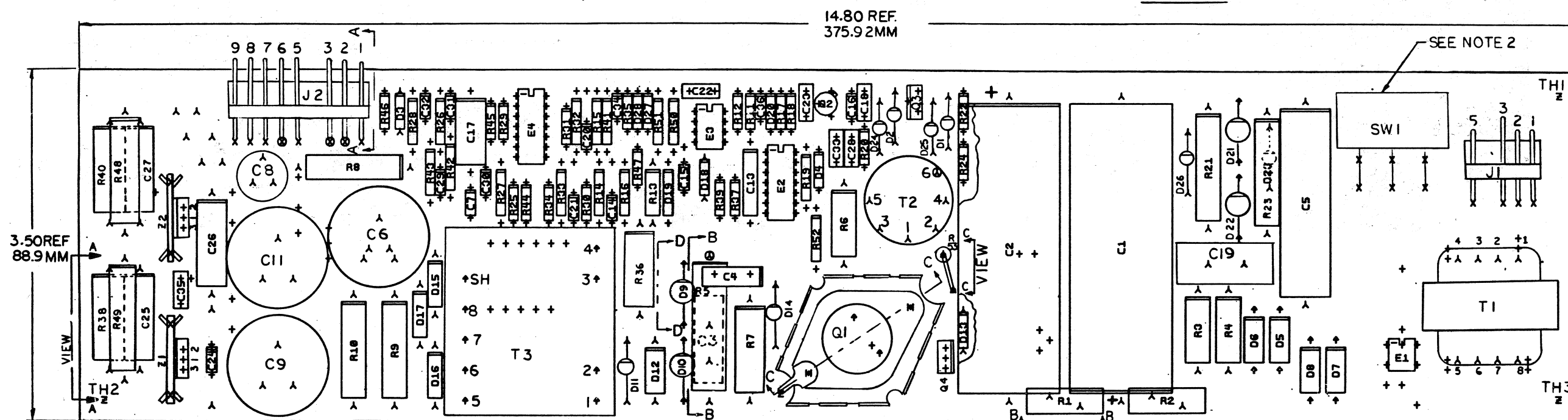
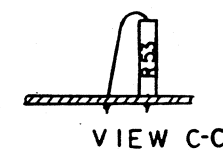
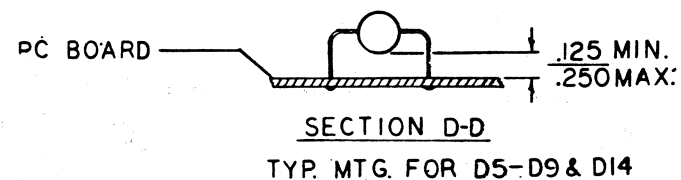
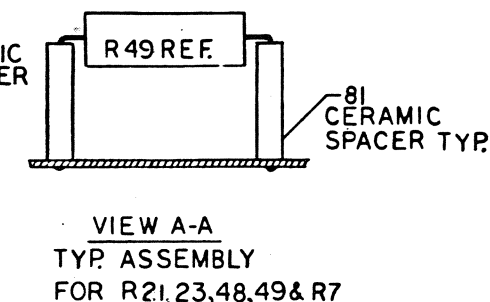
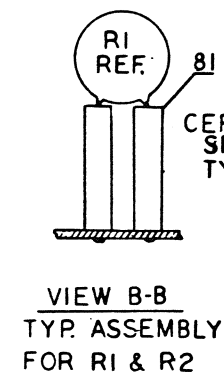
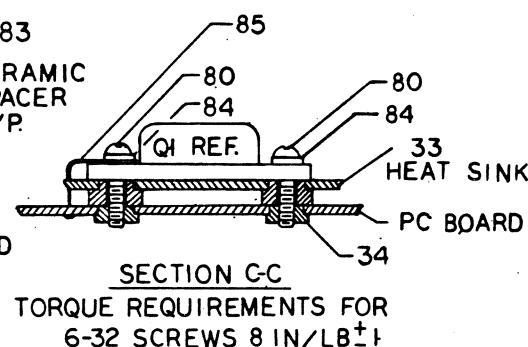
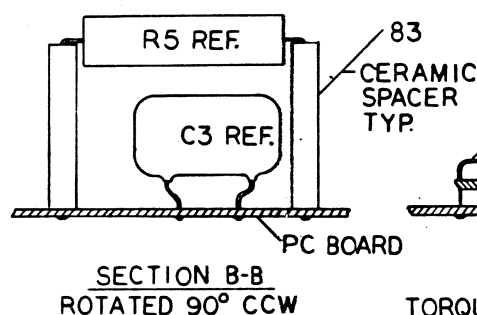
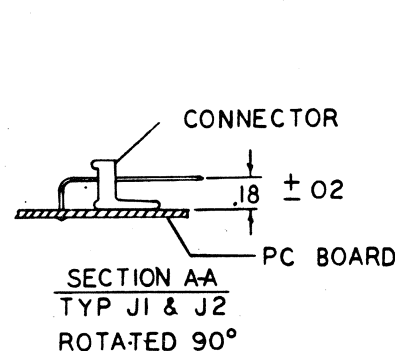
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COMPONENT SIDE VIEW



NOTES:

1. THIS BOARD MUST MEET U/L REQ.
2. SW1 MUST BE HAND INSERTED AND HAND SOLDERED AFTER WAVE SOLDER.

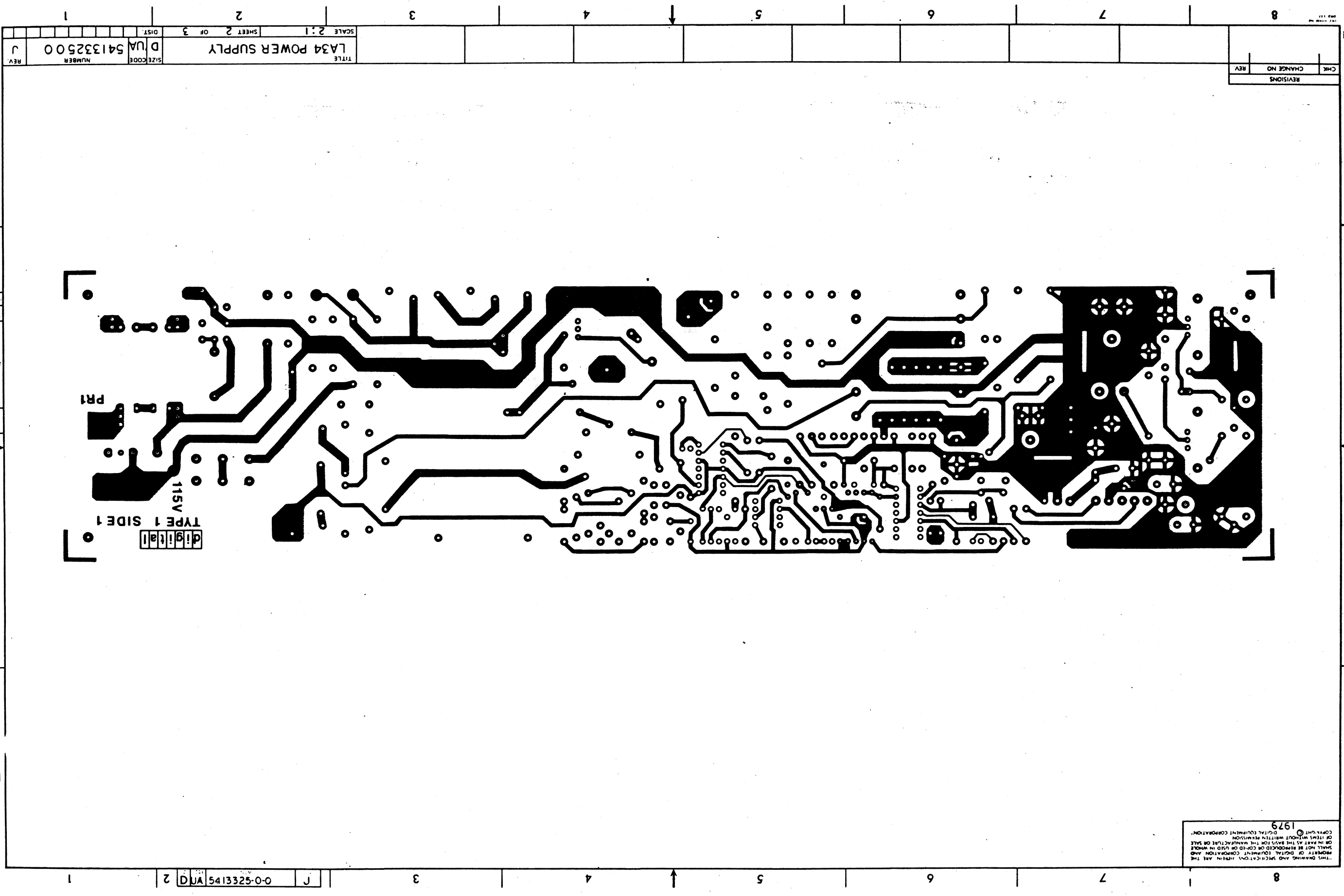
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SIGNATURES	DATE	TITLE
DRM. COSTA	1-29-79	digital
CHK'D. COSTA	1-29-79	
ENG. RALPH M. MACKENZIE	3-5-79	TITLE LA 34
PROJ. ENG. R. M. MACKENZIE	3-5-79	POWER SUPPLY
PROD. V. ERDEKIAN	6-3-79	
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