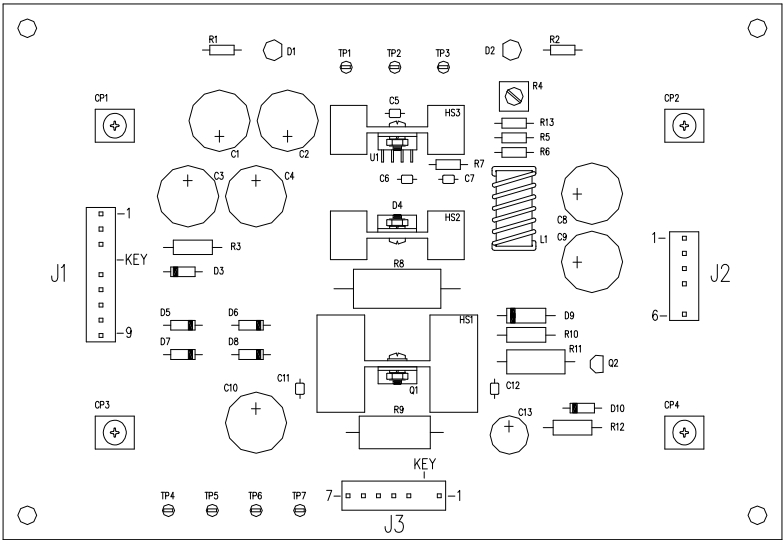
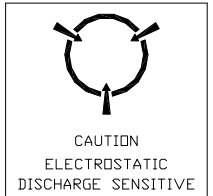
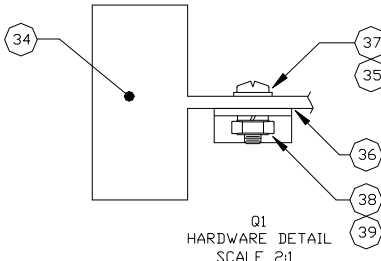
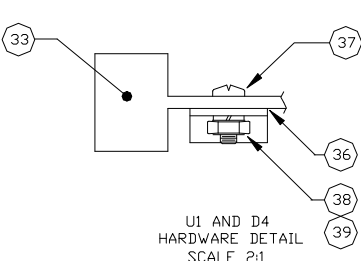


REVISION HISTORY				
ZONE	REV	DESCRIPTION	DATE	APPROVED
		DRWG. BY		
		CHK. BY		
		EC NO.		



- NOTES:
1. WORKMANSHIP IAW ANSI / IPC-A-610C, CLASS 1.
  2. ELECTROSTATIC DISCHARGE SENSITIVE DEVICES REQUIRE SPECIAL HANDLING. USE OF PROPERLY GROUNDED STATIC DISSIPATIVE WRIST STRAP REQUIRED.
  3. CUT ITEM 31 AS REQUIRED FOR USE AT J1, J2 AND J3. REMOVE PIN 4 FROM J1 PRIOR TO ASSEMBLY. REMOVE PIN 5 FROM J2 PRIOR TO ASSEMBLY. REMOVE PIN 2 FROM J3 PRIOR TO ASSEMBLY.



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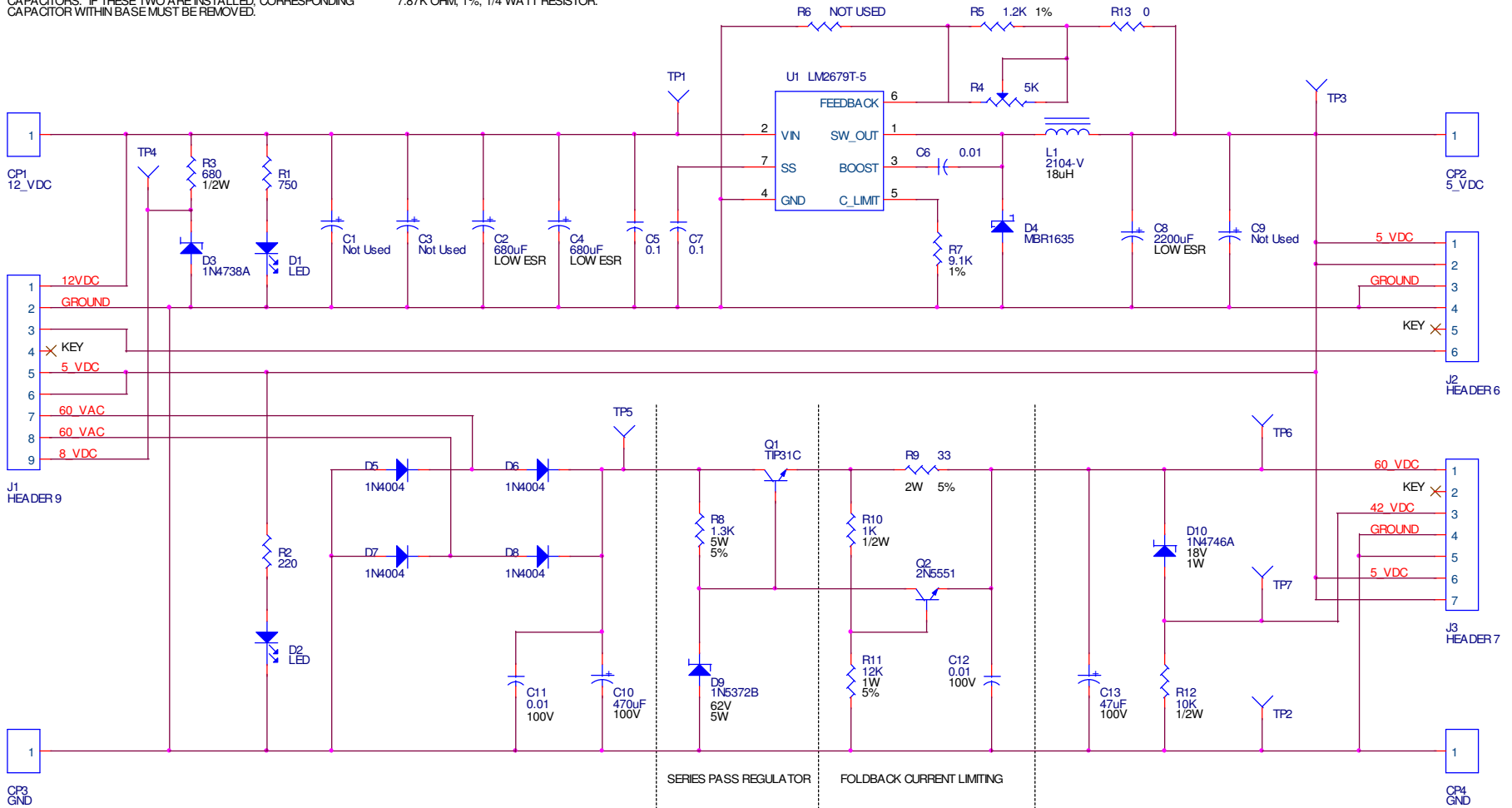
CONTRACT NO.			GREAT PLAINS ELECTRONICS		
APPROVALS	NAME	DATE			
DRAWN BY	C. KRZYCIAN	05-10-01			
ENGINEER					
PROJ ENGR					
SVS ENGR					
QUALITY					
CHRYST ENGR					
MAIL MGMT					
MFG			SIZE	CAGE CODE	DWG NO
CONTR MGMT			C		100-101
DRAFTING			SCALE	1:1	SHEET 1 OF 1
PMO					

Item	Qty	Part Number	Description	Reference Designator
1	1	101-002	Printed Circuit Board, System 80 Power	
2	1	LM2679T-5	Voltage Regulator, 5V, 5 Amp	U1
3	1	TIP31C	Transistor, NPN, 100V, 3 Amp	Q1
4	1	2N5551	Transistor, NPN, 160V, 0.6 Amp	Q2
5	2	LED-GRN	LED, Green, Size T1 <sup>3/4</sup>	D1, D2
6	1	1N4738A	Diode, Zener, 8.2V, 1 Watt	D3
7	1	MBR1635	Diode, Schottky, 35V, 16 Amp	D4
8	4	1N4004	Diode, Rectifier, 400V, 1 Amp	D5-D8
9	1	1N5372B	Diode, Zener, 62V, 5 Watt	D9
10	1	1N4746A	Diode, Zener, 18V, 1 Watt	D10
11	1	2104-V	Inductor, 18uH, 7 Amp	L1
12	2	UHD1V681MHD	Capacitor, Radial, 680uF, 35V, Low ESR	C2, C4
13	1	CCM-0.1uF-50V	Capacitor, Monolythic, 0.1uF, 50V	C5
14	4	CCM-0.01uF-100V	Capacitor, Monolythic, 0.01uF, 100V	C6, C7, C11, C12
15	1	UHD1C222MHD	Capacitor, Radial, 2200uF, 16V, Low ESR	C8
16	1	UVR2A471MHA	Capacitor, Radial, 470uF, 100V	C10
17	1	UVR2A470MPA	Capacitor, Radial, 47uF, 100V	C13
18	1	RCF1/4-750	Resistor, 750 Ohms, 1/4 Watt	R1
19	1	RCF1/4-220	Resistor, 220 Ohms, 1/4 Watt	R2
20	1	RCF1/2-680	Resistor, 680 Ohms, 1/2 Watt	R3
21	1	3362P-1-502	Trimming Potentiometer, 5K ohm	R4
22	1	RMF1/4-1.2K-1%	Resistor, 1.2K Ohms, 1/4 Watt, 1%	R5
23	1	RMF1/4-9.1K-1%	Resistor, 9.1K Ohms, 1/4 Watt, 1%	R7
24	1	RC5W-1.3K	Resistor, 1.3K Ohms, 5 Watt	R8
25	1	RMF2-33	Resistor, 33 Ohms, 2 Watt	R9
26	1	RCF1/2-1K	Resistor, 1K Ohms, 1/2 Watt	R10
27	1	RMF1-12K	Resistor, 12K Ohms, 1 Watt	R11
28	1	RCF1/2-10K	Resistor, 10K Ohms, 1/2 Watt	R12
29	1	RCF1/4-0	Resistor, Zero Ohms	R13
30	4	7691	Screw Terminal	CP1-CP4
31	1	26-48-1245	Header, 24 Pin, 0.156"	J1-J3
32	7	TP104-01-09	Test Point	TP1-TP7
33	2	531002B02500	Heat sink, TO-220	HS1, HS2
34	1	529802B02500	Heat sink, TO-220	HS3
35	1	7721-7PPS	Shoulder Washer	
36	3	HF115TAAC-58	TO-220 Insulator, Thermal film	
37	3	H781	Screw, #4-40 x 0.375"	
38	3	H236	Lock washer, Star, #4	
39	3	H216	Hex Nut, #4-40	

### Parts List, System 80 Power Supply

NOTES:

- UNLESS OTHERWISE SPECIFIED:  
ALL RESISTORS ARE IN OHMS, 5%, 1/4 WATT.  
ALL CAPACITORS ARE IN MICRO-FARADS (uF).
- CAPACITOR LOCATIONS C1 AND C3 MAY OPTIONALLY BE FILLED WITH TWO 4700uF, 25V RADIAL ELECTROLYTIC CAPACITORS. IF THESE TWO ARE INSTALLED, CORRESPONDING CAPACITOR WITHIN BASE MUST BE REMOVED.
- C8 AND C9 TO BE FILLED WITH EITHER ONE 2200uF LOW ESR TYPE CAPACITOR OR TWO 1000uF LOW ESR TYPE CAPACITORS.
- FOR LM2679T-ADJ: REPLACE R6 WITH 2.55K OHM, 1%, 1/4 WATT RESISTOR. REPLACE R13 WITH 7.87K OHM, 1%, 1/4 WATT RESISTOR.



GREAT PLAINS ELECTRONICS		
Title	System 80 / 80A Power Supply	
Size B	Document Number 102-001	Rev -
Date:	Monday, November 07, 2005	Sheet 1 of 1

# *Power-80*

## Gottlieb System 80/80A Power Supply

### Installation Notes

#### **Important Safety Warning**

*Never remove or install hardware, cabling or fuses with power applied to the machine.  
Always unplug power cord prior to working on machine.*

#### **Installation of the Power-80 replacement power supply**

Prior to installation, remove existing supply and verify proper operation of the unregulated low voltage supply from the base unit. This low voltage supply includes the transformer, bridge rectifier and low voltage filter capacitor. Installation notes are based on the assumption that there is not a short circuit within the 5, 8, 42 or 60 volt loads. If there is a short circuit present, this must be remedied prior to installation of the new *Power-80* supply.

#### **Preparation:**

1 – Remove solenoid fuse(s).

2 – Disconnect plug from J1 on existing power supply (if still installed) and disconnect any sound or auxiliary board that uses the unregulated low voltage DC source.

3 – Power up machine and verify voltage across the unregulated low voltage filter capacitor:

1 – Measure DC voltage. DC Voltage should measure 12 to 18 volts.

2 – Measure AC voltage. With low loading, this should measure no more than 0.2 volts.

Power down and unplug machine after making measurements.

If low voltage values are out of above specifications, perform repairs to unregulated low voltage source as required. Low or absent DC voltage may be due to blown fuse, bad transformer, rectifier and/or low voltage filter capacitor. Excessive AC voltage may be due to bad low voltage filter capacitor.

4 – If low voltage filter capacitor is ten years old or older – replace it! Low voltage filter capacitor is a Sprague 36DY123F025AA2A or equivalent.

5 – Inspect contacts within plugs that attach to power supply J1, J2 and J3. Replace if necessary. Bad connector contacts within plugs are often a cause of low voltage at CPU and/or Driver boards.

6 – Reinstall any previously removed fuses and plugs.

#### **Installation:**

1 – Remove existing power supply and install new the *Power-80* supply using existing brackets and screws

2 – Reattach plugs on J1, J2 and J3.

3 – Power up machine and measure +5V DC voltage. If necessary, fine tune +5V supply with R4. Carefully rotate counter clockwise to adjust voltage down, clockwise to adjust voltage up.

#### **Test Points:**

Test points have been installed on the *Power-80* supply to assist in accurately measuring voltages. All DC voltages on this board are measured with reference to ground. The test points have been defined as follows:

TP1 – Low voltage input (approximately 12VDC)

TP5 – High voltage input (70 to 80VDC)

TP2 – Ground

TP6 – +60V output (approximate voltage)

TP3 – +5V output

TP7 – +42V output (approximate voltage)

TP4 – +8V output

#### **Optional Installation:**

Screw terminals are added for more secure connections. These may be used in parallel to low voltage and ground connections within J1 and J2. As a minimum, it is recommended (but not required) to attach the cabinet's DC ground signal to one of the *Power-80*'s ground screw terminals.

The low voltage filter capacitor (within base) can be replaced with two optional radial capacitors on the new *Power-80* supply at locations C1 and C3. These capacitors are neither provided nor installed on the basic *Power-80* supply and are an optional user installation. The recommended capacitors for this location are two Nichicon radial electrolytic's part number UVR1V472MHA (GPE CER-4700uF-35V) or equivalent. If careful installation procedures are followed, user installation of capacitors at these two locations does not void warranty. These capacitors are intended to be used as an alternative to the base mounted low voltage filter capacitor. *Never* use both base mounted and board mounted capacitors at the same time.

# ***Power-80***

## **Gottlieb System 80/80A Power Supply Installation Notes (Continued)**

### ***Handling and storage of the Power-80 replacement power supply***

Like most electronic assemblies, the *Power-80* replacement power supply is comprised of static sensitive components. Proper handling precautions must be used to avoid damaging the power supply. Always use a grounded static strap when working with static sensitive assemblies and always store the assemblies in static shielding bags when not in use.

### ***Disclaimers***

Due to the harsh nature of pinball machines, the wide range of possible failed machine components and user technical capabilities – Great Plains Electronics can not be held responsible for any damage caused to the *Power-80* replacement power supply or caused by the use of the *Power-80* power supply.

The *Power-80* has been created for use within Gottlieb System 80 and System 80A electronic pinball machines. Great Plains Electronics shall assume no liability for any application of the *Power-80* when used beyond its intended purpose.

Great Plains Electronics reserves the right to make product upgrades, changes, and improvements to our products at any time without any requirement to provide these same upgrades, changes, or improvements to previously manufactured and/or delivered products.

### ***Warranty***

The *Power-80* is guaranteed to be free of manufacturer defects for a period of 1 year from date of purchase. This warranty is transferable but is valid only from date of original purchase from Great Plains Electronics or an authorized distributor. If purchase was made through an authorized Great Plains Electronics distributor – please retain invoice or sales receipt as proof of purchase. Warranty is void if someone other than Great Plains Electronics attempts repairs or modifications to this power supply. Repairs performed under warranty do not extend the original 1 year warranty period. Great Plains Electronics reserves the exclusive rights to determine cause of failures and if the failure is covered by warranty.