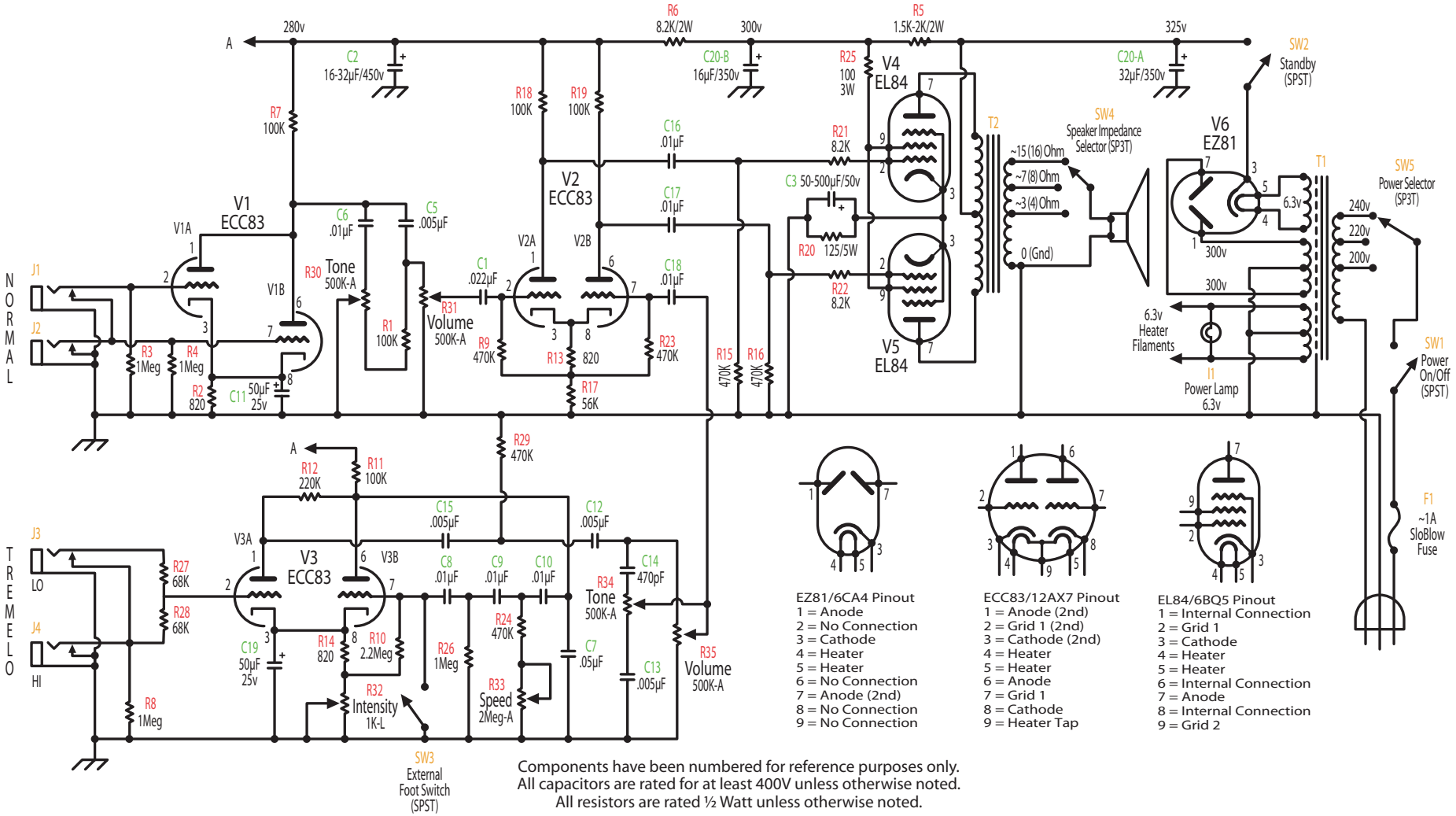
Marshall 18 Watt Combo Schematic

Revision 3



EZ81/6CA4 Pinout
1 = Anode
2 = No Connection
3 = Cathode
4 = Heater
5 = Heater
6 = No Connection
7 = Anode (2nd)
8 = No Connection
9 = No Connection

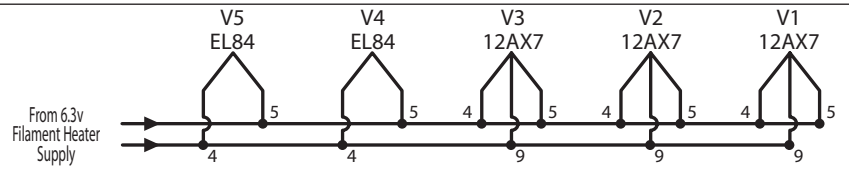
ECC83/12AX7 Pinout
1 = Anode (2nd)
2 = Grid 1 (2nd)
3 = Cathode (2nd)
4 = Heater
5 = Heater
6 = Anode
7 = Grid 1
8 = Cathode
9 = Heater Tap

EL84/6BQ5 Pinout
1 = Internal Connection
2 = Grid 1
3 = Cathode
4 = Heater
5 = Heater
6 = Internal Connection
7 = Anode
8 = Internal Connection
9 = Grid 2

Components have been numbered for reference purposes only.
All capacitors are rated for at least 400V unless otherwise noted.
All resistors are rated ½ Watt unless otherwise noted.

Notes:

1. *Some 18Watt Marshall combos came equipped with 1Meg Volume and Tone Potentiomenters (R30, 31, 34, 35).*
2. *Components with more than one value (R5, C2, C3) are the result of production variations. The differing values listed have been observed in authentic unmodified examples of this amplifier circuit. Experiment!*
3. *Capacitor C4 has been intentionally omitted from the numbering scheme. Stop looking. :^)*



Filament Connections

Note: Pins 4 and 5 of V6 (EZ81) Rectifier connect to a separate 6.3v filament supply as illustrated in the main schematic.

WARNING!

This document is distributed for educational purposes **ONLY**. The components specified in this schematic utilize **POTENTIALLY FATAL HIGH VOLTAGES**. Maintenance and repair of all equipment utilizing hazardous voltages must be referred to a properly trained and qualified technician. PedalMonkey.com expressly disclaim all liability for injury or property damage resulting from the misuse of any information contained in this document.

Part List

Resistor	Value	Min. Watt Rating	Remarks
R1, 7, 11, 18, 19	100K	½	
R2	820 ohm	½	
R3, 4, 8, 26	1Meg	½	
R5	1.5K/2K	2	(See Schematic Note 2)
R6	8.2K	2	
R9, 15, 16, 23, 24, 29	470K	½	
R10	2.2Meg	½	
R12	220K	½	
R13, 14	820 ohm	½	
R17	56K	½	
R20	125 ohm	5	
R21, 22	8.2K	½	
R25	100 ohm	3	
R27, 28	68K	½	
R30	500K Audio Pot	½	Normal Channel Tone Control (See Schematic Note 1)
R31	500K Audio Pot	½	Normal Channel Volume Control (See Schematic Note 1)
R32	1K Linear Pot	½	Vibrato Channel Intensity Control
R33	2Meg Audio Pot	½	Vibrato Channel Speed Control
R34	500K Audio Pot	½	Vibrato Channel Tone Control (See Schematic Note 1)
R35	500K Audio Pot	½	Vibrato Channel Volume Control (See Schematic Note 1)

Capacitor	Value	Min. Rating DC Voltage	Remarks
C1 *	0.022µF	400V	Polypropylene
C2	16-32µF	450V	Electrolytic, (See Schematic Note 2)
C3	50-500µF	50V	Electrolytic, (See Schematic Note 2)
C5	0.005µF	400V	Polypropylene
C6	0.01µF	400V	Polypropylene
C7 *	0.05µF	400V	Polypropylene
C8	0.01µF	400V	Ceramic Disk
C9	0.01µF	400V	Ceramic Disk
C10	0.01µF	400V	Ceramic Disk
C11	50µF	25V	Electrolytic
C12	0.005µF	400V	Polypropylene
C13	0.005µF	400V	Polypropylene
C14	470pF	400V	Ceramic Disk or Mica
C15 *	0.005µF	400V	Polypropylene
C16 *	0.01µF	400V	Polypropylene
C17 *	0.01µF	400V	Polypropylene
C18 *	0.01µF	400V	Polypropylene
C19	50µF	25V	Electrolytic
C20-A **	32µF	350V	½ Multican Electrolytic Cap
C20-B **	16µF	350V	½ Multican Electrolytic Cap

* Capacitors which most affect "tone". While there is no consensus as to best type, Sprague, Mallory, Cornell Dublier, Jensen Paper-in Oil, etc., and on and on, extra money spent for parts in these key positions will generally yield "better sound".

** Standard electrolytic capacitors of equal value may be substituted for the Multican Cap.

Other Parts

V1, 2, 3	ECC83/12AX7 Twin Triode Valve
V4, 5	EL84/6BQ5 Pentode Valve
V6	EZ81/6CA4 Voltage Rectifier Valve
T1	Power Transformer
T2	Output Transformer
J1, 2, 3, 4	¼ in Input Jack, Switched, NC (Normally Closed)
F1	1 Amp Slo-Blo Fuse
F2	¼ Amp Optional B+ Voltage Fuse (Not shown in schematic) Insert between Standby switch (SW2) and capacitor C20-A.
SW1	Power Switch, SPST
SW2	Standby Switch, SPST
SW3	Vibrato Foot Switch, SPST
SW4	Speaker Impedance Selector Switch, SP3T
SW5	Voltage Selector Switch, SP3T
I1	6.3V Power Indicator Lamp

Revision History

Revision 0 *(Original)*

Revision 1

1. Corrected Trem Channel resistor (R8) connection error.
2. Corrected Trem Channel V3 missing connection between Pin 3 and 8.

Revision 2

1. Inserted speaker symbol between Impedance Selector Switch and Output Transformer Gnd Tap.
2. Modified Normal Channel input topology per Mark Durham's request.
   Note: Original Marshall 18s didn't come equipped with an Impedance Selector Switch. I added the switch because it seemed most group members were installing this switch in their clones.

Revision 3

1. R25 - Changed from 1/2 watt to 3 watt
2. R10 - Changed from 2meg to 2.7meg
3. R26 - Changed from 1meg to 1.5meg
4. SW1 - Changed location of switch in relationship to fuse.
5. Modified Filament Connections illustration to provide increased clarity for those members less familiar with filament AC voltage wiring techniques.

Revision 4

1. R10 - Reverted back to 2.2meg
2. R26 - Reverted back to 1.5meg

PLEASE READ

The part list accompanying this schematic DOES NOT, I repeat DOES NOT match the part list 18watt.xls found at Graydon's site http://elektro.cmhnet.org/~graydon/18wattmain.html. This schematic began as a redraw of Mark Durham's original schematic located in the Group Files Section. When I created the Part List I tried as CLOSELY AS POSSIBLE to match my component numbering to that of Graydon's already existing Part List. The parts in this schematic and his list are different. A complete match was not possible. For instance, my C1 is 0.022uf while Graydon's C1 is a 1uF electrolytic. There is not a 0.022uF even on his list so I had to number it differently. What does this all mean? Absolutely nothing. I'm sure Graydon is happy with his amp as it is with some cap value other than 0.022uF. That's the magic of point-to-point wiring. Its makes modification for individual personal tastes simply simple. Is there ONE SINGLE verified accurate schematic of the Marshall 18 in existence? Of course not. Stuff happens in the front office and on the factory floor from day to day, week to week, month to month, and on and on. This certainly explains variations between those real 18W examples examined by other members of the group. The moral of this rant, if you're going to look at this schematic and then order parts from Graydon's Part List, at some point you're going to end up scratching your head and muttering "duh". Solution: Read. Plan. Read some more. Plan, plan. Then spend you're money.

Preston
"Monkeyman"