

Starving Student Millett Hybrid

PCB Design/Layout
by Dsavitsk

Last revised:
01/23/10

BOM by
Tom Blanchard

PART ID	DESCRIPTION	QTY	SOURCE	PART NO	EACH	TOTAL	SOURCE	PART NO	EACH	TOTAL
Please read the comments! (little red triangles in the upper right corners)										
BASIC CIRCUIT										
<i>Please note - the caps are limited to 20mm height if the "L" case is used .</i>										
C1/C6	680uf 63V Electrolytic (18mm dia max)	2	Mouser	647-UPW1J681MHD3	\$0.80	\$ 1.60	DigiKey	P11276-ND	\$ 2.65	\$ 5.30
C2/C4	0.22uf 250V Film Cap (10 or 15mm leads)	2	Mouser	505-M10.22/250/10	\$1.11	\$ 2.22	DigiKey	P3224-ND	\$ 1.28	\$ 2.56
C3/C5	470uf 63V Electrolytic (18mm dia max)	2	Mouser	647-UKW1J471MHD	\$0.73	\$ 1.46	DigiKey	P10352-ND	\$ 1.36	\$ 2.72
C3a/C5a*	0.22uf 250V Film Cap (10 or 15mm leads)	2	Mouser	505-M10.22/250/10	\$1.11	\$ 2.22	DigiKey	P3224-ND	\$ 1.28	\$ 2.56
C7/C8*	220uf 16V Nichicon Muse ES	2	Beezar.com	Muse ES, 220uf 16V	\$1.00	\$ 2.00	Beezar.com	Muse ES, 220uf 16V	\$ 0.90	\$ 1.80
R1/R7	33K ohm	2	Mouser	71-RN55D-F-33K	\$0.16	\$ 0.32	DigiKey	CF1/433KJRCT-ND	\$ 0.20	\$ 0.40
R2/R8, R4/R10	220K ohm	4	Mouser	71-RN55D-F-220K	\$0.15	\$ 0.60	DigiKey	CF1/4240KJRCT-ND	\$ 0.20	\$ 0.80
R3/R9, R5/R11, R6/R12, R13	2K ohm	7	Mouser	71-RN55D-F-2.0K	\$0.08	\$ 0.56	DigiKey	CF1/42KJRCT-ND	\$ 0.20	\$ 1.40
R14/R15*	1K ohm	2	Mouser	71-RN55D-F-1.0K	\$0.08	\$ 0.16	DigiKey	CF1/41KJRCT-ND	\$ 0.20	\$ 0.40
R16/R17*	50K - 1/4W	2	Mouser	71-RN55D5102F	\$0.19	\$ 0.38	DigiKey	CMF49.9KQFCT-ND	\$ 0.29	\$ 0.58
R16R17* - low gain	100K - 1/4W	2	Mouser	71-RN55D-F-100K	\$0.08	\$ 0.16	DigiKey	CMF100KQFCT-ND	\$ 0.29	\$ 0.58
RV1 (please read comments)	Alpha 50K Audio Taper Stereo Pot RV122F-20-15F-A10K	1	Mouser	313-1240F-50K	\$3.16	\$ 3.16	DigiKey	N/A		\$ -
Q1/Q2	MOSFET, IRF510, TO-220 case	2	Mouser	844-IRF510PBF	\$0.53	\$ 1.06	DigiKey	IRF510PBF-ND	\$ 1.12	\$ 2.24
Tubes**	19J6	2	Beezar.com	19J6	\$6.00	\$ 12.00	Beezar.com	19J6	\$ 5.00	\$ 10.00
Tubes Tested/Matched within 10%	Per tube, two triodes each	2	Beezar.com	Testing/Matching	\$2.00	\$ 4.00	Beezar.com	Testing/Matching	\$ 2.00	\$ 4.00
MISC:										
Headphone Jack	Neutrik NMJ6HCD2	1	Mouser	550-22302	\$1.13	\$ 1.13	DigiKey	N/A		\$ -
RCA jacks	HiQ gold-plated copper, 1 pair	1	Beezar.com	RCA-1	\$3.50	\$ 3.50	Beezar.com	RCA-1	\$ 3.50	\$ 3.50
Tube Socket	7-pin PCB Ceramic, tin-plated	2	Beezar.com	GZC7-Y-T	\$1.00	\$ 2.00	Beezar.com	GZC7-Y-T	\$ 1.00	\$ 2.00
Terminal Block, 3-pos	5mm (or 5.08mm)	1	Mouser	571-2828363	\$0.66	\$ 0.66	DigiKey	ED1931-ND	\$ 0.93	\$ 0.93
Terminal Block, 4-pos	5mm (or 5.08mm)	2	Mouser	571-2828364	\$0.76	\$ 1.52	DigiKey	ED1930-ND	\$ 0.62	\$ 1.24
Standoff Kit, for 3rd slot	SSHM Standoff kit, screws, etc.	1	Beezar.com	SSMH Standoff Kit	\$1.00	\$ 1.00	Beezar.com	SSMH Standoff Kit	\$ 1.00	\$ 1.00
SSMH PCB Heat Sink Kit	Bergquist pad, shldr washer, screws, etc.	2	Beezar.com	Heat Sink Kit	\$2.00	\$ 4.00	Beezar.com	Heat Sink Kit	\$ 1.50	\$ 3.00
Heat Sink	TO-3 style, Aavid #569003B00000G	2	Mouser	532-569003B00	\$2.53	\$ 5.06	DigiKey	HS110-3-ND	\$ 3.04	\$ 6.08
Knob	Silver anodized Al, 1.25" dia, 1/4" shaft	1	Mouser	450-6007	\$3.02	\$ 3.02				
RLED***	2.4K, 2W metal oxide resistor	1	Mouser	282-2.4K-RC	\$0.19	\$ 0.19	DigiKey	P2.4KW-2BK-ND	\$ 0.28	\$ 0.28
LEDL/R	Tube LED's, 3mm 5000 mcd - Blue	2	Beezar.com	604-WP7104QBC/D	\$0.25	\$ 0.50	Various	754-1248-ND	\$ 0.42	\$ 0.84
PCB	Circuit Board	1	Beezar.com	SSMH PCB	\$10.00	\$ 10.00	Beezar.com	SSMH PCB	\$ 10.00	\$ 10.00
POWER SUPPLY										

Power Supply	120/240V, 48VDC @0.38A, w/power cord	1	Various	Cisco PSA-18U	\$15.00	\$ 15.00	Various	Cisco PSA-18U	\$ 15.00	\$ 15.00
Power Socket	2.5mm Metal Socket, 100VDC 2A	1	Mouser	163-4025	\$3.03	\$ 3.03	Radio Shack	274-1576	\$ 2.99	\$ 2.99
SPST Switch	Black Rocker w/round hole & thread	1	Mouser	103-R13-135A-02-EV	\$1.18	\$ 1.18	Radio Shack	275-693	\$ 2.99	\$ 2.99
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ENCLOSURE***										
PCB: approx. 4" x 3"	Hammond 1455N1201 - Black	1	Hammond	1455N1201BK	\$21.27	\$ 21.27	Hammond	1455N1201BK	\$ 21.27	\$ 21.27
	Machining, tube holes, heat sink mounts, and all endplate openings	1	Hammond	Hammond machining (\$30 total per case)	\$13.73	\$ 13.73	Hammond	Hammond machining (\$30 total per case)	\$ 13.73	\$ 13.73
				TOTAL		\$118.69		TOTAL		\$ 120.19

* Optional parts - Dsavitsk additions over Pete Millett original

** 19J6 tubes at Beazar.com to be sold in tested pairs with PCB, only

*** The LED resistor is treated as a single source to two Tube Light LED's. If you choose to use a panel LED, either by itself or with the Tube LED's, you will need to calculate your own resistor sizes. We do not recommend feeding three LED's from this resistor.