

Differences between NwAvGuy/RocketScientist's O2 Headphone Amp and this 80x100mm version of an O2 desktop amplifier

agdr 4-7-2013

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This listing isn't meant to diminish NwAvGuy's O2 amp in any way. I'm just working with a taller box and a lot more PC board space due to no batteries and the use of some surface mount parts. I've included some things that may be small upgrades and some modification ideas for the O2 that I posted on DIY Audio. This listing summarizes the differences between the two amps.

Item	O2	This version of an ODA
POWER SUPPLY		
power supply rails	+/-12Vdc & +/-8.4Vdc batteries	+/-17Vdc, no batteries
batteries	yes, 2x 8.4Vdc NiMH	no
power indicator	1 LED across both rails	2 LEDS, one across each power rail
voltage regulators	LM7812 / LM7912 fixed, 3Vdc drop required	LT1963A / LT3015 adjustable low-noise LDOs
voltage regulators heatsinked	no	yes, to aluminum case
rectifier diode snubbers	no	yes, as per hagermann
power filter	capacitors	capacitor - inductor - capacitor (C-L-C)
power transformer - suggested	16Vac 400mA regular, 16Vac 1A full power	16Vac 1A regular, 16Vac 2.4A full power
power jack	2.1mm/5.5mm on front panel	2.1mm/5.5mm on back panel
EMI filter on power jack	no	yes, X2Y capacitor, optional to populate
power switch	front panel	back panel
input voltage range	14vac - 20vac	16vac - 24 vac standard, up to 28Vac
OUTPUT BUFFER STAGE		
maximum output current per channel	120mA	240mA
maximum output voltage swing	7V peak	11V peak
output jacks	3.5mm + external front 1/4" if B3 case used	3.5mm + external front 1/4" if B3 case used
output impedance	0.5R	0.25R + optional output series damping resistors
short circuit protected	yes, by NJM4556A chips	yes, by NJM4556AL chips
output current buffer chips	1 NJM4556A per channel (2 op amps)	2 NJM4556AL per channel (4 op amps)

output in 1x gain linearization loop	no	yes, with LME49990
output stage voltage gain	1x (current buffer)	1x (current buffer)
EMI filter on output jack	no	yes, optional X2Y capacitor
headphone output relay	no, some no-thump protection	yes, 12 second amp power-up turn-on delay
power management circuit	yes	no, no batteries + relay power thump prevention
intended load	headphones	headphones and small PC speakers
DC servo on output	no	yes, on one channel as a test, OPA188

CASE AND PCB

case	B2-080 or optional taller B3-080	B2-080 or optional taller B3-080
holds ODA?	yes, without batteries	yes if 2 PCB and B3-160 case are used
PCB	one 80mm x 100mm	80mm x 100mm, one or two PCBs if B3-160 used
surface mount soldering required?	no	yes, smallest is 1206 parts and SOIC8 IC chips.
layers	2	2 standard, layout available for 4 w/ ground plane
PCB type	1.6mm FR4, HASL, components top side	1.6mm FR4, HASL, components both sides

VOLUME POT AND BLOCKING CAP

location of pot and capacitor	middle of circuit	middle of circuit
value of pot	10K	1K, optionally can use 10K
brand and type of pot	Alps RK97 9mm	Bourns Pro Audio PD902 9mm
DC block capacitor per channel	2.2uF	3x 4.7uF
LPF filter corner frequency	1.8Hz	1.3Hz
input signal attenuation available	no	yes, optional pot series resistor, 50% standard

INPUT AND GAIN STAGE

input jacks	3.5mm + external rear RCA if B3 case used	3.5mm plus rear panel external RCA
gain settings	2, usually set for 1x/2.5x or 2.5x/6.5x	4 position rotary switch. 1x, 2x, 4x, 6x etc.
RFI input filter	yes	yes
RFI filter corner frequency	2.4Mhz	2.4Mhz
HF EMI input filters	no	yes, X2Y capacitor, optional to populate
Input impedance	10K	10K
gain chip	NJM2068 @ 0.7mA peak output per channel	2x LME49990 @ 7mA peak output per channel
bass boost	no	yes, optional to populate with external DPST
clipping indicator	no	yes, on gain stage output