

Lazer 5W Entry Amp

This little amplifier circuit was designed over 30 years ago, when I made it around late 1996, it was used in commercial applications, it worked well and it was a busy time but then “chip amps” came along and most people wanted the Higher Power, so it sat in the garage,

Garage gone! So, I have brought it to life and for sale online as a kit for beginners and for those who only require few watts of power with efficient speakers.

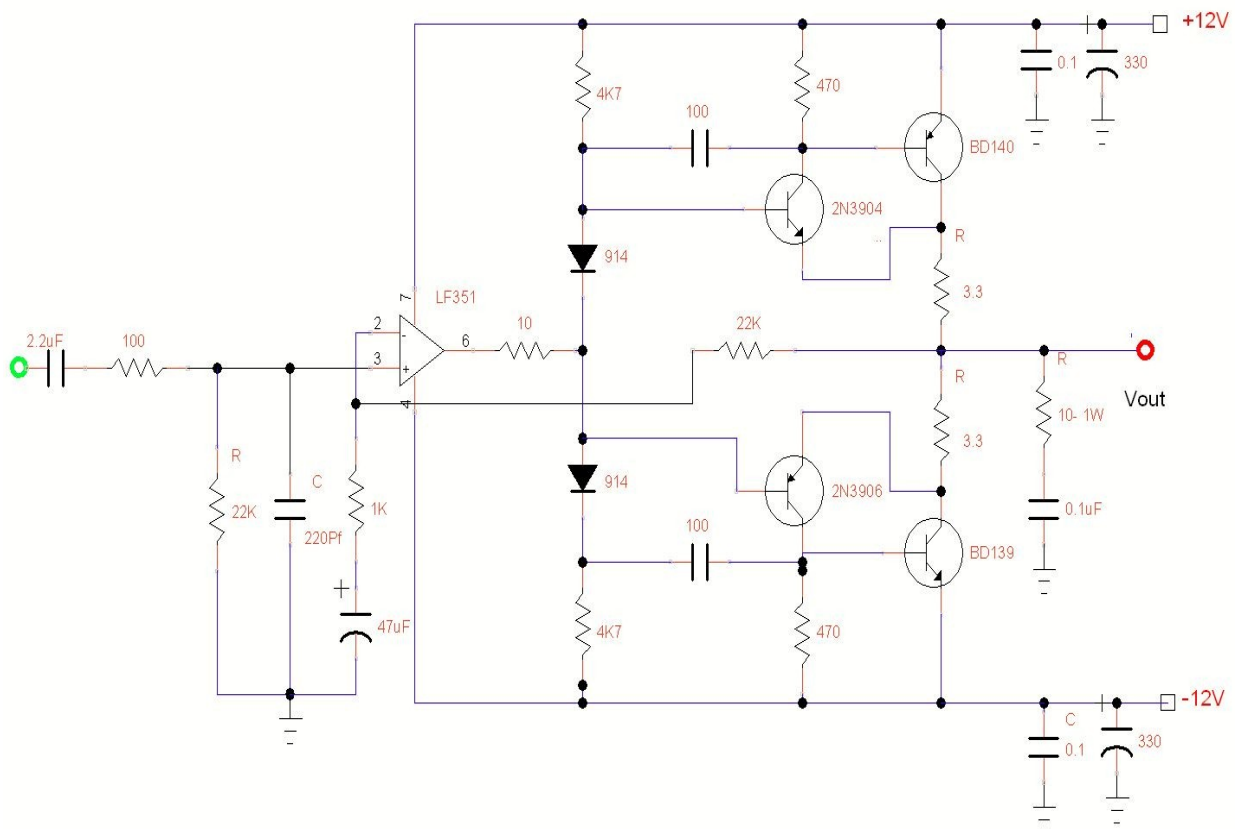
When I was younger, there used to be a great number of “Chip amp IC’s” available, the majority of which were used in ‘automotive’ amplifiers, they used quite clever designs to get the maximum power available from a single 12V supply. But now, where we used to have a great many ICs to choose from, over the years **most** have been dropped from production and are no longer available.

A discrete solution can be made up easily enough, normally the cost of the parts will generally just exceed that of single IC, and discrete circuits require a great deal more PCB real estate.

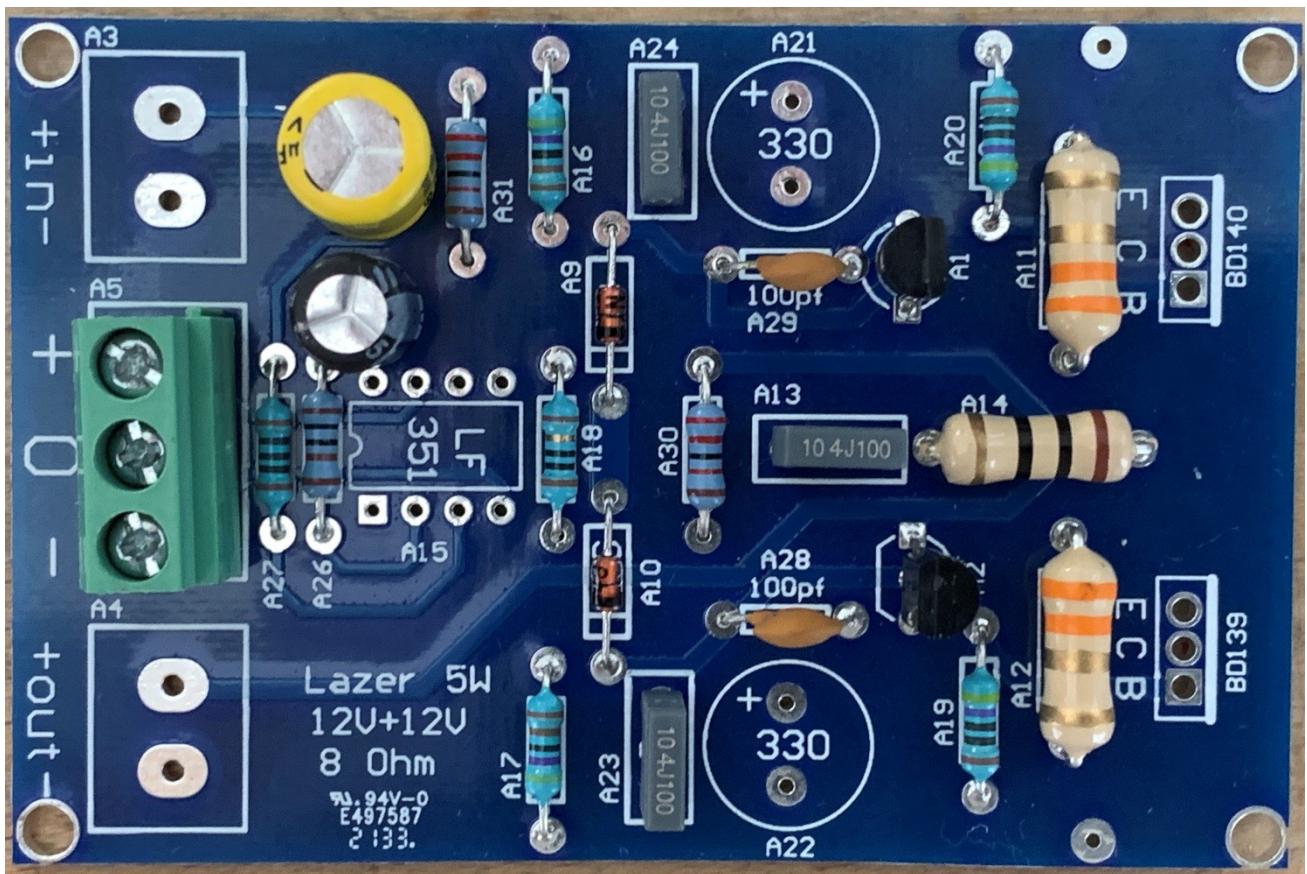
But for fun and learning, and to get the “Real Amplifier Look”, this kit gives, one must do it.

It’s a good starting point and it’s also very easy to build.

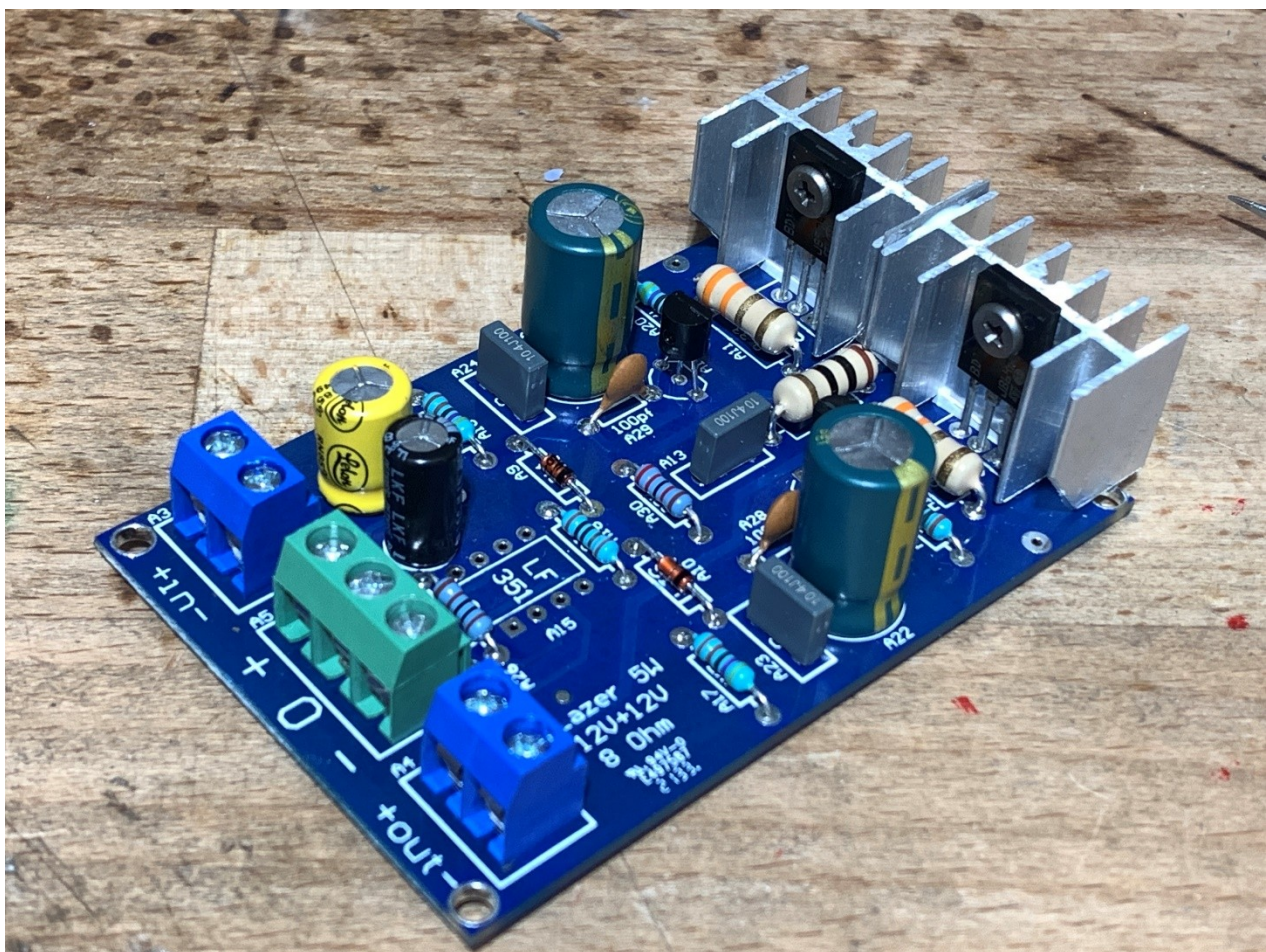
No-one will ever claim that this is a 'high performance' or a 'high fidelity' amplifier, and that's not the intention. The circuit is surprisingly good, it’s simple and with components still readily available off the shelf in most places, with the exception of the LF351N. It seems to have become an EOL product and now is hard to find. So it can be replaced by the later version of LF356, this is better in all aspects of performance.



Next, install the capacitors; Note the 2 x 330uF and the 47uF capacitor's polarity.



The Semi Completed PCB:



Note the heatsinks will change in full production, they will be smaller but taller, so they transistors can touch and the corners don't need cutting down.

Testing

Install the Test Resistors (**2 x 82 Ω**) supplied with your kit into the + and the – Input of the connector.

Do not connect the speaker yet, Connect the centre pin terminal, marked 0 v, to the power supply, then connect the +12v and the -12V to the resistors, this will safe guard the amp parts should there be an issue with your wiring or you have incorrectly installed components,

Connect your multimeter across either of the 82 Ohm test resistor, Power up and observe. If the reading is above 100mv then there is a problem, turn off the supply and check the components are in the correct positions, The Highlighted numbers in Violet are Revamped Parts

BOM	Part	Does what?	Cost
R1	100 Ohms-1/4 W	Input Limit	\$ 0.02
R2	22K Ohms-1/4W	Input Shunt	\$ 0.02
R3	1K Ohms-1/4W	DC shunt	\$ 0.02
R4	10 Ohms-1/4 W	Stop Latch Up	\$ 0.02
R5 & R6	470 Ohms 1/2W	Driver Set	\$ 0.05
R8 & R9	470 Ohms 1/2W	Bias Set	\$ 0.05
R9	4.7-10 Ohms 1/2W	Zobel Shunt	\$ 0.03
R10 & R11	3.3 Ohms 1W	Output Limit	\$ 0.05
R12	10 Ohms 1W	Zobel Shunt	\$ 0.05
C1	2.2 μ F-Bipolar 5mm	Input	\$ 0.30
C2	220pf 5mm Ceramic Disc	High Frequencies Stable	\$ 0.05
C3	47 μ F-25V- 5mm	DC blocking	Revamped
C4 & C5	100pf 5mm Ceramic Disc	Stability	\$ 0.05
C6, C7, C8	0.1 μ F-250V- 10mm	Noise & Decoupling Shunt	\$ 0.30
C9,C10	330 μ F-35V- 5mm	Line Decoupling Capacitors	Revamped
D1 & D1	1N914 Diodes	Bias Control	\$ 0.02
TR1	2N2904-NPN Transistor	Genuine On-Semi	\$ 0.60
TR2	BD140-PNP Transistor	Genuine On-Semi	\$ 0.88
TR3	2N 2906-PNP Transistor	Genuine On-Semi	\$ 0.80
TR4	BD139-NPN Transistor	Genuine On-Semi	\$ 0.80
IC1	LF351 > LF356 Op Amp DIP8	TI-Op-Amp, front of amp	\$ 1.20
Con 1	2P 5.08mm 2 Pin PCB	Blue Screw Terminal Block Connector	\$ 0.20
Con 2	3P 5.08mm 2 Pin PCB	Green Screw Terminal Block Connector	\$ 0.25
Con 3	2P 5.08mm 2 Pin PCB	Blue Screw Terminal Block Connector	\$ 0.20
HTSNK	20mm x 18mm Heatsinks	2 x NEW Heatsinks	\$ 0.80
PCB	Lazer 5W Amp	PCB	\$ 3.80

Components supplied in the kit are a combination of BRAND New and Revamped Parts, "Revamped Parts" are new parts that were removed from products that never reached the market place and/or used.

The revamped parts are free when you purchase the kit from us,

I do not believe we should throw away NEW parts into land fill, so we spend a lot of personal time removing them safely, and checking them to be 100%.