

Electro-Resales

Getting started with your HV DC Supply - Version 2

Many thanks for purchasing our DC Boost convertor. The convertor is designed to be quickly deployed as a way of providing the correct voltage and power to drive 6 Nixie tubes with a current draw of ~ 2mA/segment @ 170 -200 volts.

We appreciate your business and want to ensure that your experience with our products is a pleasurable one. We understand that you want the product to work without fault and that is our wish also. The following hints are designed to help you get up and operational as quickly as possible.

***** SAFETY NOTE *****



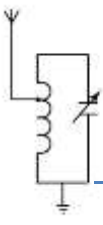
This boost convertor can output voltages as high as 300 volts DC, this is a high voltage and caution needs to be applied when using the board in an unprotected condition (bare board). We advise locating the unit in the final product enclosure or a separate enclosure to reduce the risk of coming into contact with the high voltage



Product details

[Please refer to the PCB photo while reading these notes](#)

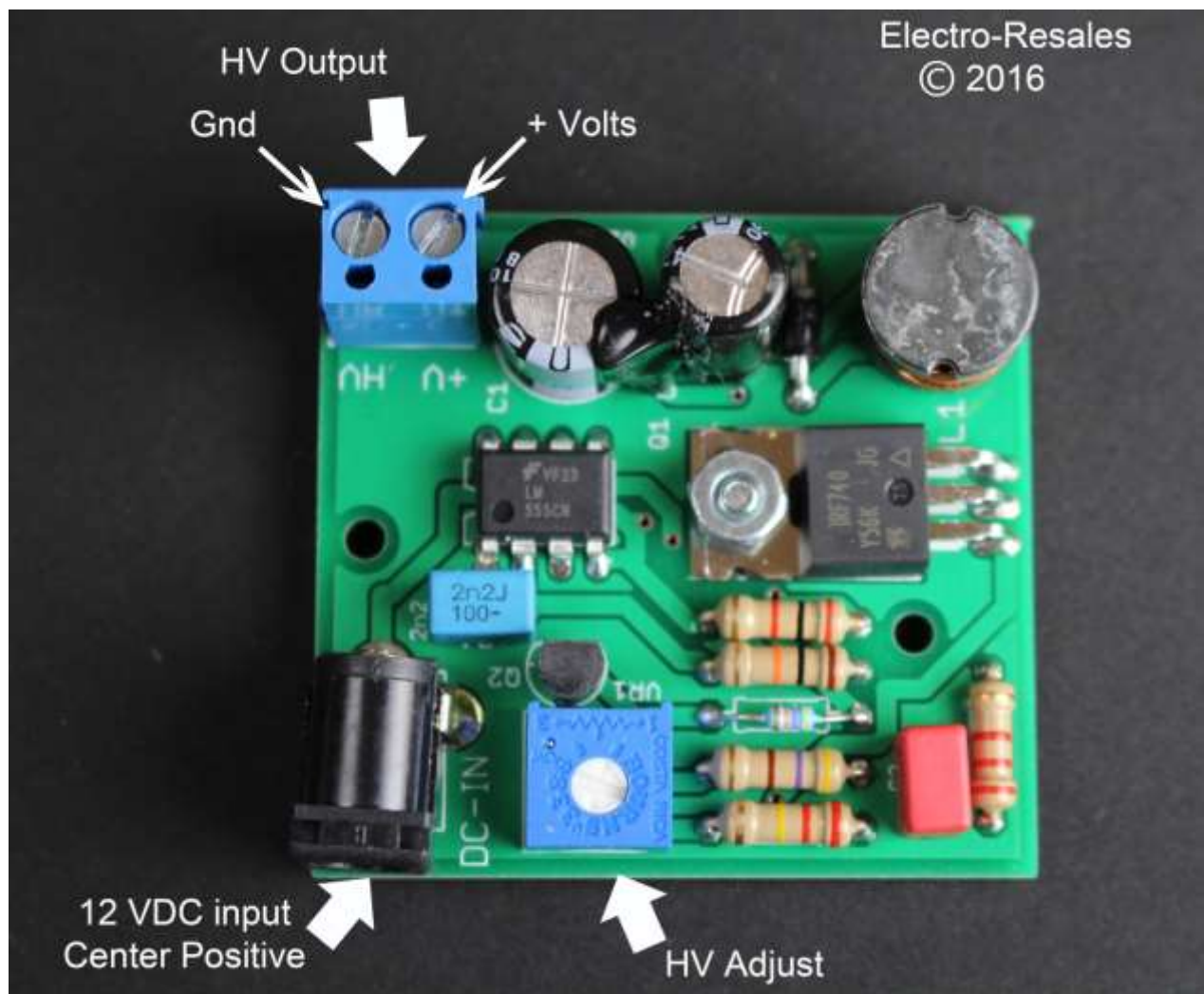
1. The unit is best powered from a 12 volt, 1Amp DC 'wall wart' style power block, use of portable batteries is possible, but battery life will be short.
2. Input voltages can be as low as 9 VDC or as high as 16 VDC.
3. A 2 terminal screw block on the board allows easy attachment of cables to the High Voltage
4. The unit is supplied with the trim pot set to give a voltage output of 200 volts, higher or lower voltages are possible by changing the trim pot position. To do this follow these instructions;
 - a. Set the board on a clean dry surface.
 - b. Attach two wires to the HV screw terminals
 - c. Connect these wires to a voltmeter capable of measuring up to 500 volts DC.
 - d. Set the voltmeter to a range above 500 V DC
 - e. Connect a dc voltage of 12 volts to the input connector – center positive
 - f. Using a small screwdriver, carefully adjust the trim pot clockwise or anti-clockwise, observe the meter output, and continue adjusting until the output voltage on the voltmeter equals your desired new voltage. Voltage range of this unit is between (approx.) 100 V and 290 VDC.

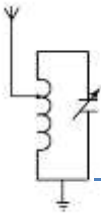


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5. Nixie tubes typically draw between 1.3mA and 2.2mA/segment when active; this boost convertor is capable of supplying up to 6 tubes at once. The regulated output means that digit flicker is eliminated.
6. In use the PCB will get warm, especially the resistor bank and item marked L1. Measured temperature at these points never exceeded 105 F (40 C). They will feel warm to the touch.
7. Be careful if working on the board outside an enclosure, as while we have worked hard to make the board as safe as possible we are talking high voltages! Observe normal safe working habits associated with high voltages.
8. Above all be safe!

Photo 1 - High Voltage (HV) Boost convertor PCB





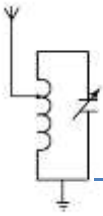
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LIABILITY DISCLAIMER

A person who constructs or works on electronic equipment may be exposed to hazards, including physical injury, the risk of electric shock or electrocution.. These hazards can result in health problems, injury, or death. Only qualified persons who understand and are willing to bear these risks themselves should attempt the construction of electronic equipment. By purchasing this item, the buyer acknowledges these risks.

There is a risk of electric shock, electrocution, burns, or fires that is inherent in the construction and use of electronic equipment. By purchasing this item, the buyer acknowledges these risks.

IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE including, but not limited to, property damage, personal injury, death or legal expenses. Buyer's recovery from Seller for any claim shall not exceed the purchase price paid by Buyer for the goods, irrespective of the nature of the claim, whether in warrant, contract or otherwise. By purchasing this item, BUYER AGREES TO INDEMNIFY, DEFEND AND HOLD SELLER HARMLESS FROM ANY CLAIMS BROUGHT BY ANY PARTY REGARDING ITEMS SUPPLIED BY SELLER AND INCORPORATED INTO THE BUYER'S PRODUCT.



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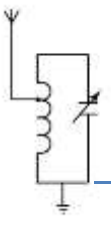
Appendix 1 - Operational details, for reference only.

The heart of this unit is the 555 timer that generates square waves on pin 3 at approx. 40 KHz, under load; this feeds the gate of the IRF740 a fast switching low on resistance N channel Mosfet.

The Mosfet acts to switch the inductor at high speed to generate the required voltages via the fast recovery diode D1, a UF4004.

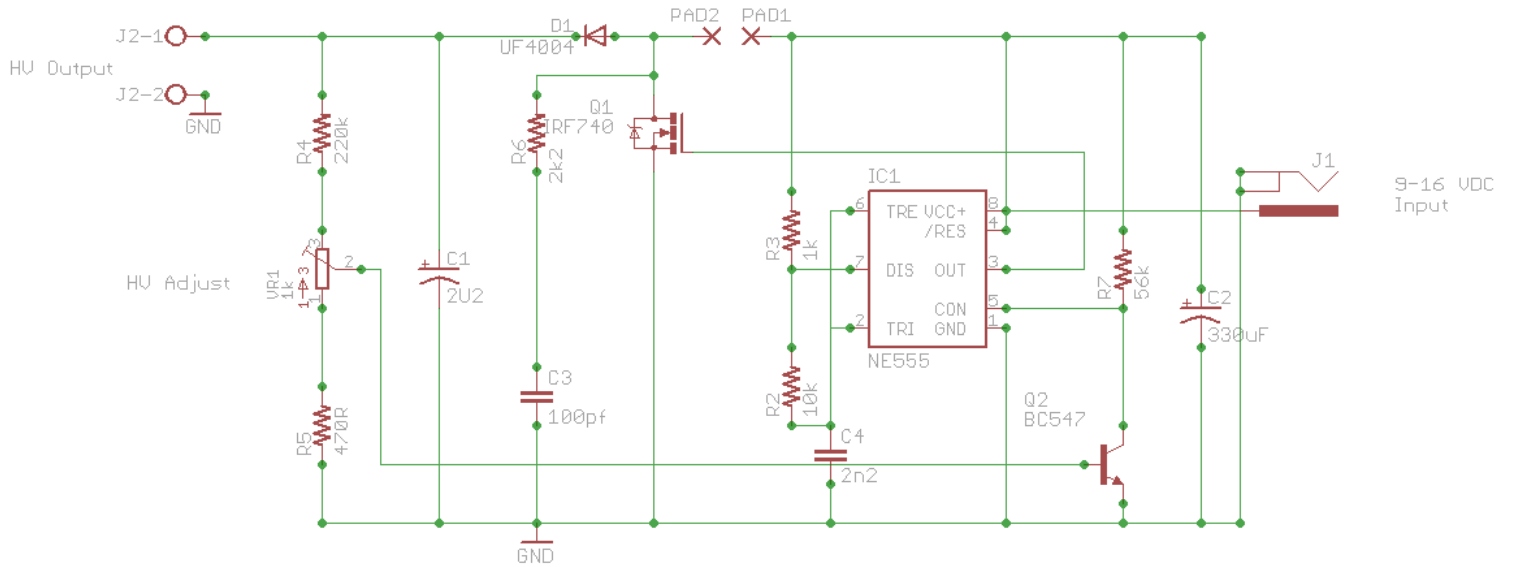
Output voltage is adjusted by means of the divider network comprising R4/R5 and VR1, by controlled feedback to the 555 and the BC547

The power supply has no short circuit protection, so shorting the HV output terminals can cause the unit to stop functioning.



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Diagram 1 - Schematic



Drawn by SJP
Revisions - 2013
2014
2015

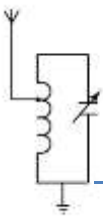
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Diagram 2 – Output of Pin 3 NE555

This is with the output at 200VDC, with a 3 Nixie tube load.

