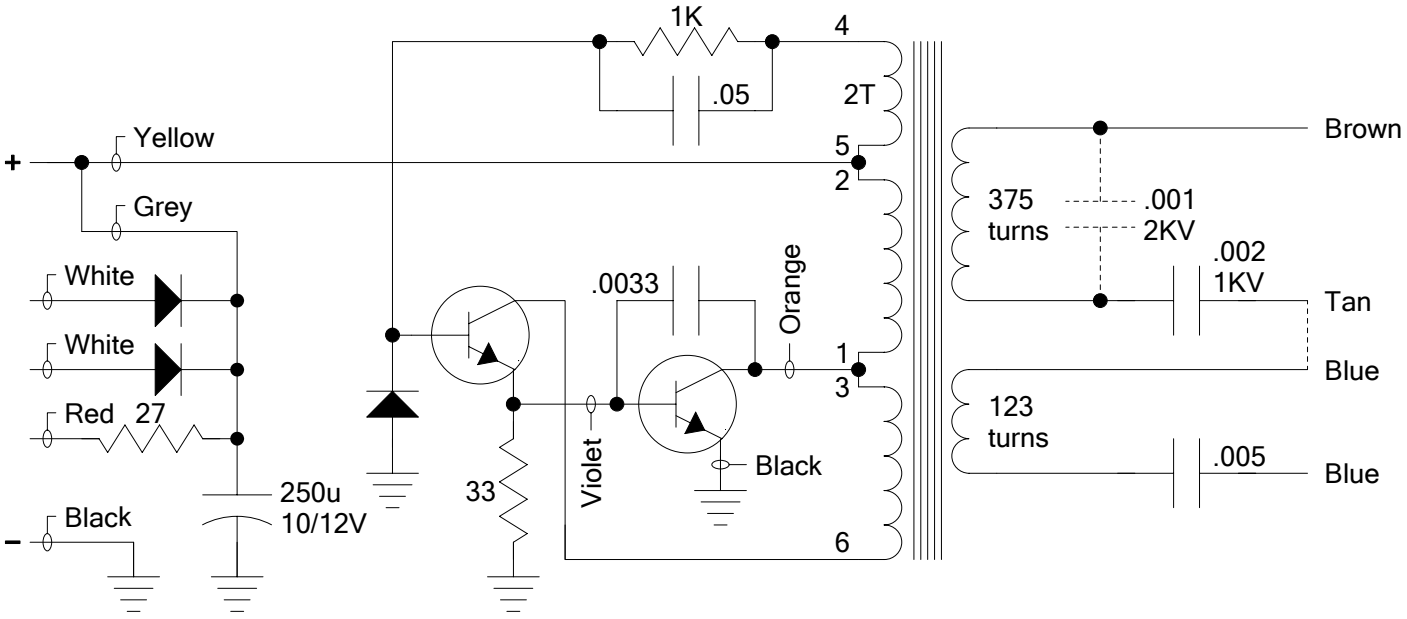
DC to HV AC Converter



It appears that the circuit was designed to have power applied to the Red lead with the Grey & Yellow leads connected, possibly through a control switch or relay, in which case the supply voltage would have been less than 10 volts due to the 250u 10/12V capacitor.

A higher supply voltage could likely be used for an even higher output voltage if the Grey & Yellow leads are not connected and power is supplied to the yellow lead directly, but it's hard to say what the maximum safe operating voltage may be before the transistors or transformer will be damaged from excessive voltage.

Power can also be supplied to the yellow lead directly with the Grey & Yellow leads connected to save the power lost in the 27 ohm resistor when supplying power via the red lead. The resistor is rated for 2 watts which makes the maximum current 272 ma. that the table below shows is reached at ≈ 6-7 volts (depending on the high voltage load) which now becomes the maximum supply voltage when supplying power via red lead.

The switching frequency is ≈ 50 to 150 KHz (depending on the secondary load) a maximum supply voltage of 6-7 volts agrees with the fact that the .001 2KV capacitor on the higher voltage secondary gets extremely hot and begins to fry at higher supply voltages due to its fairly low impedance at the high switching speed.

With everything above in mind, here's how I've been using these converters.

1) Power is supplied to the Yellow lead to allow using supply voltages up to 10V for maximum output voltage.
2) Grey & Yellow leads are connected to make use of the 250u 10/12V capacitor for filtering switching noise.
3) The .001 2KV capacitor on the secondary is removed. The other 2 capacitors are also removed and replaced with jumpers as one is only rated for 1KV, the other is likely only rated for 500V and the 2 outputs are usually connected in series for an output voltage >1000V so best to eliminate both.
4) The following table shows the operating current at various supply voltages and the output voltage of each secondary and when both are connected in series for maximum voltage (which requires connecting the Tan and proper Blue wire as shown on the schematic for correct phasing).

Input		Output Voltage (open-circuit)		
VDC	mA	Sec. 1	Sec.2	Sec. 1+2
1.0 VDC	4 ma	20 Vp-p	50 Vp-p	70 Vp-p
2.0 VDC	10 ma	50 Vp-p	130 Vp-p	180 Vp-p
3.0 VDC	21 ma	80 Vp-p	215 Vp-p	295 Vp-p
4.0 VDC	80 ma	130 Vp-p	350 Vp-p	480 Vp-p
5.0 VDC	130 ma	175 Vp-p	470 Vp-p	645 Vp-p
6.0 VDC	190 ma	220 Vp-p	590 Vp-p	810 Vp-p
7.0 VDC	265 ma	250 Vp-p	670 Vp-p	920 Vp-p
8.0 VDC	430 ma	300 Vp-p	800 Vp-p	1100 Vp-p
9.0 VDC	530 ma	340 Vp-p	910 Vp-p	1250 Vp-p
10.0 VDC	690 ma	400 Vp-p	1070 Vp-p	1470 Vp-p