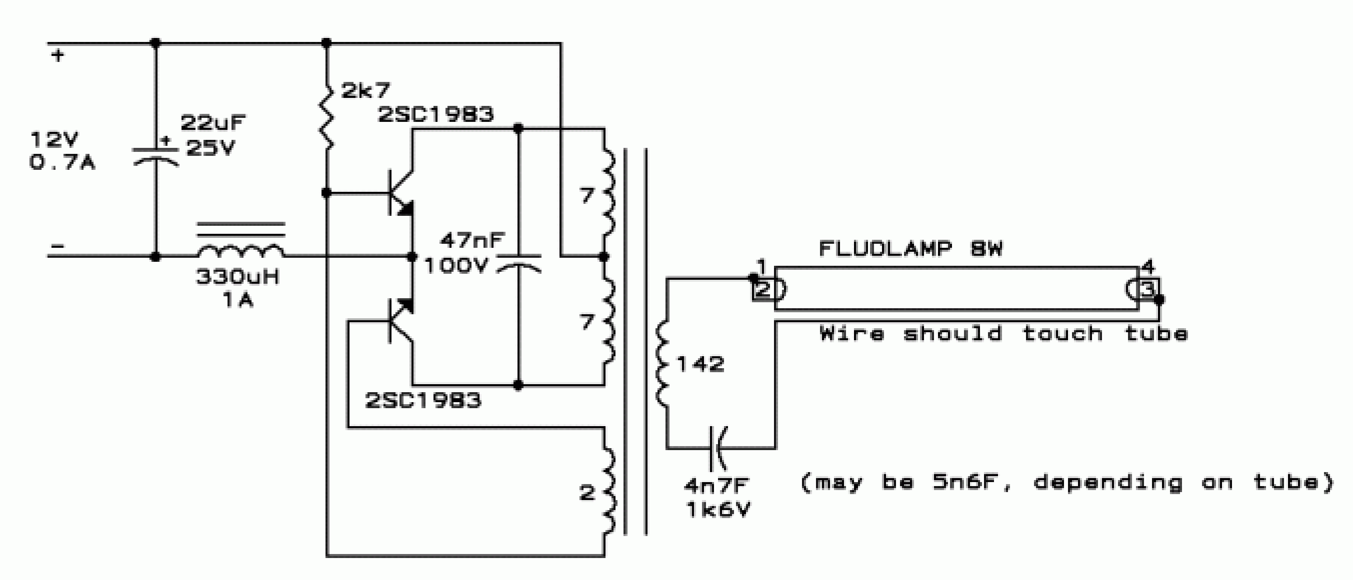
CCFL teszter , http://www.qsl.net/xq2fod/Electron/Fluolamp/fluolamp.html

The 8 Watt driver

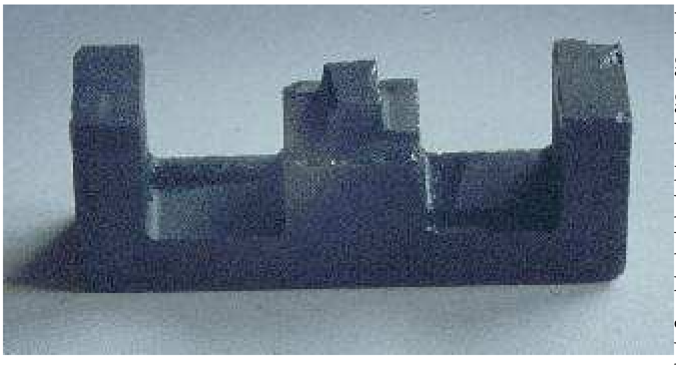
I developed this circuit in early 1999, when Chile was affected by a severe drought, most hydroelectric power plants had no water, and we were subjected to planned power cuts for two hours each day. I needed more battery powered lights in the home...



The schematic for the 8 Watt driver will show you that this design is quite different from both previous ones. It uses capacitive ballasting like the 2 Watt driver, and a two-transistor saturation-limited oscillator like the 20 Watt design. But note an important difference: This circuit has a choke added in the DC supply, that produces more effects than you may think: Thanks to this choke, mutual conduction between the two transistors is no longer a problem, allowing for a very simple drive scheme and almost lossless operation. The input current becomes almost clean DC, minimizing further filtering requirements. And the waveform becomes a quite clean sine wave, which gives a tremendous advantage in terms of radiated noise! This lamp can be used in a radio station without causing any interference.

The transistors used in this design are high-gain types. I just happened to have them on hand, salvaged from an old video recorder. You can use lower gain transistors, but then you must lower the value of the bias resistor (2k7 in my design). No heat sinks are required.

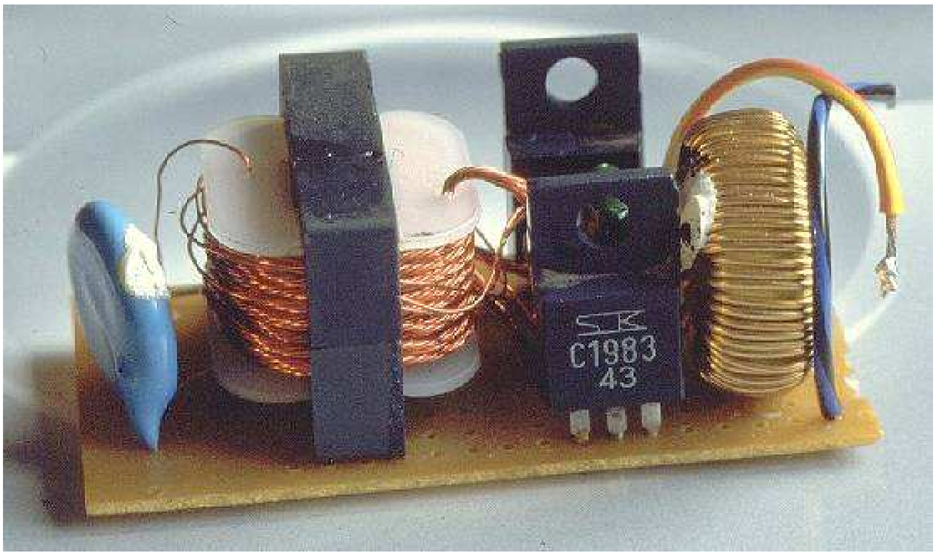
The ferrite core (detailed on the printable version of the schematic, obtained by clicking on this one) is one that was not designed for saturation-limited operation at this frequency. This kind of ferrite has considerable loss when operated at saturation flux densities at 25kHz, and so it gets very warm. It still worked well, but I was not satisfied with the performance. Not having a proper square-loop ferrite core in my material box, I came up with a solution that may well be an invention! At least I have not seen anyone using this before: **The bottlenecked magnetic core!**



I used a Dremel tool fitted with one of the green grinding stones (designed for very hard materials) to grind off some of the ferrite from the center leg of one E-half, as shown in this photo. The effect of this is interesting and very useful: At low flux levels the core has almost the same effective permeability it would have without this treatment. But the small section remaining after the grinding has to carry the same flux as the thicker rest of the core, and so works at a much higher flux density.

When the flux increases, this small section will saturate, while the rest of the core is still far from doing so. When the small section saturates, the core changes its behavior to that of an air-gapped core, drastically reducing its effective permeability! The result is that a saturation-limited oscillator built around this core will be controlled by saturation of just this little segment, while the rest of the core will work at a low flux density level. Only the small segment will run at the high loss level associated with saturation, while the rest of the core will work at a very low volumetric loss! Since the amount of saturated ferrite is so small, the losses of it are negligible, and the overall core losses are very low despite working in saturation-limited mode!

Here is the completed circuit. Almost all parts were recycled from old equipment, which explains the white cement residues on the capacitor and the choke. Note that the primary winding is not made from one solid wire, but from several twisted strands of thin wire. This makes it possible to wind it around this small bobbin, and also results in lower AC resistance.



I mounted this circuit into an aluminum canoe reflector made to size for the 8 Watt tube. This is very elegant, since the canoe is used as a return connection and ionization antenna, eliminating any visible wires

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This circuit is technically the best of the three, being easily reproducible, quite uncritical, small and cheap, highly efficient and RFI-friendly.