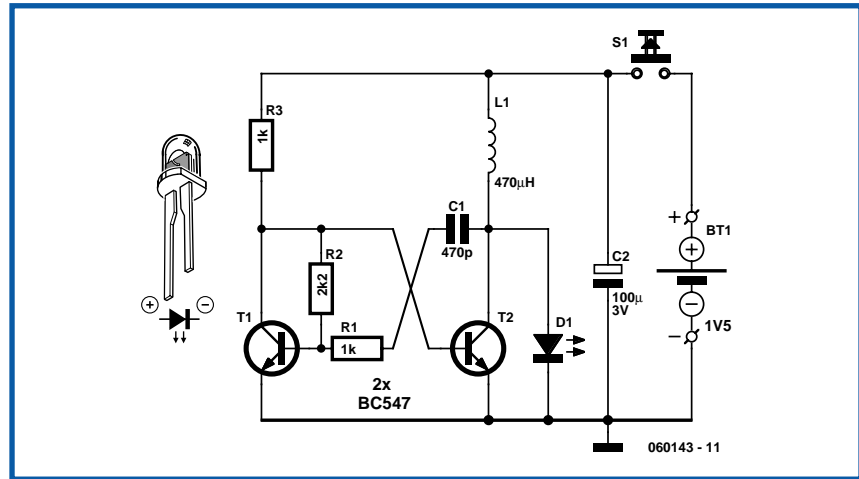


LED Phototherapy Unit

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It is widely thought that light can be therapeutic for the human skin and soul. Light at the correct wavelength may also be effective against depression and allergies. There is a wide range of products on the market, at prices from a few tens of pounds to a hundred pounds or so, which are presented as universal remedies for dust allergies or hay fever. If we look at these devices in more detail, we find that their operation is relatively simple to explain.

Common to all the devices is that they emit intense red light with a wavelength of 660 nm. Some biophysicists claim that light of this wavelength can have a positive effect on the human body and can initiate healing processes. This so-called 'phototherapy' is a treatment which is claimed to have an effect against allergic reactions in the body, since it acts against free oxygen radicals and strengthens the immune system, reducing inflammation of the mucous membrane. Since this treatment does not take the form of a medicine, but rather the form of visible light, there is no risk of side-effects. There has been scientific research showing that this therapy does not work in every case, but success rates as high as 72 % have been reported. Since it may not be possible to obtain these devices under the NHS or under private medical insurance, our thoughts naturally turn to do-it-yourself.



For the enclosure we decided to use an old nasal hair trimmer. These can be obtained new for a few pounds, or you may have an old one that can be recycled. The choice of enclosure also dictates the choice of battery: the unit contains therefore not only be very compact (there is little spare room in the enclosure), it must also be able to drive a high-brightness red LED from a voltage between 1 V and around 1.6 V. Here again we can indulge in a little recycling: we can re-use the circuit from a Mini Project by Burkhard Kainka for driving a white LED, published in *Elektor Electronics* in June 2002. In this circuit the inductive voltage pulse is limited by the LED itself, ensuring that the output voltage will automatically match the forward voltage of the LED. The circuit is

suitable as it stands for driving a high-brightness 660 nm red LED to make a do-it-yourself phototherapy unit.

In view of the small number of components, the circuit can be assembled by soldering them together directly or by using a small piece of stripboard. The circuit can operate from a wide range of voltages, and so we can use either an alkaline AA cell or an AA-size NiMH rechargeable cell with a voltage of 1.2 V. The current consumption of the circuit is about 20 mA. Assuming the circuit has been built correctly, the red LED should light brightly as soon as power is applied. Five to ten minutes' use in each nostril every day should be sufficient to obtain noticeable benefit after two weeks of treatment.