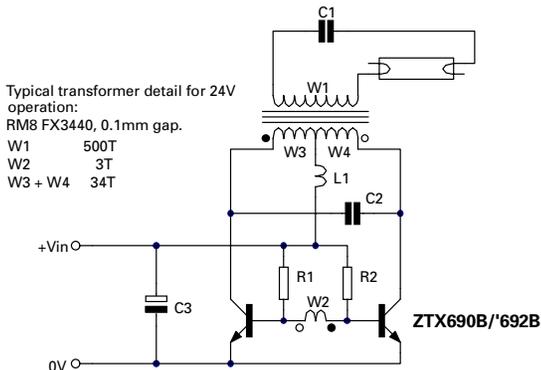


## LCD Display Fluorescent Backlighting



LCD displays are becoming more common in such diverse areas as laptop computing and supermarket till systems. As the LCD display itself does not generate light, a small fluorescent tube and diffusing panel are usually integrated into the unit. The tube is driven by an inverter that must (typically) generate 1000V ptp to initiate conduction, and 500V ptp while the tube is running. The unit must be compact, efficient, and probably be operable over a wide voltage range, to enable contrast adjustments.

The push-pull inverter shown, running at an inaudible 30kHz was designed as a replacement option for a commercially available 24V unit. It uses Matrix geometry Super E-Line (TO92 style) transistors that offer a more efficient performance than the "tall TO92" devices sometimes utilised; a compact RM series transformer core; and a few

**Note 1:** For this circuit topology the collector-emitter only experiences a high voltage when the base has been driven negative by the feedback winding. This means that the voltage rating most relevant is the BVCEV or BVCEs parameter.

Consideration of this feature will allow selection of a lower rated BVCEO device for the application, which in turn, will provide a lower VCE(sat) and hence higher conversion efficiency.

other components to allow this design to be constructed at a fraction (estimated to be 50%) of the cost of pre-built units.

The ZTX690B and ZTX692B devices are part of the ZTX688B-696B high gain series; the transistor choice being dependant on the operating voltage range. These particular devices possess BVCEO ratings of 45V and 70V, (see note 1 below) yet still provide typical VCE(sat) values at 500mA of 50mV and 80mV respectively. For lower power requirements, the high performance FMMT489 and FMMT491 SOT23 transistors should also prove attractive. (For optimum performance the "SuperSOT" FMMT618 series should be considered).

[Also refer to AN14]