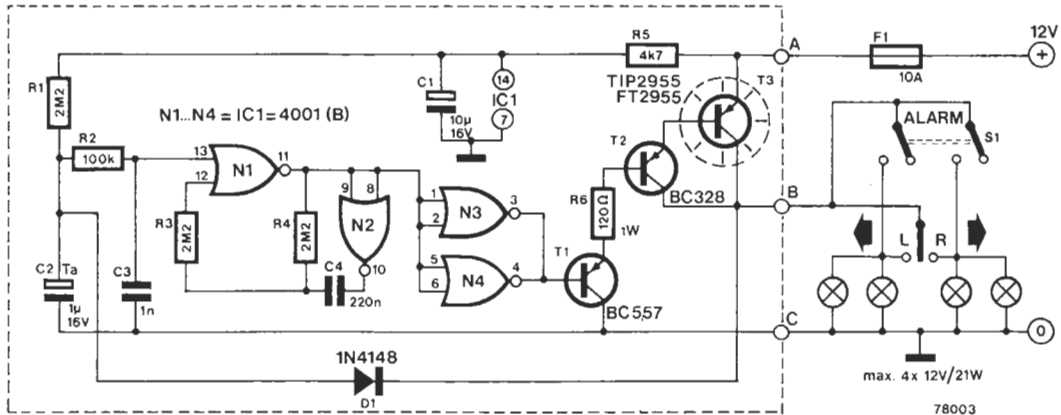


# 40 power flasher



Despite the vast array of solid-state devices now available, the flasher units for car direction indicators are still almost exclusively electro-mechanical. Apart from the obvious objection of unreliability, these units suffer from the problem that the flashing rate is dependent on ambient temperature, battery voltage and load. This latter factor means that if one wishes to wire all four indicators to flash simultaneously as a hazard warning, it is necessary to use a separate flasher unit.

The electronic flasher discussed here suffers from none of these disadvantages. The repetition rate is practically independent of battery voltage, temperature and load, has a built-in hazard warning switch and is extremely reliable. Furthermore it

complies with all the legal requirements for turn indicators, the repetition rate of 40 to 90 flashes per minute being within the specified range and the circuit being arranged so that the indicators light immediately when the turn indicator switch is operated.

The circuit is basically an astable multivibrator constructed around two CMOS NOR gates N1 and N2. N3, N4, T1, T2 and T3 buffer the output of this astable to drive the indicator lamps.

When the indicator switch is operated C2 discharges rapidly through D1 and the indicator lamps. Pin 13 of N1 goes high and its output goes low. The outputs of N3 and N4 thus go high, turning on T1, T2 and T3 and lighting the indicators. The

astable then begins to oscillate at approximately 1 Hz, turning the indicator lamps on and off. If the hazard warning switch, S1, is closed then the circuit operates in exactly the same fashion except that all four lamps are connected in parallel and flash in synchronism. T3, which switches most of the I<sub>c</sub> current, must be mounted on a heat sink. If a metal box is used to house the unit then T3 can be bolted to the wall of this using an insulating washer and bush. The current in the leads connected to points A and B is quite large (up to 8 A) so heavy-gauge wire must be used for these connections. The positive supply lead must be fitted with a 10 A fuse if not already fused.

## Parts list.

### Resistors:

R1, R3, R4 = 2M2  
R2 = 100 k  
R5 = 4k7  
R6 = 120 Ω (1 Watt)

### Capacitors:

C1 = 10 μ/16 V  
C2 = 1 μ/16 V (tantalum)  
C3 = 1 n  
C4 = 220 n

### Semiconductors:

IC1 = 4001 (B)  
T1 = BC 557, BC 177  
T2 = BC 328, BC 327  
T3 = FT 2955 (Fairchild) TIP 2955  
D1 = 1N4148

