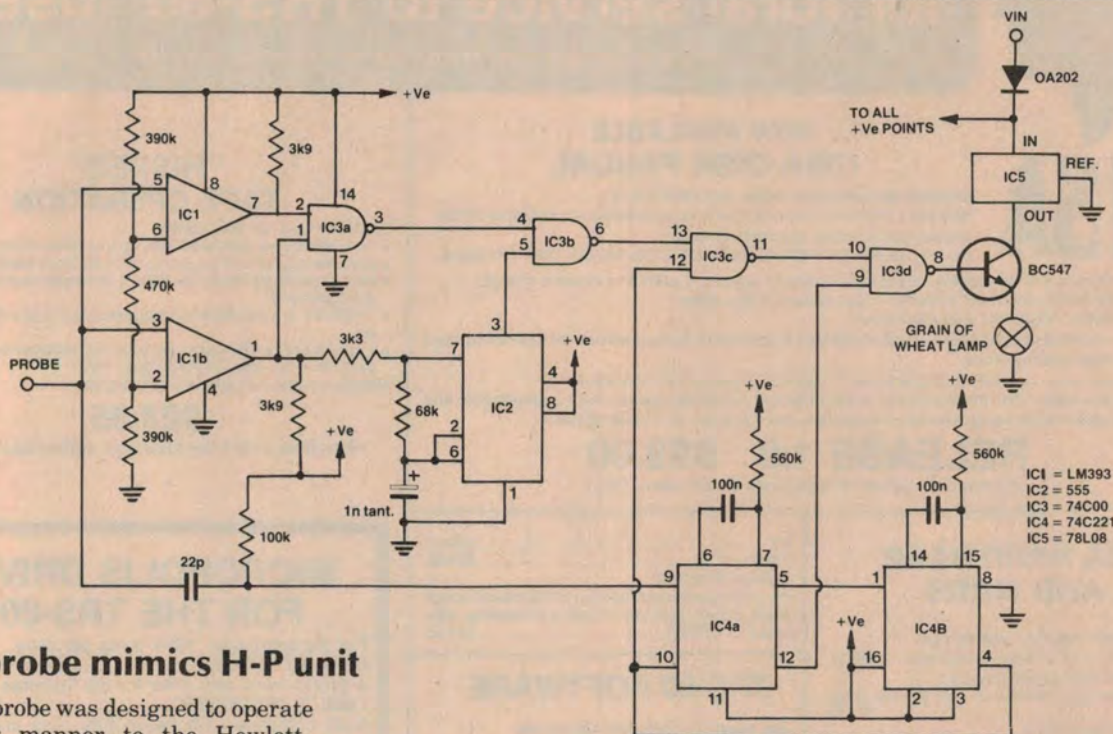


# Ideas for Experimenters



IC1 = LM393  
 IC2 = 555  
 IC3 = 74C00  
 IC4 = 74C221  
 IC5 = 78L08

## Logic probe mimics H-P unit

This logic probe was designed to operate in similar manner to the Hewlett-Packard Logic Probe. It uses a single lamp to indicate all states including open circuit and pulse trains, says **R.A. Jackson of Glenelg, S.A.**

IC1 is a dual comparator: IC1a detects the logic 1 level threshold and IC1b detects the logic 0 level. The resistor network is set for CMOS levels but can easily be changed for TTL.

With the probe input open circuit, IC1a output is low and IC1b output is high. IC2 oscillates at about 100 Hz and the square wave output is fed through gates IC3b, c and d to drive the lamp with a 50% duty cycle square wave. This

gives half brilliance.

When a logic 1 is applied, both the comparator outputs go high. IC3a output goes low thus inhibiting gate IC3b and driving the lamp to full brilliance.

A logic 0 input gives low outputs from the comparators. IC2 stops oscillating and its output goes high. This gives IC3b two high inputs and the lamp is turned off.

If a pulse is present at the input, its negative-going edge is coupled to the trigger input of IC4a. This is one half of a dual monostable. Pin 5 goes high for approximately 50 ms, and then goes

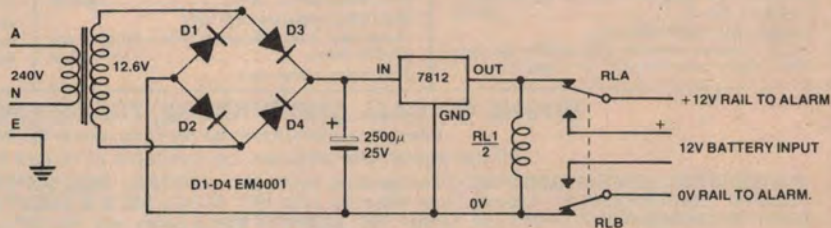
low. This triggers IC4b for 50 ms. The Q output of IC4b is connected to the inhibit input of IC4a. This prevents retriggering until 100 ms after the first pulse. The Q outputs of IC4 drive gates IC3c and d. This arrangement turns the lamp off, then on, giving a positive indication of a pulse, regardless of the input level or the pulse frequency.

IC5 is an 8 V regulator. This limits the lamp voltage when the input voltage is high (up to 18 volts). The diode protects against reverse voltage.

With careful construction the probe can be built into a penlight torch case.

## Alarm power supply

House alarms require a power source in the event of a mains failure. This unit, from **Mark Tiddy of Highgate S.A.**, is a simple unit to fulfil that function. Most alarms operate from a 12 Vdc rail so that a 12 V battery may be used to supply power during mains failures. The circuit employs a conventional transformer-bridge rectifier configuration and a three-terminal 12 V regulator. The coil of a relay is connected directly across the 12 V regulated supply rail and is held operated during mains operation.



During mains failure, the 12 V supply rail from the regulator will discharge and the relay will drop out, connecting the supply rail for the alarm through to a 12 V battery.

A suitable resistor (or even a diode)

from the positive output of the bridge rectifier to the positive terminal of the battery, plus a diode between the 0 V RAIL TO ALARM and bridge rectifier negative will keep the battery trickle charged.