

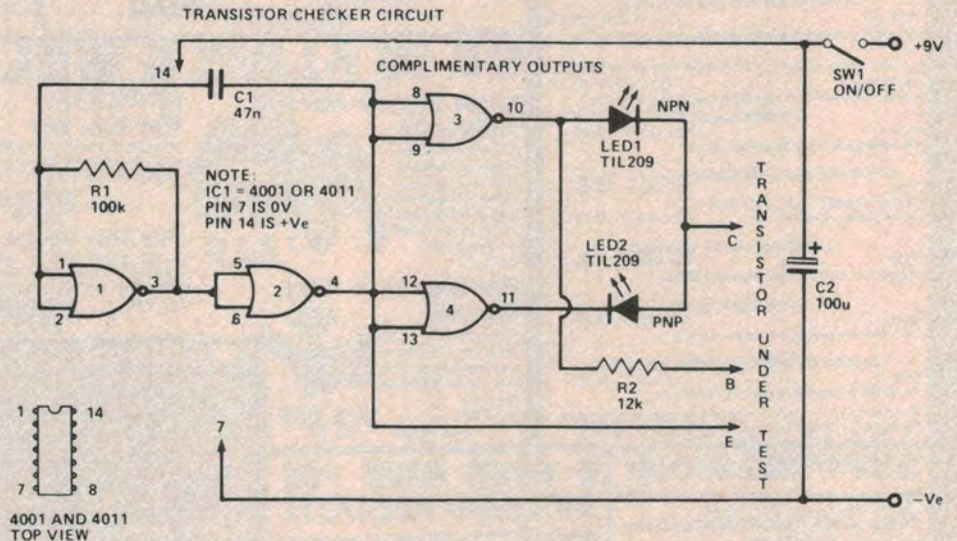
## GO/NO GO transistor checker

THIS VERY SIMPLE and inexpensive circuit is not designed to measure any transistor performance figures, but is intended for quick testing to show whether or not the test device is functional.

The basic method of testing a transistor is to first connect a supply to its emitter and collector terminals and check that no significant current flows. If the base terminal is then given a small forward bias, this will be amplified and produce a large collector-emitter current.

This circuit employs a CMOS quad 2-input NAND or NOR gate IC. Either type is suitable as each gate has its two inputs connected together so that it acts as an inverter. The first two inverters are used in conjunction with R1 and C1 as a conventional CMOS oscillator operating at a frequency of a few hundred Hertz. The other two inverters are connected in parallel and fed from the output of the oscillator so that they provide a complementary output. In other words, one output will be high and the other will be low, except during the brief periods when the outputs change state.

The collector and emitter of the transistor are fed from the outputs via LED1 and LED2, and the base is fed from one output via R2. If we assume that an NPN device is being tested, when gate 2 output is high gate 3 output is low. The transistor will be reverse biased via R2 and it should pass no significant collector current. If it is a short circuit device and does pass collector current, this will pass through LED2 which will light up and indicate the fault. When the outputs of gates 3 and 4 are in the



### INDICATIONS

#### Transistors

- LED1 only on ..... functional NPN device
- LED2 only on ..... functional PNP device
- No LEDs on ..... open circuit or low gain device
- Both LEDs on ..... short circuited device

#### Diodes

- LED1 on ..... device OK, anode lead on C
- LED2 on ..... device OK, anode lead on E
- Both LEDs on ..... short circuited device
- No LEDs on ..... open circuit device

opposite state, the transistor will be forward biased via R2 and should conduct heavily, causing LED1 to pass a current and light up. Failure of LED1 to come on indicates an open circuit or very low gain device. PNP devices operate with the opposite polarity, and so when testing one of these it is LED2 that should switch on, and LED1 which should remain off.

The tester can be used with diodes too.

Connect one lead to C (collector connection), the other to E (emitter connection).

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