

DIGITAL TRIGGER FOR OSCILLOSCOPES

A. Rigby

The circuit described here enables an oscilloscope to be triggered when a predetermined binary code word is applied to one of the circuit's inputs.

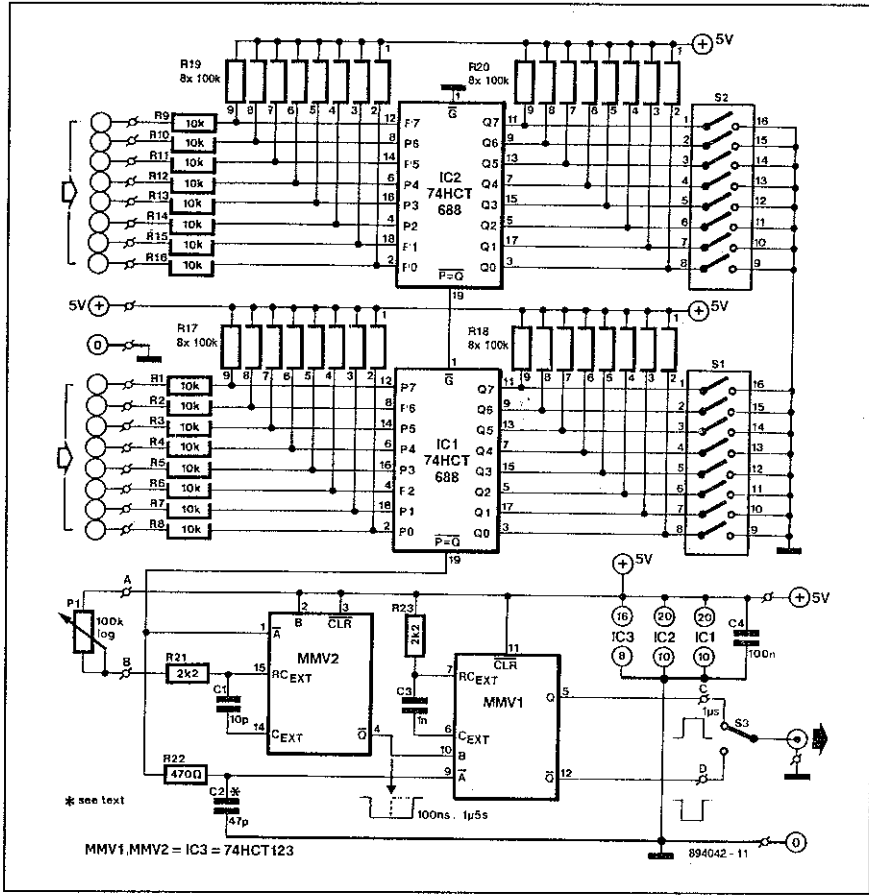
Integrated circuits IC₁ and IC₂ compare the 16 input levels with the code set by switches S₁ and S₂. If one of the inputs has a dataword that is equal for not less than 100 ns to that set by S₁ and S₂, pin 19 of IC₁ goes high. Note that, because of the pull-up resistors, open inputs are treated as high.

When pin 9 of IC₁ is high, monostable MMV₂ is triggered and outputs a negative pulse from its pin 4. The length of this pulse is 0.1–1.5 μs, depending on the setting of P₁. If during that time the predetermined trigger value disappears, no triggering takes place. Potentiometer P₁ is a logarithmic type to enable very short times to be set accurately.

The output pulse from MMV₂ triggers a second monostable, MMV₁, whose monotime has been set to 1 μs by R₂₃-C₃.

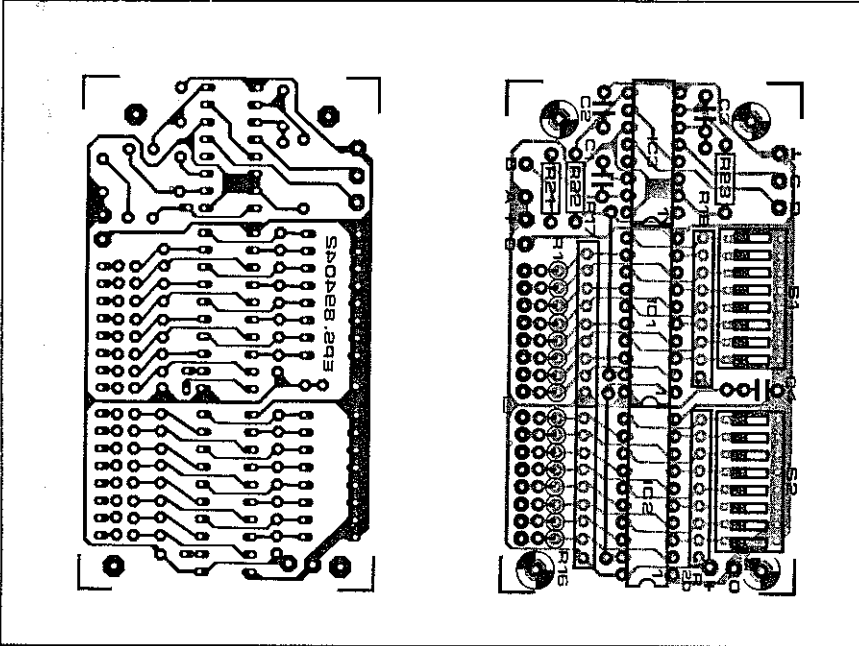
Either the positive signal from the Q output or the negative signal from the \bar{Q} output, depending on the setting of S₃, may be applied to the oscilloscope.

The printed circuit board is relatively small. Most resistors are mounted upright. If difficult to obtain locally, the four single-in-line (SIL) resistor arrays may each be replaced by eight vertically fitted resistors whose top wires are cut short for connecting to a horizontally running wire to the +5 V line.



* see text

MMV1, MMV2 = IC3 = 74HCT123



COMPONENTS LIST

Resistors:

- R₁–R₁₆ = 10k
- R₁₇–R₂₀ = 100k
- R₂₁, R₂₃ = 2k2
- R₂₂ = 470 Ω
- P₁ = 100k logarithmic potentiometer

Capacitors:

- C₁ = 10p
- C₂ = 47p
- C₃ = 1n0
- C₄ = 100n

Semiconductors:

- IC₁, IC₂ = 74HCT688
- IC₃ = 74HCT123

Miscellaneous:

- S₁, S₂ = 8-way DIP switch
- S₃ = miniature SPDT switch
- K₁ = BNC socket
- Qty. 18: miniature test clip
- Enclosure: e.g., OKW A9010 065
- PCB 894042

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