Engineer's notebook

Stepper checks state of E-PROM's memory

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Too often, ultraviolet-light–erasable programmable read-only memories have their contents blindly destroyed by users who cannot determine whether the memory contains valuable information or is totally blank. However, this circuit can scan each E-PROM location with a binary counter and so will distinguish memories that contain data from those that do not—all at a cost of around $8.

In use, the memory device is placed into the test socket and the momentary contact switch, S_1, is pressed. If as little as 1 bit of memory is stored in any of the E-PROM's locations (logic 0 for an E-PROM), the light-emitting diode will light.

A 2-kilohertz clock signal for the 12-bit binary counter, B_1, is generated by oscillator and buffer A_1 so that the addresses will cycle through the 2716 2-K-by-8-bit E-PROM in about 1 second. (Although this circuit was dsigned for the 2716, it may also be adapted for any type of memory, bipolar or MOS.)

If any bits in a given location are low, then a pulse will be generated at the E-PROM's output and will drive the 4068 NAND gate high. This pulse, which is generated at the NAND output, is stretched to 2 s by one-shot and buffer A_2 to drive the LED. □
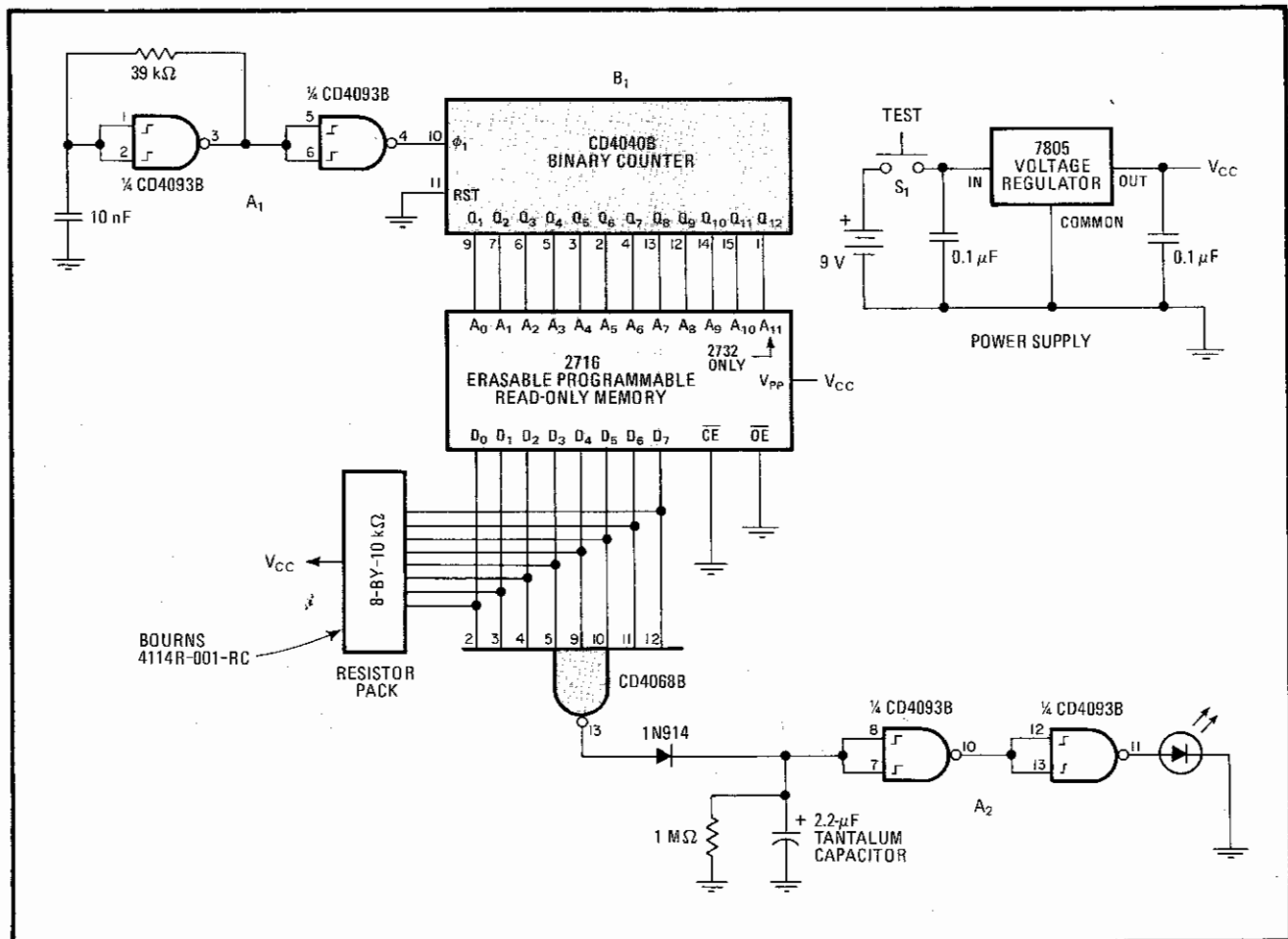
Seeing is believing Using a 12-bit binary counter, a tester of ultraviolet-light–erasable PROMs inspects each location of the device to determine if it contains data or is blank, thereby saving contents from accidental erasure. For a 2-K-by-8-bit E-PROM, the test takes about 1 second, with a light-emitting diode turning on if any memory location contains a data bit.