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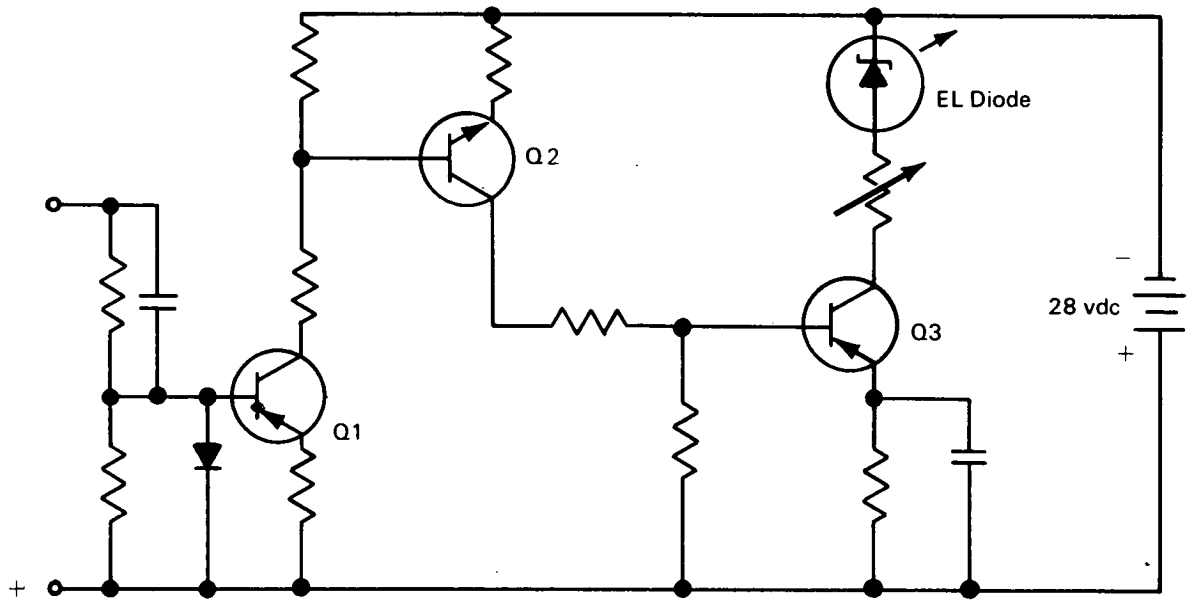
NASA TECH BRIEF

Electro-Optical Time Marker for High-Speed Cameras



When high-speed motion pictures are used to record events for scientific study, it is desirable to record precise timing information on the film simultaneously. An improved electro-optical device has been developed that is capable of converting high-frequency electrical pulses into permanent optical records on film. Accurate, well defined images have been formed of electronic pulses having repetition rates greater than 10^4 pulses/sec and pulse widths of 20 μsec or less. The device, a schematic diagram of which is shown above, uses a silicon carbide electroluminescent diode driven by a small electronic switch.

Previous attempts to provide such a film strip timing record have required the use of neon-filled gas discharge lamps. However, there are various troublesome features inherent to the design of these lamps, such as relatively long glow initiation and decay times, low maximum current capability, and rapid electrode degradation by ion bombardment if the current rating is exceeded. In high-speed photography, these problems combine to produce a poorly defined image of the timing code and a high failure rate of the lamps.

The illustrated circuit was designed to modify a camera system previously equipped with neon-lamp time markers to permit the low-voltage electroluminescent diode to function with the high-voltage timing signal supplied to drive the neon lamps. The circuit is a three-stage switching amplifier. Negative-going timing pulses (OFF level equals +150 volts; ON level equals +15 volts) are connected across the input. The first stage operates as a low-power, class A amplifier whose input is drawn from a high-resistance voltage

(continued overleaf)

divider. This stage isolates the circuit from the timing pulse generator. The second stage is a normally saturated electronic switch. The final, intermediate power stage is capable of driving one, two, or more electroluminescent diodes connected in parallel.

Note:

Requests for further information may be directed to:

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Reference: B70-10229

Patent status:

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