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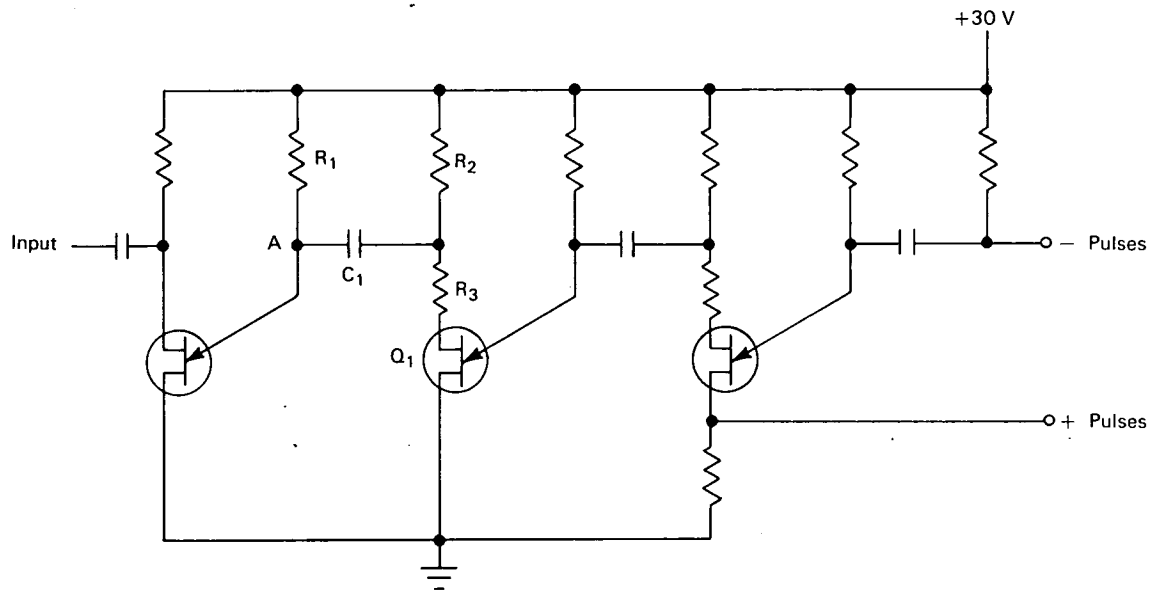
NASA TECH BRIEF

Unijunction Frequency Divider Is Free of Backward Loading



The problem: Present unijunction frequency dividers have a tendency toward loading in the backward direction. This causes undesirable triggering of preceding stages.

The solution: A simple frequency divider using unijunction transistors has few elements per stage and reduces backward loading to a minimum.

How it's done: Each stage in the frequency divider is a relaxation oscillator. The capacitor C_1 quickly charges through R_2 and slowly discharges through R_1 and R_2. The charging current through R_2 lowers the voltage at point A and may cause the next stage to fire. However, the larger value of R_3 keeps the current through the base of Q_1 low so that the size of the pulse generated in R_2 is kept so low that one stage will not trigger a preceding stage. Thus the circuit reduces loading of each stage by feeding each output into a low impedance loop. At the same time, backward loading is reduced since the synchronization signal of each stage is picked up by a high impedance loop in the following stage. This high impedance loop results in low currents which do not create appreciable sync voltages in the preceding stage.

Notes:

1. Circuits of this design should find application in timing devices and in sync generators for television systems.

(continued overleaf)

2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, California, 91103
Reference: B65-10112

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: Avard F. Fairbanks
(JPL-WOO-010)