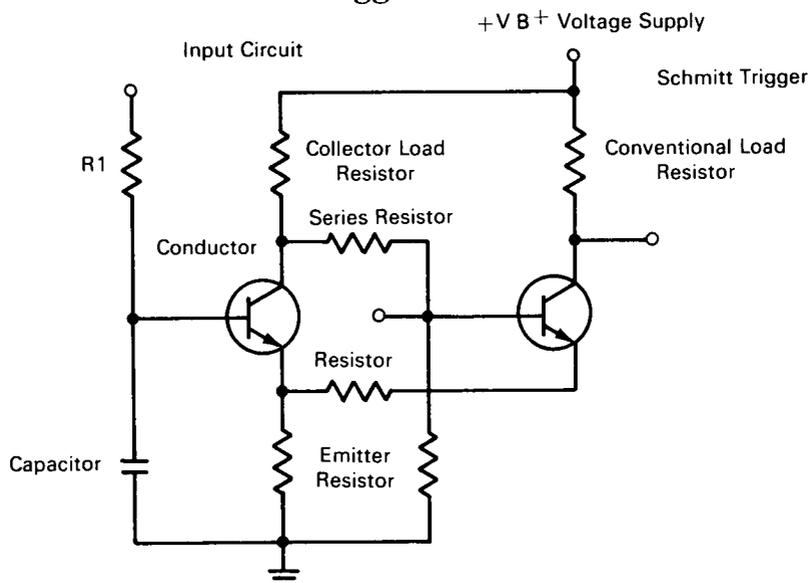


NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U.S. space program, to encourage their commercial application. Copies are available to the public at 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Schmitt Trigger Multivibrator



Numerous multivibrator circuits have been developed which utilize unijunction transistors, integrated circuits and discrete components in varying degrees of sophistication. The Schmitt trigger multivibrator circuit, capable of astable, monostable or bistable operation, offers a unique circuit design incorporating an input circuit in conjunction with a Schmitt trigger circuit. The combination of circuits results in the formation of two output signal levels, and may be useful in switching circuit applications where flexibility is required. An additional advantage of this invention is that the astable multivibrator will spontaneously initiate oscillations without the use of additional circuitry, resulting in a reduction in cost and complexity. The invention should be of particular interest to designers and engineers of control and computer circuits, and to research personnel in the communications industry.

The preferred embodiment of an astable multivibrator features a controlled and predictable degree of hysteresis in operation. The values of the resistor capacitor input circuit are selected to insure astable operation and to determine the frequency and pulse width.

Bistable and monostable operations can also be achieved by modifying the multivibrator input circuitry. The bistable multivibrator can be of the set-reset variety, or can operate as a triggered flip-flop which reverses states on application of a pulse.

The Schmitt trigger multivibrator can be adapted to form highly unsymmetrical wave forms. Also, the circuitry of this invention does not require capacitors connected to the collectors of the transistors in the astable configuration. The recovery time of the collector waveforms is therefore improved. Another advantage is that only one capacitor is required in the

(continued overleaf)

astable circuit. The rise and fall times of the collector waveforms are very small; therefore, "speed-up" capacitors should not be required in bistable application. Another useful feature is that positive or negative polarity pulses can be obtained depending on which collector is used as the output.

Note:

Documentation is available from:

Clearinghouse for Federal Scientific and
Technical Information
Springfield, Virginia 22151
Price \$3.00
Reference: TSP69-10143

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, non-exclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to NASA, Code GP, Washington, D.C. 20546.

Source: William E. Zrubek
Manned Spacecraft Center
(MSC-10955)