

NASA TECH BRIEF

Marshall Space Flight Center



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Heart Simulator

The problem:

Design a device that may be substituted for a live subject to use as a calibrator for heart monitoring equipment.

The solution:

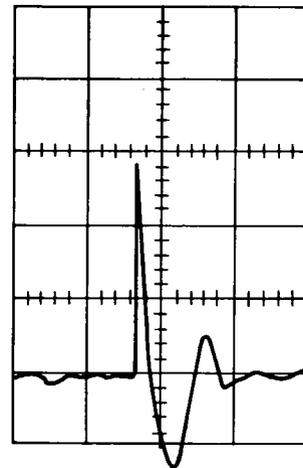
Use a unijunction oscillator controlled by a potentiometer to generate a spike that may be converted by transformer action to the simulated heart beat.

How it's done:

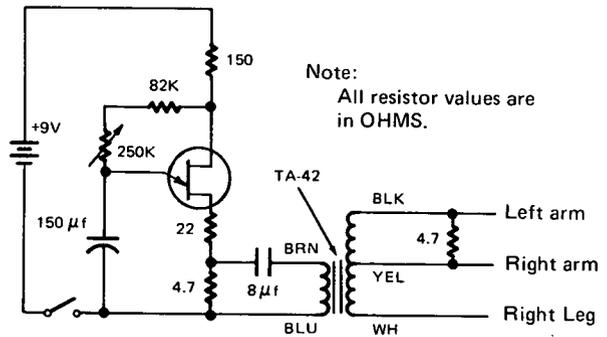
The device, designed and developed for use as a calibrator for heart monitoring equipment, may be used in design and experimental work as well as the calibration of heart monitoring equipment, without the use of a live subject. The circuit (as shown) creates a simulated heart pulse that is variable over a range of approximately 40-200 pulse beats per minute with component values as noted.

The power source for the simulator is a 9-volt battery. A unijunction oscillator generates repetitive pulses at a rate determined by the setting of the 250-kilohm potentiometer. Pulse shaping, to simulate a heart waveform, is provided by the circuit consisting of the primary winding of the TA-42 transformer, the 4.7-ohm (primary side) resistor, and the 8- μ f capacitor.

The transformer secondary provides the simulated heart pulse output. A reproduction of the simulator generated pulse beat waveform is shown.



Heart Simulator Waveform



Heart Simulator Schematic

Note:
All resistor values are in OHMS.

(continued overleaf)

Notes:

1. Information concerning this innovation may be of interest to manufacturers of heart monitoring equipment and to metrology engineers.
2. No additional information exists on this device, however, specific questions may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Code A & TS-TU
Huntsville, Alabama 35812
Reference: B72-10131

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to:

Patent Counsel
Mail Code A&TS-PAT
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B72-10131

Source: E. Palmer
Marshall Space Flight Center
(MFS-21609)