

July 1967

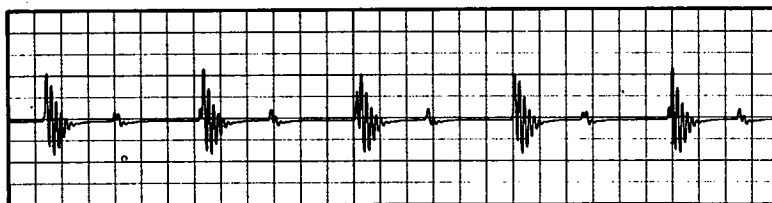
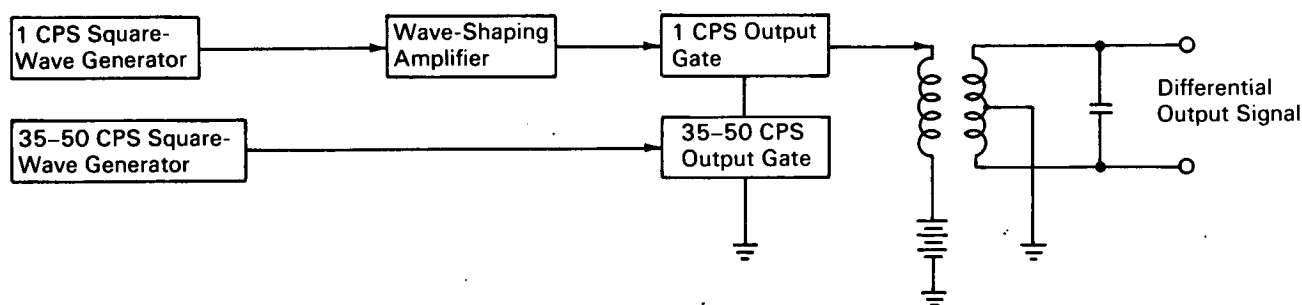
Brief 67-10239

# 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.

## A Phonocardiogram Simulator



A phonocardiogram that produces a pattern of electrical signals exactly duplicating, in time and amplitude, the sounds of the human heart, has become a very important tool in physiological monitoring of astronauts in flight and during flight simulation. To calibrate and check out such a device, it is necessary to simulate, with accurate control, the timing and amplitude of heart activity signals.

A phonocardiogram simulator accomplishes this by the circuitry diagramed to produce the waveforms illustrated. As to timing and amplitude, the waveforms are adjustable to simulate all known ranges of human heart activity.

The 1 cps square wave multivibrator generates the basic repetition rate of the signal complex, as the 35-50 cps multivibrator generates the frequency

within each "heart sound" pulse. Circuit resistances are used to control pulse amplitude and a potentiometer is used to regulate output voltage level.

### Notes:

1. This innovation may be used to check out telemetry systems and instrumentation systems for phonocardiogram monitoring in hospitals and medical care centers, and may also be used in training personnel to use such systems.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
Kennedy Space Center  
Kennedy Space Center, Florida 32899  
Reference: B67-10239

(continued overleaf)

**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: John M. Keefer  
Kennedy Space Center  
(KSC-67-94)