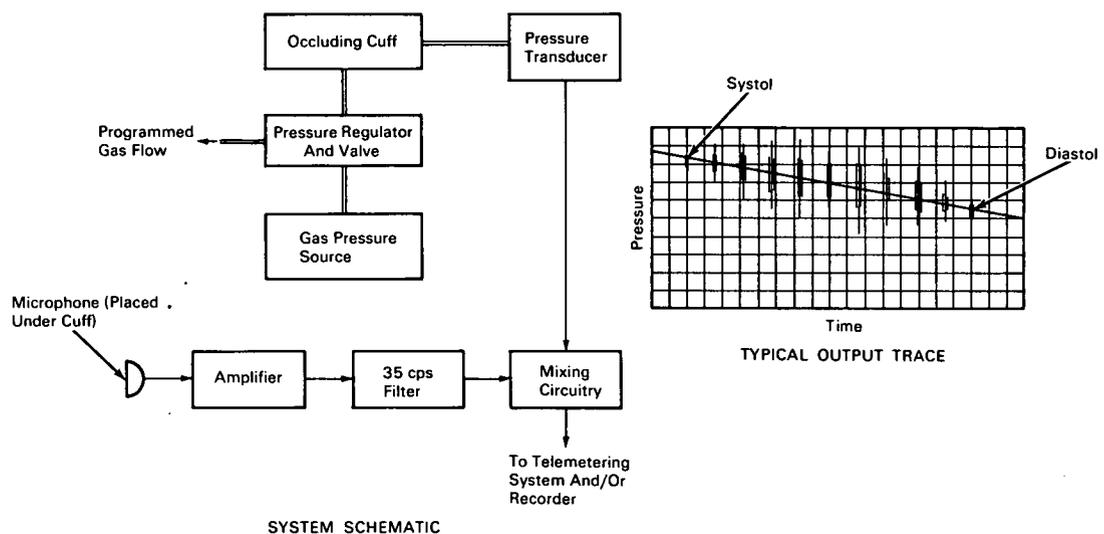


NASA TECH BRIEF



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Blood-Pressure Measuring System Gives Accurate Graphic Output



SYSTEM SCHEMATIC

The problem: To develop an instrument that will provide an external (indirect) measurement of arterial blood pressure in the form of an easily interpreted graphic trace that can be correlated with standard clinical blood-pressure measurements. From sphygmograms produced by conventional sphygmographs, it is very difficult to differentiate the systolic and diastolic blood-pressure pulses and to correlate these indices with the standard clinical values. It is nearly impossible to determine these indices when the subject is under physical or emotional stress.

The solution: An electronic blood-pressure system, basically similar to conventional auscultatory sphygmomanometers, employing a standard occluding cuff, a gas-pressure source, and a gas-pressure regulator and valve. An electrical output transducer senses

cuff pressure, and a microphone positioned on the brachial artery under the occluding cuff monitors the Korotkoff sounds from this artery. The output signals present the conventional systolic and diastolic indices in a clear, graphical display. The complete system also includes an electronic timer and cycle-control circuit.

How it's done: The output of the microphone is fed through a solid-state amplifier and a 35-cps filter into the mixing circuitry where it is superimposed on the signal from the pressure transducer. The output of the mixing circuitry is fed to a continuous chart recorder which gives a plot of cuff pressure versus time. The first signal pulse appearing on the graph as the cuff pressure is slowly reduced indicates the systolic pressure and the last pulse corresponds to the diastolic pressure.

(continued overleaf)

Notes:

1. The occluding cuff must be of a minimum width in order to ensure correlation of the measured systolic and diastolic values with the accepted indices. A narrow cuff is highly desirable for comfort and mobility of the subject.
2. Over 2,000 blood pressure measurements have been taken using this system on various individuals, and many of the readings have been compared with those taken with a conventional sphygmomanometer and stethoscope. In only a few instances were the readings off by more than a few millimeters of mercury.
3. A small amount of additional development would be required to make the system completely automatic. Such a system should be of considerable value for monitoring the blood pressure of hospitalized patients and as a clinical diagnostic aid.

4. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
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P. O. Box 1537
Houston, Texas, 77001
Reference: B65-10365

Patent status: NASA encourages the immediate commercial use of this invention. It is owned by NASA and inquiries about obtaining royalty-free rights for its commercial use may be made to NASA, Code AGP, Washington, D.C., 20546.

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