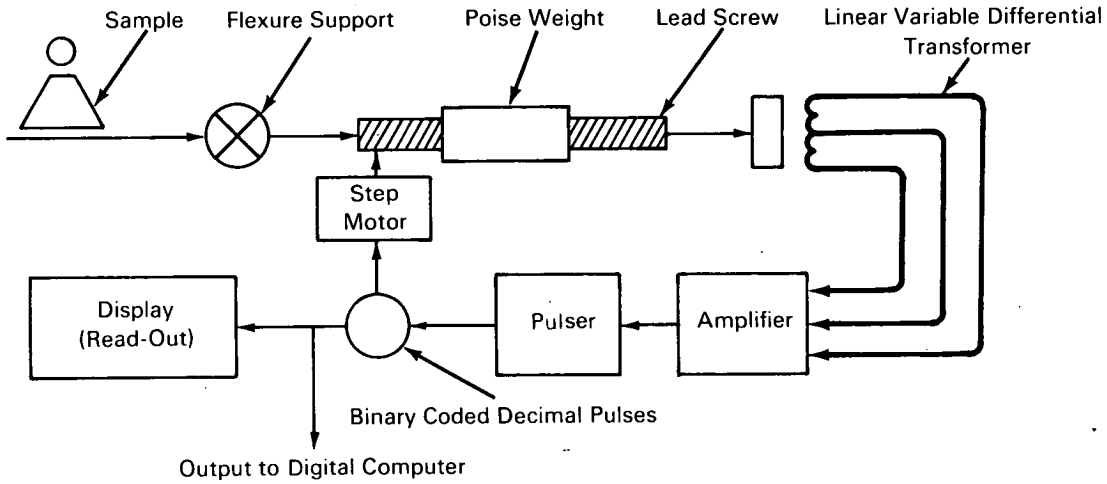
AEC-NASA TECH BRIEF

Digital Servo Readout System Increases Recording Accuracy of Servo-Balance Scales



The problem:

Commercially available servo-balance weighing scales had poor resolution due to the analog- (dc) type servo mechanism employed. The readout did not accurately track the poise weight for balancing the system. Also, the dc servo was affected by temperature and electronic noise. In addition to the need for improving these conditions, it was necessary to develop a minimum complexity system which would adapt the readout mechanism for direct input to a digital computer.

The solution:

Replace the analog servo readout mechanism with a digital servo unit.

How it's done:

The digital servo unit is driven by a linear variable differential transformer (LVDT) error signal to deliver pulses in a direction that reduces error. These pulses drive a step motor which turns the lead screw to position the balance poise weight and bring the LVDT to zero position. The pulses also power a local display which gives the sample weight directly. The pulses can also be fed into a digital data computer system. Pulses are BCD (Binary Coded Decimal).

Notes:

1. Use of the digital servo mechanism with the zero displacement balance for weighing was not adversely affected by temperature changes and electronic noise. Reliability was increased due to the reduction of the number of components.
2. The digital servo readout system was applied to a typical servo-balance scale for laboratory use, weighing samples up to 2 kilograms to within 0.05 gram accuracy.

(continued overleaf)

3. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
AEC–NASA Space Nuclear Propulsion Office
U.S. Atomic Energy Commission
Washington, D.C. 20545
Reference: B67-10496

Patent status:

No patent action is contemplated by AEC or NASA.

Source: L. C. Faupell
of the Westinghouse
Astronuclear Laboratory
and J. B. Davies
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