NASA TECH BRIEF

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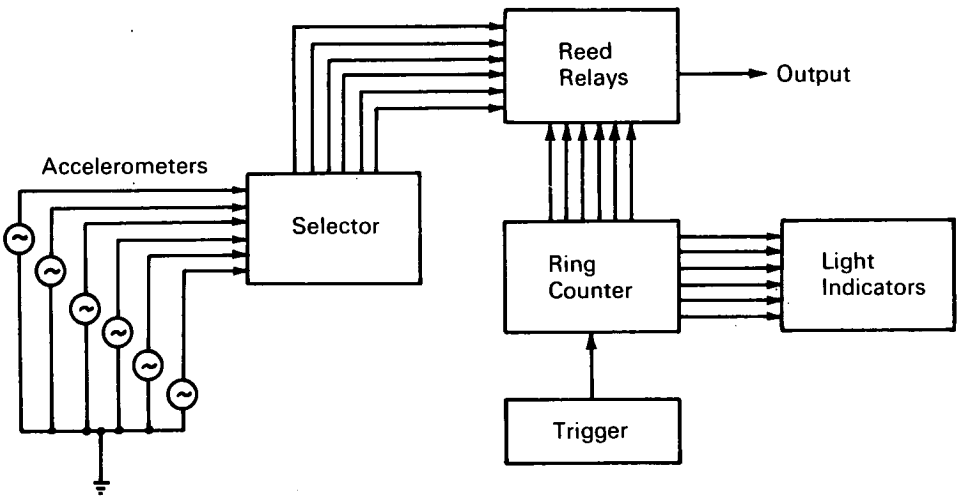
Instrument Sequentially Samples AC Signals from Several Accelerometers



The problem:

In conducting random noise vibration tests using several accelerometers to obtain a representative measurement of the vibration levels over the entire test structure, it is necessary to provide a means for sampling each of the accelerometer signals in such a manner that all of the frequency information is preserved.

The solution:

A scanner circuit that sequentially samples the ac signals from the accelerometers and provides an essentially time-averaged output signal.

How it's done:

A main unit of the scanner is a modified ring counter employing silicon controlled rectifiers to actuate magnetically shielded, mercury wetted reed relays. A unijunction transistor is used as the active element of a sawtooth generator that provides a trigger pulse to switch the counter. The pulse duration and repetition rate are adjustable to permit a sampling rate from less than 1 Hz to approximately 200 Hz. The number of accelerometer channels to be sequentially sampled can be selected by means of a selector switch on the front panel of the instrument. The direction of sampling (forward or reverse) can be controlled by another switch on the front panel. The sampling can also be stopped on any desired channel, so that only the signal from that channel will be gated through the instrument.

Notes:

1. The output of the scanner has been applied to an automatic equalizer to enable precise control of the vibration levels of a vibration system used for random noise vibration tests on structural specimens. The scanner may also have application in conjunction with devices used for automatic control of vibration levels on motors or other equipment subject to mechanical vibrations.

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2. An instrument that will automatically select the peak ac signal from several accelerometers is described in NASA Tech Brief 66-10462. Inquiries may also be directed to:

Technology Utilization Officer
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, California 91103
Reference: B67-10029

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: Carl P. Chapman
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