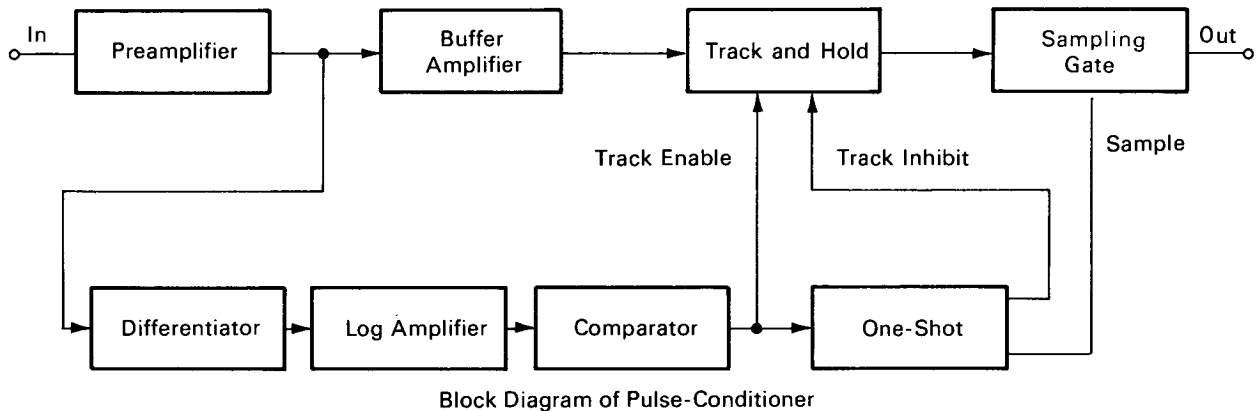


NASA TECH BRIEF



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Conditioning of Pulses from Aerosol-Particle Detectors



Block Diagram of Pulse-Conditioner

The problem:

To develop a method of conditioning (translating) pulses, generated by aerosol-particle detectors, to a form acceptable by commercially available pulse-height analyzers designed for nuclear-energy spectroscopy.

Detectors of aerosol particles generate electrical pulses related to size and distribution of the particles. Usually the pulses are Gaussian or half-sinusoidal in shape and occur randomly, they have rise and fall times and durations of the order of tens of microseconds. Pulse amplitude represents detected particle size, and aerosol size distributions can be studied by pulse-height spectroscopy.

Commercially available pulse-height analyzers, designed for nuclear-energy spectroscopy, characteristically require pulse inputs having much shorter rise and fall times and durations. Thus a pulse-conditioner must "interface" an aerosol-particle detector with the analyzer. The conditioner must shape the pulses properly while processing the amplitude information linearly and over a wide dynamic range.

The solution:

Such a conditioner has been developed (see figure), and a prototype has been built and reconciled with two typical analyzers—the DEC LINC-8 and the TMC Gammascopie-101. A refinement of this conditioning system, involving greater cost and complexity, has been designed but not built.

Notes:

1. Meteorologists and those concerned with air-pollution or instrumentation may be interested.
2. Requests for further information may be directed to:
Technology Utilization Officer
Electronic Research Center
575 Technology Square
Cambridge, Massachusetts 02139
Reference: B69-10691

Patent status:

No patent action is contemplated by NASA.

Source: C. T. Martin and J. E. Bowie
Electronics Research Center
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Category 01