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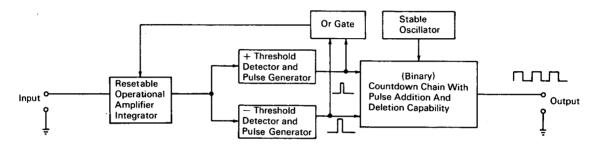
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NASA TECH BRIEF



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Digital Voltage-Controlled Oscillator



The problem:

To generate a variable frequency signal that is voltage controlled about a discrete center frequency in close linearity. Prior art VCO's (voltagecontrolled oscillators) required expensive and critical temperature compensation coupled with closely regulated power supplies.

The solution:

A digital voltage-controlled oscillator that generates a variable frequency signal controlled linearly about a center frequency with high stability and that is phase controlled by an applied voltage.

How it's done:

The control voltage drives a resetable integrator. When the integral of the control voltage exceeds a positive threshold voltage, a pulse is generated that resets the integrator and simultaneously adds (or deletes) a specified number of pulses in a binary countdown chain. When the integrator becomes more negative than a negative threshold voltage, a pulse is generated that also resets the integrator but now deletes (or adds) pulses in the binary countdown chain. Thus, the output signal steps in phase at a rate proportional to the applied control voltage. A zero control voltage generates no pulses and the output signal frequency is an exact submultiple of the stable oscillator in this situation.

Notes:

- 1. The center frequency of this digital VCO is related to the accuracy of the stable oscillator but has the capability of large linear frequency excursions.
- 2. Integration ahead of the digital circuitry provides linear operation with control voltage having appreciable noise components.
- 3. Inquiries concerning this innovation may be made to:

Technology Utilization Officer Goddard Space Flight Center Greenbelt, Maryland 20771 Reference: B67-10449

Patent status:

No patent action is contemplated by NASA.

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Category 01

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