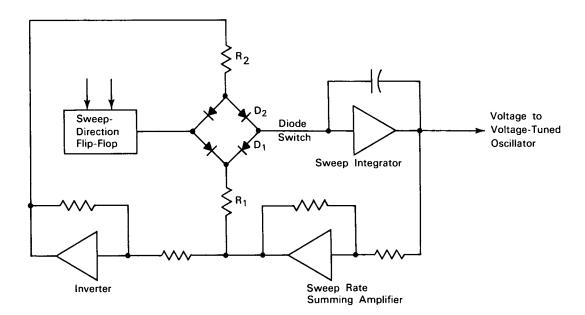
## NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the space program.

## **Voltage Generator Sweeps Oscillator Frequency Linearly with Time**



The problem: To sweep linearly with time, the output signal frequency of frequency-modulated oscillator circuits, in particular, voltage-tuned oscillator circuits, has required relatively costly and complex circuitry.

The solution: A circuit that generates a voltage exponentially varying with time. When applied to a voltage-tuned oscillator, the output of which varies logarithmically with applied voltage, the resultant output is a linear frequency variation with respect to time.

**How it's done:** Assuming that the sweep-direction flip-flop is in the upward position, the diode switches are biased so that the output of the sweep-rate summing amplifier is connected directly to the sweep integrator through diode  $D_1$  and resistor  $R_1$ . The sweep-rate summing amplifier is driven by a

signal proportional to the sweep-integrator output voltage. The sweep-direction flip-flop is reversed at the end of each sweep by a pulse generator or other device (not shown). With the sweep direction reversed, the sweep integrator is connected via diode  $D_2$  and resistor  $R_2$  to the inverter whose voltage is the negative of that from the summing amplifier, thus the sign of proportionality is reversed.

**Note:** Inquiries concerning this invention may be directed to:

Technology Utilization Officer Marshall Space Flight Center Huntsville, Alabama, 35812 Reference: B64-10320

(continued overleaf)

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