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 D₁ and resistor R₁. 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 D₂ and resistor R₂ 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
**Patent status:** NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA Headquarters, Washington, D.C., 20546.

*Source: Melpar, Inc. under contract to Marshall Space Flight Center (M-FS-219)*