

ABSTRACT

A GENERAL PURPOSE LOW COST DIGITAL AMPLITUDE REGULATOR

Apparatus for digital amplitude regulation is disclosed, for use as a volume control or the like, utilizing pulse width modulation to control gain through the variation of the incremental resistance of a two terminal non-linear element (46), the resistance of which varies with current, e.g., a diode or diode like element. A stream of pulses, (from 12), the duty cycle of which is variable and digitally controlled, is filtered to produce a quasi-continuously variable direct-current (DC) voltage (at 22). The DC voltage either directly or by providing a DC current regulates the gain of an amplifier (26) for amplifying the signal of interest by regulating the transmission characteristics of the diode. For low cost implementation in a system already employing a microprocessor or microcomputer the determinative duty cycle can be derived under software control and supplied as an output from a single latchable output pin (13).

In an exemplary implementation, the incremental resistance of an ordinary silicon diode is operated in accordance with the small signal model of a diode. Additionally, the use of an energy storing type filter (14,16,18,20) allows the continuous stream of variable duty cycle pulses to be momentarily interrupted so that a pin (13) used for supplying the pulses can be used for the performance of additional functions without affecting the perceived volume level.

Figure 1

This Sheet Has Been Replaced

