

- [54] **AUDIO AMPLIFIER WITH PHASE MODULATED PULSE WIDTH MODULATION**
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- [52] **U.S. Cl.** 330/10; 363/26
- [58] **Field of Search** 330/10, 207 A, 251; 323/283; 363/26.41

Stereo Amplifiers for Consumer and Professional Use, Attwood, Brian E., Hamburg, Feb. 28-Mar. 3, 1978. A 0.5 MHz Switching DC-AC Inverter Topology Provides Low EMI Environments for Critical Spacecraft Applications, Attwood, Brian E., Apr. 10-12, 1984. Phase-Modulated AC Supply Exhibits High Efficiency, Zansky, Zoltan, Oct. 3, 1985.

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[57] **ABSTRACT**

In a digitally controlled amplifier circuit a dc power source is modulated by an oscillator signal for producing a reference square wave signal. A sawtooth signal, double the frequency of the reference signal and synchronized therewith, is compared with a variable input signal to be amplified. When the sawtooth exceeds the input signal a phase shifted version of the reference signal, shifted in phase in accord with the instantaneous amplitude of the variable signal is produced. A switching circuit logically governed by the reference and phase shifted signals produce a pulse width modulated output signal of a selected polarity. An output filter smooths the pulse width modulated output signal and steering diodes control the polarity of the switching circuit.

- [56] **References Cited**
- U.S. PATENT DOCUMENTS**
- 4,178,556 12/1979 Attwood 330/10
- 4,182,992 1/1980 Attwood 330/251
- 4,479,175 10/1984 Gille et al. 363/41
- 4,509,101 4/1985 Kenji 361/79
- 4,600,891 7/1986 Taylor, Jr. et al. 330/10

OTHER PUBLICATIONS
Very High Fidelity Quartz Controlled PWM (Class D)

28 Claims, 4 Drawing Sheets

