Abstracts

Surface-Acoustic-Wave Random-Access Memories

G.F. Manes. "Surface-Acoustic-Wave Random-Access Memories." 1981 Transactions on Microwave Theory and Techniques 29.5 (May 1981 [T-MTT] (Joint Special Issue on Surface-Acoustic-Wave Device Applications)): 498-507.

An acoustic tapped-delay line (TDL) undermultiplexer control exhibits random-access-memory (RAM) capability; programmable time compression/expansion is achieved by controlling the difference between tap switching interval and intertap delay. A serial-in/parallel-out configuration can perform spectral compression of high input bandwidths, while requiring a single sampling operation to be performed, at the output data rate; dual properties are demonstrated by a parallel-in/serial-out organized RAM used for time compression. A new powerful N-phase configuration is discussed, which allows the intrinsic switching capability of multiplexers employed to be increased by N, while offering high dynamic range capability. The basic operation of the new technique is discussed, some theoretical aspects are investigated, and various effective configurations are described. In particular, the natural format of the time contracted/segmented output from a nonlinear convolver, asynchronously operated, is recovered; a clock-programmable bandpass filter is demonstrated, based on complementary time compression expansion. Extension to read-only memory (ROM) is briefly outlighted, with reference to frequency synthesis. Finally, processing of signals in basel and format is demonstrated using acoustic TDL's, via a simple modulation technique, which increases flexibility and the potential attraction of the new technique.

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