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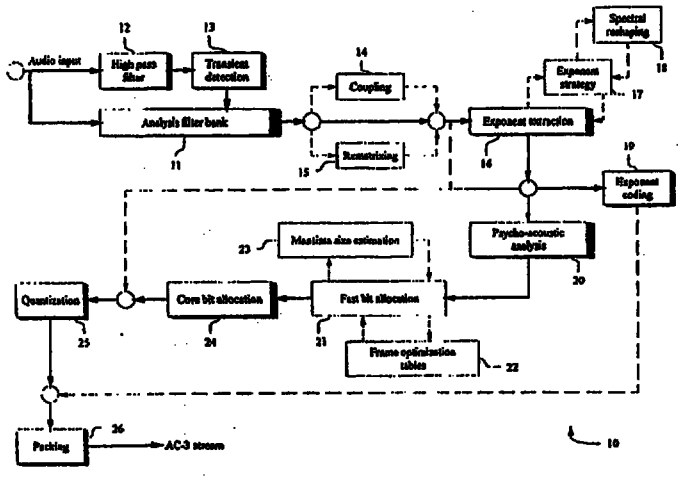
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(54) Title: MULTI–PRECISION TECHNIQUE FOR DIGITAL AUDIO ENCODER



(57) Abstract

AC–3 is a high quality audio compression format widely used in feature films and, more recently, on Digital Versatile Disks (DVD). For consumer applications the algorithm is usually coded into the firmware of a DSP Processor, which due to cost considerations may be capable of only fixed point arithmetic. Commercial AC–3 Encoders have been successfully implemented on 20–bit and 24–bit word–length processors. However, it is generally assumed that 16–bit processing is incapable of delivering the high fidelity audio, expected from the AC–3 technology. Double precision computation can be utilised on such processors to provide the high quality; but the computational burden of such implementation will be beyond the capacity of the processor to enable real–time operation. Through extensive simulation study of a high quality AC–3 Encoder implementation, a multi–precision technique for each processing block is presented whereby the quality of the encoder on a 16–bit processor matches the single precision 24–bit implementation very closely without excessive additional computational complexity.