

ADAPTIVE DELTA MODULATION CIRCUIT

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ABSTRACT:

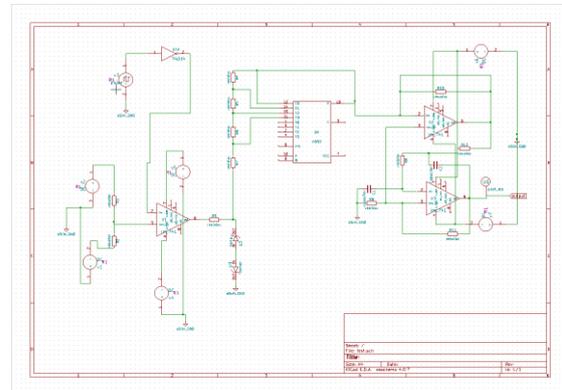
Refined form of modulation is called as delta modulation. This method was introduced to solve the granular noise and slope overload error causes during Delta modulation. This modulation method is similar to delta modulation except that the step size is variable according to the input signal in Adaptive Delta Modulation whereas it is a fixed value in delta modulation.

Keywords—Refined form of modulation, delta modulation, granular noise, adaptive delta modulation.

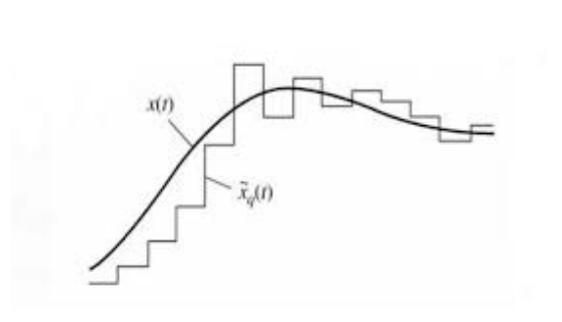
REFERENCE CIRCUIT DETAILS:

In Adaptive Delta Modulation, the step size of the staircase signal is not fixed and changes depending upon the input signal. Here first the difference between the present sample value and previous approximation is calculated. This error is quantized i.e. if the present sample is smaller than the previous approximation, quantized value is high or else it is low. The output of the one-bit quantizer is given to the Logic step size control circuit where the step size is decided. At the logic step size control circuit, the output is decided based on the quantizer output. If the quantizer output is high, then the step size is doubled for the next sample. If the quantizer output is low, the step size is reduced by one step for the next sample. Adaptive delta modulation decreases slope error present in delta modulation. During demodulation, it uses a low pass filter which removes the quantized noise. The slope overload error and granular error present in delta modulation are solved using this modulation. Because of this, the signal to noise ratio of this modulation is better than delta modulation. In the presence of bit errors, this modulation provides robust performance. This reduces the need for error detection and correction circuits in radio design.

DIAGRAM:



REFERENCE OUTPUT WAVEFORM:



REFERENCE:

https://www.researchgate.net/publication/26620058_A_2-bit_Adaptive_Delta_Modulation_System_with_Improved_Performance