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Technical Report:

**Digital Signal Processing of
Frequency Shift Keyed (FSK) Audio Signals**

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Abstract:

For information to be transmitted easier and with a shorter length wave, so that accordingly there would be no need of bigger Antennas in the destination, it has to be modulated on a carrier wave with a much greater frequency. Modulation could be in the forms of frequency, phase and domain. In frequency modulation each kind of data (0, 1) or a sequence of data, is sent with a special frequency (tone) on the signal (carrier). In this work many audio signals that have been Frequency Shift Keyed (FSK) are analyzed. Different methods for extracting the number of tones, their values (in Hertz) and symbol rate (symbol length) from signals are studied and implemented and their results are analyzed. Afterwards, using these extracted items as features, methods for classifying these signals is studied. After classification a look-up table is used to extract more precise features of signals. Finally, using Partial Fourier Transform, frequencies of different parts of the signal (for each part equivalent to one single wave length), and consequently the raw bits and symbols of the signals are extracted. The results for extraction of tones, symbol rate, symbol length, and decoding were comparable.