

# PSK Data Transmission in Medium Wave Broadcasting System

March, 1995

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This thesis describes the medium-wave AM radio broadcasting system used for low-phase-deviation PSK data transmission. Expressions for the  $2\phi$ ,  $4\phi$ ,  $8\phi$ , and  $16\phi$  low-phase-deviation PSK signals are given on the basis of the general expression for the low-phase deviation PSK signal.

Power spectra for the low-phase-deviation PSK signals were given by combination of the carrier and  $\sin X/X$  power spectra.

The PSK data encoder and decoder are used together with the medium-wave AM radio transmitter for low-phase-deviation PSK signal transmission.

The performance of the system for low-phase-deviation PSK data transmission is evaluated in terms of the BER (Bit Error Rate) and CNR (Carrier to Noise Ratio) of data.

A data rate of 1,200 bps, 2,400 bps, or 4,800 bps, and a number of phases of  $2\phi$  or  $4\phi$  were found to be used for the low-phase-deviation PSK data transmission system.

The low-phase-deviation PSK signal is superimposed on the AM radio signal. The Incidental Phase Modulation (IPM) has occurred in the AM radio transmitter due to amplitude modulation. The SNR (Signal to Noise Ratio) on the AM radio transmitter is degraded due to PSK. The IPM and SNR are used as parameters to evaluate the signal quality degradation.