The thesis embodies results of investigations on some phase locking techniques and their applications to Communication carried out at the Institute of Radio Physics and Electronics, University of Calcutta and I. I. T, Kharagpur during the period from 1964 to 1968.

We have examined two types of phase locking techniques which we call carrier phase and sideband phase locking techniques. An arrangement is called a carrier phase locking circuit if the synchronisation information is obtainable even when the signal is unmodulated. In a sideband phase locking circuit on the other hand the synchronisation information is obtainable only when the signal is modulated. Such classification will be found useful in focusing attention on some central properties of locking techniques.

In present day communication technology almost all optimum reception systems use phase coherent techniques. This is true not only of digital systems where time coherence is essential in addition, but also of many analog systems.

In the present thesis a study has been made of the characteristics of several locking techniques applicable for a few typical analog/digital communication systems. Special arrangements needed when the sync data are intermittent have been considered. The study includes evaluation of system performance in the presence of noise and interference.

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