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## Evaluation of electrotherapeutic sleep by evoked potentials

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Electrotherapeutic sleep devices have been used to treat patients with various disorders. However, analysis of these devices has been, for the most part, empirical. This study has been designed to evaluate the feasibility of producing sleep in a variety of subjects without the use of sedatives and narcotics.

The study is treated in a two-fold manner: (1) detection and evaluation of physiological changes in evoked scalp potentials due to small rectangular currents (0 - 1.5 ma average) (2) detection and evaluation of changes in evoked potentials due to the induced sleep state. The recording system employs a Northern Scientific Model NS 544 Digital Memory Oscilloscope for on-line data retrieval. An electronic cancellation network has been designed to remove artifact signals produced by the electrosleep currents. A potential is coupled to a sampling network placed in series with the electrosleep current. The voltage is inverted, amplitude adjusted and fed through a variable phase lead-lag network. The composite brain signal (electrosleep artifact and evoked potential) and the sampled signals are then summed by an operational amplifier and fed to the computer for averaging. The stimulus is a rectangular constant current pulse initiated at a limb.

During the initial phase of the study squirrel monkeys were used to standardize the recording technique and to determine the physiological effects of the rectangular currents. The final stage treats human volunteer subjects in the quantitative study of sleep.