Thesis Title A Study on the Design and Construction of the Equipment for Electromyography, Nerve Conduction Velocity and Somatosensory Evoked Potentials

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ABSTRACT

The design and construction of an equipment for electromyography, nerve conduction velocity and somatosensory evoked potential were studied in order to use for diagnosis of the diseases of muscle and nervous system in general hospital. This design and construction were performed in3 parts as the amplifier part,the electronic stimulator part and the averager part.

This constructed equipment was tested technically,and the results are obtained as follow. In the amplifier part, the common mode rejection ratio is 102 dB at frequency 50 Hz, the frequency response is 0.1 Hz to 15 kHz,the maximum amplification is 100,000 and the sensitivity for the lowest signal detection is 10 uV, using the signal averaging technique for signal elimination. In the electronic stimulation part,it is able to produce a waveform having frequency varying from 1 to 100 Hz, the waveform duration is variable from 0.01 to 1000 milliseconds,

the constant voltage output power of the stimulator is variable from 1 to 150 VDC, the isolation system is a transformer type. In the averaging part, the data sampling is 2000 times per second, the maximum averaging is 250 times. The averaging amount and the response time are displayed numerically in 3 digits. At a normal operation, the leakage current is 0.25 uA. From these technical results, this equipment can be utilezed both as electromyography, and for nerve conduction velocity measurement, but could not be used to record somatosensory evoked potential because the sensitivity is too high.