THE VISUAL FIELD EXAMINATION AND ITS AUTOMATION

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ABSTRACT

An automated system for examination of the visual fields is described. The entire campimetric examination was simulated in order to enable an in-depth analysis of actual examinations. The program runs on a HP2100 computer with a 16K core.

The main advantages of the system are: greater speed, less patient fatigue, greater reliability, repeatability and accuracy.

The visual field examination is used not only for the fine semiology of visual field defects already known, but also for early diagnosis or mass screening procedures. Two general types of measurement are available. The simplest alternative is the basic data logger (campimeter/converter combination with a plotter or punched tape output) which has no on-site computational capability for controlling the course of the examination, monitoring the patient and analyzing data. On the other hand, when simultaneous data analysis and control based on results are required, an on-line computerized system has to be used.

Our system consists of a remotely controlled campimeter driven by a minicomputer, a visual display and a storage unit (Fig. 1). Important features of the use of the minicomputer are the following:

a) control of the campimeter;
b) correction of data according to patient supplied parameters and their conversion to a standard form;
c) compensation for changes in the patient's state of alert;
d) log or display of the results and their memorization.

An important advantage arising from the use of the computerized campimeter is an increase in accuracy and dependability of the results. At the same time, skilled people are released from the task of performing tiresome campimetric examinations.

Before going into some details of our project, it may be helpful to describe the shortcomings which occur when the examination is performed directly by a human operator:

a) The operator cannot take into account the complex relationships existing among the various factors which may bias numerical values collected during the examination, e.g. latency time, age, attention.
Fig. 1. Block diagram of visual field examination using a computer.

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