



*Advancing the Science of Vision Testing*

## **VEP/EEG Technology Explained**

Sensors placed on the head will record “brainwaves” (the electroencephalogram or EEG), and when properly enhanced, this electrical activity from the brain can be displayed on a monitor. The pattern of the brainwaves changes with whether the patient is fully awake and alert, or drowsing, or sleeping. EEG is typically used in clinical studies of epilepsy to assist in localizing the part of the brain in which seizures occur.

The Visual Evoked Potential (VEP) occurs when a patient observes a visual stimulus, such as a flash of light, or a pattern on a monitor. The size (magnitude) of the VEP is very small, even smaller than the background EEG of which it is a part. With appropriate enhancement, and the presentation of a number of identical visual stimuli, the VEP can be visualized and measured.

VEP recordings have been employed to assess the status of the optic nerve. In cases of optic nerve inflammation, for example, the transmission of the visual pathway is slowed, and this can be visualized as a delay between the timing of the stimulus and the VEP response from the visual cortex. It has also been employed in cases of suspected “malingerers”, since is very difficult to “fake” a VEP test.

The Diopsys NOVA is able to utilize the VEP to measure the function of the entire visual pathway, from the lens of the eye to the visual cortex of the brain, allowing the clinician to detect abnormalities in vision. These abnormalities are often subtle and difficult to detect by other means. The NOVA produces visual stimulus consisting of an equal number of black-and-white squares (checkerboard) or lines (horizontal or vertical). These stimuli are reversed twice per second and the electrical response is measured in micro-volts. The clinician may then compare OD, OS, and all responses. Additionally, the clinician may wish to study VEP as it changes with therapy (patching, drops, prisms, lenses, or other modalities).

The eye of the bars may be compared with snellen characters when viewed at an appropriate distance.