Digital EEG System from Grass
George Dib
Biomedical Engineering Department
University of Rhode Island

Introduction (EEG waves):
1. *Alpha* (7.5 to 13Hz): caused by relaxation best seen in the posterior region of the head.
2. *Beta* (14Hz and greater): Accentuated by Sedative-hypnotic drugs (Barbiturates). Seen on both sides of the head.
3. *Theta* (3.5 to 7.4Hz): Seen in generalized distribution in diffuse disorder or metabolic encephalopathy. Abnormal in awake adults.
4. *Delta* (3Hz or below): Dominate in stages 3 & 4 of sleep and it have highest in amplitude and the slowest wave.

Digital EEG System:
The EEG is used as a diagnostic aid in primary brain disorders.
Operation Of the digital EEG System:
1. The location of the scalp electrodes is decided by using the **10-20 System**. Using identifiable skull landmarks as reference points the equally spaced electrode positions are assigned.
2. **Electrodes**:
   a. The Gold electrode (most used Light reusable and easy to clean).
   b. The Silver-Silver Chloride (Ag-AgCl).
   c. The plantium needle.
   All Three types have the same conductivity.
3. **GRASS MINI ELECTROD BOARD** is connected to the EEG.
4. The **AMPLIFIER SYSTEM** is the heart and the soul of any digital EEG system located in the lower section. The Quad Neuroamps amplifiers designed specially for neurophysiological measurements. It is a differential amplifier. It has tow floating inputs an active input and common reference input for all active inputs. The amplifier is effective in canceling the unwanted phase signals by measuring the voltage difference between the two electrodes. This will leave out all the noise introduced into the input.

5. Variable gain and filter settings produce the highest signal quality and resolution. The signals then appear on a high-resolution monitor.

Features:
Powerful Windows 95 based recording and analysis software.
POLYVIEW:
1. Allows recording up to 128 channels of EEG data.
2. Creating or editing the patient file is easy just by selecting a recording montage and the calibration.
3. Pre-programmed and free-text annotations to be placed in the EEG during a recording.
4. It has a " Look-Back" feature, which splits the screen to compare the real-time recording in one window to an earlier portion (or another recording).
5. Change the display parameters meaning having variable gain, digital filtering and time scales.
6. Provided by a built-in record able CD-ROM drive for long-term data storage.

Grass's digital EEG is the only system capable of true bipolar recordings. This system brings the accuracy dependability and ease of operational GRASS system into the digital arena.