

A unit for detecting, memorizing and recording peak voltages

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In experiments where multiphasic field potentials are continuously averaged and plotted on an analogue pen recorder, it is difficult to appreciate changes in amplitude of the component waves in the complex without manually plotting a graph of those amplitudes during each experiment. A unit was therefore devised which recorded the amplitude of each peak relative to the baseline and plotted out the results on a chart recorder. It was designed to be interfaced with the analogue output of an averager.

The analysing circuit (shown in part in Figure 1) makes extensive use of high input impedance operational amplifiers and digitally controlled solid state switches. All voltage holding circuits were chosen to be analogue rather than digital for simplicity, speed and accuracy. The circuit consists of a sample and hold amplifier recording the value of the pre-stimulus baseline which will be subtracted from the maximum field potential appearing at the output of the peak detector. The input signal is gated by the solid state switches to each of these sample and hold and peak detector circuit modules. The digital control circuit is designed in such a way that by easy external adjustment, these switches can be independently closed for carefully chosen periods during the analyser sweep time. The unit is currently used as a two-channel positive peak detector, but any combination of these circuit modules can be used so that negative or positive peak voltages can be recorded and referred to any other point in, or before, the waveform under investigation.

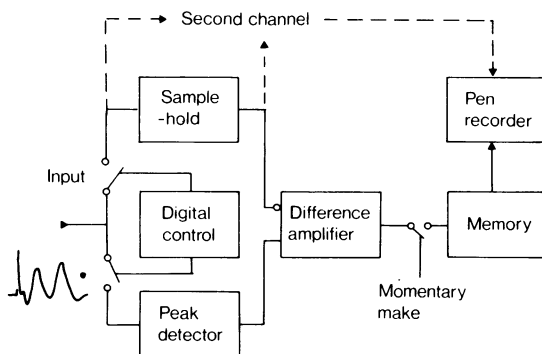


Figure 1

The level at the output of the difference amplifier is switched into the memory circuit at the end of a cycle and this level is held until the next sweep of the analyser. Drift rates of 6 mV/h (for signal inputs of ± 3 V) can be achieved with care in printed circuit layout (Underwood, 1972). The output of the memory circuit is then presented to a pen recorder so drawing a graph of peak voltage values against time.

Although originally designed to interface with the output of an averager with an output sweep of 20 s, the circuit has proved to have a bandwidth of DC-300 Hz. It could therefore have considerable further uses in measuring, holding and recording peak voltage values of selected parts of any waveform within the limitations of its bandwidth.

Reference

UNDERWOOD, R.K. (1972). National Semiconductor, *Application note AN-63*.

How to apply drugs to the ventral surface of the brain stem in anaesthetized cats (T)

W. FELDBERG & P.G. GUERTZENSTEIN

Does activation of 5-HT neurones support self-stimulation? (T)

T.J. CROW & J.F.W. DEAKIN