

## Low cost PC-based seismic refraction recording system

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A 24 trace seismic refraction recording system has been developed for MS Windows platform. The heart of this system is a two-channel component which digitizes the seismic signals using the 16 bit PC sound card. It is a complete software based data acquisition solution with only two geophones connected to the audio input of a laptop. The sampling frequency, record length, number of traces per record and other recording parameters can be specified using a setup interface. A special spread geometry has been designed for data acquisition, where one geophone is fixed at the origin while the other moves away at increasing offsets. Data is acquired for each moving geophone offset using a hammer or weight drop as an energy source. The first geophone trace is processed to automatically detect events and pick the first arrival time which is used as the starting instant for the second geophone trace. All samples before this time are clipped while an equal number of zero samples are padded at the end to complete the trace length. The final trace from the second geophone is added to the field record. In this way for each offset point a trace is added and a 24 trace record is completed. All the acquired traces are displayed on screen in real time (Fig. 1). The software provides interactive tools for deletion and retake of any bad traces. Using digital signal processing techniques automatic gain control, notch filter and band pass filter have been incorporated for initial processing of raw data to enhance the weak events from far offsets and suppress any coherent noise. The final record is saved in SEG-2 format. This system completely simulates a 24 channel seismic recorder, commonly used for shallow seismic refraction surveys.

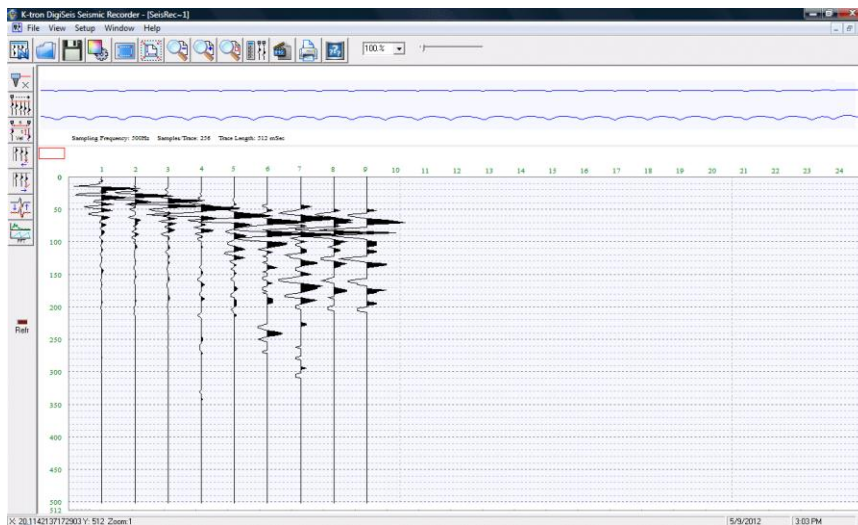


Fig. 1. PC based Seismic refraction recorder interface showing some recorded traces.