

## COMPUTER APPLICATIONS WHILE DRILLING

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There are currently a number of computer systems available for data acquisition and display on drilling rigs. Most systems use microprocessors and analog-to-digital (A/D) converters to provide a form of digital display. The display usually consists of five to twenty channels of data acquired from various sensors located on the rig.

The present systems convert sensor data, via the A/D converter and microprocessor, to engineering units for display and use by an operator. Some systems provide a printer to capture this data for future analysis. Often preset alarm set points are checked by the microprocessor and lights, relays, or sounding devices are actuated when a given set point is reached. Channel names, units, and data are displayed on liquid crystal displays, cathode ray tubes (CRT), or analog meters.

Some manufacturers provide relatively small indicating heads, however most are affixed to a driller's panel and are not portable. The small display devices generally display only one function or group of related functions. A CRT with appropriate selection switches can provide more channels of data and a method of looking at selected data from the microprocessor's entire data base, perhaps dozens of channels. Colour CRT displays provide a method of decreasing the clutter of many channels. This display is, of course, large in size.

An 8- or 16-bit microprocessor is used to scan a group of channels and provide the calculations to display data in engineering units. A programme is stored in read only memory to control the sequence of events. Generally, little user control exists as a fixed sequence of channels is displayed. The user is sometimes allowed the flexibility of turning a selected channel on or off and is always allowed to set the required alarm point. Considering today's high cost of drilling operations, the inflexibility of many current data acquisition systems provides little to help optimize the use of the data gathered or to increase drilling efficiency. The topical subjects presented here are the following :