The Logic State Analyzer, a Viewing Port for the Data Domain

A new logic state analyzer has expanded capabilities that speed the location of the sources of problems in digital systems and broaden the range of problems that can be resolved with this class of instrument.

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ENGINEERS DEVELOPING DIGITAL systems—especially those that involve microprocessors—now find themselves more concerned with word flow than with waveforms. But until recently, it was considerably more difficult to perceive word flow within an operating system than it was to view waveforms.

This situation was improved two years ago when a new kind of instrument, the parallel-mode logic state analyzer, was introduced.[1] The first of these instruments, the Hewlett-Packard Model 1601L, monitored data buses or other multinodal locations in a digital system, "captured" a sequence of digital words as it occurred there, and displayed the sequence as a table of 1's and 0's.

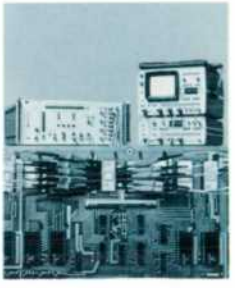
With the insight provided by this instrument, it became much easier to trace data flow and track down problems in digital systems. Digital designers who have had the opportunity to use this instrument now find it indispensable for analyzing and troubleshooting the digital systems on which they are working.

New Directions

Two years' experience with the Model 1601L has uncovered a number of additional capabilities that such an instrument might have. These capabilities have now been incorporated in a new logic state analyzer, Model 1600A, which works with or without a companion instrument, Model 1607A.

Basically, the Model 1600A (Fig. 1) works like the earlier Model 1601L: digital data appearing in parallel on several different lines is monitored through a multi-probe system and clocked into the instrument in synchronism with the clock or other pulses from the system under test. When a preselected trigger word appears on the data lines, the instrument stores the trigger word and the next 15 words and then displays the stored data in tabular form. Digital delay may be introduced making it possible to view the 16 words that occur as many as 99,999 clock periods after the trigger. Alternatively, the instrument may be set to store data continuously and then stop acquiring data when the trigger occurs. The 15 words leading up to the trigger word are thus captured for study.

Data acquisition and display cycles may alternate repetitively, or data may be acquired once and then displayed continuously until the RESET pushbutton



Cover: *Multichannel is the byword as new test instruments are developed in response to the accelerating rush to digital electronics. Described in this issue is the latest logic state analyzer, which gives a multiport view of what's happening in an operating digital system, and an eight-channel word generator for supplying the multichannel bit patterns needed for digital testing.*

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