High Speed Data Acquisition Utilizing an IBM 1800 Computer

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On-line real-time testing of space flight data processing hardware systems creats a unique challenge to the hardware and software systems of a 2 microsecond computer, such as the International Business Machines model 1800 process controller. The supported system software, for this machine, is oriented around a multi-device slow scan data collection system.

The high degree of complexness and inefficiency of the released input/output software packages virtually guarantees their inability to handle high speed data. In order to overcome this difficulty; digital input, digital output and interrupt servicing must be taken away from the system rhelm and tightly programmed to guarantee efficient operation. This goal is accomplished with full I/O overlap as an absolute prerequesite.

System programs by virtue of their generality are designed to inhibit high speed data acquisition in many insidious ways. Thus not only must real time input/output be tightly programmed but also code conversion routines, time clock routines, printer software drivers and even mass storage media software (such as magnetic tape or disk files) must be expunged of surplus coding.

This paper will present some of the methods we have used to converse with space flight data system computers during ground qualification testing.