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## Microprocessors

The term "microprocessor" as used today in the industry literature, has two possible meanings:

1. An LSI processor on a single chip.
2. A microprogrammable processor.

It is unfortunate from the literary standpoint that we use a word with two meanings; however, it is perfectly acceptable as a title for the series of sessions entitled "MICROPROCESSORS" at NCC 75 because both subjects are dealt with in these sessions.

LSI single chip processors are now becoming, very quickly, a mature design component from the standpoints of cost, availability, and performance. Microprogramming techniques have been around for a number of years as they were the prime innovation in third generation computers. The combination of the two makes a very powerful team which is undoubtedly the leading direction for the future of the industry. It is expected to cause the next major evolution, not just in the computer industry but in the total electronics industry much like the transistor did a couple of decades ago. The sessions are organized in a manner that presents both the hardware and software aspects of the state of the art.

The first session consists of three papers intended to address some of the fundamental topics of LSI microprocessors in a tutorial fashion utilizing state of the art components as examples. The first paper entitled "Microprocessor Rationale" examines some of the basic philosophies and design trade-offs and introduces the Signetics PIP microprocessor. The second paper presents the industry's first 16-bit LSI single chip microprocessor (National Semiconductor's PACE) from a user's viewpoint and explores applications that would benefit from such a product. The third paper addresses the important issues of I/O and data transfer techniques using Motorola's M6800 as an example.

The second session which is entitled "Microprocessors at Work" provides both an overview and specific examples of microprocessor applications in data communications, process control, numerical control, instrumentation and intelligent terminals.

The third session which is entitled "Bipolar Microprocessors" is intended to provide a forum for wider publicity and awareness of the state of the art developments in the area of bipolar LSI microprocessors. These devices are currently in the process of emerging and there is a large degree of interest in them due to their inherent high speed which is about one order of magnitude higher than the currently available MOS devices. Their prime applications will be in the implementation of high performance systems. Intel, Monolithic Memories, and others will present their cases in that session.

The fourth session is entitled "Microprogramming and Microcomputer Programming." This session treats the important considerations of the development and maintenance of software for microprocessor. Individual papers in this session include "An Emulation System for User Microprogramming," "Testing and Sequencing in Microprogrammed Computers," "Optimization Techniques for Horizontal Microprograms," and "Engineering and Maintaining Microcomputer Software."