Abstract of Paper Submitted to Datafair 71

1 Title - MINIC - An 8-Bit Microprogrammed Minicomputer

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5 Significant Features - Classification L1 CPU Design

Paper explores relations between instruction sets, order codes, programming and applications in minicomputers. The possibility of an 8-bit instruction-length, data unit, machine is examined, and a complete machine of this type is described and contrasted with machines of larger word-length.

6 Abstract - As part of a program of research into instruction-sets and order-codes of computers in relationship to applications and costs, an 8-bit word-length machine, MINIC, has been developed and is now in commercial manufacture. This paper analyses the design objectives behind this machine and compares it with alternative machine designs.

MINIC is a modular, microprogrammed minicomputer based on a set of functional blocks which may be plugged into standard hiway racking to form a range of specialized and general-purpose computers, controllers and data-communication systems.

In the paper attention is focussed on a particular instruction-set for the computer in which an 8-bit 'byte' is both the unit of data and of programming. The majority of instructions in this set are single-length and occupy one byte - all data operations operate on one or two bytes to produce a one-or two byte result.

Programs may be executed and data referenced in up to 65Kbytes of store. Operations available include byte multiplication and division, half-word operations for character-handling and decimal arithmetic, and stack manipulation of the operand registers. A change-environment instruction automatically saves the eight programmer-visible registers on entering a new program, and may be executed by an external-device on the 254-level priority-interupt system.

The data-structure addressing techniques are such that any arithmetic or logical operation on single byte words is readily extended to multiple byte words up to 256 bytes. Thus the machine may be thought of either as a single-byte machine with an exceptionally compact instruction set, or as a variable word length machine with an extremely flexible instruction set.

8 Publication clearance - not required