

## NCR family utilizes emitter-coupled logic, 64K-bit memory chips

NCR's new V-8600 family features the first use of 64K-bit memory chip technology in a large-scale system, as well as the first use of ultrafast emitter-coupled logic circuitry in a commercially available general-purpose computer, according to the company.

The new family is based on NCR's migration path engineering concept. The manufacturer notes that this allows transport of applications software, compilers, and other software from the smallest N-mode 8000 series or NCR Century system on up through all N-mode and V-mode systems, including the large-scale V-8600 family.

In addition to extensive use of ECL 100K circuitry and high-speed random-access memory based on 64K-bit chips, the V-8650 and V-8670 feature high-speed cache memory, flexible internal transfer bus architecture, and multiple virtual machine capabilities. The largest V-8600 processor has approximately five times the internal processing power of the previous largest V-8000 series system, says NCR.

Both systems operate with NCR's Virtual Resource Executive, providing batch-processing, telecommunications, transaction-processing, data-base, and interactive application development capabilities. Languages supported include Cobol, Fortran, and RPG. The new processors and software also conform to NCR's Distributed Network Architecture.

The primary design characteristic of the V-8600 family is the internal transfer bus, a data highway to which all other system components are linked. Each data path of the transfer bus is 32 bits wide and can transfer messages between subsystems at a rate of 72M bytes/sec.

ECL 100K, an IC family with 750-psec gate speeds, is used in the processor subsystem. The processor cycles at 28 nsecs and uses pipelining for instruction execution. It breaks each instruction into segments—or stages of performances—and can process multiple stages at the same time.

The processor also includes a high-speed instruction storage unit for storing firmware or microcoded instructions loaded into the system via flexible diskette. The firmware interacts between the hardware and the software to give the machine its processing personality. The machine can be conditioned to process statements written in a specific programming language, thus providing faster compiling and execution than conventional non-language-oriented processors.

The systems' control unit employs two medium-scale processors which monitor all system elements continuously on a millisecond basis. The unit controls two visual-display stations and functions as the operator control center as well as a system-

diagnostics unit. Either of the system consoles or a remote console can be used to perform diagnostic routines concurrent with normal operations. The remote console can be located at regional or national service centers and linked to the system via telephone lines, according to NCR.

The input/output subsystem includes from two to four channel-control processors. These attach to the system bus and control up to 32 channels. Each channel has a 2M-byte/sec transfer rate. The channels feed directly into a switching center called the "dynamic channel exchange" which automatically routes the data flow to one of the channel control processors for transmission to other system elements. The distributed processor design, "front-ended" by the dynamic channel exchange, provides a high degree of reliability and speed in an area that has traditionally been one of the weakest links in the data processing environment, the company states.

A new peripheral for the V-8600 computer family is the 6550 disk unit, with a capacity of over 1 billion bytes of data and a 1.2M-byte/sec transfer rate. Other peripherals include printers with speeds up to 2000 lpm and magnetic tape handlers with recording densities up to 6250 bpi.

The V-8650 model features a single 28-sec main processor, 32K bytes of cache memory, and a 4M- to 8M-byte main memory. The purchase price, with 4M bytes of memory, is \$1,776,500. Under a five-year rental agreement, the basic processor and memory cost \$39,200 per month. The price includes operator console and two I/O channel-control processors serving up to 16 I/O channels.

The V-8670 model features 128K bytes of cache memory and from 4M to 16M bytes of main memory. Purchase price for the V-8670, with a 4M-byte main memory, is \$2,555,000. Under a five-year agreement, the basic processor and memory rent for \$53,500 a month. Also included are the twin-station console and two-channel control processors with 16 channels for I/O.

Purchase prices for typical complete configurations of the V-8650 system range from \$2.4 million to \$3.5 million; for the larger V-8670 the range is from \$3.8 million to \$5.3 million. For larger configurations, 4M bytes of additional memory carry a purchase price of \$196,800. The new systems will be available for customer delivery in the fourth quarter of 1980.

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4-page brochure contact Amrex Corp., 9215 151st St. NE, Redmond, WA 98052.

Solid-state disk. STC's 4305 disk subsystem, designed to replace the fixed-head disk, utilizes CCD technology. For 6-page brochure write Storage Technology Corp., 2270 South 88th St., Louisville, CO 80027.

DG mass storage. Brochure describes large capacity cartridge and fixed-head disks, diskettes, and mag tape subsystems. Write for #012-337-1 from Data General, Communication Services Dept., M/S 82310, 15 Turnpike Rd., Westboro, MA 01581.

PC vendors/products. *Guide to Personal Computing* categorizes and compares over 600 products from 65 vendors. Includes vendor directory. The *Guide* is \$25 from Alltech Publishing, 212 Cooper Center, Dept. 1, North Park Dr. & Browning Rd., Pennsauken, NJ 08109.

MPU testing. Book discusses use of signature analysis in microprocessor and LSI circuit testing and diagnostics. For more information contact Gerald Trussell at Phoenix Digital Corp., 7745 E. Redfield Rd., Scottsdale, AZ 85260; (602) 991-6360.

Beckman catalog. 12-page short form summarizes specs for resistor networks, potentiometers, turns-counting dials, LCDs, and planar gas discharge displays. Contact Beckman Instruments, Electro-Products Sales Operations, Tech. Info. Dept., 2500 Harbor Blvd., Fullerton, CA 92634; (714) 871-4848.

Distributed processing. Brochures describe features of Honeywell's Distributed Systems Environment; include diagrams of different distributed systems structures. Write Honeywell Information Systems, 200 Smith St., M/S 461, Waltham, MA 02154.

Oscilloscope tutorial. "How to Use an Oscilloscope" is a 76-minute program featuring H-P scopes but applicable to use of all scopes. Descriptive brochure is available from Inquiries Mgr., Hewlett-Packard, 1507 Page Mill Rd., Palo Alto, CA 94304.

Microcomputer I/O. Free 74-page catalog gives specs and prices for microcomputer analog I/O systems. Covers DEC LSI-11, Intel SBC-80, Zilog Z-80 MCB, MCS and others. Write Data Translation, 4 Strathmore Rd., Natick, MA 01760.

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