

Computer Systems Hardware

HIGHLIGHTS IN DEVELOPMENTS of computer systems hardware were the announced availability of a number of optical readers, improvements in disk storage capabilities, and improved features in many computer systems. This article lists a number of advances as announced by manufacturers, illustrating the directions that these advances are taking. The list is necessarily incomplete and the hardware is described without verification or critical evaluation of claimed capabilities.

Paper tape and punched cards

A Univac paper tape reader-punch accommodates five, six, seven and eight channel tape with complete severance of the chad after punching. Operating on line it reads at 500 characters per second, punches at 100 characters per second, and is limited to six data channels.

The Univac 5440 optical scanning punch can read at the rate of 9,000 cards per hour. Data designated by pencil marks on source document cards can be read and punched.

The American Bosch Arma paper tape reader-recorder employs an electrostatic charge deposition technique to record coded information as permanent visible dots without punching or chemical processing. The Tele-Buffer combines a 300 characters per second record and a 10 characters per second read suitable for direct entry into a teletype machine at 100 characters per minute.

Magnetic tape systems

A Thompson-Ramo-Wooldridge magnetic tape system has been designed for use with

the 130 Stored Logic digital computer. A single magnetic tape set consists of a 192 magnetic tape controller and one to four 170 tape units. Controls permit selection of tape recording densities of either 200 or 556 bit rows per inch. Speed of tape is 75 inches per second, with a transfer rate of 90,000 bits per second at high density.

Start/stop, reverse/stop, and forward/reverse operations may be made on the Potter Instrument MT-120 at a rate up to 200 commands per second. Data transfer rates up to 242,000 bits per second are possible using continuous double-transition high density recording techniques, and up to 62.5 kc using standard techniques.

The random access Facitape ECM 64 Carousel features a platter which holds 64 tape reels, each containing 29½ feet of 5/8 inch, eight-track magnetic tape. Average access time of this random access device is approximately two seconds. Packing density is approximately 200 bits per inch; tape speed is 16.4 feet per second.

IBM has brought out a cartridge for automatic loading and unloading of magnetic tape for use with Hypertape drives on the IBM 7074, 7080, 7090 and 7094 systems. The loader holds a cartridge of tape in reserve while another is being processed; when the first is finished the second automatically is moved into processing position.

Honeywell's recent tape system is the superdensity magnetic tape system which is capable of reading 186,000 decimal digits a second. Forty-four percent more data is written on the tape by the new system than by the

Honeywell high density system, and about 100 percent more than by the standard tape system.

Printers and plotters

The General Dynamics SC 3070 is a new and comparatively noiseless message printer which can print at speeds up to 3,000 words per minute. The printer operates asynchronously and uses standard code. The 3070's electrostatic printing process uses the Charactron tube by which beam-formed images are optically projected from the tube onto light sensitive paper.

The Clary Corporation Model E2000 military printer features "hypocycloidal" printing action accomplished by a compound motion of the type drum as it rotates at constant speed of six to ten lines per second in 12 to 21 columns. Each column displays 12 characters.

The Transdata TD-943 Microfilm Printer is an ultra-high speed electronic printer for use as an output for large or medium scale computer systems. The TD-943 prints information, plots curves or draws lines at computer speeds on a cathode ray tube and records this data on microfilm or photographic paper. Speed is up to 62,500 characters per second.

The Benson-Lehner Model 1155B Electroplotter J and magnetic tape converter system provides automatic plotting of points, symbols and digits, and draws line graphs from digital data recorded on magnetic tape or punched cards. Points can be plotted at rates up to 300 per minute to an accuracy of 0.05 percent of full size or 0.015 inch.

The California Computer Products 580 magnetic tape plotter uses 556 bit per inch tape and has been designed for off line digital plotting. The system includes a 565 plotter which produces fully annotated plots up to 120 feet long and 11 inches wide at 18,000 line segments per minute.

Optical readers

The RCA Videotape accepts documents from 2½ to 8½ inches in width, 2½ to 4 inches in height. It utilizes a vidicon tube to recognize numbers, letters, and special symbols, handling up to 79 characters on a line. It can be operated on line with a 301, processing up to 90,000 documents per hour, or off line to segregate copies.

Direct conversion of printed information to magnetic tape for use with computing systems can now be accomplished with the Univac Optical Character Reader. Provision of a plugboard control permits a variety of data arrangements for scanning and checking features which help to insure a high degree of accuracy. The unit can read alphanumeric characters and has mark scanning capabilities; both operations can be performed on the same document.

The IBM 1428 Optical Reader reads all alphabetic letters as well as 16 numeric and special characters, to be used as a direct input device with the 1401. Reading speeds of the 1428 are up to 480 characters per second from as many as 400 documents a minute.

Image storage and retrieval

Continuous forms from any punched card tabulator or high speed computer printer can be reproduced without separation by the 575 Tab-Tronic microfilm recorder (Bell & Howell). The 575 makes high speed microfilm copies of sunburst fanfold continuous forms, automatically feeds, microfilms and stacks the refolded forms in their original sequence.

The Space General Corporation's "Microspan" is a new information storage technique which records 100 printed pages full size on a single piece of film. The process is useful in libraries and research centers where storage space is a problem, as well as where automatic indexing and retrieval are not feasible. The new storage device consists of two plates of photographic film positioned face-to-face which record data in a polka dot arrangement.

Memory

RCA's word-addressed memory stack is capable of a complete read/write cycle in 300 nanoseconds with less than 350 m.a. drive current, utilizing ferrite cores.

Development of a compact, welded module, miniaturized, and extremely flexible coincident current memory system called the Isodrive Memory, Model SE 1440 Z1, was announced by Electronic Memories Inc. Primarily designed for airborne applications in satellites or missile systems, the Isodrive Memory can also be used in small mobile military ground systems. Capacity is 1,440 bits. When used as a buffer, the unit provides a 100 kc reading or

two megacycles.

Burroughs' recently announced disk file data communications system provides 20 milli-second access to 960 million characters of alphanumeric information. The system employs a fixed read/write head for each information track. The storage is expandable in modules of 9.6 million characters each to a maximum of 480 million on the B200 equipment, and 960 million on the B5000 system.

Computer systems

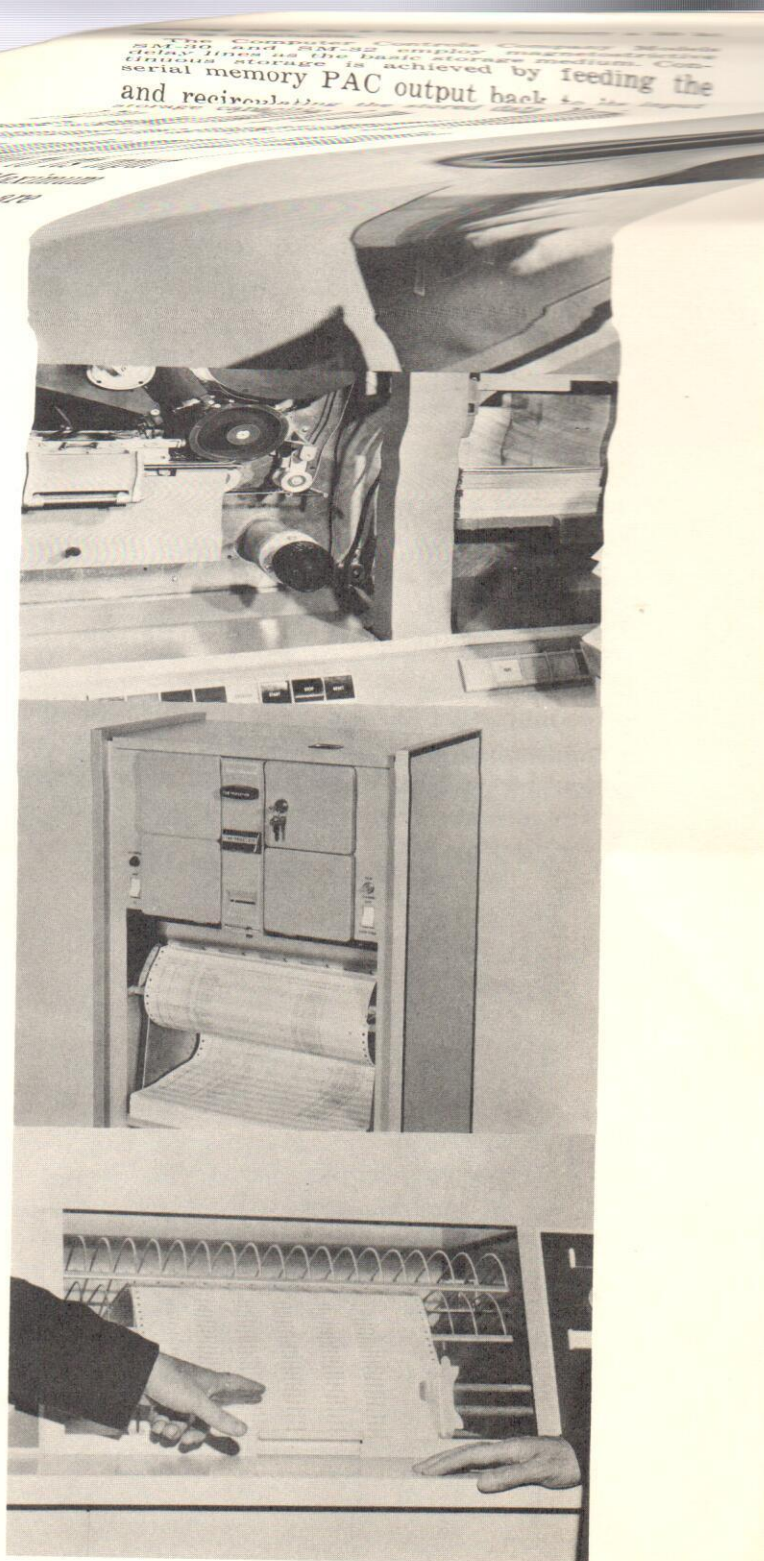
The PB 440 was announced by Packard Bell Computer Company. The dual memory stored logic system provides a flexible catalogue of instructions with a five microsecond memory, 24 bit word, 4,096 to 32,728 words, and a one microsecond nondestructive read. The basic orders, called microsteps, are decoded to enter a subroutine to perform the desired function.

The Univac 1004 Card Processor is machine accounting equipment about four times faster than conventional equipment and incorporates an eight microsecond magnetic core memory. User interest in such a sub-1401 system has apparently been substantial and sales figures are projected at about 300 systems per month.

The IBM 1440 features the new 1311 disk storage with interchangeable packs of six 14-inch magnetic disks. It lies between the Univac 1004 and the IBM 1401 in capability. The 7010 was also announced to fill a gap between the 7070 and 7074. Typical average instruction times for the IBM sequence are 250 microseconds for the 1401; 120 for the 1410; 85 for the 7070; 33 for the 7010; and 22 for the 7074.

The Philco 2000 computer series was provided with a new satellite system including disks operating at 960,000 characters per second and 240 kc tapes. The system can per-

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