IBM 3740 System With Flexible Diskette
A versatile system for entering information into a computer—with a dramatically different look in data storage media—has been announced by International Business Machines Corporation.

The IBM 3740 data entry system incorporates a flexible disk cartridge for capturing data called the IBM Diskette. Weighing just over an ounce, the flexible diskette resembles a small phonograph record, yet can store as many as 242,000 characters—equivalent to a box and a half of 80-column cards.

Components of the system are:

- The IBM 3741 data station, which includes a single keyboard, visual display unit, one or two diskette drives and the optional ability to communicate over telephone lines directly with a central computer
- The IBM 3742 dual data station, with two keyboards, two diskette drives and a shared visual display
- The IBM 3747 data converter, which can hold up to 20 diskettes for conversion to magnetic tape
- The IBM 3713 printer, that can be attached optionally to the 3741 data station to provide hard copy of data recorded on diskettes or information transmitted from a central computer.

To record data, an operator simply drops a diskette into a slot in the work station and begins keying directly from a nearly noiseless typewriter-like keyboard. As information is entered, it appears on the visual display unit before being recorded on the diskette. This allows the data to be verified at a glance—greatly reducing keying errors and helping the operator work more productively.

The 3740 system is designed for ease of use. For example, operators at single data stations in separate departments of a company can be helped in keying correct information by a guidance feature of the system’s visual display unit. While the operator is keying, two lines of information are flashed on the screen containing the type and format of data to be entered—simplifying the operator’s job.

The IBM 3540 diskette input/output unit, also announced, can be attached to an IBM System/370, permitting data recorded on diskettes to be entered directly into the computer. This high speed unit can hold up to 20 diskettes at a time and read more than 5,000 data records per minute into a System/370. The 3540 also has the capability to receive information from the computer and record it on a diskette at more than 2,000 records per minute.

Prices of the 3740 data entry system depend upon the particular configuration. A system consisting of two 3741 data stations, eight 3742 dual data stations, and a 3747 data converter would cost $88,450, or rent for $2323 per month. The IBM 3540 diskette input/output unit has a purchase price of $22,000, or rents for $535 per month.

The IBM Diskette may be purchased in quantities of five for $40.

First customer shipments of the IBM 3740 data entry system are scheduled to begin in the second quarter of this year. The 3540 is scheduled for first customer shipments in January of next year. The 3740 and 3540 were developed at IBM facilities in Rochester, Minnesota, where they will be manufactured.
Solid State Scientific Introduces Two New Monolithic CMOS-Bipolar Devices

Solid State Scientific has announced the addition of two new monolithic integrated circuits to be included in the company's SCL 4400A high performance logic series.

Both of the new offerings are decade counter/7 segment decoders, the first (SCL 4426A) with display enable and featuring bipolar outputs and the second (SCL 4433A), ripple blanking with bipolar outputs. CMOS front end counting and decoding are employed to assure high noise immunity as well as low power consumption and each of the seven segment drive outputs are NPN Darlington transistors having sufficient current to directly interface with popular LED numerical displays.

The combination of bipolar and CMOS processing technologies in a single device eliminates the need for separate bipolar driver circuits in this application, thus effecting new efficiency and economy. Both devices are available in 1K quantities at a price of $5.65 each.

Dionics High-Voltage, Constant-Current IC Drivers For Gas Discharge Displays.

Dionics Inc. has developed a series of dielectrically-isolated monolithic integrated circuits—designated D1267N, -277N, -287N and -297N—for the constant-current driving of seven-segment gas discharge displays. The circuits are presently in volume production and are being supplied to several calculator manufacturers for driving Burroughs Panaplex I and Panaplex II displays and Sperry SP-734 and SP-754 panels. In making the announcement, George R. Seaton, Dionics Marketing Manager, stated that a new series of eight-segment drive circuits, including decimal point drive, are now in final stages of development and will be announced shortly.

The new Dionics drivers—in 18-pin plastic DIP configurations—are the first monolithic drivers commercially available that are capable of operating at up to 200 volts. Other units in the line are rated at 175-, 150- and 125-volts. Output current levels are externally programmable from 0.2 to 2.0 ma. Prices range from $3.77 each in single unit quantities to $1.50 each for 10,000.

Powerful Pocket Calculator Announced By H-P

A powerful electronic calculator, small enough to fit into a shirt pocket yet capable of performing the most complex business and financial calculations, was announced recently by Hewlett-Packard Company.

The new HP-80 differs from the HP-35 (Hewlett-Packard's original pocket-sized scientific calculator) in its built-in programming. The HP-35 solves functions with a single keystroke; the HP-80 solves equations with a single keystroke. Typical of the functions solved by the HP-35 with one keystroke are: log, ln, sin, cos, tan and \( x^2 \). Some of these functions are hard-wired into the HP-80 as subroutines within the single keystroke programs. In other words, the HP-35 has one level of programming, while the HP-80 has two levels.

The most important equations used in banking, finance, accounting and real estate have been programmed into the HP-80. Data is entered, then a key is pressed for the unknown. The HP-80 executes the appropriate program, calling upon all the required functions, each of which is wired into the calculator as a subroutine. Thus, the HP-80 executes the entire program needed to solve an equation, including the necessary subroutines, all with one keystroke.

Four temporary memory registers used in the HP-80 are arranged in a stack, in the same way as in the HP-35 scientific calculator. Like the HP-35, the HP-80 also uses reverse Polish (Lukawicz) notation. The combination of the stack arrangement and Polish notation is the most efficient way known to computer science for evaluating mathematical expressions. This scheme helps achieve the goal of packing a great deal of calculator power into a very small space.

The operational stack consists of four registers, X, Y, Z and T. The stack stores intermediate results and the calculator automatically recalls them from the stack when required for further processing. This eliminates the need for manual scratch notes or re-entry of intermediate answers. Only the contents of the X register are displayed on the solid-state display.

Numbers are entered into the stack from the bottom on a first in, last out basis. When a number is keyed in, it goes into the X register and is displayed. When 'SAVE' is pressed, the number is repeated in the Y register. At the same time, any number in Y moves up to Z, any number in Z moves up to T, and T is lost. When an operation is performed on data in the X and Y registers, the answer automatically appears on the display, and the entire stack drops.

Both the HP-80 and the HP-35 use specially-designed MOS/LSI (Metal-Oxide-
Semiconductor/Large-Scale-Integration) circuits using a low-power, high-performance ion-implantation process. The HP-80 uses seven Read-Only-Memories (ROMs) versus three for the HP-35. The four additional ROMs handle logic needed to solve these complex equations.

Answers appear on a 15-character solid-state display. Each digit of the light-emitting diode (LED) display is of passivated monolithic construction made up of seven segments. The inherent ruggedness and long life of these monolithic solid-state devices contribute to the reliability of the HP-80. Use of one digit for the decimal point results in excellent legibility.

Each key has a touch similar to the action of an electric typewriter. A vapor barrier used between the keys and their contacts reduces environmental effects on the machine.

The calculator is powered by rechargeable nickel-cadmium batteries with about five hours of operating time. An AC adapter-recharger is provided.

The calculator is priced at $395 and is sold directly by Hewlett-Packard. Deliveries will begin immediately.

Low Power LEDs From Xciton Corp.

Xciton Corporation has announced the introduction of the first in its new series of low power Light Emitting Diodes, the XC-200 and XC-300 series. The XC-200 is a low profile point source of light available in both clear and red epoxy lens, the high-profile version, the XC-300, has a magnifying lens also available in both clear and red.

These devices combine the inherent low power requirements and high luminance capability of Gallium Phosphide material to offer efficiency standards and brightness characteristics consistently higher than existing LEDs. GaP has quantum efficiency ratings 20 times greater than the more common Gallium Arsenide Phosphide materials.

Xciton lists luminosity specifications of typically three millicandella for the XC-300 series and .5 millicandella for the XC-200 series at operating currents as low as 10 milliamperes.

The XC-200 and 300 are direct replacements for the TIL-207 and TIL-208 devices.

The XC-200 and 300 are available through Comparator Corporation. Price in quantities of 1000 is $67 each.

Additional information is readily available by contacting Xciton Corporation, Dept. C, Shaker Park, Latham, N. Y. 12110.

Fortran IV Simulator for Intel 8008 One-Chip Computer

Intel Corporation has introduced a Fortran IV program for simulating the operation of Intel's 8008 computer-on-a-chip, a complete 8-bit CPU packaged in an 18-pin DIP.

The program, designated INTERP/8, is available from Intel on magnetic tape. It is also available under time-share arrangements with General Electric Timeshare, Tynshare Corporation and Applied Logic Corporation.

INTERP/8 accepts machine code produced by the INTEL 8008 Assembler, along with execution commands from a timesharing terminal, card reader, or disk file. The execution commands allow manipulation of the simulated system memory and the 8008 CPU registers. In addition, operand and instruction breakpoints may be set to stop execution at crucial points in the program. Tracing features are also available which allow the CPU operation to be monitored. INTERP/8 provides symbolic reference to storage locations as well as numeric reference in various number bases.

The addition of this simulator program completes a comprehensive set of hardware and software support to assist development of Intel's MCS-8 micro computer systems. Support now includes prototyping system, PROM programmer, hardware assembler, Fortran IV assembler, Fortran IV simulator, several control programs and a system interface and control module.

Delivery is immediate from stock and price is $750.

For further information in the U.S.A. contact Hank Smith, Micro Computer Systems Manager, Intel Corporation, 3065 Bowers Avenue, Santa Clara, California 95051. Phone (408) 246-7501. In Europe, contact Jens Paulsen, European Marketing Manager, Intel Corporation, Avenue Louise 216, B 1050, Brussels, Phone 492003. In Japan, contact Mr. Magami, Intel Japan Inc., Hanei 2nd Bldg., No. 1-1 Shinjuku, Shinjuku-ku, Tokyo, Phone 03-405-4747.

Analog Simulation Computer With All-Digital Operation

A new British simulation computer which is programmed and used in a similar way to an analog computer offers digital accuracy, reliability and repeatability.

Designed to replace conventional analog and hybrid equipment with an all-digital system, the Membrain MBD24 consists of a number of separate digital computing modules which are interconnected by means of a patchboard. Each unit is addressable from a keyboard to enable the setting of problem parameters such as gains, initial conditions, range of problems, etc. Data is transmitted and received simultaneously by all units, the output of each unit being a 8-bit serial number which is updated once every 100 micro-seconds.

Digital operation is devoid of the instability normally associated with analog systems, and also gives great accuracy. Each computing unit has a resolution of approximately one part in eight million. The maximum value of any computer variable is represented by a machine unit of one, minimizing scaling problems. There is no drift with the Membrain machine, and computation can be stopped and held for any period of time.

Compared with an analog computer, programming and patching a problem is claimed to be easier and to take less time. Typically, less than half the number of operational elements and patch cords are needed.

All operations are controlled from the keyboard, which contains address keys in four columns of 13, data keys in seven columns of 10, and mode control keys in three rows of 4. Any problem parameter or variable may be viewed continuously on a seven digit numerical display, and individual overflow indication is given for each computing unit.


COS/MOS IC's Data Multiplexers Display Drivers From RCA

Three analog data multiplexers with low-level logic control inputs and three liquid-crystal display drivers that provide level-shifting functions are now available on a limited sampling basis from RCA Solid State Division.

The multiplexer IC's designated CD4051A (Preliminary), CD4052A (Preliminary), and CD4053A (Preliminary) are digitally controlled analog switches having low "ON" impedance and very low "OFF" leakage currents, and are intended for analog and also digital multiplexing and demultiplexing, A/D and D/A conversion, and signal gating.

The CD4051A is an 8-Channel Multiplexer functionally equivalent to an SP8T switch. It has three binary control inputs for addressing and an inhibit input to allow expansion. The CD4052A is a Differential, 4-Channel Multiplexer functionally equivalent to a DP4T switch. It has two binary address control inputs and an inhibit input. The CD4053A is a Triple 2-Channel Multiplexer functionally equivalent to three SPDT switches. Each of the three multiplexers has an individual control input, and shares a common inhibit input for the package. Features include:

- wide range of control levels - 5V TTL levels or 3 to 15V C-MOS levels
- wide range of digital or analog data signal levels - 0 to 15V P-P
- matched switch characteristics - ON-resistance variation 50 ohms typical at $V_{DD} - V_{EE} = 15V$
- very low quiescent power dissipation - 0.1µW typical at $V_{DD} - V_{SS} = V_{DD} - V_{EE} = 10V$

The CD4055A (Preliminary) is a single-digit 7-Segment Decoder/Driver that provides a level-shifted DF (Display...
Frequency) output required for the common-line drive signal in the liquid-crystal displays, as well as the BCD to 7-Segment Decoder and seven AC segment drivers. The CD4056A (Preliminary) is a single-digit 7-Segment Decoder/Driver that provides a strobed latch function at the BCD inputs.

The CD4054A (Preliminary) is a 4-Segment Display Driver that provides level shifting, four independently strobed latches, and AC modulation of the 4 output signal lines. It is intended to provide drive-signal compatibility with the CD4055A and CD4056A for the decimal point, colon, polarity, and similar display segments.

Features include:

- equivalent AC output drive for liquid-crystal displays such as RCA developmental types TA8054 and TA8055.
- voltage doubling across displays ($V_{DD} - V_{EE} = 15V$) results in 30-volts impressed across selected display segments.
- choice of active low or active high output level DC drive for other types of displays.
- on-chip voltage-level conversion for different input-and-output-level swings.
- general COS/MOS logic characteristics: low power dissipation, high noise immunity, low output impedance, high input impedance.

The CD4051A, CD4052A, CD4053A, CD4054A, CD4055A, and CD4056A are available on a limited sampling basis only in 16-lead dual-in-line ceramic packages. Price at the 1-24 unit level is $15 each for all types.

Further information may be obtained from RCA Solid State Division, Box 3200, Somerville, N. J. 08876.

**Field Alterable ROM For DEC PDP-11 Computer**

Integrated Memories, Incorporated (IMI) of Wilmington, Massachusetts now offers a 256 x 16 Field Alterable CROM (Capacitive Read Only Memory) System, Model 1002G, that is pin-to-pin compatible to the DEC PDP-11 Computer. Any discrete bit in the CROM can be reprogrammed repeatedly within seconds as required by the user - even while the system is operating. Or, if desired, 100% of the data content can be reprogrammed quickly and economically by IMI without replacing any circuit components on the circuit board.

The complete 256 x 16 CROM system is packaged on a single circuit board and uses only one card slot in the PDP-11. Fully assembled and tested CROM systems sell to OEM's for about 2 cents per bit in volume. The CROM in a plug-in card with storage array, less electronics, can be purchased in volume for a price of about 1/2 cent per bit.

Detailed price and delivery information can be obtained from IMI. Contact: Mr. Francis J. Ash, Manager Marketing & Sales Telephone: (617) 658-5073.

**TRANSLATION and ECHO Added to Telephone Channel Simulation System**

At the request of the data communications industry, active impairments of frequency translation (offset) and echo generation (delay) have been added to SEG's expanding FA-1564 Telephone Channel Simulation system. For the first time, these impairments are available for evaluation and testing of modems, data transmission systems and training of operating personnel. These newly developed impairments are compatible and usable simultaneously with SEG's FA-1564 existing phenomena of phase jitter, harmonic distortion, bandwidth and impulse noise and phase hits.

Delivery is stock to 15 days for complete systems and/or components. Contact: David Kohn (212) 441-3200.

**New Automated Data Entry System Reads Free-Form Handwritten Numerics**

A new automated data entry system designed especially for direct computer entry of handwritten numeric source documents has been developed by Data Recognition Corporation.

Designated the ADES-1, the multimedia system eliminates the constraints of previous handwritten character recognition. This is accomplished through advanced proprietary software resident within each unit's minicomputer.

The system also provides the optional flexibility of second entry from CRT/keyboards by one or more operators. In this way, source numerics which are unreadable by the ADES-1, can be entered in proper sequence through the key-to-disc buffer.

The new device has been designed to read the millions of handwritten documents prepared by utility meter readers, salesmen, retail sales clerks, service technicians, inventory control clerks, and other data originators.

In addition to the minicomputer and optics, the basic unit includes a nine-inch capacity input hopper and document transport capable of processing, on an intermixed basis, documents varying in length from 4.25 to 8.75 inches, in height from 2.75 to 4.25 inches and in weight from 20 lb. bond to 110 lb. card stock. Documents are directed to four output stackers operating under program control. Contact: Gary Turner, (415) 326-4810.

**Honeywell Adds Multics System To Product Line**

Honeywell Inc. has introduced to commercial markets what it calls the most advanced, sophisticated computer system available in the world.

The system, known as Multics (Multiplexed Information and Computing Service) derives from a system that evolved through more than seven years of joint effort with the Massachusetts Institute of Technology. It is designed to operate as a general-purpose system serving a large community of users and their diverse needs.

The firm termed Multics "a unique combination of hardware, software, communications capabilities and supervisory techniques." The computer hardware portion of Multics is based upon the technology of Honeywell's successful 6000 Series of large-scale computers.

The company said that data processing productivity is increased because all Multics software, including the operating system supervisor, user programs and data files, is free of core memory restraints and of any particular hardware configuration. The total resources of the system are available on demand to any user.

According to a Honeywell spokesman, Multics is the most powerful virtual memory system yet available. The Multics hardware and software, ring protection features, and paging and segmentation techniques provide "close to ideal" on-line system characteristics for interactive problem solving.

The company said that a typical small Multics configuration would include one 6180 central processor (an enhanced version of the company's 6080) 192,000 words of main memory, one million words of bulk core storage, 200 million bytes of disk storage, one input/output multiplexor, one Datanet 355 communications processor, five tape units, a card reader, card punch and printer, plus terminals. Purchase price of this configuration would be $3,565,000.

The system can support much larger configurations, including multiple processors. A typical large system might include dual processors, 384,000 words of main memory, two million words of bulk core storage, 1.6 billion bytes of disk storage, eight magnetic tapes, two Datanet 355 communications processors, and two card readers, punches and printers. Purchase price of this system would be $7,064,000. Contact: Brooks Roberts (212) 996-6100.