The 1970 Fall Joint Computer Conference reflected the general state of the economy; exhibitors and attendees were fewer, sales brochures were sparse or nonexistent, and exhibit inquiry cards were the principal method of requesting follow-up data. The exhibitors were not attempting to cater to the casual attendees and low-volume prospects.

The majority of the products fell into the categories of peripheral equipment, terminals, and other communications equipment. The peripheral equipment, terminals, and other communications equipment. The peripheral equipment emphasis was centered around plug-to-plug compatibility to System/360 and the various minicomputers. Although communications-oriented terminals were popular products, there was a notable decrease in the number of CRT terminals.

There were few new announcements in computer technology. The exhibitors of core memories and semiconductor devices demonstrated significant cost/performance improvements. These devices tie-in with the majority of new-products displayed at the conference.

The shakeout in the industry was also evidenced by a drastic reduction in the number of exhibitors of time-sharing services, and the emphasis by the exhibitors (and interest by attendees) in lower cost plug-to-plug compatible peripherals. Military products were also deemphasized.

The Fall Joint Computer Conference presented a consistent picture of a continuing industry downturn. As several attendees suggested, it appears that the first half of 1971 will be a critical period and many businesses appear to be planning on that time frame as the turning point in the economy. Although the present shakeout is unfortunate, adversity and hardship have historically been the factors which bring out the best in American businesses and the people who manage them. As a result, there will be a more mature and viable computer industry in the 1970s.

— Cecil R. Frost
New Products Editor

FJCC NEW-PRODUCT COMMENTARY
New Minicomputer

Nuclear Data has announced a small general purpose computer with a powerful instruction set, resulting in unusual ease and flexibility of programming. The basic ND 812 stand-alone system provides 8,192 words of core memory and is priced under $10,000. The ND 812 has 16 memory reference instructions, double accumulators with individual sub-accumulators, and hardware multiply and divide as standard features. In addition to relative and indirect addressing, the entire 8,192 words of core may be directly addressed, using two-word instructions.

Four-level priority interrupt is a standard feature in the ND 812. Level selection is programmable, and for each level, priorities are determined by the sequence in which devices are connected. A peripheral device may trap to any specified core location in the first 4K of memory, thus eliminating polling requirements in the program.

CIRCLE 33 ON READER SERVICE CARD

5120 Bit-LSI ROM

Electronic Arrays introduced the EA 4000, a 5120 bit (organized as 512 words of ten bits each) Read Only Memory array containing 5,746 active devices on a die measuring only 93 x 100 mils. This ROM offers users extremely high capacity, high speed and complete compatibility with bipolar IC's. Among its many applications are high resolution character generators, code converters, logic function generators, microprogramming and high accuracy "look-up-tables."

The first standard pattern ROM in the EA 4000 family is the EA 4001 device which is programmed to provide 64 standard ASCII encoded alpha-numeric characters in a 7 x 9 vertical scan font. The EA 4000 product is particularly applicable for CRT terminals, signboard displays, and other advanced types of scanning displays. The larger 7 x 9 font gives superior character definition than presently available with 5 x 7 matrix character generators.

Until now, CRT and non-impact printer displays generally have had to use 5 x 7 dot patterns, since larger fonts were not economically available. The 7 x 9 font of the EA 4001 offers extremely clear and easy to read characters, including the difficult symbols such as "$", ",", "@", and "&".

Since the EA 4000 is a static device, no clocks are required. This, however, does not limit the device's access time: this can be as low as 250 ns, depending upon the output configuration utilized. The maximum power consumption of the chip is only .06 mW/bit. Bipolar compatibility is easily achieved through the addition of a single external resistor on the output devices. Although no external input interfacing components are required, additional resistors used on the input will provide the operational speed of the device. The EA 4000 operates from a standard ±12 V power supply. The EA 4001 is available from distributor and factory stock. Price per device at the 100 lot quantity is $40.00.

S/360 Interface

Data General Corporation has announced the availability of a general purpose IBM System 360 interface for the Nova and Supernova computers. First deliveries will be early this fall. The Data General 360 interface makes it possible for a Nova or Supernova computer with appropriate software to emulate standard IBM peripheral controllers, including such widely used devices as the 2803 magnetic tape controller, the 2703 communications processor, and the 2840 graphic display controller.

The interface allows communications to take place via either the System 360 selector or multiplexer channel. Data transfer is in the burst mode, with the burst length under program control and ranging from one to 641 bytes. The interface is contained on a standard 15-inch square Data General printed circuit board, which slides into one of the seven subsystem slots in the computer chassis. The interface also includes a separate panel with local manual controls for the standard IBM power control and sequencing procedures. The base price of the interface unit is $5000. Quantity discounts are available.

CIRCLE 34 ON READER SERVICE CARD

CIRCLE 35 ON READER SERVICE CARD
Fast Core Memory

Lockheed Electronics has introduced a small-to-medium capacity memory system with a half-microsecond cycle speed. The CC-50 Memory System makes available for the first time in small capacity systems the performance and cost advantages of 14-mil cores and 3-wire 3D organization. The CC-50 system is available in modules that provide memory capacities from 4096 to 65,536 words and word sizes from 8 to 72 bits.

The basic building block is a core-stack of 4096 18-bit words. Systems of various capacities are built up from these core modules that include associated inhibit drivers, sense amplifiers and data registers and four additional modules used in various combinations to achieve any of the available capacities and word structures. The CC-50 is mounted in a 19-inch rack. There are two chassis configurations — single or double, depending on capacity. Each chassis requires only 7 inches of panel space. System options available in any combination include: A. C. Data Save, Pluggable Memory Exerciser, Data Parity Generation and/or Check, Zone Control, Data and/or Address Indicator Lights, and a Fan Pack.

CIRCLE 36 ON READER SERVICE CARD

Cassette Recorder

Genisco Technology Corporation has announced their ST-2 MINICORDER, a high reliability, low cost Cassette Tape Recorder. Over 1.6 megabits is stored on a double width data track organized into 1536 blocks, each containing 1024 bits. A separate double width address track permits location of data under computer control. Software is included for direct coupling to most major minicomputers. No external controller is required.

The ST-2 has a dual precision capstan drive, a single phase-locked motor and a special cassette loading drawer that eliminates mechanical linkages. No solenoid actuated pinch rollers are used. Of greater importance, Genisco's unique (patented) reel tensioning system has removed many previously required moving parts, such as reel motors.

The cassette recorder is fully compatible with the major minicomputers now in use. Plug to plug compatible interfaces, software packages and installation instructions are supplied with each ST-2 Minicorder. The price with software is under $2,500.

CIRCLE 37 ON READER SERVICE CARD
CCI Announces TOTELCOM

Computer Communications Inc. has announced a totally teletype compatible telecommunications display, the CC-335 TOTELCOM. TOTELCOM is a portable, totally self-contained, solid state CRT Display Terminal which is completely interchangeable with Model 33 and 35 Teletypes. TOTELCOM is fully compatible with existing Teletype programs, programming practices, and input/output formats regardless of the central computer utilized. It is designed to replace Teletype units in communications network without requiring hardware or software modifications. TOTELCOM permits the entry and editing of displayed data on the CRT screen for on-line use and provides the necessary storage for input/output transmission of data over a wide range of data rates.

TOTELCOM uses the USASCII character and code set and displays the 64 character upper case graphic subset in a flicker-free format of 12 lines of either 72 or 80 characters (switch selectable). From a communications standpoint the CC-335 operates exactly like a Teletype unit. The keyboard is designed to appear as a TTY Keyboard to an operator. The CC-335 operates in two modes. On-line mode provides direct teletypewriter replacement with or without character echo. Off-line mode provides off-line editing and full screen output in either a half or full duplex operating environment. All editing functions are accomplished through the terminal's cursor, horizontal tab, screen-line erase, character and line insert/delete and split screen (format capability) controls.

TOTELCOM provides data transmission rates of 110, 150, 300, 600 or 1200 bits per second. This enables the CC-335 to serve as a Teletype replacement over voice grade lines, while also providing much greater transmission speeds than possible with Teletypes. The self-contained unit includes Keyboard, CRT, refresh memory, logic system, communications interface, acoustic coupler and power supply all packaged in a single carrying case. It weighs approximately 25 pounds and fits anywhere, including under an airplane seat. The single unit price of TOTELCOM with built-in acoustic coupler is $4,250, and $3,950 with RS 232 B interface. Quantity discounts are available. Deliveries begin the first quarter of 1971.

CIRCLE 38 ON READER SERVICE CARD

Small Computer Drum Memory

Vermont Research Corporation, makers of drum memories and systems, has announced the development of a new, low cost drum memory system specifically designed to be compatible with the majority of mini and midicomputers now on the market. The VRC 1004 Drum Memory provides field expandability from 16 to 128 tracks with corresponding storage capacity of 65.5K bytes to 524K bytes of usable data. The VRC 6100 Series Drum Memory System will come in three basic models covering the range of popular word lengths in smaller computers: the model 6101 is designed for 8 bit words, the 6102 for 12 bit words, and the 6103 for 16 bit words length computers.

In addition to low price and a wide range of storage capacities, the VRC 6100 features a hardware interface that provides the most efficient transfer rate for each given application, and a buffer storage controller that provides an asynchronous interface capability and maximizes storage efficiency. The error checking and data validation technique involves the generation of an 8-bit polynomial group code which is compared for each sector of stored data, rather than the simpler and more conventional odd or even parity technique. Data transfer rates between computer and controller vary widely according to the interface mode selected for a specific application. The interface mode itself can easily be modified in the field by a simple wire change.

Average access time for the VRC 6100 series is 8.7 msec for 60 Hz and 10 msec for 50 Hz. Block transfers may be accomplished in any multiple of the buffer storage size up to the maximum drum implementation in a particular application. Buffer size for the Model 6101 8 bit oriented system is 32 words. Buffer size is 16 words for both the Model 6102 12 bit system and the 6103 16 bit configuration. Minor changes may be required to adapt the VRC 6100 Series to a specific computer interface. System I/O cables are available at extra cost for specific computer systems, as are non-TTI I/Os and single cycle data break I/Os. The price for a VRC 6100 System with a 16-track 1004 Drum is $7,110, including the drum. Initial deliveries of the VRC 6100 Series Drum Memory Systems are expected in the first quarter of 1971.

CIRCLE 39 ON READER SERVICE CARD

Semiconductor LSI ROM Memory System

Datapac, Inc. has introduced a new high speed, high density LSI Semiconductor Read-Only Memory (ROM) system. The new product line called SemPac features a one inch square system module with up to 4,096 bits of storage and all associated circuitry. The modules can be placed on 8" x 6" PC cards to give card capacities of up to 32K. ROMs are presently one of the fastest growing markets for semiconductor memories. Applications include microprogramming, character generation, code translation and stored on look-up tables. Because of its highly flexible modular design and adaptability to the building block concept, the new bipolar ROM module offers the systems designer a means to functionally and physically tailor a complete memory system to fit his own unique system.

The one inch square multilayer thin film substrate module will be available with speeds ranging from 75 nanoseconds to 150 nanoseconds cycle times. Logic level is TTL compatible. Bit/Word configuration is highly flexible. The company will offer single system modules, card systems and complete chassis assemblies called SemStac with up to 250,000 bit capacities. Pricing will range from 3 cents to 10 cents per bit depending on system capacity speed and quantity.

CIRCLE 40 ON READER SERVICE CARD