Olivetti Computers OC 5300 Series

MANAGEMENT SUMMARY

Olivetti, Italy's largest data processing systems manufacturer, has decided to re-enter the mainframe market through a new subsidiary, Olivetti Computers SpA, with two different series of IBM plug-compatible processors. The smaller series, the OC 5300, will be manufacturered by IPL Systems, the U.S. company that makes the IPL 480 series for Control Data.

Only one model, the OC 5320, has been announced, but others are expected. The OC 5320, which can process up to 900,000 instructions per second, has a CPU cycle time of 50 nanoseconds and a memory cycle time of 400 nanoseconds for an 8-byte fetch. The OC 5320 is similar to the IPL-built Omega 480-III sold by Control Data.

In the performance range of the IBM 3031, the OC 5320 comes in models that range from 2,097,152 bytes to 8,388,608 bytes of main memory. Memory is built using 16K-bit N-channel MOS chips. Emitter-coupled logic circuitry is used throughout the OC 5320. The density of the memory and logic packaging allows the largest OC 5320 to fit into a cabinet less than half the size of an IBM 370/158 with one megabyte of memory.

The OC 5320 processor is claimed to employ about one-fourth the number of integrated circuits as it counterparts in the IBM/370 series. As a result, it consumes nearly 75 percent less power and requires only about one-half the floor space.

A microprogrammed System/370 emulator, the OC 5320 can be attached to any current IBM peripheral device that does not require either the Direct Control feature or integrated controllers and adaptors or to any plug-compatible IBM-replacement peripherals.

Control storage is made up of 50-nanosecond bipolar memory. The OC 5320 processor includes a minimum of 64K bytes of control storage, but is designed to incorporate up to 128K bytes, thus allowing future expansion of features and capabilities. Control storage is loaded from a floppy disc subsystem.

The OC 5320 basic system includes 2 million bytes of main memory, 72K bytes of control storage, 8K bytes of cache memory, a CRT console terminal, one byte multiplexer channel, five block multiplexer channels, and an integral floppy disc drive for loading control storage. At the time of writing, prices were not yet available but were expected to be set at a level that would be extremely competitive with the prices of both the IBM counterparts and the plug-compatible mainframes from other vendors.

The OC 5320 channels function according to IBM's Standard Interface definitions. The byte multiplexer data ▷

With the OC 5300 series of IBM plug-compatible processors, Olivetti has re-entered the mainframe market in Europe. With a performance similar to an IBM 3031, the OC 5320 is aimed at IBM's 370/148 and 158 customer base. Main memory ranges from 2 million to 8 million bytes. One byte and up to five block multiplexer channels are provided. The OC 5320 can execute System/360 or System/370 software and can utilize the peripherals that are compatible with these IBM processors.

CHARACTERISTICS

SUPPLIER: Olivetti Computers SpA, Via Ennio Visconti 8, 00193 Rome, Italy. Telephone 06 389 096. Telex 610662

MANUFACTURER: IPL Systems Incorporated, 12 Crosby Drive, Bedford, Massachusetts 01730, U.S.A. Telephone (617) 275-1475.

MODEL: OC 5320.

DATA FORMATS

BASIC UNIT: 8-bit byte. Each byte can represent 1 alphanumeric character, 2 BCD digits, or 8 binary bits. Two consecutive bytes form a halfword of 16 bits, while 4 consecutive bytes form a 32-bit word.

FIXED POINT OPERANDS: Can range from 1 to 16 bytes (1 to 31 digits plus sign) in decimal mode; 1 halfword (16 bits) or 1 word (32 bits) in binary mode.

FLOATING-POINT OPERANDS: 1 word, consisting of 24-bit fraction and 7-bit hexadecimal exponent, in "short" format; 2 words, consisting of 56-bit fraction and 7-bit hexadecimal exponent, in "long" format; or 4 words in "extended precision" format.

INSTRUCTIONS: 2, 4 or 6 bytes in length, specifying 0, 1 or 2 memory addresses, respectively.

INTERNAL CODE: EBCDIC (Extended Binary-Coded Decimal Interchange Code).

MAIN STORAGE

STORAGE TYPE: Metal oxide semiconductor (MOS).

CAPACITY: From 2,097,152 bytes to 8,388,608 bytes in increments of 1,048,576 bytes.

CYCLE TIME: 400 nanoseconds for both read and write operations.

CHECKING: All data paths between the central processor and main storage are parity-checked by byte. When data is stored, an error-correcting code is substituted for the parity bits. (An 8-bit modified Hamming code is appended to each 8-byte "doubleword" of data.) When the data is retrieved, single-bit errors are detected and corrected automatically, and most multiple-bit errors are detected and signalled so that appropriate program action can be taken. ▶

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▷ transfer rate is 50K bytes per second in byte mode and 180K bytes per second in burst mode. Each block multiplexer channel has a two-word buffer and can transfer data at 1.86 megabytes per second. The aggregate data transfer rate is 7.5 megabytes per second.

The byte multiplexer channel can support up to 256 unshared subchannels and each block multiplexer channel can support up to 256 subchannels. All OC 5320 models come with one byte multiplexer channel and up to five block multiplexer channels.

The OC 5320 processor can support all major IBM system control programs, including DOS, DOS/VSE, OS/VS1, and MVS.

The introduction of the IBM plug-compatible mainframes marks a bold step for Olivetti, which traditionally has concentrated on the office equipment and distributed processing markets. However, this is not the first time that Olivetti has entered the mainframe market. Olivetti's first attempt was in 1959 when its Electronic Division designed and produced the ELEA series mainframe. In 1964, the Electronic Division formed a new company with General Electric (U.S.) but, in 1968, sold all its shares in the company to GE.

One explanation for the sudden interest in IBM's mainframe market is the vast potential market of Italian governmental and quasi-governmental institutions, which at present run on IBM equipment.

Another reason for Olivetti's move may be a wish to share in the success of the other plug-compatible mainframe vendors, such as Amdahl, in capturing IBM users. Mainframe users are getting over their initial hesitance about acquiring plug-compatible systems, a trend revealed by a recent user survey conducted by Datapro in the United States.

The OC 5300 computers are initially being offered in Italy, and the first machine has been delivered to the parent company in Ivrea for internal use. European-wide marketing is planned for the latter half of 1980, but in the meantime Olivetti is busy creating a network of maintenance technicians in order to be able to give the support required to make this venture a success. Remote diagnostic services for both hardware and software will be available through a modem supplied with the system console.

Other reliability features are instruction retry and error checking and correction (ECC) circuitry in the main memory.

Olivetti Computers is aiming at the replacement market for IBM 370/148's and 370/158's. Olivetti's OC 5320 will be competing directly with IBM's 4341 and IBM's 3031. Other competitors will include ICL's 2956, Honeywell's 66/DPS-520, Siemens's 7.760, and Univac's 1100/60 model C2. Equivalent and competitive plug-compatible ▷

▶ **STORAGE PROTECTION:** The Store and Fetch Protection features, which guard against inadvertent overwriting and/or unauthorized reading of data in specified 2048-byte blocks of storage, are standard.

CENTRAL PROCESSORS

The OC 5320 generally maintains full compatibility with IBM System/360 and System/370 CPU's except for those programs that contain time-dependent coding.

The OC 5320 processor includes a high-speed buffer memory and instructions pre-fetch hardware.

REGISTERS: The OC 5320 processor contains sixteen 32-bit general-purpose registers that can be used for indexing, base addressing, and as accumulators; four 64-bit floating-point registers; and sixteen 32-bit control registers.

INSTRUCTION REPERTOIRE: The OC 5320 processor features the IBM System/370 Commercial Instruction Set with two exceptions: the Store Channel ID instruction cannot set condition codes 1 and 2; and the two instructions associated with direct control, READ DIRECT and WRITE DIRECT, are not provided.

OPERATIONAL MODES: Like the System/370, the OC 5320 processor can operate in either the Basic Control (BC) mode or the Extended Control (EC) mode. In the Extended Control mode, certain bits of the Program Status Word are interpreted differently than they are in the Basic Control mode. In addition, the reserved portion of lower main memory is altered. Both these changes are implemented in order to facilitate dynamic address translation and thereby support the virtual memory operating systems.

PROCESSOR FEATURES: The OC 5320 processors incorporate the following standard features: the System/370 Commercial Instruction Set; floating-point facilities including extended-precision; storage protection for both store and fetch operations; conditional swapping (a standard IBM 370/138 feature); a console printer and keyboard; a console file for initial microprogram loading; control registers; dynamic address translations; single-bit error correction; machine check handling; program-event recording; the standard System/370 timing facilities including the interval timer, clock comparator, and CPU timer, and time-of-day clock; channel retry facilities and channel indirect data addressing; microprogrammed instruction retry; and standard microcode enhancements, including extended control mode. OS/DOS compatibility, and advanced control program support and virtual machine assist are standard, as on the IBM 370/148.

A unique double-word buffer that provides greater levels of throughput is included with each block multiplexer channel.

MULTIPROCESSOR CONFIGURATIONS: The OC 5300 processors are intended for use only in uniprocessor configurations. No hardware support for multiple-processor systems has been provided; however, users with IBM systems possessing the Channel-to-Channel Adapter can implement these systems.

INPUT/OUTPUT CONTROL

The OC 5320 processor supports one byte multiplexer channel and up to five block multiplexer channels.

Each byte multiplexer channel has 256 unshared subchannels and can address up to 256 devices. Similarly, each block multiplexer channel can have up to 256 subchannels. Unit control words (UCW's) can be dynamically assigned from a pool of 432 unshared and 16 shared UCW's. ▶

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▷ mainframes include National Advanced Systems' AS/5-3, Magnuson's M80/42 and M80/43, and Digital Computer Peripheric's DCP-1642, which is also based on IPL's products.

BACKGROUND

Olivetti Computers SpA, created in September 1979, is completely owned by Ing. C. Olivetti and C. SpA, whose head office is at Via G, Jervis, 77, Ivrea (To), Italy. As Italy's largest data processing systems company, Olivetti is involved in the production and manufacture of distributed processing systems, small business computers, data entry equipment, telecommunications equipment, office products and supplies, and systems for industrial automation.

Started in 1908, the Piedomontese firm employs over 57,000 people worldwide and has 28 manufacturing and assembly plants throughout the world. Olivetti Computers SpA will have the back up, support and necessary know-how from the parent company.□

▶ The maximum byte multiplexer channel data rate is 50,000 bytes per second in normal operating mode and 180,000 bytes per second in burst mode. Any block multiplexer activity reduces the byte multiplexer data rate.

Each block multiplexer channel has a maximum data rate of 1.86 million bytes per second. The aggregate data rate for all block multiplexer channels in a system is 7.5 million bytes per second.

PERIPHERAL EQUIPMENT

The OC 5320 can utilize all IBM System/360 and System/370 input/output and mass storage devices, except those devices that require the Direct Control feature or integrated controllers and adapters, as well as the plug-compatible counterparts from other vendors. Detailed coverage of many of these peripherals can be found in Volume 2 of DATAPRO 70.

SOFTWARE

The OC 5320 fully supports the following IBM operating systems; DOS/VS, OS/VS1, OS/VS2 (SVS and MVS), and VM/370, as well as DOS, OS/MFT, and OS/MVT.

PRICING

Pricing had not been set at the time this report was prepared.■