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Honeywell Series 60, Level 61

MANAGEMENT SUMMARY

On October 17, 1974, Honeywell Information Systems announced the availability in the United States of its Series 60 Level 61 processors, which were previously offered only in Europe. With Honeywell's earlier introduction of the more advanced Level 62 system, in April 1974, the total number of small-scale Series 60 systems released in the United States now stands at three: the 61/58, 61/60, and 62/60.

Two versions of the Model 61/58 will be available: the 61/58 Batch System for direct entry and batch processing, and the 61/58 Multiworkstation System for concurrent processing of up to four communications programs with one batch job.

Obviously similar to the earlier Honeywell Model 58 (Report 70C-480-21), the Level 61 systems are, in fact, the long-promised enhanced versions of the Model 58. These enhancements are most notable in the areas of additional data communications capabilities, increased mass storage facilities, and new programming languages. Very reasonably priced "retrofit" kits are available for conversion of Model 58 systems to Level 61 configurations.

The Model 61/58 is a disk-oriented system with 5,120 or 10,240 8-bit bytes of 1.2-microsecond main memory. Its memory capacity can be expanded through the addition of 16,384 to 65,536 bytes of Extended Memory Store, a novel MOS memory unit designed primarily to store segments of large programs for transfer into main memory upon request. Integrated peripheral controls allow attachment of a 100- to 300-cpm card reader (or optical mark reader), a 40-column-per-second card punch, a 100- to 650-lpm printer, and optional mass storage units with up to 92 million bytes of storage. Communications facilities provide integrated controls for a single-line synchronous controller (2,000 to 9,600 bits per second) or a multiline controller which is capable of transmitting ▷

The new Level 61 systems are the entry-level offerings in Honeywell's broad Series 60 family of computers. The Model 61/58 system is, effectively, an enhanced version of the earlier Honeywell Model 58, while the Model 61/60 is a new design oriented toward transaction processing.

CHARACTERISTICS

MANUFACTURER: Honeywell Information Systems, Inc. 200 Smith Street, Waltham, Massachusetts 02154. Telephone (617) 890-8400.

MODELS: Models 61/58 and 61/60.

DATA FORMATS

BASIC UNIT: 8-bit byte (plus parity bit). Each byte can represent 1 alphanumeric character, 1 or 2 BCD digits (in unpacked or packed format, respectively), or 8 binary bits.
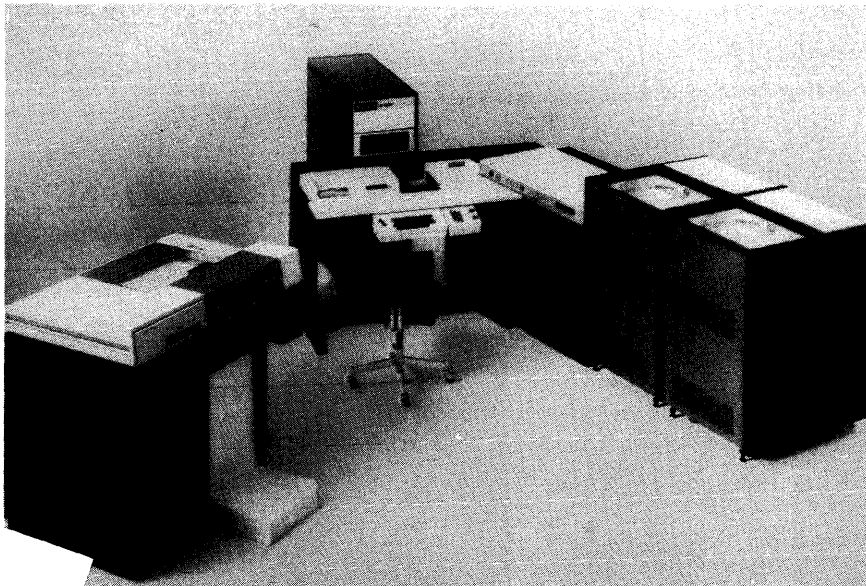
FIXED-POINT OPERANDS: Arithmetic operations are performed on data held in registers, in packed decimal form. A single-register field is 5 bytes long and can hold up to 9 digits and sign; a double-register field is 10 bytes long and can hold up to 19 digits and sign. Other operations, including move, compare, pack, and unpack, are performed on variable-length fields ranging from 1 to 99 bytes.

INSTRUCTIONS: Range from 1 to 8 bytes in length. Arithmetic instructions are 3 bytes long, consisting of a 1-byte operation code and two 1-byte register addresses. Most instructions using variable-length fields (Move characters, Compare characters, Pack, Unpack, etc.) are 6 bytes long, consisting of a 1-byte operation code, a 1-byte field specifying the operand length, and two 2-byte operand address fields.

INTERNAL CODE: EBCDIC; also ASCII or ISO for Model 61/58 communications and ASCII for Model 61/60 communications.

MAIN STORAGE

STORAGE TYPE: Model 61/58—core; Model 61/60—metal oxide semiconductor (MOS). ▶

The Honeywell Model 61/58 was introduced to the U.S. market in October 1974. Its basic configuration includes the central processor with 5,120 bytes of main memory, a dual-drive disk subsystem with 3.456 megabytes of storage, a 100-line-per-minute printer, and a 100-card-per-minute card reader console. This enhanced version of Honeywell's earlier Model 58 computer system can be purchased for $66,590 or rented for five years at $1,405 per month.

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▷ With the Series 60 announcement in April 1974, Honeywell joined the ranks of "unbundled" computer manufacturers (notably IBM) by establishing separate pricing for most of its software. Monthly rental for Level 61 systems includes the operating system (incorporating basic job-management and file-management systems) and programming tools such as link editors, debugging aids, job control language, and conversion aids. Language processors and utilities, applications packages, and communications software are separately priced, along with services such as program development, network design, education, and additional sets of documentation.

Software support is provided by subsets of Honeywell's proven GCOS operating system. Honeywell supplies three versions of GCOS for Level 61 systems, each oriented toward a specific type of processing environment. Model 61/58 users can choose either a single-job-stream version or one that permits simultaneous execution of one batch program and up to four terminal-oriented programs, with the batch program receiving processing priority. Model 61/60 systems, on the other hand, run under a GCOS version that gives up to eight conversational terminal programs priority over a single batch program. Level 61 GCOS provides automatic program segmentation and swapping between main memory and disk storage or extended memory.

A new COBOL-74 compiler runs on the Model 61/60 processor. In addition, MiniCOBOL and COBOL-68 are available for Models 61/58 and 61/60, and BASIC for Model 61/60. An EDITOR program provides an easy to learn and use facility for generating report printing and file inquiry programs on both models. RPG and FORTRAN are not currently available for Level 61 systems.

The Level 61 computers are accompanied by a repertoire of preprogrammed applications packages that should contribute substantially to easing the installation process for first-time computer users. These include inventory reporting, bill of materials, sales order processing, student scheduling, hospital accounting, and financial management program products.

As the upgrade systems for Honeywell's customer base of Model 58 users, the Level 61 processors offer a high degree of compatibility with the Model 58. All applications programs previously released for the Model 58 will run on Level 61 systems, and the GCOS Level 61 Batch and Multiworkstation software systems are being released to run on currently installed Model 58 systems (although the Model 58 was withdrawn from the currently marketed Honeywell product line with the Level 61 announcement). Prospective users should note, however, that there are significant architectural differences between the Level 61 systems and the various higher levels of the Series 60. These differences may make future upgrades to larger Series 60 systems less straightforward than upgrades within a more architecturally consistent computer family such as the IBM System/370 or NCR Century Series.

Initial deliveries of the Model 61/58 were made in November 1974, with the model 61/60 scheduled to follow in the second quarter of 1975. □

▶ 5.76 million bytes, 100-lpm printer with 128 print positions, multiline asynchronous communications controller, and at least one terminal.

The minimum configuration for a Model 61/60 system consists of a central processor with 10,240 bytes of memory, Front-End Network Processor (with 8K bytes of memory, CRT, keyboards and 2 cassette tape units), MSU0310 Mass Storage Subsystem with 46 million bytes, 300-lpm printer, and at least one terminal.

All Level 61 configurations can be expanded through the use of an optional card punch, faster card readers (to 300 cpm), faster printers (to 650 lpm), and increased disk storage capacities (to 92 million bytes). The maximum number of terminals is four in a Model 61/58 Multiworkstation System and eight in a Model 61/60 system.

MASS STORAGE

MSS1500 MASS STORAGE SUBSYSTEM: Provides economical random-access storage for Model 61/58 only, on removable Honeywell M4005 Disk Packs which are physically compatible with the 6-disk IBM 1316 Disk Pack. The MSS1500 subsystem consists of a control unit flanked by two independent disk pack drives. Each drive holds one pack and has a comb-type access mechanism with one read/write head serving each of the 10 recording surfaces.

Each data track holds 2880 bytes in ten 288-byte sectors. The basic dual-drive MSS1500 subsystem has 60 usable data tracks on each recording surface for a total data capacity of 3,456,000 bytes. Optional features raise the number of usable tracks on each surface to 100 or 200, for a data capacity of 5,760,000 or 11,520,000 bytes, respectively. An additional two disk drives can be added to the subsystem, giving a total of 23,040,000 bytes. Average head movement time is 60 milliseconds for the basic 60-track drives, 70-milliseconds for the 100-track model, and 85 milliseconds for the 200-track model. Average rotational delay is 12.5 milliseconds, and data transfer rate is 165,000 bytes per second.

MSU0310 MASS STORAGE UNIT: Provides medium-capacity random-access storage for Level 61 systems, using removable Honeywell M4180 Disk Packs (or equivalent). Each 11-disk pack has 20 recording surfaces, with 203 tracks per surface (including 3 spares). Maximum data capacity per unit is 23 million bytes. From two to four units can be connected to a Level 61 system. Average head movement time is 40 milliseconds, average rotational delay is 12.5 milliseconds, and data transfer rate is 312,500 bytes per second.

INPUT/OUTPUT UNITS

CARD READER AND CONSOLE: The basic CSU1581 Card Reader is an integrated card console unit with a standard speed of 100 80-column cards per minute. A speed of 200 cards per minute can be achieved through the addition of the CSF1502 High Speed Attachment plus the CSF1503 200-cpm Feature, and the speed can be further increased to 300 cards per minute with the CSF1502, the CSF1503, and the CSF1504 300-cpm Feature. The CSU1581 also includes a 10-position display for visual verification of entered data, a 63-character alphanumeric keyboard, and a 13-key numeric pad for direct data entry. Feature CSF1505 equips the card reader to read handwritten vertical black marks as well as punched holes. The card reader is required on Model 61/58 configurations and is optional for Model 61/60 configurations.

CARD PUNCH: The PCU0040 Card Punch punches standard 80-column cards at a speed of 40 columns per second. It can be equipped with an optional printing unit to permit interpretation of punched data. Use of the card punch is optional on both Model 61/58 and Model 61/60 configurations.

PRU0110/PRU0210 PRINTERS: Available only for Model 60/58 systems, the PRU0110 has a minimum print speed of 100 lines per minute using either 96, or optionally 128, print positions. The PRU0210 Printer can achieve a print ▶

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►ANS COBOL-76: A compatible subset of the full Level 66 COBOL-74 compiler used in larger Series 60 computer systems. It has facilities for handling packed and unpacked decimal data and fixed-point binary data, plus capabilities under the GCOS operating system for overlaying user-specified program segments. New capabilities, previously not available in COBOL-68, include a debugging facility that allows the programmer to specify debugging instructions in the COBOL language, a new capability for communication with terminals, the ability to call other programs written in higher-level languages during execution, and the ability to copy predefined COBOL text into the source program. Level 61 COBOL-74 runs on a Model 61/60 and requires 10K bytes of main memory, one disk unit, one printer or system output file, and one input device or source library. Delivery of COBOL-74 is scheduled for the third quarter of 1975.

BASIC: A conversational compiler language designed for time-shared problem-solving applications. It operates on a Model 61/60 computer with a Front-End Processor, 46 million bytes of disk storage, line printer, and from one to eight terminals. Delivery is scheduled for the second quarter of 1975.

EDITOR: A programming aid that converts user-written report descriptions into MiniCOBOL report-writing programs. After compilation, these programs can retrieve data from one or more files on either disk or punched cards and print reports in the specified formats. Alternatively, EDITOR can generate file-inquiry programs for use by operators at the console keyboard or terminals. EDITOR operates under Level 61 GCOS and requires at least 5K bytes of main memory, card console, line printer with 128 positions, and 5.76 million bytes of disk storage.

APPLICATION PROGRAMS: Application programs available for Level 61 systems include: Financial Management Systems (accounts receivable, accounts payable, general ledger, and payroll), Inventory Reporting, Mini-Factor (bill of materials processor, inventory control, and material requirements planning), Hospital Accounting System, and a Student Scheduling System.

PRICING

EQUIPMENT: The following systems represent the basic Level 61 configurations. Rental prices include equipment maintenance.

MODEL 61/58 BATCH SYSTEM: Consists of a 61/58 processor with 5K bytes of main memory, a removable-disk storage subsystem (3.46 megabytes), an Integrated Card Console (100-cpm card reader, 10-position display, numeric and alphanumeric keyboards), and a 100-lpm printer. Monthly rental (on a 5-year lease) is $1,405, and the system can be purchased for $66,590.

MODEL 61/58 MULTIWORKSTATION SYSTEM: Consists of a 61/58 processor with 10K bytes of main memory, a removable-disk storage subsystem (5.76 megabytes), an Integrated Card Console (100-cpm card reader, 10-position display, numeric and alphanumeric keyboards), a multiline controller, and the capability for attachment of one remote terminal. Monthly rental (on a 5-year lease) is $1,937, and purchase price is $91,400.

MODEL 61/60 TRANSACTION PROCESSING SYSTEM: Consists of a 61/60 processor with 10K bytes of MOS memory, a front-end processor unit, a removable-disk storage subsystem (46 megabytes), a 300-lpm printer, and the capability for attachment of five remote keyboard terminals. The system can be rented for $3,135 a month (on a 5-year lease), or purchased for $138,715.

SOFTWARE: The basic operating system, basic job management and file systems, programming tools such as linking and debugging aids, the control languages, and conversion aids are provided to all Series 60 users at no additional cost. A basic kit of documentation is also provided with the system. Monthly license fees are charged for language processors, utilities, application packages, commmunications software, and advanced job management and file systems. Extra charges are also levied for customer services, such as education, program development, system design, implementation and conversion, and network design.

CONTRACT TERMS: Series 60 equipment is available for purchase or for rental under a 1-year, 3-year, or 5-year lease. The 1-year and 3-year basic monthly rentals entitle the user to 176 hours of central processor usage per month with on-call remedial maintenance between the hours of 8 a.m. and 6 p.m. on Mondays through Fridays. For scheduled usage beyond this period, with on-call maintenance service, the user pays an additional charge which is a fixed percentage of the monthly maintenance charge. Alternatively, the user can obtain on-call maintenance service at standard hourly rates of $45 per man-hour. Unlimited use is permitted for all peripheral devices and for central processors on a 5-year lease. ■