A SUMMARY OF FACTS AND FIGURES ON THE NEW HONEYWELL 300

The Honeywell 300 is an extremely fast and efficient system with a design predicated upon the most exacting needs of the computer sciences. This brochure summarizes the outstanding highlights of this low-cost, highly expandable system.
The Honeywell 300 starts as low as $2,345 monthly rental for a 4,096-word (16,384-character) system with paper tape input/output and a keyboard printer. Additional input/output and specialized performance features are available to expand the system for the most demanding applications.
HARDWARE HIGHLIGHTS

- 24-BIT WORD (4 CHAR.) AND PARITY BIT
- SINGLE-ADDRESS INSTRUCTIONS
- 1.75-MICROSECOND MAIN MEMORY CYCLE (875-NANOSECOND ACCESS)
- 500-NANOSECOND CONTROL MEMORY CYCLE (250-NANOSECOND ACCESS)
- FIXED-POINT BINARY ARITHMETIC ON 24-BIT WORD
- ADD TO ACCUMULATOR AND ADD TO MEMORY LOGIC
- MEMORY INTERLACED OPERATIONS
- ADD TIME: 3.5 MICROSECONDS *
- MULTIPLY TIME: 7 MICROSECONDS *
- FLOATING-POINT ARITHMETIC ON A 48-BIT WORD: 38-BIT MANTISSA; EXPONENT RANGE 2^-3 TO 2^7
- FLOATING-POINT ADD TIME: 7.0 MICROSECONDS *
- FLOATING-POINT MULTIPLY TIME: 15.75 MICROSECONDS *
- MEMORY EXPANDS FROM 4,096 TO 32,768 WORDS (16,384 TO 131,072 CHARACTERS)
- ALL OF MEMORY IS DIRECTLY ADDRESSABLE
- 6 REGISTERS FOR Indexed ADDRESSING
- MULTI-LEVEL INDIRECT ADDRESSING
- UP TO 24 LEVELS OF PRIORITY INTERRUPT
- BUFFERED INPUT/OUTPUT ALLOWS THREE SIMULTANEOUS OPERATIONS WITH COMPUTATION
- CHARACTER-MANIPULATION INSTRUCTIONS
- AUTOMATIC SOFTWARE IMPLEMENTATION OF OPTIONAL INSTRUCTIONS NOT IN GIVEN SYSTEM
- CENTRAL PROCESSOR TEMPERATURE RANGE 0 - 125° F,
- NON-VOLATILE MEMORY

* Time without memory interlace
MAGNETIC TAPE EQUIPMENT

**TAPE UNIT**

- **204A-3**
- **204A-2**
- **204A-1**
- **204B-1**
- **204B-3**
- **204B-6**
- **204B-7**

**CONTROL UNIT**

- **203A-3**
- **203A-2**
- **203A-1**
- **203B-1**
- **203B-2**
- **203B-3**

**Honeywell 300 Option**

- **301-Central Processor**
  - Includes: 4096 Words (16,384 Characters), 6 Priority Interlock
  - Options:
    - 502 Additional 4096 Words
    - 100 Memory Interlace
    - 112 Additional Set of 6 Lines, Max. No. of Ls 1
    - 114 High-Speed Multiplex
    - 116 Buffered Read/Write of Three in System
    - 117 Floating-Point Number
    - 118 Character Handling

**Communications Control Equipment**

**Single Channel**

- **281-1** Telex
- **281-2** Telex
- **281-3** Voice Grade Lines
- **281-4** Voice Grade Lines

**Multiple Channel**

- **284-1** Maximum 15 Lines
- **284-2** Maximum 31 Lines
- **284-3** Maximum 47 Lines
- **284-4** Maximum 63 Lines

**Keyboard Printer Equipment**

- **320** Keyboard Printer

**Standard Input/Output**

Each control unit occupies two input/output trunks on the central processor, giving a theoretical maximum of 64 tape drives.

*Note:* On control unit 203B-1, a primary drive is essential, followed by up to seven secondary drives.
SOFTWARE HIGHLIGHTS

□ ASSEMBLY SYSTEMS
  a) Basic symbolic assembly system. For equipment configurations using paper tape or card input/output.
  b) A comprehensive symbolic programming language which uses magnetic tapes as well as paper tape or card input/output. Extensive updating and library facilities are provided.

□ FORTRAN II
  A highly efficient (one pass) scientific-language compiler operating in the compile-and-execute mode. This system operates in a paper tape, card, or magnetic tape environment.

□ FORTRAN IV
  A comprehensive implementation of this advanced scientific language. This compiler operates in the magnetic tape system environment and features extremely high compilation rates, code optimization, assembly language subprogram integration, and operational simplicity.

□ ALPS 300
  Linear Programming System

□ PERT 300
  Program Evaluation and Review Technique

□ SCIENTIFIC SUBROUTINE LIBRARY

MATHEMATICAL
  Differentiation
  Exponentiation
  Log (natural and common)
  Square Root
  Roots and Powers
  Matrix Transformations
  Polynomial Evaluation
  Trigonometric
  Hyperbolic
  Statistical

NUMERIC CONVERSION
  Binary to Decimal
  Decimal to Binary

□ INPUT/OUTPUT Routines
  Typewriter
  Paper Tape
  Magnetic Tape
  Drum
  Disc

□ UTILITY PROGRAMS
  Monitor/Loader
  Memory dump
  Library update
  Source program update

□ MAGNETIC TAPE HANDLING Routines
  Copying
  Record Comparisons
  Item Location
  Positioning

□ DRUM AND DISC HANDLING Routines
  Loader
  Sorts
  Utility Routines

INSTRUCTION REPERTOIRE

<table>
<thead>
<tr>
<th>Arithmetic</th>
<th>Mnemonic</th>
<th>Execution Time (microseconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add to Accumulator</td>
<td>ADD</td>
<td>3.50</td>
</tr>
<tr>
<td>Add to Memory</td>
<td>ADM</td>
<td>5.25</td>
</tr>
<tr>
<td>Augment Index</td>
<td>AUX</td>
<td>1.75</td>
</tr>
<tr>
<td>Subtract from Accumulator</td>
<td>SUB</td>
<td>3.50</td>
</tr>
<tr>
<td>Tally</td>
<td>TLY</td>
<td>5.25</td>
</tr>
</tbody>
</table>

Logic

| Decrement and Jump on Index not Zero | DJX  | 3.50 |
| Extract                                | EXT  | 3.50 |
| Half Add                               | HAD  | 3.50 |
| Jump on Accumulator Negative           | JAN  | 1.75 or 3.50$^*$               |
SECTION III
INFORMATION FORMAT

The Honeywell 300 uses a fixed-length, 24-bit word. Associated with each word is a parity bit, the value of which is not subject to program control. Subsequent discussion of the H-300 word, therefore, refers only to the 24 information bits, unless otherwise noted.

Each memory location and each arithmetic register is capable of storing one word. A machine word may represent an instruction or one or more units of data.

The H-300 is a twos-complement machine. That is, all negative numbers are stored in memory in their twos-complement form, and twos-complement arithmetic is used exclusively. Appendix A contains a discussion of twos-complement arithmetic.

FIXED-POINT WORD

The fixed-point word contains a 24-bit, twos-complement binary number in the range minus 8,388,608 to plus 8,388,607.

![Fixed-point word diagram]

FLOATING-POINT WORD

A floating point number occupies two machine words, as shown below. The first word, and the high-order 15 bits of the second word, make up the mantissa. These 39 bits hold a twos-complement binary number in the range $\pm 2.56 \times 10^{11}$. The high-order bit of the first word represents the sign of the mantissa. The exponent occupies bits 16-24 of the second word and is a 9-bit, twos-complement binary number in the range minus 256 to plus 255.

![Floating-point word diagram]

ALPHANUMERIC WORD

The alphanumeric word consists of four six-bit groups. Each group can represent one of 26 characters, 10 decimal digits, or 29 special characters such as punctuation marks, plus and minus signs, etc., or a blank. See Appendix B for a list of the H-300 character codes.