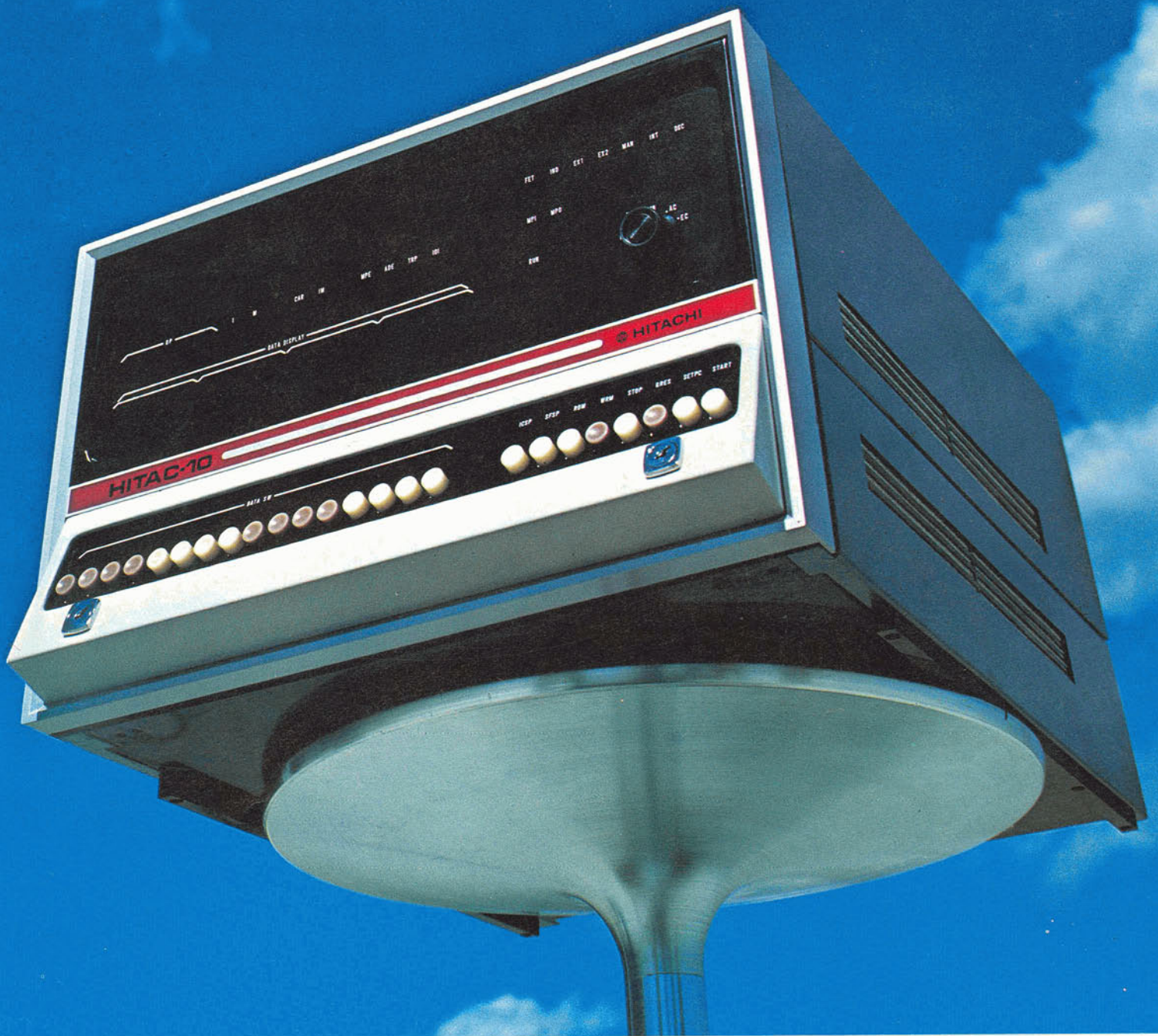




HITAC 10

HIGH PERFORMANCE MINI COMPUTER





Introduction

HITAC 10 is a general purpose digital computer designed mainly as a systems computer dedicated to real-time data acquisition, reduction and analysis, etc. Also, HITAC 10 is designed as a stand-alone, personal computer for scientific engineering.

HITAC 10 provides low cost and high performance, portable compact size, flexibility and ease of application.

Input/output facility of HITAC 10 is very flexible, accommodating a wide range of peripheral equipment.

Over 50 instruction repertory and software systems are useful and powerful for general data processing applications.

Features

General

16-bit plus parity, single address, fixed word length.

Fully parallel, two's complement arithmetic.

Basic 4,096 words core memory expandable to 32,768 words (4,096/8,192 words in basic console).

1.4 microseconds memory cycle time.

Desk-top and rack mountable.

TTL integrated circuit.

Over 50 powerful instructions.

Power failure protection.

Page addressing (512 words per page).

Single-level indirect addressing and optional indexing.

Hardware multiply and divide option.

Double-precision arithmetic option.

Input/Output

Up to 64 channels for program controlled I/O bus facility.

Direct memory access standard with one-cycle and three-cycle data break facility.

Program interrupt facility.

Wide range of peripheral devices.

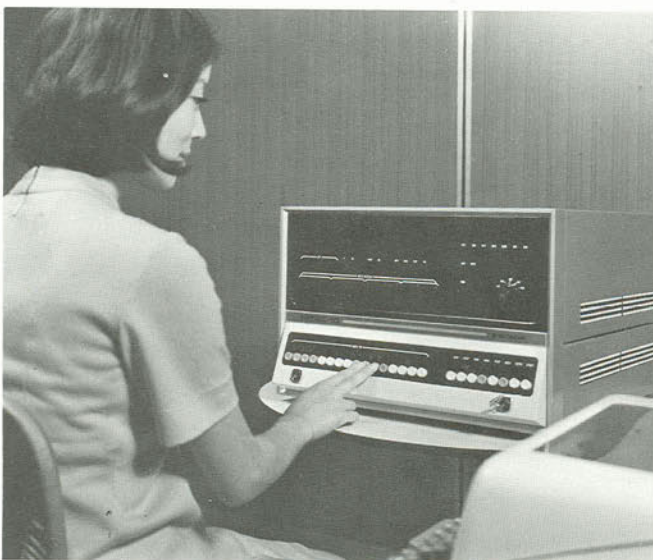
Software

Assemblers and Utility Package

FORTRAN

Calculator

Diagnostics



Specifications

Memory

Memory size : 4,096 words (8,192 words optional in single console) expandable to 32,768 words.
Word length : 16-bit plus parity bit.
Cycle time : 1.4 microseconds.

Arithmetic

Parallel, two's complement binary.

Compute speed

Add/Subtract : 2.8 microseconds
Load/Store : 2.8 microseconds
Branch : 1.4 microseconds
Indirect address : 1.4 microseconds

Instruction

Over 50 instructions; Multiply, divide, double-length arithmetic, and index operation are optional.

Input/output capability

Maximum optional multiplexed I/O devices: 64

Standard I/O device

H-9331 Data Typewriter, 10 char/sec.

Physical Specifications

Dimensions*

Height : 11.8 inches (300 mm)
Width : 17.7 inches (450 mm)
Depth : 23.6 inches (600 mm)

Weight*

100 pounds (45 Kg)

Power requirements

Source : 115V \pm 10%, 50 to 60 Hz, single phase
Consumption : 500W

Environmental conditions

Temperature : Operating 5 to 35° C
Humidity : Operating 35 to 85%

Applicable to basic console with all options excluding I/O device.

* Includes Power Supply

Options and Peripherals

HITAC 10 can be connected to various types of input/output equipment and optional features

Options

H-P1610-11 Extended Instruction Option
H-P1610- 2 Peripheral Expansion Mount
H-P1610-21 Memory Expansion
H-P1610-23 Power Failure Option
H-P1610-25 Tape Reader Controller
H-P1610-26 Tape Punch Controller

Peripherals

H-8226-2 High-speed Photo Tape Reader (500 cps)
H-8227-2 High-speed Tape Punch (110 cps)
H-1613-1 On-line Analog Data Processing Equipment.
8 or 16-channel analog inputs, 1-channel AD converter, up to 2-channel DA converter, up to 2-channel digital inputs, and 1, 2 or 4-channel digital outputs
External mass memories and other peripherals are under development.

Software

HITAC 10 is supported by a software package designed for system applications; Basic and MACRO Assemblers; FORTRAN, FAP(Floating Arithmetic Package), Subroutines, Debugging Utility, EHS(Extended Hardware Interpreter System), and Calculator. Also, these softwares are very useful for general data processing applications.

Basic Assembler (ASSY)

The Basic Assembler is a one-pass assembler which translates symbolic language into standard machine language.

MACRO Assembler (MASS)

The MACRO Assembler is a two-pass, more advanced assembler with the same functions as the Basic Assembler and a capacity to process MACRO instructions specified by users.

FORTRAN

The FORTRAN allows problem descriptions in a mathematical language with a basic 4K core memory.

FAP (Floating Arithmetic Package)

The FAP performs floating point arithmetic operations without specified hardware.

Mathematical Subroutine (single and double precision)

- * Multiplication, Division
- * Fixed point square root, sine, cosine, arctangent
- * Binary to decimal conversion
- * Decimal to binary conversion

Debugging Utility

The Debugging Utility offers a set of routines such as memory dump, trace, symbolic editor, etc., useful for debugging programs.

EHS (Extended Hardware Interpreter System)

The EHS is a routine providing the same functions as extended hardware which has instruction options.

Calculator

The Calculator is a conversational desk calculator-type language.

Instruction

Memory Reference Instructions

LOAD-STORE

	Time (μ S)
L : Load	2.8
ST : Store	2.8
* LE : Load EC	2.8
* LD : Load Double	4.2
* STE : Store EC	2.8
* STD : Store Double	4.2

ARITHMETIC

A : Add	2.8
S : Subtract	2.8
* AD : Add Double	4.2
* SD : Subtract Double	4.2
* M : Multiply	9.8
* D : Divide	11.2

LOGICAL

N : And	2.8
X : Exclusive Or	2.8
O : Or	2.8

CONTROL

B : Branch	1.4
BAL : Branch and Link	2.8
KCT : Skip on Count	4.2

SHIFT-ROTATE

SRL : Shift Right Logical	1.4
SLL : Shift Left Logical	1.4
SRA : Shift Right	1.4
SLA : Shift Left	1.4
* SRDL : Shift Right Double	1.4
Logical	
* SLDL : Shift Left Double	1.4
Logical	
* SRDA : Shift Right Double	1.4
* SLDA : Shift Left Double	1.4

Status Control Instructions

MISCELLANEOUS CONTROL GROUP **

	Time (μ S)
NE : No Effect	2.8
LCAr : Load Carry Register	2.8
SCAR : Set CAR*	2.8
LDSW : Load Data Switch	2.8
SIM : Set Interrupt Mask	2.8
RIM : Reset IM	2.8
HLT : Halt	2.8

SKIP GROUP **

Skip on Condition	2.8
Skip on Error	2.8
Skip on Error and Clear	2.8

I/O Transfer Instructions

TELETYPE KEY BOARD/READER

	Time (μ S)
KTI : Skip on TI (Flag)	4.2
STI : Start TI	4.2
RTI : Read TI	4.2
RTIF : Read TI and Feed	4.2

Others

* Option

** Produced by Bit Microprogramming

Specifications are subject to change without notice.



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