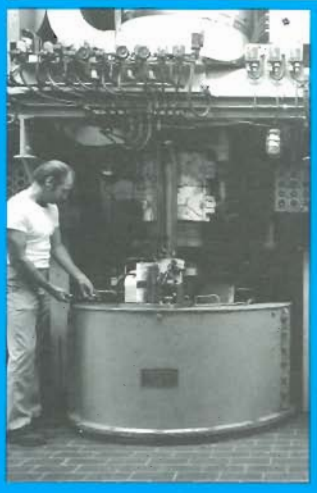
HEWLETT hp PACKARD



9800

COMPUTER SYSTEMS SELECTION GUIDE

For data acquisition and control . . .

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

ANALOG-TO-DIGITAL MEASUREMENTS

At speeds to 100,000 channels/sec

Option G00
(±10.24v fs, 12 bits, to 47,000 chan/sec w/DMA, 50 nanosec aperture, up to 1056 chan. w/extenders)

Option G20
Low-Level Multiplexer for Option G00 (±10mV to ±10.24v, to 15,000 chan/sec, up to 1024 chan.)

Option G60
(±1/±2.5/±10v fs, 10 bits, 100,000 chan/sec w/DMA, 100 nanosec aperture, 8 or 16 chan.)

Option G65
(±10v fs, 14 bits, 18,000 chan/sec, 50 nanosec aperture, up to 64 chan.)

Accessory Instruments
Data Amplifiers
Programmable and preset pacers

One I/O chan/subsystem

At speeds to 900 dc channels/sec; ac, resistance, timing, and frequency measurements available

Option E00
(0.1 to 1000v fs, 5 digits, to 14 chan/sec, 200 chan. expandable to 1000)

Option E20
(0.1 to 100v fs, 5 digits, to 40 chan/sec, 10 to 1000 chan.)

Option E00 and E20 subsystems use three I/O channels.

Option F10
(0.1 to 10v fs, 4 digits, to 900 chan/sec, 10 to 50 chan.)

Options H01-H09
(Nanosec intervals, freq. to 550 MHz, 7 digits)

Option H01-H09 and F10 subsystems use two I/O channels.

ANALOG OUTPUT SUBSYSTEMS AND INTERFACES

Programmable Voltage Sources*

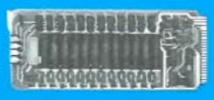
Up to eight of these voltage sources can be operated from one I/O slot.

Option I30/I32/I36
(to ±50v, 1A/±100v, 0.5A/±50v, 5A, 5mV increments

Analog Output

Option I29
(Two 0-10v outputs, resolved to 1 part in 256 — plugs into one I/O slot)

Multiple Resistance/Voltage Outputs
(for Multiprogrammer options T17, T18)



Option I01-I12
12-Bit Resistance Output Cards

Option I20-I21
11/12-Bit Digital-to-Analog Converter Cards

DIGITAL INPUT/OUTPUT AND INSTRUMENT/PERIPHERAL INTERFACES

Computer Interfaces

Option J00
32-bit Data Source Interface

Option S00/S02
16/8-bit (transistor) Duplex Register

Option K00
40-bit Output Register

Option S04
16-bit Microcircuit Duplex Register

Option K06
16-bit Relay Register

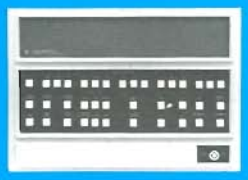
Interfaces for Multiprogrammer
(options T17, T18)

Option J10-J15
12-bit Digital Input Microcircuit and Transistor levels

Option K05/K10
12-bit Relay Output

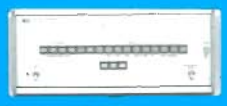
Option K04
12-bit TTL Output

SYSTEM CONTROL AND I/O EXTENSION



2100A Computer
(14 I/O slots, memory plug-in expandable from 8K to 32K, DMA optional)

Option T00
I/O Extender
(Adds 31 I/O slots, DMA optional)



Option T17
Multiprogrammer
(Fifteen 11/12-bit input/control channels)

Option T18
Multiprogrammer Extender
(Fifteen 11/12-bit input/control channels ▲)

▲Up to 240 input/control channels can be programmed from one computer I/O slot with one option T17 Multiprogrammer and fifteen option T18 Extenders.

MASS STORAGE

Option Q40-Q63
Magnetic Tape Subsystems and Additional Tape Units (7- or 9-track, read/write to 36,000 words/sec, 200, 556, 800 and 1600 cpi. DMA may be required. Can use up to four tape units through two I/O slots.)

Option Q70
Moving Head Cartridge Disc Memory — Std. in 9600E Systems (2.5 to 10 million words, read/write to 122,000 words/sec, two I/O slots, DMA required)

Option Q80
Fixed Head/Track Disc Memory — Std. in 9600F Systems (262,000 to 1,048,000 words, read/write to 118,000 words/sec, two I/O slots, DMA required)

OPERATOR COMMUNICATIONS AND DATA LOGGING

Option R00
Teleprinter*
(10 char/sec
72 char/line)

Option R02
Teleprinter
(Heavy duty
replacement
for option R00)

Standard in all 9600 series Systems

One I/O slot per device.

Option R04
Keyboard-Display
Terminal
(200 char/sec)

Option R06
Console Printer
(30 char/sec,
132 char/line)

Option Q00
Punched Tape
Reader*
(500 char/sec)

Option Q03
Tape Punch
(120 char/sec)

Option Q05
Tape Punch
(75 char/sec)

Option R50
Line Printer
(80 char/line,
356 lines/min.)

Option Q20
Card Reader
(600 punched
cards/min.)

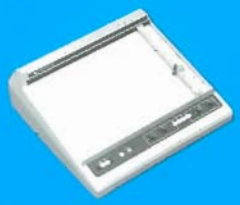
DATA DISPLAY AND PLOTTING

Option R81
X-Y Display Subsystem
(8 x 10 inches)■

■*Resolution is 1 part in 256*

One I/O slot per device

Option R82
X-Y Display
Subsystem
(7 x 9 cm with
high-intensity
storage)■



Option R85
Graphic Plotter
(10 x 15 inches)*

**Resolution is 1 part in 10,000*

Option R80
Interface to Digital Incremental Plotter
(Cal Comp 563, 565, or equivalent, 11 or
29.5 inches wide, 0.01 inch resolution)

INTERFACES AND REMOTE DATA ACQUISITION TERMINALS FOR DISTRIBUTED SYSTEMS

Option U07
Computer – Coupler/Controller Data Comm. Kit
(rates to 4,100 words/sec, distances to 10,000 feet)

Option U08
Computer – Computer Data Comm. Kit
(rates to 24,000 words/sec, distances to 10,000 feet)

Each kit uses one I/O slot in central computer and one I/O slot in remote terminal.

2570A
Coupler/Controller
Remote Terminal
7 I/O slots available*

2100A
Computer
Remote Terminal
13 I/O slots available,
expandable to 44*

Option R52
Line Printer
(132 char/line,
200 lines/min.)

Option Q28
Optical Mark Reader
(200 mark-sense or
punched cards/min.)

NOTE: X-Y Displays, Recorder, and Plotter Interface include character and graph generating software

CABINETS

Series 2940A/B

Two heights

Up to 3 bays

Optional front extensions

Fully-wired for 115/230V

Built-in ventilating system

All aluminum, modular construction

A CHOICE OF FOUR SYSTEMS

HP 9600A Basic Control System

- Simplified Loading and Linking of programs
- Simultaneous buffered I/O
- Powerful Program Library

HP 2100A Computer with 8K, 500 char/sec tape reader, teleprinter I/O, operating system, and standard software.

HP 9600G Data Acquisition and Control Executive System

- Real-Time Scheduling of Data Acquisition Tasks
- Modification of Task Parameters Without Recompiling
- Simultaneous buffered I/O
- Powerful Program Library

HP 2100A Computer with 8K, Time Base Generator, 500 char/sec tape reader, teleprinter I/O, operating system and standard software.

HP 9600E Real Time Executive System

- Multiprogramming (99 priority levels)
- Foreground-Background Processing
- Real-Time FORTRAN IV, ALGOL, Assembler, Editor
- Time-Out Check on Operation
- Swapping
- Simultaneous buffered I/O

HP 2100A Computer with 16K, DMA, 2.5 million word moving head cartridge Disc Memory, Time Base Generator, 500 char/sec tape reader, teleprinter I/O, operating system and standard software.

HP 9600F Real Time Executive System

Same as 9600E System, but uses 262K word fixed head/track disc memory instead of 2.5 million word moving head disc.

SOFTWARE

HP 9600 series Systems are fully software supported.
The standard software includes:

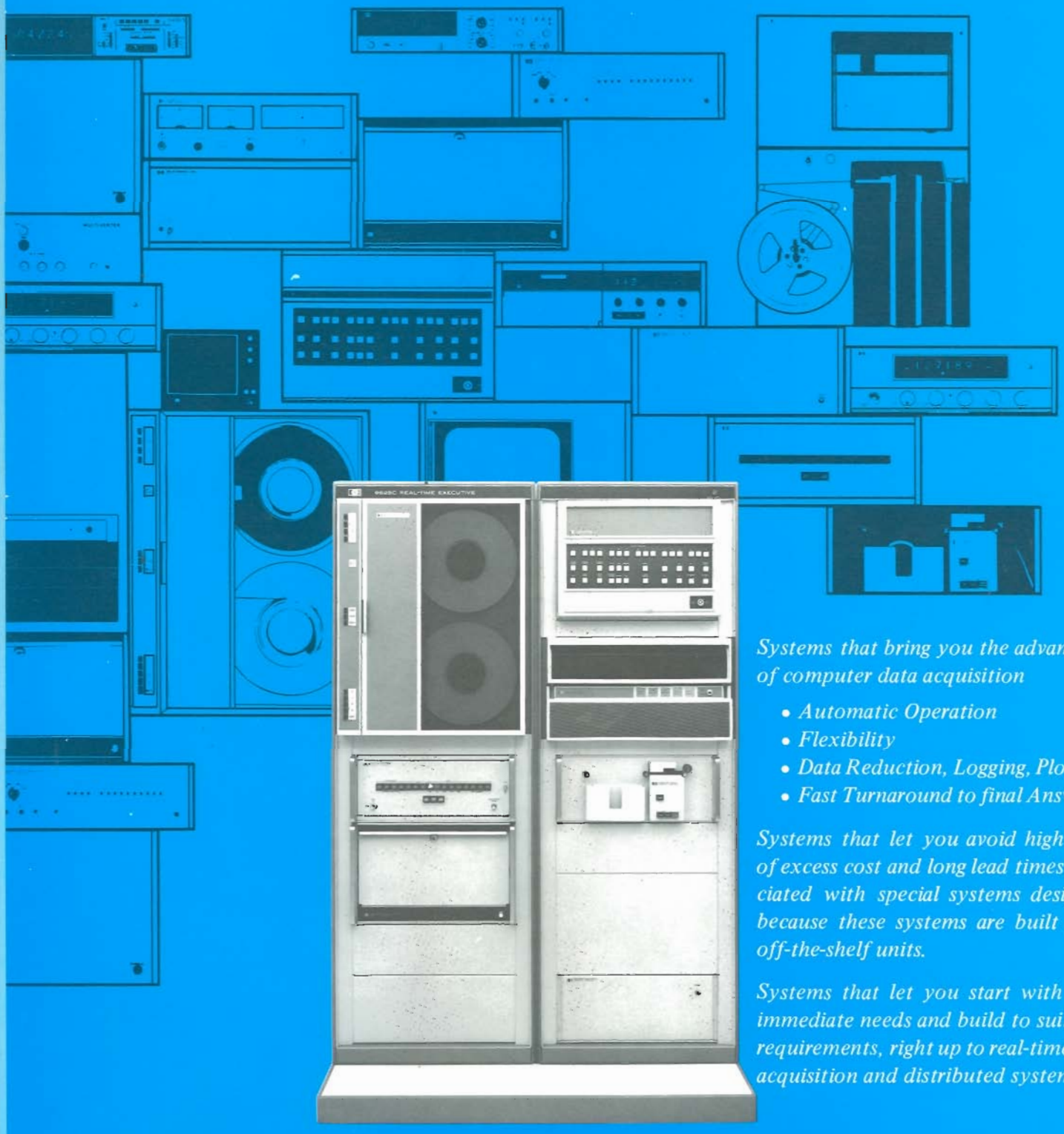
FORTRAN and ALGOL Compilers
Assembler
Editor
Systems Input/Output Software
Program Library

HP 9600E and 9600F Systems also include:

Real Time FORTRAN IV Compiler
Real Time ALGOL Compiler (with 24 or 32K memory)
Real Time Assembler
Real Time Editor
FORTRAN IV Program Library

Tailor made Data Acquisition with ready mades . . .

9600
COMPUTER SYSTEMS



Systems that bring you the advantages of computer data acquisition

- *Automatic Operation*
- *Flexibility*
- *Data Reduction, Logging, Plotting*
- *Fast Turnaround to final Answers*

Systems that let you avoid high risks of excess cost and long lead times associated with special systems design – because these systems are built from off-the-shelf units.

Systems that let you start with your immediate needs and build to suit new requirements, right up to real-time data acquisition and distributed systems.

HP DIGITAL DATA SYSTEMS

Hewlett-Packard has for many years been an industry leader in the development, manufacture, and supply of automatic digital data acquisition systems. Hundreds of HP digital data systems of the type shown here are on duty worldwide on land, at sea, and in the air, performing data acquisition tasks automatically and often on a 100% duty cycle basis during measurements.

These systems far surpass any manual data taking methods in accuracy and dependability, while at the same time releasing skilled people from the costly routine of meter reading, data reduction, and other tedious procedures to more skilled and creative scientific and engineering work.

HP COMPUTER

The controller used in HP 9600 series Systems is the new HP 2100A Computer. This computer is well-suited in computational power, input/output flexibility, and modularity to data acquisition, reduction, and control applications. It is supported by comprehensive software, including FORTRAN IV, basic FORTRAN, and ALGOL compilers. Hardware multiply/divide is standard, and floating point hardware for ultra-fast floating point computations is optional. Two capabilities of the computer's input/output system are of key importance for data acquisition: multilevel priority interrupt and optional Direct Memory Access (DMA). Since many I/O devices may request servicing simultaneously, each device interface is assigned a specific priority. The interrupt system acknowledges each request, and interrupts the program in progress to service devices in order of priority . . . on a multilevel basis. The DMA capability extends the range of computer applications to include those in which data is generated at rapid rates or in large quantities. Dual-channel DMA, assignable to any I/O channel under program control, transfers data directly to and from memory rather than through the computer's arithmetic and control logic. The computer's modularity is an important element of the "pay as you grow" philosophy of 9600 series Systems. For example, memory is plug-in expandable, in the mainframe, from 8K to 32K. Equally important, input/output capacity is expandable from the 14 channels provided in the mainframe to a total of 45 channels with an Input/Output Extender. The mainframe and extender are already wired and tested for all options including any which may be added later.

HP SUPPORT FOR YOUR SYSTEM

User Training

HP provides complete user (programming) training for HP computers. The basic course covers instruction on standard programming languages. Follow-on courses on specific operating systems are also available. Instruction includes hands-on experience. HP maintenance training courses are offered on a tuition basis to those customers who wish to maintain their own systems.

Documentation

HP is known for the quality and thoroughness of its operating and service manuals. Documentation furnished with HP computer systems includes programmer's reference manuals, operating procedures, and detailed technical descriptions with diagnostics and maintenance procedures.

Service

Service and parts assistance are supported by some 700 people located throughout HP. More than 80 HP field sales offices located in North America and abroad provide rapid and convenient service for Hewlett-Packard systems. Customers need not correspond with a factory several thousand miles away for repair service, replacement parts, and technical assistance. Backing up local offices are four regional service centers in the United States and major service centers in both the United States and Europe. The centers are equipped with extensive replacement parts inventories. Board exchange programs for computers and other complex instruments enable systems to be returned to normal service with minimal down-time.

Customer Service Agreements

When you have a customer service agreement, HP assumes your maintenance responsibilities for a basic annual charge, relieving you of the need for hiring your own trained specialists. Assistance can range from 5-day service during normal working hours to 7-day, all-hours backup.

Data Centers

To bring factory support closer to our computer system users, HP has established four regional data centers in the U.S., one in Canada, one in Mexico, one in Brazil, four in Europe, one in Japan, and one in Australia. These locations are highlighted in the list of world-wide sales and service offices on the rear page. At these centers, you can purchase the assistance of experienced system engineers and system analysts in the development of specialized solutions to your data acquisition and control applications.

Open this folder to select your system . . .

World-Wide Hewlett-Packard Sales & Service

Call your HP System Sales Engineer at any of these convenient locations:

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Telex: 034-8461
Cable: HEWPACK Palo Alto

★ Identifies data center location.

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West (213) 877-1282. Or, write: Hewlett-Packard, 1501 Page Mill Road, Palo Alto, California 94304. In Europe, 1217 Meyrin-Geneva, Switzerland

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