

200 Things you should know about the Prime200

First, The Software

1. The PRIME 200's design is unique. The software was specified and developed first, and then the hardware was designed to maximize the software's performance. The result is a computer that enables you to develop and execute software more efficiently and at less cost than ever before possible on a small computer.
2. PRIME has put together the most powerful array of system software ever offered with a new small computer. It includes an interactive Disk Operating System, modular Real Time Operating System, FORTRAN IV compiler, advanced Macro assembler, Text Editor, and Input Output Control System.
3. All system software is available now, with first deliveries.
4. For the first time with any computer, large or small, a uniform and consistent file structure is provided that permits compatible file interchange between program development and program execution environments.
5. The PRIME FORTRAN compiler is efficient. So efficient, in fact, that it allows FORTRAN to be used as the PRIME systems programming language.
6. All programs written for the PRIME 200 utilize a common set of systems software elements. Programs developed with stand-alone system software are compatible with those developed in an operating system environment.

Disk Operating System

7. System file management features include multiple directories and multiple volume control and file access methods.
8. The entire Disk Operating System is written in FORTRAN.
9. DOS functions as a batch operating system, providing automatic job and data stream routing by storing command sequences on a disk.
10. Disk files are constructed with forward and backward pointers to prevent accidental loss of one file from snowballing into multiple losses.
11. Files are addressed by name rather than absolute location.
12. DOS supports compressed ASCII files.

Real Time Operating System

13. RTOS is a compact, multiprogramming operating system that schedules processor, main memory and disk memory resources for optimum control of application programs executed in a real-time environment.
14. RTOS is available in memory-only and memory/disk configurations.
15. RTOS provides interrupt handling, multiprogram scheduling, simultaneous input/output and general supervisory functions.
16. DOS can run under control of RTOS, and conversely, real-time systems can be developed under DOS.
17. RTOS is supported by a complete set of utility, debugging, and I/O device test programs.

Stand-alone Systems

18. Stand-alone systems are supported with exactly the same language translators, I/O controllers, and loaders as larger operating system configurations.

FORTRAN IV

19. The compiler executes in one pass and produces highly optimized code.
20. The source language is ANSI extended FORTRAN plus other extensions derived from the proposed Instrument Society of America FORTRAN for control applications.
21. Source language extensions include embedded logical functions such as AND, OR, NOT and XOR; run-time trace; octal constants; and an extended support library.

Macro Assembler

22. A major improvement in symbolic language processor design, PRIME's macro assembler offers a simple, yet powerful means of generating

application-oriented macro statements.

23. The assembler features pseudo-ops for assembly, listing, and loader control; symbol and data definition; storage allocation; program linking; and conditional assembly.

Desectorizing Link-loader

24. Relocatable or absolute program modules from a PRIME language translator may be loaded, linked and bound with the link-loader.
25. Cross-sector references are automatically desectorized and literals, links and temporaries are optimized.
26. The link-loader saves the loader table for fast symbolic debugging.
27. DOS can be used to save and restore partial program loads.

Edit and Debug Resources

28. A full-context editor provides line-by-line and character-by-character editing and automatic execution of string buffers for multiple changes of the same text throughout a program.
29. A bulk media converter provides editing and transcription resources for handling large volumes of data.
30. Debugging aids include an interactive trace routine for examining, patching, tracing, etc.

Input Output Control System

31. The IOCS is a system of stream control routines and device drivers which provide device independence for user programs and centralized I/O control for all systems software.
32. A unique IOCS feature is the provision for source file editing and merging.

Support Library

33. The support library includes I/O conversion and driver packages, and standard and extended math functions.
34. The FORTRAN support library provides formatted I/O, encode and decode statement translators, and list processing functions.
35. The extended I/O driver library provides both interrupt driven and queued request device handling.

Verification and Maintenance

36. Thorough verification routines are provided for the PRIME 200 and each of its peripheral devices. Special processor features, including non-functional tests and micro diagnostics greatly enhance the fault diagnosis capabilities of the various test and maintenance routines.
37. Prime Software Configurator.

Then, The Hardware

The Central Processor

38. The PRIME 200's architecture is based on proven design concepts which have demonstrated their reliability through millions of hours of usage.
39. Parity per byte on all internal transfers
40. MSI/TTL logic throughout.
41. 16-bit word length.
42. 118 instructions, including 15 memory reference instructions.
43. Integral Direct Memory Access processor.
44. Direct, indexed and indirect (in both relative and sectorized modes) addressing.
45. Power monitor, power failure interrupt option.
46. Push-pop and recursive stack processing.
47. 32 addressable hardware registers.
48. Double precision arithmetic.
49. Hardware multiply/divide.
50. Automatic program loading.
51. Real-time clock option.
52. 100% microprogrammed logic.
53. 64-level vectored priority interrupt system.
54. Unimplemented instruction vectored trap.

MOS Memory

55. 750 nanosecond cycle time.
56. Parity per byte.
57. Modularly expandable to 32K words.
58. Battery standby power option.

Input/Output

59. Byte, word and multiword transfers.
60. I/O data rates up to 1 megaword.
61. I/O bus handles 64 devices.
62. EIA compatible, serial interface handles devices with speeds up to 9600 baud.
63. Byte parity on all I/O transfers.

Peripherals

64. Fixed-head storage file provides random access to 128K or 256K words with an average access time of 8.7 milliseconds and a transfer rate of 4 microseconds per word.
65. Moving-head disk cartridge file handles standard 2315 cartridges and provides random access to 1.5M or 3.0M words with an average seek time of 70 milliseconds and a transfer rate of 10 microseconds per word.
66. Paper tape reader and punch reads eight-channel, fan-fold tape at 200 cps and punches fan-fold tape at 75 cps.
67. Model 33 ASR, 33 KSR and 35 ASR teletypes.

Packaging

68. Big-board packaging permits entire central processor to be fabricated on a single circuit board.
69. A complete 8K MOS memory module is contained on a single circuit board.
70. The PRIME 200 chassis provides 10 slots for mounting the processor, memory and controller circuit boards.
71. There are no reserved slots in the chassis; any board can be inserted in any slot.
72. Modular, plug-in packaging is used throughout the PRIME 200. Plug-in components include the processor, memory modules, interfaces, controlled impedance backplane, control panel, and power supply.

Physical and Electrical Requirements

73. The PRIME 200 chassis measures 10½" H x 19" W x 20" D.
74. A chassis with power supply, processor, one memory and one I/O controller board weighs 70 pounds.
75. The system operates on 117 V AC, 50-60 cycle (230 V AC optional).
76. Prime Hardware Configurator.

Analog to Digital

77. Analog to digital differential input subsystem
78. High-level, solid-state differential signed multiplexer
79. Handles up to 64 channels
80. 11 bit plus sign digitization
81. Programmable input ranges of 0 to ±1, ±2, ±5, ±10 volts full scale
82. Operates in programmed I/O or DMA modes

83.-200. PRIME 200 Instruction Complement

Register Operate

- ĈRA Clear A
- CRB Clear B
- CRL Clear Long (A and B)
- LDA Load A
- STA Store A
- LDX Load Index
- STX Store Index
- IMA Interchange Memory and A
- IAB Interchange A and B
- XCA Transfer A to B and Clear A
- XCB Transfer B to A and Clear B
- CEA Computer Effective Address

Arithmetic

ADD Add Memory to A
 SUB Subtract Memory from A
 AOA Add One to A
 A2A Add Two to A
 SOA Subtract One from A
 S2A Subtract Two from A
 ACA Add C-Bit to A
 CSA Copy Sign to C-Bit, set Sign Plus
 SSP Set Sign Plus
 SSM Set Sign Minus
 CHS Change Sign
 TCA Two's Complement A
 PIM Position for Integer Multiply
 PID Position for Integer Divide
 MPY Multiply
 DIV Divide
 DLD Double Precision Load
 DST Double Precision Store
 DAD Double Precision Add
 DSB Double Precision Subtract

Input/Output

OCP Output Control Pulse
 SKS Skip if Set
 INA Input to A
 OTA Output from A
 ISI Input Serial Interface to A
 OSI Output Serial Interface from A
 SMK Set Interrupt Mask

Control

HLT Halt
 NOP No Operation
 SCB Set C-Bit
 RCB Reset C-Bit
 XFA Index from A
 XFB Index from B
 XFS Index from S
 XFX Index from X
 SGL Enter Single Precision Mode
 DBL Enter Double Precision Mode
 EMCM Enter Machine Check Mode
 LMCM Leave Machine Check Mode

RMC Reset Machine Check
 E16S Enter 16K Sector Addressing Mode
 E32S Enter 32K Sector Addressing Mode
 E32R Enter 32K Relative Addressing Mode
 SVC Supervisor Call
 DIAG Diagnose

Logical

ANA And to A
 ERA Exclusive or to A
 CMA Complement A
 LEQ Convert A = 0 to True
 LNE Convert A ≠ 0 to True
 LLE Convert A ≤ 0 to True
 LGE Convert A ≥ 0 to True
 LLT Convert A < 0 to True
 LGT Convert A > 0 to True

Interrupt

ENB Enable Interrupt
 INH Inhibit Interrupt
 ESIM Enter Standard Interrupt Mode
 EVIM Enter Vectored Interrupt Mode
 CHI Clear Highest Interrupt
 INK Transfer (Input) Status Keys to A
 OTK Transfer (Output) A to Status Keys

Shift

ALL A Left Logical
 ARL A Right Logical
 ALR A Left Rotate
 ARR A Right Rotate
 ALS A Left Shift
 ARS A Right Shift
 LLL Long Left Logical
 LRL Long Right Logical
 LLR Long Left Rotate
 LRR Long Right Rotate
 LLS Long Left Shift
 LRS Long Right Shift

Shift

NRM Normalize
 SCA Transfer shift Counter to A

Byte Manipulation

ICA Interchange Bytes of A
 ICL Interchange Bytes of A and Clear Left Byte
 ICR Interchange Bytes of A and Clear Right Byte
 CAL Clear Left Byte of A
 CAR Clear Right Byte of A

Transfer and Skip

JMP Unconditional Jump
 JST Jump and Store P
 SKP Unconditional Skip
 IRS Increment, Replace Memory and Skip
 IRX Increment, Replace Index and Skip
 DRX Decrement Replace Index and Skip
 CAS Compare A With Memory
 CAZ Compare A With Zero
 SPL Skip on A Plus
 SMI Skip on A Minus
 SZE Skip on A Zero
 SNZ Skip on A Not Zero
 SGT Skip on A Greater Than Zero
 SLE Skip on A Less than or Equal to Zero
 SLZ Skip on A Bit 16 Zero
 SLN Skip on A Bit 16 One
 SASn Skip on A Bit n Set
 SARn Skip on A Bit b Reset
 SSC Skip on C-Bit Set
 SRC Skip on C-Bit Reset
 SMCS Skip on Machine Check Set
 SMCR Skip on Machine Check Reset
 SSS Skip on Any of Sense Switches 1-4 Set
 SSR Skip on None of Sense Switches 1-4 Set
 SSn Skip on Sense Switch n Set
 SRn Skip on Sense Switch n Reset

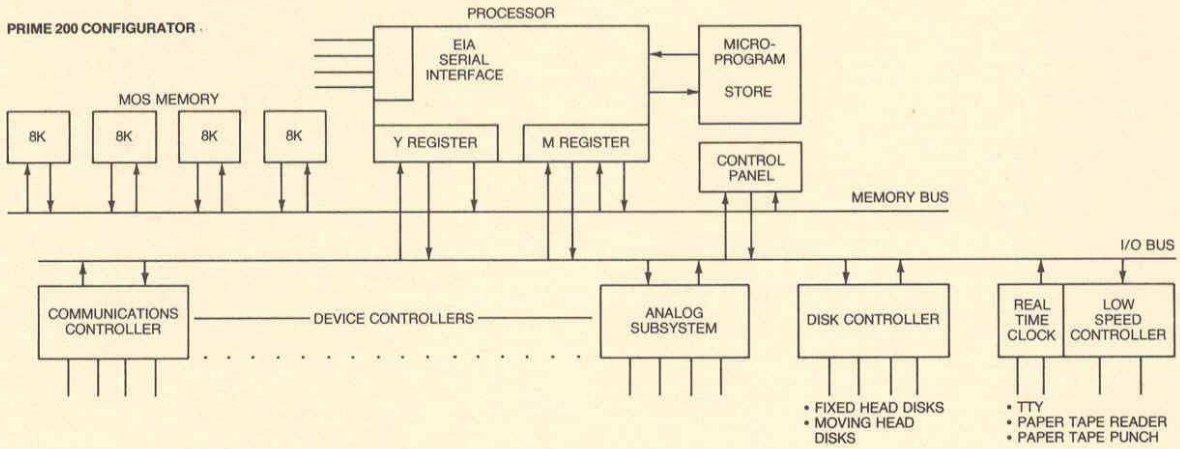
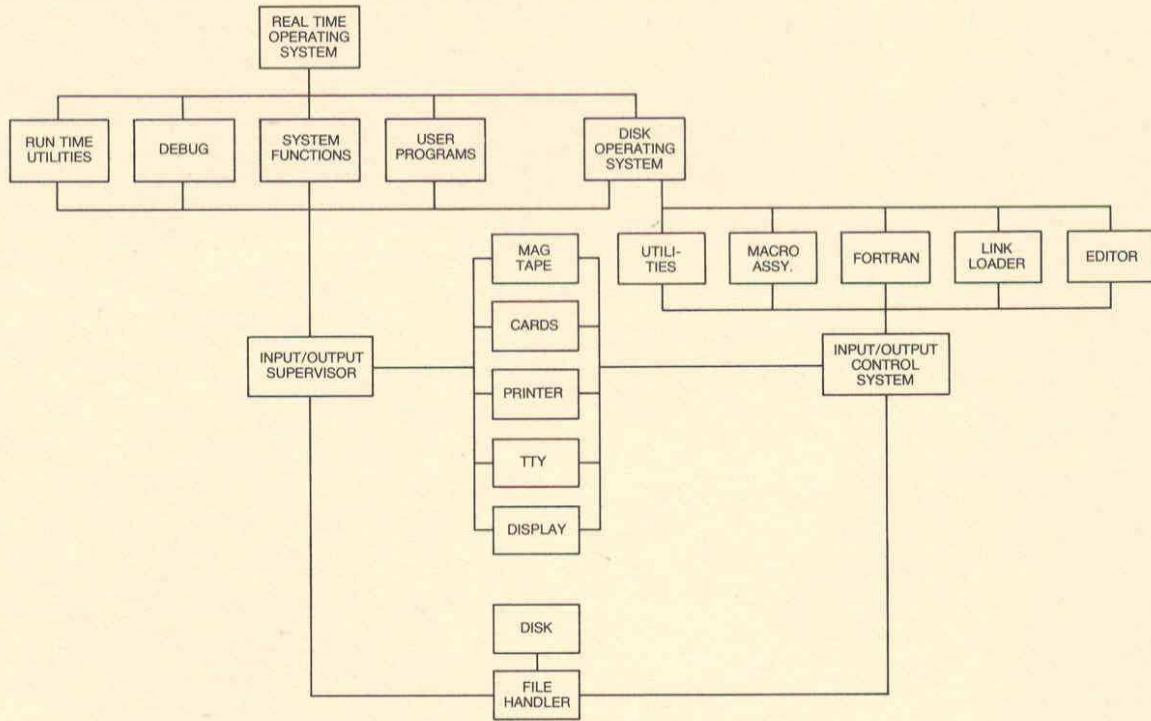
201. The most important thing you should know about the PRIME 200 is what it can do for you. To help us supply you with specific information about the PRIME 200 in your application, fill out this card and mail it today.

Description of Application**Equipment Requirements**

Main Memory	Fixed-head Disk	Moving-head Disk	Paper Tape	TTY	Other Peripherals	Interfacing Requirements
8K <input type="checkbox"/>	128K <input type="checkbox"/>	1.5M <input type="checkbox"/>	Reader <input type="checkbox"/>	ASR 33 <input type="checkbox"/>		
16K <input type="checkbox"/>	256K <input type="checkbox"/>	3.0M <input type="checkbox"/>	Punch <input type="checkbox"/>	KSR 33 <input type="checkbox"/>		
24K <input type="checkbox"/>				ASR 35 <input type="checkbox"/>		
32K <input type="checkbox"/>						

Name: _____
 Title: _____
 Company: _____
 Address: _____

THE PRIME SOFTWARE SYSTEM



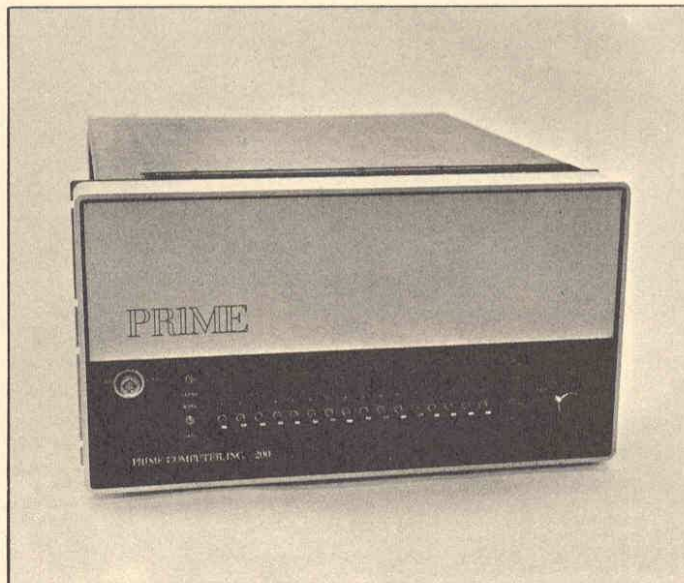
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