All About Minicomputers: Addendum 1

MANUFACTURER & MODEL	Basic Time Sharing BIT 4000 Series	Data General Nova 3/4	Data General Nova 3/12	Digital Computer Controls MOD FIVE	Display Data In*sight
DATA FORMATS					
Word length, bits	16	16	16	16	8
Fixed-point operand length, bits	16	16	16	16	8/16/24/32
Instruction length, bits	16	16	16	16	8/16/24/32
MAIN STORAGE					
Storage type	Core	MOS or core	MOS or core	Core or MOS	Core
Cycle time, microseconds/word	0.98	0.7 or 0.8/1.0	0.7 or 0.8/1.0	1.0 or 1.2	1.0
Minimum capacity, words	32,768	4,096	4,096	4,096	32,768
Maximum capacity, words	32,768	32,768	131,072	131,072	65,536
Parity checking	Standard	Optional	Optional	No	No
Storage protection	Standard	None	None	Optional	No
CENTRAL PROCESSOR					
No. of accumulators	2	4	4	8	3
No. of index registers	0	2	2	2 + 2	1
No. of directly addressable words	2,048	1,024	1,024	1,024	32,768
Indirect addressing	Multi-level	Multi-level	Multi-level	Multi-level	One-level
Microprogrammable	By user	No	No	By vendor only	By user
Add time, microseconds (full word)	1.96	1.15 to 1.75	1.15 to 1.75	1.0 or 1.6	6.38
Hardware multiply/divide	Standard	Optional	Optional	Optional	Standard
Hardware floating point	Standard	Optional	Optional	No	No
Hardware byte manipulation	No	Standard	Standard	Standard	Standard
Immediate (literal) instructions	Standard	No	No	Standard	Standard
Power failure protection	Standard	Optional	Optional	Standard	Standard
Real-time clock or timer	Standard	Optional	Optional	Optional	Standard
INPUT/OUTPUT CONTROL					
I/O word size, bits	16	16	16	16	8
Direct memory access channel	Standard	Standard	Standard	Standard	Standard
Maximum I/O rates, words/sec	1,000,000	1,100,000	1,100,000	1.0 or 0.833M	1,000,000
No. of external interrupt levels	60	16	16	1-16	2
PERIPHERAL EQUIPMENT					
Floppy disk (diskette) drives	No	Yes	Yes	Yes	No
Disk pack/cartridge drives	Pack, cartridge	Pack, cartridge	Pack, cartridge	Pack, cartridge	Cartridge
Non-interchangeable disk storage	No	Yes	Yes	No	No
Magnetic tape cassettes/cartridges	No	Yes	Yes	Yes	No
Magnetic tape, ½-inch	Yes	Yes	Yes	Yes	Yes
Punched card input speed, cpm	No	150-1000	150-1000	150-600	No
Line printer speeds, lpm	No	240-300	240-300	60-600	75-600
Data communications interface	Yes	Yes	Yes	Yes	Yes
Other standard peripheral units	No	CRTs, punched tape units, plotter	CRTs, punched tape units, plotter	Punched tape units, CRTs, plotters, A/D and D/A units, TTY, etc.	CRTs
SOFTWARE					
Assembler	No	2-pass	2-pass	2-pass	No
Macro assembler	No	Yes	Yes	Yes	No
FORTRAN compiler	No	Yes	Yes	Yes	No
Other compilers	BASIC	ALGOL, BASIC	ALGOL, BASIC	BASIC	BASIC
Operating system	Time-sharing	Batch, real-time, time-sharing	Batch, real-time, time-sharing	Batch, real-time, time-sharing	Time-sharing
PRICING & AVAILABILITY					
Price of basic system with minimum main storage	$49,500	$2,600	$3,600	$2,975	$19,075
Price of basic system with 8K words	—	$3,200	$4,200	$3,365	—
Date of first delivery	NA	NA	NA	February 1976	January 1974
Number installed to date	NA	—	—	—	Over 30
COMMENTS	Time-sharing system for up to 32 users, built around HP 2100; price includes disk	Fully compatible with previous Nova systems	Fully compatible with previous Nova systems	Uses same instruction set as DCC D-216 through D-616	Turnkey multi-user system

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MANUFACTURER & MODEL	Four-Phase Systems, Inc. NP/80	IBM 5100	IMS Associates Hypercube	Interdata 6/16	Isyx 3780
DATA FORMATS					
Word length, bits	16	16	8	8/16/32	8
Fixed-point operand length, bits	16	16	8	8/16/32	8
Instruction length, bits	16	16	8	16/32	8
MAIN STORAGE					
Storage type	MOS	MOSFET	MOS	Core or MOS	Semiconductor
Cycle time, microseconds/word	0.5	0.53	—	1.0 or 0.5	—
Minimum capacity, words	8,192	8,192	262,144	4,096 (16-bit)	16,384
Maximum capacity, words	131,072	32,768	16,777,216	32,768 (16-bit)	65,536
Parity checking	—	Standard	—	Optional	No
Storage protection	—	—	—	No	No
CENTRAL PROCESSOR					
No. of accumulators	—	—	—	16	6
No. of index registers	—	—	—	15	0
No. of directly addressable words	—	—	—	32,768	65,536
Indirect addressing	—	—	—	No	—
Microprogrammable	—	—	—	By vendor only	No
Add time, microseconds (full word)	—	—	—	1.0 or 0.9	2.0
Hardware multiply/divide	—	—	—	Optional	—
Hardware floating point	—	—	—	Optional	—
Hardware byte manipulation	—	—	—	Standard	—
Immediate (literal) instructions	—	—	—	Standard	—
Power failure protection	—	—	—	Optional	—
Real-time clock or timer	—	—	—	Optional	—
INPUT/OUTPUT CONTROL					
I/O word size, bits	—	8	8	8/16	8
Direct memory access channel	—	No	Yes	Optional	Optional
Maximum I/O rate, words/sec	—	430,000	32M-162M	2,000,000	—
No. of external interrupt levels	—	—	—	255	—
PERIPHERAL EQUIPMENT					
Floppy disk (diskette) drives	No	No	No	No	Yes
Disk pack/cartridge drives	Pack	No	No	Pack, cartridge	No
Non-interchangeable disk storage	No	No	No	Yes	No
Magnetic tape cassettes/cartridges	No	Cartridge	No	Yes	No
Magnetic tape, ½-inch	No	No	No	Yes	No
Punched card input speed, cpm	No	No	No	1000	No
Line printer speeds, lpm	No	36	No	600	165-200
Data communications interface	Yes	Yes	No	Yes	Yes
Other standard peripheral units	—	CRT	—	Punched tape units	CRT
SOFTWARE					
Assembler	No	No	—	1- & 2-pass	Yes
Macro assembler	No	No	—	Yes	No
FORTRAN compiler	No	No	—	Yes	Yes
Other compilers	No	BASIC, APL interpreters	—	BASIC	No
Operating system	Real-time	No	Real-time, time-sharing	Batch, real-time, time-sharing	Real-time
PRICING & AVAILABILITY					
Price of basic system with minimum main storage	Contact vendor	$8,975	$80,000	$2,800	$9,850
Price of basic system with 8K words	—	$8,975	—	$3,300	—
Date of first delivery	1Q 1976	September 1975	1Q 1976	1Q 1976	1975
Number installed to date	—	NA	—	—	NA
COMMENTS	Communications controller linking multiple Four-Phase CRT systems to disk data base and/or host system	Portable desk-top computer; price includes cartridge tape drive and CRT	Built around 16, 81, or 256 pairs of microcomputers, with 8-way inter-connection. 1922 Republic Ave., San Leandro, CA 94577; (415) 483-2093	Specifically for OEM usage; fully compatible with previous Inter-data systems	Built around Intel 8080 micropro-cessor; price includes floppy disk and CRT. P.O. Box 935, Columbia, MD 21044; (301) 997-3639

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MANUFACTURER & MODEL	Minuteman Computer	Nixdorf 8870	Randall Link-100	Raytheon PTS 1200	Tandem NonStop
DATA FORMATS					
Word length, bits	16	16	—	16	16
Fixed-point operand length, bits	16	16	—	16	16
Instruction length, bits	16	16	—	16	16
MAIN STORAGE					
Storage type	Core	Core	Core	MOS	Core or MOS
Cycle time, microseconds/word	1.0	0.96	—	1.0	800 or 500
Minimum capacity, words	4,096	24,576	32,768 bytes	24,576	32,768
Maximum capacity, words	32,768	32,768	65,536 bytes	65,536	128K or 256K
Parity checking	No	No	—	—	Standard
Storage protection	No	No	—	—	—
CENTRAL PROCESSOR					
No. of accumulators	4	4	—	—	—
No. of index registers	2	2	—	—	—
No. of directly addressable words	1,024	1,024	—	—	—
Indirect addressing	Multi-level	Multi-level	—	—	—
Microprogrammable	No	No	—	—	—
Add time, microseconds (full word)	1.0	1.0	—	—	—
Hardware multiply/divide	—	No	—	—	—
Hardware floating point	—	No	—	—	—
Hardware byte manipulation	—	Standard	—	—	—
Immediate (literal) instructions	—	No	—	—	—
Power failure protection	—	Standard	—	—	—
Real-time clock or timer	—	Standard	—	—	—
INPUT/OUTPUT CONTROL					
I/O word size, bits	16	16	—	—	16
Direct memory access channel	Standard	Standard	—	—	Standard
Maximum I/O rate, words/sec	833,000	833,000	—	—	64M
No. of external interrupt levels	16	16	—	—	—
PERIPHERAL EQUIPMENT					
Floppy disk (diskette) drives	No	No	Yes	No	No
Disk pack/cartridge drives	Cartridge	Cartridge	No	Cartridge	Cartridge
Non-interchangeable disk storage	No	No	No	No	No
Magnetic tape cassettes/cartridges	No	No	No	Cassette	No
Magnetic tape, ½-inch	No	Yes	No	No	Yes
Punched card input speed, cpm	No	Yes	No	300	No
Line printer speeds, lpm	Yes	300-600	60-600	300	—
Data communications interface	—	No	Yes	Yes	—
Other standard peripheral units	CRT	CRTs	CRTs	CRTs	—
SOFTWARE					
Assembler	—	No	—	—	—
Macro assembler	—	No	—	—	—
FORTRAN compiler	—	No	—	—	—
Other compilers	—	BASIC	BASIC	MACROL	T/TAL
Operating system	Real-time	Time-sharing	Time-sharing	Time-sharing	Time-sharing
PRICING & AVAILABILITY					
Price of basic system with minimum main storage	Contact vendor	$39,900	$12,000	Contact vendor	$65,300
Price of basic system with 8K words	—	—	—	—	—
Date of first delivery	NA	1975	NA	September 1975	April 1976
Number installed to date	NA	NA	NA	NA	—
COMMENTS	Business system built around Data General Nova 2/10. 895 Stanton Rd., Burlingame, CA 94010; (415) 692-5025	Turnkey, multi-user system; price includes disk, 1 CRT, and printer	Price includes floppy disk and CRT; supports 2 users; other Randall systems support 64 users. 2807 Oregon Ct., Torrance, CA 90503; (213) 320-8550	Multi-user system supporting up to 24 users. 1415 Boston-Providence Trnpk., Norwood, MA 02062; (617) 762-6700	Price includes disk and mag. tape; built around 2 to 16 pairs of micro-computers. 2909 Stender Way, Santa Clara, CA 95051; (408) 984-1800

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MANUFACTURER & MODEL	Tektronix 4051	Texas Instruments 990/4	Texas Instruments 990/10	Varian V 76	Wintex System
DATA FORMATS					
Word length, bits	8	16	16	8/16/32	8
Fixed-point operand length, bits	8	8/16	8/16	16/32	8
Instruction length, bits	8/16/24	16/32/48	16/32/48	16/32	16
MAIN STORAGE					
Storage type	NMOS	MOS	MOS	NMOS	NMOS
Cycle time, microseconds/word	1.2 effective	0.65	0.65	0.66	0.9
Minimum capacity, words	8,192	4,096	8,192	32,768 (16-bit)	2,048
Maximum capacity, words	32,768	32,768	1,048,576	262,144 (16-bit)	2,048
Parity checking	None	Optional	Optional	Optional	No
Storage protection	None	None	Standard	Optional	No
CENTRAL PROCESSOR					
No. of accumulators	2	16 (multiple sets)	16 (multiple sets)	8-16	16
No. of index registers	1	16 (multiple sets)	16 (multiple sets)	7-16	—
No. of directly addressable words	65,536	65,536	65,536	32,768	—
Indirect addressing	—	One-level	One-level	Multi-level	—
Microprogrammable	By vendor only	No	No	By user	Yes
Add time, microseconds (full word)	2.0	4.7	3.6	1.32	0.2
Hardware multiply/divide	—	Standard	Standard	Standard	—
Hardware floating point	—	No	No	Optional	—
Hardware byte manipulation	Standard	Standard	Standard	Standard	—
Immediate (literal) instructions	—	Standard	Standard	Standard	—
Power failure protection	—	Standard	Standard	Optional	—
Real-time clock or timer	—	Standard	Standard	Optional	—
INPUT/OUTPUT CONTROL					
I/O word size, bits	8	1-128	1-128	16	8
Direct memory access channel	No	No	Standard	Standard	No
Maximum I/O rate, words/sec	—	1,500,000	4,000,000	6,000,000	700,000
No. of external interrupt levels	—	7	15	0-64	16
PERIPHERAL EQUIPMENT					
Floppy disk (diskette) drives	No	Yes	Yes	No	Yes
Disk pack/cartridge drives	No	Cartridge	Cartridge	Pack, cartridge	No
Non-interchangeable disk storage	No	No	No	Yes	No
Magnetic tape cassettes/cartridges	Cartridge	Cassette	Cassette	No	No
Magnetic tape, ½-inch	No	No	No	Yes	No
Punched card input speed, cpm	No	400	400	300-600	No
Line printer speeds, lpm	82	40-90	40-90	300-600	75
Data communications interface	Yes	Yes	Yes	Yes	Yes
Other standard peripheral units	Graphic CRT, plotter, joystick	Typewriter terminals, CRTs	Typewriter terminals, CRTs	Punched tape units, CRTs, analog plotter	—
SOFTWARE					
Assembler	No	1-pass	1-pass	2-pass	Yes
Macro assembler	No	Yes	Yes	Yes	No
FORTRAN compiler	No	Yes	Yes	Yes	No
Other compilers	BASIC	BASIC, COBOL	BASIC, COBOL	COBOL, BASIC, RPG II	No
Operating system	None	Real-time	Batch, real-time, time-sharing	Batch, real-time, time-sharing	—
PRICING & AVAILABILITY					
Price of basic system with minimum main storage	$6,995	$1,750	$2,925	$12,200	$9,500
Price of basic system with 8K words	$6,995	$2,375	$2,925	—	—
Date of first delivery	October 1975	March 1976	March 1976	1Q 1976	1975
Number installed to date	NA	—	—	—	NA
COMMENTS	Price includes graphic CRT and cartridge tape drive	990/4 is based on TI TMS9900 microcomputer; 990/10 is a TTL implementation of same architecture. Also available without chassis and power supply.		Fully compatible with previous V 70 series models; features 4K NMOS memory chips	Small bus. system built around Wintex 200NS microcomputer; price includes 2 floppy disks and CRT. 544 Lunt Ave., Schaumberg, IL 60172; (312) 529-3080