All About Plug-Compatible Mainframes

The plug-compatible mainframe (PCM) industry was launched in 1975 with the introduction of Amdahl Corporation's 470/V6 system. Since that time, other vendors have successfully competed for a share of the market. The primary thrust of the PCM manufacturers has been to provide cost-effective alternatives to the IBM System/370, 303X Series, 308X Series, and 4300 Series computers.

Plug-compatible mainframes can be installed easily, can replace or augment IBM mainframes with little or no need for changes in software or operating procedures, and can be expected to perform reliably and efficiently. What's more, most of the PCM suppliers have demonstrated their ability to provide first-class field maintenance and software support.

Should your organization install a PCM? And if so, which one? This report is designed to help you answer those questions by assessing the pros and cons of PCMs in general, profiling their current suppliers, and presenting the characteristics of 34 PCMs from 6 vendors in detailed comparison charts.

Plug-compatible mainframes offer attractive alternatives to IBM's medium- and large-scale computer systems. This report discusses the pros and cons of installing a PCM, profiles the current PCM suppliers, and provides detailed comparison charts describing 34 systems from 6 vendors.

The PCM Concept

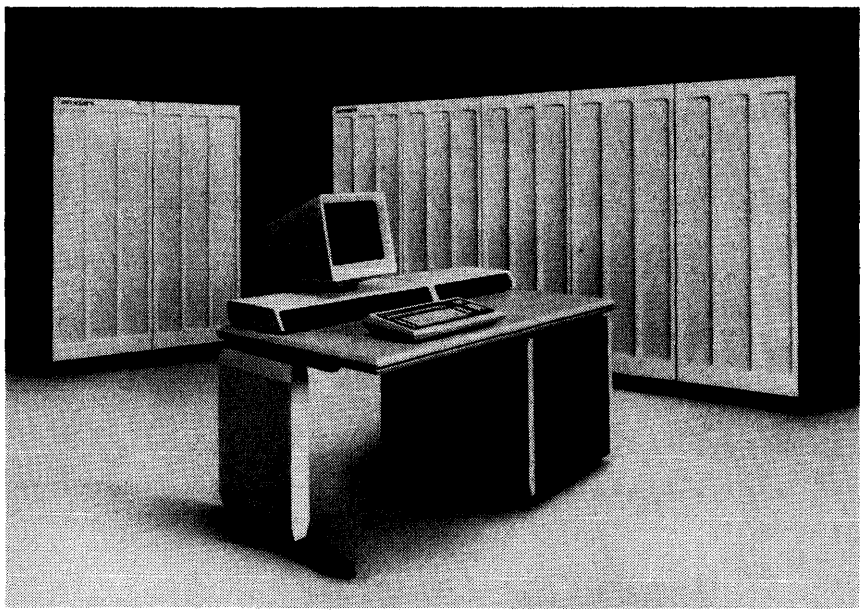
Plug-compatible mainframes are typically defined as computer mainframes that can directly execute all application programs and systems software written for the IBM System/370, 303X Series, 308X Series, and/or 4300 Series computers and can utilize the peripheral equipment available for these computers. The PCM concept would, of course, be equally applicable to the computers made by Burroughs, Honeywell, Sperry, or any other mainframe supplier. However, IBM, with its large user base, attracts the most serious attention from the PCM vendors.

The PCM industry resulted from the convergence of two important trends:

- The widespread availability and user acceptance of plug-compatible peripherals designed to directly replace IBM's own magnetic tape units, disk storage units, printers, terminals, and even main memory units. From there, the next logical step was to offer replacements for the IBM central processors themselves.

- The acknowledgement that the IBM System/370 instruction set has become a de facto standard for the industry and that most IBM computer users will not seriously consider switching to a computer that requires extensive reprogramming. In the 1960s, RCA and Sperry developed a number of systems that used the System/360 instruction set but were incompatible with systems software and peripherals. The next logical step, which was first taken by Amdahl Corporation, was to build computers which exhibited total functional compatibility with the IBM mainframes and could use all the same software and peripheral equipment.

The current trend in the PCM industry is to target a family of systems toward a specific IBM product line, rather than be all things to all users. For example, Amdahl Corporation



Amdahl Corporation has concentrated on technology that enables its computers to deliver more performance per dollar than comparable IBM models. Amdahl's 580 Series is targeted at IBM's 308X processors and consists of seven models: the single-processor 5840, 5850, and 5860 (shown here) and the dual-processor 5867, 5868, 5870, and 5880. The 580 Series processors feature from 16 to 128 megabytes of main memory and from 16 to 48 I/O channels. Amdahl is the original plug-compatible mainframe supplier and is also one of the most active PCM participants today.

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	Amdahl	IPL	NAS	IBM 4300	IBM 308X
Ease of operation	3.43	3.58	3.38	3.17	3.26
Reliability of mainframe	3.57	3.75	3.69	3.73	3.69
Reliability of peripherals	3.38	3.17	3.42	3.51	3.43
Responsiveness of maintenance service	3.83	3.08	3.54	3.47	3.47
Effectiveness of maintenance service	3.60	3.33	3.46	3.46	3.36
Technical support:					
Troubleshooting	3.47	3.25	3.31	3.03	3.26
Education	3.27	2.80	3.00	2.94	3.05
Documentation	3.03	3.00	3.08	2.84	2.98
Ease of programming	2.78	3.00	3.33	2.94	2.93
Ease of conversion	2.90	2.86	3.22	2.84	3.04
Overall satisfaction	3.14	3.25	3.44	3.15	3.24

pits its 580 Series against IBM's high-end systems, the 308X Series. Firms like Cambex, IPL Systems, and Global-Ultimacc compete with IBM's popular 4300 Series. With high technology costs and the costs associated with maintenance and software support to consider, it is eminently more practical for a manufacturer to concentrate on a particular IBM product line. The various manufacturers and their product lines appear to bear this out, although National Advanced Systems (NAS) has entered both the 4300-compatible and the 308X-compatible markets.

User Reaction

Three currently extant PCM manufacturers—Amdahl, IPL, and NAS—were represented in Datapro's 1984 survey of computer users. We received a total of 30 responses from Amdahl 470/580 Series users, 13 responses from NAS AS Series users, and 12 responses from IPL 4400 Series users.

Using 11 of Datapro's rating criteria and our usual scale of 4.0 for Excellent, 3.0 for Good, 2.0 for Fair, and 1.0 for Poor, we've compiled the weighted average ratings these users have assigned to their systems, and present the results in the chart above.

For comparison we've also included the weighted averages of the IBM system families the PCMs compete with, the 4300 Series (437 responses) and 308X Series (89 responses).

As you can see, the user ratings earned by the PCM vendors once again compared favorably with those of IBM in all 11 categories. The PCM vendors were rated comparable to and in some instances above IBM in key categories like overall satisfaction, ease of conversion, technical support, and both responsiveness and effectiveness of maintenance service. Equipment reliability was essentially a standoff between IBM and the PCMs, with all the parties earning high ratings. Thus, it seems clear that a wisely chosen PCM can yield worthwhile cost savings without imposing offsetting penalties in any of the other areas that help to determine overall user satisfaction.

PCM Pros and Cons

The first and foremost advantage of plug-compatible mainframes is, of course, the prospect of substantial *increases in processing power per dollar.* The user can elect to realize this price/performance gain in either of two distinct ways: 1) by choosing a PCM that delivers performance comparable to that of a certain IBM mainframe but is offered at a lower price; or 2) by choosing a PCM that has a price tag comparable to that of a certain IBM mainframe but offers more processing power. The PCM vendors tend to position their product offerings so that users can elect either approach or, in some cases, a combination of the two (i.e., somewhat more power at a somewhat lower cost).

Faster delivery is another advantage that the PCM vendors have enjoyed over IBM. The slow delivery schedule of IBM's 4300 and 303X systems generated many sales opportunities for the PCM vendors, who typically could ship a system 30 to 60 days ARO. This situation has changed, however, especially in the very large system arena. IBM's delivery schedules for its initial 3081 processor compared very favorably with its announced competitors.

Becoming a *multiple-vendor shop* can be viewed as either an advantage or disadvantage of installing a PCM. Some users are IBM loyalists, who fear that their IBM service will deteriorate and every hardware problem will result in a nasty "finger-pointing" session if they allow any non-IBM equipment into their shops. Conversely, other users are convinced that dealing with multiple vendors helps to "keep IBM honest" and leads to better overall service and support.

Three potential disadvantages are commonly cited by prospective PCM users: the possibility of hardware or software incompatibilities, the possibility of weak vendor support, and the possibility that their PCM vendor may not survive. Each of these problems can be minimized through careful selection of a well-qualified vendor.

Incompatibilities in hardware or software were widely feared by early PCM users, but Datapro's user surveys have clearly shown that users who choose to deal with established PCM suppliers need have no fears. What's more, most PCM manufacturers have demonstrated their ability to develop the specialized hardware and/or software needed to maintain full compatibility when IBM adds new functions to its systems. Conversely, users who decide to

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deal with a newer PCM vendor should demand proof (in the form of a rigorous benchmark test) and/or an ironclad guarantee that the new mainframe will be totally compatible with their IBM equipment, systems software, and application programs.

Poor vendor support is another frequently expressed worry of prospective PCM users. Our 1984 user survey indicated that Amdahl, IPL, and NAS have all established competent field service and support organizations. In fact, the survey respondents considered Amdahl and NAS to be more responsive than IBM. As always, it's up to the buyers to determine the amount of service and support they need and are willing to pay for, and then to select a PCM vendor that can meet those needs.

Vendor survival has always been a topic of concern to PCM buyers, and Magnuson's recent demise illustrates the hazards of the PCM business. A PCM vendor's long-term survival will depend upon a continued ability to maintain full compatibility together with a worthwhile price/performance advantage over the steadily improving mainframes that IBM offers. During the past year, IBM has improved performance and reduced prices in both the 4300 Series and 308X Series product lines. Amdahl and NAS, both of which supply 308X-compatible systems, were the most active PCM vendors last year and responded the most quickly to IBM's announcements. In general, fewer announcements were made by the companies that specialize in 4300-compatible systems.

The PCM Suppliers

Amdahl Corporation, which was formed in 1971 and delivered its first computer in June 1975, is one of the leading suppliers of IBM-compatible mainframes, with several hundred installations nationwide. The firm's software development efforts have resulted in significant improvements over comparable IBM products. Amdahl also offers its Universal TimeSharing System (UTS), which is based on the Unix operating system developed by Bell Laboratories.

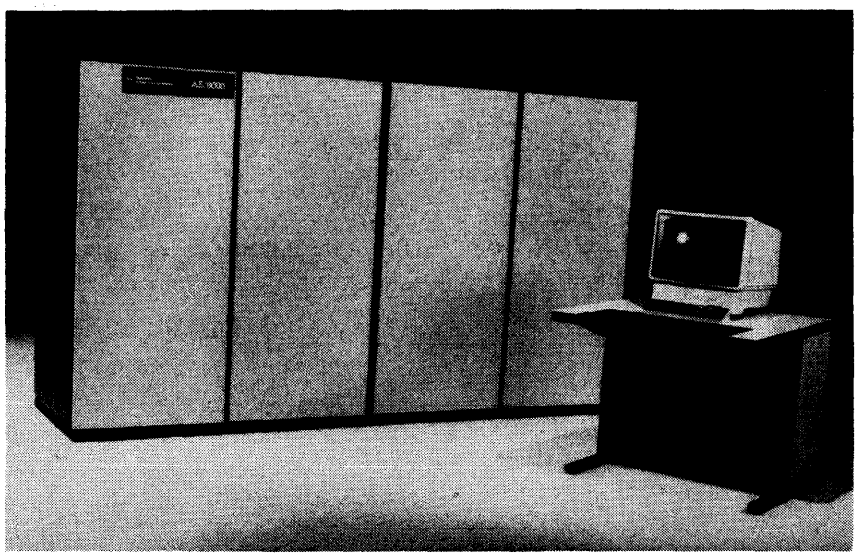
Amdahl focuses on the upper end of IBM's mainframe product line and has developed advanced technology that enables its computers to deliver more performance per dollar than the comparable IBM models. Amdahl's current systems, the 580 Series, are targeted at IBM's 3083, 3081, and 3084 systems. During the past year, Amdahl added two new models, the 5867 and 5868, bringing the total number of 580 Series models to seven. Amdahl also increased the maximum main memory on the 5880 to 128 megabytes, matching the memory now available on IBM's 3084. Amdahl continues to be one of the most successful PCM vendors.

Cambex Corporation, formerly Cambridge Memories, Inc., is best known as a supplier of add-on memory for IBM System/360 and System/370 computers and for various minicomputers. Cambex entered the PCM market in 1977 with replacements for the System/370 Model 115 and 125, but the firm is now concentrating its attention on the IBM 4300 Series. The current product line consists of three models, the 1636-10, 1641-11 and 1651-1, that compete with IBM's 4341 Model Groups 10, 11, and 2, respectively. The 1636-1 and 1641-1 are not in new production.

Global-Ultimacc Systems Inc., formerly STC Ultimacc Inc., is a subsidiary of Storage Technology Corporation. Global-Ultimacc sells software and turnkey systems as well as IBM 4300-compatible mainframes.

Four systems are available from Global-Ultimacc. The USX40 system, which was initially delivered first quarter 1983, competes with the IBM 4331-2 and 4361. The USX44 system was initially delivered in the second quarter of 1983; it competes with the 4341-2. Global-Ultimacc added two new systems to its product line last year: the USX43 and USX46. The new models are enhanced versions of the USX40 and USX44, respectively. The USX39 is no longer available.

IPL Systems, Inc. has been building PCMs for use since 1977, and the company currently supports OEM agree-



National Advanced Systems' AS/8000 Series was introduced to the plug-compatible marketplace in the second quarter of 1983. There are five models in the Series: the AS/8023, AS/8043, AS/8053, AS/8063, and AS/8083. These uniprocessors compete with IBM's 3083. Memory available with the series ranges from 8 megabytes to 32 megabytes. All models are field upgradable to the next model.

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ments with Masstor in the U.S. and with Olivetti and other distributors in Europe, the Middle East, and the Far East. The company also has a joint development agreement to design and build compatible CPUs with Mitsubishi Electric Corporation using advanced ECL large-scale integration gate array technology. IPL saw an opportunity for growth by selling directly to end users, and in October 1980 the company announced the 4400 Series.

Magnuson Systems Corporation is no longer in business.

National Advanced Systems Corporation (NAS) is the wholly owned subsidiary of National Semiconductor Corporation that was formed in October 1979 to take over nearly all of Itel Corporation's IBM-compatible mainframe business. NAS took over Itel's worldwide computer activities, acquired Itel's inventory of computers, and assumed the maintenance and support responsibilities for all of Itel's installed computer base, including those systems manufactured by Hitachi, Ltd.

The company's current product line includes the IBM 4300-compatible AS/6600 Series, the 3083-compatible AS/8000 Series, and the 3081- and 3084-compatible AS/9000 Series. NAS now offers a total of 14 models in these three families of systems. Recent additions to the Advanced Systems product line include the AS/6660, AS/8023, and AS/8083. The earlier AS/8040, AS/8050, and AS/8060 have been replaced by the AS/8043, AS/8053, and AS/8053, respectively. The new AS/6600 and AS/80X3 models use 256K-bit chips, as does IBM's new 4381 Model Group 3 processor. NAS also added a group of vector processors to its product line. The AS/91X0 vector processors are used in conjunction with the AS/90X0 Series processors.

Nixdorf Computer Corporation introduced the 8890 product family to the United States in the second quarter of 1982. One of the largest subsidiaries of Nixdorf AG, Germany, Nixdorf Computer Corporation is offering a product line equivalent to the lower end of the IBM 4300 and System/370 mainframes but with a price/performance target of at least 15 percent over IBM. The 8890 product family features four models: the 8890/10, 8890/30, 8890/50, and 8890/70. No new models or significant enhancements were announced in 1984.

The Comparison Charts

The principal characteristics of those processors that are plug-compatible with IBM computers are presented in the accompanying comparison charts. The entries for each model are spread across two facing pages to maximize the amount of useful information in the charts. All information in the charts was furnished by the seven vendors whose products are represented.

The entries on the left-hand pages of the comparison charts and their significance are explained in the following paragraphs:

Model refers to the product number as known in the equipment price book or list of the vendor or manufacturer.

Date of introduction indicates when the processor was first announced to the public in the U.S.

Production status indicates whether the processor is now in new production or being sold from returned and refurbished stocks.

Operating systems indicates the IBM monitoring software that will run on the processor. All operating systems that apply to a particular processor are specified.

Virtual storage capability defines the presence of a hardware/software feature enabling the user to access and utilize memory space without regard to its existence in real main memory or auxiliary memory space.

The *Clock comparator* is a hardware feature that causes an interruption when the time-of-day equals or exceeds the value specified by a program or virtual machine.

The *CPU timer* measures the elapsed processing unit time and causes an interruption when a previously specified amount of time has elapsed.

Control registers are used for operating systems control of relocation, priority interruption, program event recording, error recovery, and masking operations.

CPU one-level addressing is a synonym for direct addressing, where the instruction contains the actual address of the data being requested.

A *doubleword buffer* consists of a 64-bit area temporarily reserved for data used in performing an I/O operation.

The *interval timer* is a 32-bit decremental counter that is reduced by one, several hundred times per second. The timer generates an interrupt when the contained value is decremented from a positive to a negative number.

Machine check handling analyzes errors and attempts recovery by retrying the failed instruction if possible. If retry is unsuccessful, it attempts to correct the malfunction or to isolate the affected task.

Multiple bus architecture implies that the various segments of the processor (namely, memory, arithmetic and logic, central control, etc.) are tied together by more than one central bus.

Storage protection determines the right of access to main storage by matching a protection key associated with a store or fetch reference to main storage with a storage key associated with each block of main storage.

The *time-of-day-clock* is incremented once every microsecond and provides a consistent measure of elapsed time suitable for the indication of data and time.

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Some channels have the capability to perform *channel command retry,* a channel and control-unit procedure that causes a command to be retried without requiring an I/O interruption.

Channel indirect addressing (CIA) is a companion feature to dynamic address translation, providing data addresses for I/O operations. CIA permits a single channel command word to control the transmission of data that crosses noncontiguous pages in real main storage. If CIA is not indicated, then channel one-level (direct) addressing is employed.

The *byte oriented operand feature* permits storage operands of most nonprivileged operations to appear on any byte boundary. Instructions must appear on even byte boundaries. The feature does not pertain to instruction addresses.

The *extended precision floating point* feature provides instructions to handle floating point numbers with a fraction of 28 hexadecimal digits. The characteristic is seven bits plus sign in short and extended floating point numbers.

The *high-speed floating-point feature* provides a means for improved execution of the floating-point instruction set.

The *System/370 Universal Instruction set* is composed of storage protection, standard instruction set, decimal arithmetic, extended precision, dynamic address translation, and instructions to facilitate programming and reduce execution times for record blocking and unblocking.

The *console audible alarm* is a device activated when predetermined events occur that require operator attention or intervention for system operation.

The *integrated console printer* is an integral part of the system console, furnishing hard copy output from the console display.

A *light pen* is a photosensitive stylus used to detect and identify elements displayed on the console CRT.

A *remote console* is a console attached to a system through a data link. The remote console is configured in addition to the standard console.

The *remote data link* allows establishment of communications with a technical data center to remotely diagnose system malfunctions.

The *console file* is the basic microprogram loading device for the system, containing a read-only file device. The medium read by this device contains all the microcode for field engineering device diagnostics, basic system features, and any optional system features.

The *CPU activity monitor* can be either hardware or software. It provides a measure of CPU utilization by various hardware or software elements.

The *extended control mode* (EC) is a mode in which all features of the System/370 computing system, including dynamic address translation, are operational.

Program event recording is a hardware feature used to assist in debugging programs by detecting and recording program events.

The *virtual machine assist* feature provides an assist to VM/370 firmware emulation of certain privileged operations. The feature causes a reduction in real supervisor time used by VM/370 to control the operation of virtual storage operating systems such as DOS/VS and OS/VS1.

Under *other features and comments* any additional information that may help to give you a feel for the distinctive attributes of each unit is included.

The right-hand pages of the charts compare Processor Performance, I/O Channels, Control Storage, Pricing, and Availability, and identify the manufacturer and vendor of each processor. These entries should all be self-explanatory.

Manufacturers/Vendors

Amdahl Corporation, 1250 East Arques Avenue, Sunnyvale, CA 94086. Telephone (408) 746-6000.

Cambex Corporation, 360 Second Avenue, Waltham, MA 02154. Telephone (617) 890-6000.

Global-Ultimacc Systems, Inc., 4 North Street, Waldwick, NJ 07463. Telephone (201) 445-5050.

IPL Systems Inc., 1317 Main Street, Waltham, MA 02154. Telephone (617) 890-6620.

National Advanced Systems (NAS), 800 East Middlefield Road, Mountain View, CA 94043. Telephone (415) 962-6100.

Nixdorf Computer Corporation, 300 Third Avenue, Waltham, MA 01803. Telephone (617) 890-3600. □

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MODEL	Amdahl Corporation 5840	Amdahl Corporation 5850	Amdahl Corporation 5860	Amdahl Corporation 5867
SYSTEM PARAMETERS				
Date of introduction	June 1983	September 1982	November 1980	March 1984
Date of first delivery	4th Quarter 1983	3rd Quarter 1983	3rd Quarter 1982	3rd Quarter 1984
Number installed to date	—	—	—	—
Production status	Active	Active	Active	Active
Operating systems				
DOS/VS	Yes	Yes	Yes	Yes
DOS/VSE	Yes	Yes	Yes	Yes
OS/VS1	Yes	Yes	Yes	Yes
SVS	Yes	Yes	Yes	Yes
MVS	Yes	Yes	Yes	Yes
MVS/XA	Yes	Yes	Yes	Yes
VM/370	Yes	Yes	Yes	Yes
VM/SP	Yes	Yes	Yes	Yes
Others	ACP, MVS/SP	ACP, MVS/SP	ACP, MVS/SP	ACP, MVS/SP
PROCESSING FEATURES				
Virtual storage capability	Standard	Standard	Standard	Standard
Processor arrangements				
Uniprocessor	Yes	Yes	Yes	No
Attached processor	—	—	—	No
Front end to	—	—	—	—
Back end to	—	—	—	—
Multiprocessor	—	—	—	Yes
Minimum in complex	—	—	—	2
Maximum in complex	—	—	—	2
Clock comparator	Standard	Standard	Standard	Standard
CPU timer	Standard	Standard	Standard	Standard
Control registers	Standard	Standard	Standard	Standard
CPU one-level addressing	Standard	Standard	Standard	Standard
Doubleword buffer	Standard	Standard	Standard	Standard
Interval timer	Standard	Standard	Standard	Standard
Machine check handling	Standard	Standard	Standard	Standard
Multiple bus architecture	Standard	Standard	Standard	Standard
Storage protection	Standard	Standard	Standard	Standard
Time-of-day clock	Standard	Standard	Standard	Standard
Channel command retry	Standard	Standard	Standard	Standard
Channel indirect addressing	Standard	Standard	Standard	Standard
Byte oriented operand feature	Standard	Standard	Standard	Standard
Extended precision floating point	Standard	Standard	Standard	Standard
High speed floating point	Optional	Optional	Optional	Optional
System/370 Universal Instruction set	Standard	Standard	Standard	Standard
Console audible alarm	Standard	Standard	Standard	Standard
Integrated console printer	No	No	No	No
Light pen	No	No	No	No
Remote console	Optional	Optional	Optional	Optional
Remote data link	Standard	Standard	Standard	Standard
Console file	Standard	Standard	Standard	Standard
CPU activity monitor	Standard	Standard	Standard	Standard
Extended control mode	Standard	Standard	Standard	Standard
Program event recording	Standard	Standard	Standard	Standard
Virtual machine assist	Optional	Optional	Optional	Optional
OTHER FEATURES & COMMENTS	Two-byte channel interface is optional	Two-byte channel interface is optional	Two-byte channel interface is optional	Two-byte channel interface is optional

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Amdahl Corporation 5840	Amdahl Corporation 5850	Amdahl Corporation 5860	Amdahl Corporation 5867	MODEL
				PROCESSOR PERFORMANCE
23.25	23.25	23.25	23.25	Machine cycle time, nanoseconds
IBM 3083BX	IBM 3083JX	IBM 3081GX	IBM 3081KX	Relative performance* To
—	—	—	—	Performance of
—	—	—	—	To
—	—	—	—	Performance of
5850	5860, 5867, 5868	5867, 5868, 5870, 5880	5868, 5870, 5880	Field upgradable to
				MAIN STORAGE
Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Storage type
				Checking
Yes	Yes	Yes	Yes	Parity
Yes	Yes	Yes	Yes	Error detection & correction
1	1	1	—	No. of check bits per byte
1	—	—	—	No. of check bits per word
280	280	280	280	Read cycle, nanoseconds
280	280	280	280	Write cycle, nanoseconds
8	8	8	8	Bytes fetched per cycle
16M	16M	16M	24M	Minimum capacity, bytes
64M	64M	64M	64M	Maximum capacity, bytes
8M	8M	8M	8M or 16M	Increment size, bytes
Yes	Yes	Yes	Yes	Interleaving
16	16	16	16	Minimum number of ways
16	16	16	16	Maximum number of ways
				BUFFER (CACHE) STORAGE
Bipolar RAM	Bipolar RAM	Bipolar RAM	Bipolar RAM	Storage type
—	—	—	—	Cycle time, nanoseconds
8	8	8	8	Bytes fetched per cycle
2 x 32K	2 x 32K	2 x 32K	2 x 32K	Minimum capacity, bytes
2 x 32K	2 x 32K	2 x 32K	2 x 32K	Maximum capacity, bytes
				I/O CHANNELS
—	—	—	—	Selector channels standard
—	—	—	—	Selector channels optional
14 or 15	14 or 15	14 or 15	14 or 15	Block multiplexers standard
8 to 16	8 to 16	8 to 16	8 to 16	Block multiplexers optional
1	1	1	1	Byte multiplexers standard
1	1	1	1	Byte multiplexers optional
				Subchannels per channel
256	256	256	256	On a block multiplexer
256	256	256	256	On a byte multiplexer
	—	—	—	On a selector
Optional	Optional	Optional	Optional	Channel to channel adapter
				Maximum channel data rates
6M	6M	6M	6M	Block multiplexer, bytes/sec.
200K	200K	200K	200K	Byte multiplexer, bytes/sec.
—	—	—	—	Selector channel, bytes/sec.
50-80M	50-80M	50-80M	50-80M	Aggregate data rate, bytes/sec.
Yes	Yes	Yes	Yes	Data Streaming
				CONTROL STORAGE
4K RAM	4K RAM	4K RAM	4K RAM	Storage type
7.5	7.5	7.5	7.5	Access time, nanoseconds
Variable	Variable	Variable	Variable	Word size, bits
Variable	Variable	Variable	Variable	Minimum number of words
Variable	Variable	Variable	Variable	Maximum number of words
Variable	Variable	Variable	Variable	Control storage usage
				PRICING & AVAILABILITY
$1,700,000	$2,010,000	$2,300,000	$3,100,000	Purchase of CPU with min. memory
				Lease terms offered
2 or 4 years	2 or 4 years	2 or 4 years	2 or 4 years	Vendor's
—	—	—	—	Third party
$102,045/mo. (2-yr.)	$119,900/mo. (2-yr.)	$132,650/mo. (2-yr.)	$173,980/mo. (2-yr.)	Lease of CPU with min. memory (1-yr.)
8MB	8MB	8MB	8MB or 16MB	Memory increment size
$130,000	$130,000	$130,000	$130,000 or $260,000	Memory increment purchase
				Vendor offered maintenance
—	—	—	—	Prime time
—	—	—	—	Additional hours
$8,200/mo.	$8,500/mo.	$9,850/mo.	$12,500/mo.	24 hour
—	—	—	—	Other plans
Amdahl	Amdahl	Amdahl	Amdahl	Manufacturer
Amdahl	Amdahl	Amdahl	Amdahl	Vendor

*As rated by the PCM vendor.

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MODEL	Amdahl Corporation 5868	Amdahl Corporation 5870	Amdahl Corporation 5880	Cambex Corporation 1636-10
SYSTEM PARAMETERS				
Date of introduction	March 1984	October 1981	November 1980	January 1983
Date of first delivery	1st Quarter 1985	4th Quarter 1983	4th Quarter 1983	2nd Quarter 1983
Number installed to date	—	—	—	Information not available
Production status	Active	Active	Active	Active
Operating systems				
DOS/VS	Yes	Yes	Yes	Yes
DOS/VSE	Yes	Yes	Yes	Yes
OS/VS1	Yes	Yes	Yes	Yes
SVS	Yes	Yes	Yes	Yes
MVS	Yes	Yes	Yes	Yes
MVS/XA	Yes	Yes	Yes	—
VM/370	Yes	Yes	Yes	Yes
VM/SP	Yes	Yes	Yes	Yes
Others	ACP, MVS/SP	ACP, MVS/SP	ACP, MVS/SP	MVS/SP, ACP
PROCESSING FEATURES				
Virtual storage capability	Standard	Standard	Standard	Standard
Processor arrangements				
Uniprocessor	No	No	No	Yes
Attached processor	No	—	—	—
Front end to	—	—	—	—
Back end to	—	—	—	—
Multiprocessor	Yes	Yes	Yes	—
Minimum in complex	2	2	2	—
Maximum in complex	2	2	2	—
Clock comparator	Standard	Standard	Standard	Standard
CPU timer	Standard	Standard	Standard	Standard
Control registers	Standard	Standard	Standard	Standard
CPU one-level addressing	Standard	Standard	Standard	Standard
Doubleword buffer	Standard	Standard	Standard	Standard
Interval timer	Standard	Standard	Standard	Standard
Machine check handling	Standard	Standard	Standard	Standard
Multiple bus architecture	Standard	Standard	Standard	Standard
Storage protection	Standard	Standard	Standard	Standard
Time-of-day clock	Standard	Standard	Standard	Standard
Channel command retry	Standard	Standard	Standard	Standard
Channel indirect addressing	Standard	Standard	Standard	Standard
Byte oriented operand feature	Standard	Standard	Standard	Standard
Extended precision floating point	Standard	Standard	Standard	Standard
High speed floating point	Optional	Optional	Optional	Standard
System/370 Universal Instruction set	Standard	Standard	Standard	Standard
Console audible alarm	Standard	Standard	Standard	Standard
Integrated console printer	No	No	No	Optional
Light pen	No	No	No	No
Remote console	Optional	Optional	Optional	Optional
Remote data link	Standard	Standard	Standard	Optional
Console file	Standard	Standard	Standard	Standard
CPU activity monitor	Standard	Standard	Standard	No
Extended control mode	Standard	Standard	Standard	Standard
Program event recording	Standard	Standard	Standard	Standard
Virtual machine assist	Optional	Optional	Optional	Standard
OTHER FEATURES & COMMENTS	Two-byte channel interface is optional	Two-byte channel interface is optional	Two-byte channel interface is optional	

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Amdahl Corporation 5868	Amdahl Corporation 5870	Amdahl Corporation 5880	Cambex Corporation 1636-10	MODEL
				PROCESSOR PERFORMANCE
23.25	23.25	23.25	50	Machine cycle time, nanoseconds
				Relative performance*
IBM 3081KX	IBM 3084QX	IBM 3084QX	IBM 4341-10	To
—	—	—	0.9-1.1	Performance of
—	—	—	—	To
—	—	—	—	Performance of
5880	5880	Not applicable	Cambex 1641-11	Field upgradable to
				MAIN STORAGE
Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Storage type
				Checking
Yes	Yes	Yes	Yes	Parity
Yes	Yes	Yes	Yes	Error detection & correction
—	1	1.0	1	No. of check bits per byte
—	—	—	4	No. of check bits per word
280	280	280	400	Read cycle, nanoseconds
280	280	280	400	Write cycle, nanoseconds
8	8	8	16	Bytes fetched per cycle
32M	32M	32M	1M	Minimum capacity, bytes
128M	64M	128M	16M	Maximum capacity, bytes
16M	16M	16M	1M or 2M	Increment size, bytes
Yes	Yes	Yes	No	Interleaving
16	16	16	—	Minimum number of ways
16	16	16	—	Maximum number of ways
				BUFFER (CACHE) STORAGE
Bipolar RAM	Bipolar RAM	Bipolar RAM	Bipolar RAM	Storage type
—	—	—	100	Cycle time, nanoseconds
8	8	8	16	Bytes fetched per cycle
4 x 32K	4 x 32K	4 x 32K	8K	Minimum capacity, bytes
4 x 32K	4 x 32K	4 x 32K	8K	Maximum capacity, bytes
				I/O CHANNELS
—	—	—	—	Selector channels standard
—	—	—	—	Selector channels optional
28 or 30	14 or 15	28 or 30	2	Block multiplexers standard
16	8 to 16	16	2	Block multiplexers optional
2	1	2	1	Byte multiplexers standard
2	1	2	0	Byte multiplexers optional
				Subchannels per channel
256	256	256	256	On a block multiplexer
256	256	256	256	On a byte multiplexer
—	—	—	—	On a selector
Optional	Optional	Optional	Yes	Channel to channel adapter
				Maximum channel data rates
6M	6M	6M	2M	Block multiplexer, bytes/sec.
200K	200K	200K	180K	Byte multiplexer, bytes/sec.
—	—	—	—	Selector channel, bytes/sec.
50-80M	50-80M	50-80M	11M	Aggregate data rate, bytes/sec.
Yes	Yes	Yes	No	Data Streaming
				CONTROL STORAGE
4K RAM	4K RAM	4K RAM	Bipolar RAM	Storage type
7.5	7.5	7.5	25	Access time, nanoseconds
Variable	Variable	Variable	36	Word size, bits
Variable	Variable	Variable	16K	Minimum number of words
Variable	Variable	Variable	32K	Maximum number of words
Variable	Variable	Variable	Instruction microcode, operating system assist	Control storage usage
				PRICING & AVAILABILITY
$3,690,000	$3,800,000	$4,260,000	$98,500	Purchase of CPU with min. memory
				Lease terms offered
2 or 4 years	2 or 4 years	2 or 4 years	Yes	Vendor's
—	—	—	Yes	Third party
$207,650/mo. (2-yr.)	$224,180/mo. (2-yr.)	$246,770/mo. (2-yr.)	Contact vendor	Lease of CPU with min. memory (1-yr.)
16MB	16MB	16MB	1MB	Memory increment size
$260,000	$260,000	$260,000	$9,000	Memory increment purchase
				Vendor offered maintenance
—	—	—	$750/mo.	Prime time
—	—	—	Yes	Additional hours
$13,950/mo.	$17,650/mo.	$18,715/mo.	Yes	24 hour
—	—	—	Third party available	Other plans
Amdahl	Amdahl	Amdahl	Cambex	Manufacturer
Amdahl	Amdahl	Amdahl	Cambex	Vendor

*As rated by the PCM vendor.

All About Plug-Compatible Mainframes

MODEL	Cambex Corporation 1641-11	Cambex Corporation 1651-1	Global-Ultimacc Systems Inc. USX40	Global-Ultimacc Systems Inc. USX43
SYSTEM PARAMETERS				
Date of introduction	January 1983	August 1980	November 1982	—
Date of first delivery	3rd Quarter 1983	3rd Quarter 1981	February 1983	—
Number installed to date	Information not available	Information not available	—	—
Production status	Active	Active	Active	Active
Operating systems				
DOS/VS	Yes	Yes	Yes	Yes
DOS/VSE	Yes	Yes	Yes	Yes
OS/VS1	Yes	Yes	Yes	Yes
SVS	Yes	Yes	Yes	Yes
MVS	Yes	Yes	Yes	Yes
MVS/XA	—	—	Yes	Yes
VM/370	Yes	Yes	Yes	Yes
VM/SP	Yes	Yes	—	Yes
Others	MVS/SP, ACP	MVS/SP, ACP	DOS26	—
PROCESSING FEATURES				
Virtual storage capability	Standard	Standard	Standard	Standard
Processor arrangements				
Uniprocessor	Yes	Yes	Yes	Yes
Attached processor	—	—	—	—
Front end to	—	—	—	—
Back end to	—	—	—	—
Multiprocessor	—	—	—	—
Minimum in complex	—	—	—	—
Maximum in complex	—	—	—	—
Clock comparator	Standard	Standard	Standard	Standard
CPU timer	Standard	Standard	Standard	Standard
Control registers	Standard	Standard	Standard	Standard
CPU one-level addressing	Standard	Standard	Standard	Standard
Doubleword buffer	Standard	Standard	Standard	Standard
Interval timer	Standard	Standard	Standard	Standard
Machine check handling	Standard	Standard	Standard	Standard
Multiple bus architecture	Standard	Standard	Standard	Standard
Storage protection	Standard	Standard	Standard	Standard
Time-of-day clock	Standard	Standard	Standard	Standard
Channel command retry	Standard	Standard	Standard	Standard
Channel indirect addressing	Standard	Standard	Standard	Standard
Byte oriented operand feature	Standard	Standard	Standard	Standard
Extended precision floating point	Standard	Standard	Standard	Standard
High speed floating point	Standard	Standard	No	No
System/370 Universal Instruction set	Standard	Standard	Standard	Standard
Console audible alarm	Standard	Standard	Standard	Standard
Integrated console printer	Optional	Optional	Optional	Optional
Light pen	No	No	No	No
Remote console	Optional	Optional	Optional	Optional
Remote data link	Optional	Optional	Optional	Optional
Console file	Standard	Standard	Standard	Standard
CPU activity monitor	Standard	Standard	Standard	Standard
Extended control mode	Standard	Standard	Standard	Standard
Program event recording	Standard	Standard	Standard	Standard
Virtual machine assist	Standard	Standard	Standard	Standard
OTHER FEATURES & COMMENTS	Field upgradable from 1636-10	1651 available on field upgrade basis only	Sold only as complete system that includes CPU, 1270MB Disk, 1 tape, 1 printer, and 3 channels	Sold only as complete system that includes CPU, 1270MB disk, 1 tape, 1 printer, and 3 channels

All About Plug-Compatible Mainframes

Cambex Corporation 1641-11	Cambex Corporation 1651-1	Global-Ultimacc Systems Inc. USX40	Global-Ultimacc Systems Inc. USX43	MODEL
				PROCESSOR PERFORMANCE
50	50	100	100	Machine cycle time, nanoseconds
				Relative performance*
IBM 4341-11	IBM 4341-2	IBM 4331-2	IBM 4341	To
0.9-1.1	0.9 to 1.1	1.5	—	Performance of
—	—	IBM 4361	—	To
—	—	—	—	Performance of
—	—	USX44	USX44, USX46 II	Field upgradable to
				MAIN STORAGE
Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Storage type
Yes	Yes	Yes	Yes	Checking
Yes	Yes	Yes	Yes	Parity
1	1	1	1	Error detection & correction
4	4	4	4	No. of check bits per byte
400	400	600	—	No. of check bits per word
400	400	500	—	Read cycle, nanoseconds
16	16	8	8	Write cycle, nanoseconds
2M	2M	2M	2M	Bytes fetched per cycle
16M	16M	8M	8M	Minimum capacity, bytes
2M	2M	2M	2M	Maximum capacity, bytes
No	No	No	No	Increment size, bytes
—	—	—	—	Interleaving
—	—	—	—	Minimum number of ways
				Maximum number of ways
				BUFFER (CACHE) STORAGE
Bipolar RAM	Bipolar RAM	Static TTL	Static TTL	Storage type
100	100	300	—	Cycle time, nanoseconds
16	16	8	8	Bytes fetched per cycle
8K	8K	16K	16K	Minimum capacity, bytes
8K	8K	16K	16K	Maximum capacity, bytes
				I/O CHANNELS
—	—	—	—	Selector channels standard
—	—	—	—	Selector channels optional
4	4	2	2	Block multiplexers standard
1	1	5	5	Block multiplexers optional
1	1	1	1	Byte multiplexers standard
0	0	—	—	Byte multiplexers optional
				Subchannels per channel
256	256	256	256	On a block multiplexer
256	256	256	256	On a byte multiplexer
—	—	—	—	On a selector
Yes	Yes	Optional	Optional	Channel to channel adapter
				Maximum channel data rates
2M	2M	2M or 3M	2M or 3M	Block multiplexer, bytes/sec.
180K	180K	180K	180K	Byte multiplexer, bytes/sec.
—	—	—	—	Selector channel, bytes/sec.
11M	11M	—	—	Aggregate data rate, bytes/sec.
No	No	Yes	Yes	Data Streaming
				CONTROL STORAGE
Bipolar RAM	Bipolar RAM	Static NMOS	Static NMOS	Storage type
25	25	45	—	Access time, nanoseconds
36	36	32	—	Word size, bits
16K	16K	4K	—	Minimum number of words
32K	32K	16K	—	Maximum number of words
Instruction microcode, operating system assist	Instruction microcode, operating system assist	Instruction microcode, operating system assist	Instruction microcode, operating system assist	Control storage usage
				PRICING & AVAILABILITY
$170,000	Upgrade only, contact vendor	$121,000 (system)	$150,000 (4MB system)	Purchase of CPU with min. memory
				Lease terms offered
Yes	Yes	No	No	Vendor's
Yes	Yes	Yes	Yes	Third party
Contact vendor	Contact Vendor	$5,808/mo. (2-yr.)	$7,200/mo. (2-yr.)	Lease of CPU with min. memory (1-yr.)
2MB	2MB	2MB	2MB	Memory increment size
$9,000/M	$15,000	$13,000	$13,000	Memory increment purchase
				Vendor offered maintenance
$925/mo.	$925/mo.	Yes	Yes	Prime time
Yes	Yes	Yes	Yes	Additional hours
Yes	Yes	No	No	24 hour
Third party available	Third party available	No	No	Other plans
Cambex	Cambex	—	—	Manufacturer
Cambex	Cambex	Global-Ultimacc Systems	Global-Ultimacc Systems	Vendor

*As rated by the PCM vendor.

All About Plug-Compatible Mainframes

MODEL	Global-Ultimacc Systems Inc. USX44	Global-Ultimacc Systems Inc. USX46	IPL Systems, Inc. 4460	IPL Systems, Inc. 4480
SYSTEM PARAMETERS				
Date of introduction	September 1982	—	October 1982	February 1983
Date of first delivery	May 1983	—	2nd Quarter 1983	May 1984
Number installed to date	—	—	—	—
Production status	Active	Active	Active	Active
Operating systems				
DOS/VS	Yes	Yes	Yes	—
DOS/VSE	Yes	Yes	Yes	—
OS/VS1	Yes	Yes	Yes	—
SVS	Yes	Yes	Yes	—
MVS	Yes	Yes	Yes	Yes
MVS/XA	Yes	Yes	Yes	Yes
VM/370	Yes	Yes	Yes	Yes
VM/SP	—	Yes	Yes	Yes
Others	DOS26	—	MVSSP	MVS/SP
PROCESSING FEATURES				
Virtual storage capability	Standard	Standard	Standard	Standard
Processor arrangements				
Uniprocessor	No	No	Yes	—
Attached processor	No	No	—	—
Front end to	—	—	—	—
Back end to	—	—	—	—
Multiprocessor	Yes	Yes	—	Yes
Minimum in complex	2	2	—	2
Maximum in complex	2	2	—	2
Clock comparator	Standard	Standard	Standard	Standard
CPU timer	Standard	Standard	Standard	Standard
Control registers	Standard	Standard	Standard	Standard
CPU one-level addressing	Standard	Standard	Standard	Standard
Doubleword buffer	Standard	Standard	Standard	Standard
Interval timer	Standard	Standard	Standard	Standard
Machine check handling	Standard	Standard	Standard	Standard
Multiple bus architecture	Standard	Standard	Standard	Standard
Storage protection	Standard	Standard	Standard	Standard
Time-of-day clock	Standard	Standard	Standard	Standard
Channel command retry	Standard	Standard	Standard	Standard
Channel indirect addressing	Standard	Standard	Standard	Standard
Byte oriented operand feature	Standard	Standard	Standard	Standard
Extended precision floating point	Standard	Standard	Standard	Standard
High speed floating point	No	No	Yes	Yes
System/370 Universal Instruction set	Standard	Standard	Standard	Standard
Console audible alarm	Standard	Standard	Standard	Standard
Integrated console printer	Optional	Optional	Optional	Optional
Light pen	No	No	No	No
Remote console	Optional	Optional	No	No
Remote data link	Optional	Optional	Standard	Standard
Console file	Standard	Standard	Standard	Standard
CPU activity monitor	Standard	Standard	No	No
Extended control mode	Standard	Standard	Standard	Standard
Program event recording	Standard	Standard	Standard	Standard
Virtual machine assist	Standard	Standard	Standard	Standard
OTHER FEATURES & COMMENTS	Sold only as complete system that includes dual processors, 2.5GB disk, 1 tape, 1 printer, and 6 channels	Sold only as complete system that includes dual processors, 2.5GB disk, 1 tape, 1 printer, and 6 channels		IBM-compatible, fault tolerant computing complex consisting of 2 independent processing units sharing partitioned dual-ported main storage

All About Plug-Compatible Mainframes

Global-Ultimacc Systems Inc. USX44	Global-Ultimacc Systems Inc. USX46	IPL Systems, Inc. 4460	IPL Systems, Inc. 4480	MODEL
				PROCESSOR PERFORMANCE
100	50	50	50	Machine cycle time, nanoseconds
IBM 4341-2	IBM 4341	IBM 4341-12	IBM 4381-2	Relative performance* To
1.0	—	1.00	1.00	Performance of
—	—	IBM 4361-5	IPL 4460	To
—	—	1.20	1.70	Performance of
—	—	IPL 4480	—	Field upgradable to
				MAIN STORAGE
Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Storage type
Yes	Yes	Yes	Yes	Checking
Yes	Yes	Yes	Yes	Parity
1	1	1	1	Error detection & correction
4	4	4	4	No. of check bits per byte
600	—	400	400	No. of check bits per word
500	—	500	500	Read cycle, nanoseconds
8	8	8	8	Write cycle, nanoseconds
4M	2M	2M	8M	Bytes fetched per cycle
16M	32M	16M	16M	Minimum capacity, bytes
2M	2M	2M	4M	Maximum capacity, bytes
No	No	No	No	Increment size, bytes
—	—	—	—	Interleaving
—	—	—	—	Minimum number of ways
				Maximum number of ways
				BUFFER (CACHE) STORAGE
Static TTL	Static TTL	Bipolar RAM	Bipolar RAM	Storage type
300	—	100	100	Cycle time, nanoseconds
8	8	8	8	Bytes fetched per cycle
16K	2 x 32K	24K	2 x 24KB	Minimum capacity, bytes
16K	2 x 32K	24K	2 x 24KB	Maximum capacity, bytes
				I/O CHANNELS
—	—	—	—	Selector channels standard
—	—	—	—	Selector channels optional
4	4	5	8	Block multiplexers standard
10	18	—	—	Block multiplexers optional
2	2	1	2	Byte multiplexers standard
—	—	—	—	Byte multiplexers optional
				Subchannels per channel
256	256	256	256	On a block multiplexer
256	256	256	256	On a byte multiplexer
—	—	—	—	On a selector
Optional	Optional	Yes	Yes	Channel to channel adapter
				Maximum channel data rates
2M or 3M	2M or 3M	3M	3M	Block multiplexer, bytes/sec.
180K	180K	180K	180K	Byte multiplexer, bytes/sec.
—	—	—	—	Selector channel, bytes/sec.
—	—	12M	20M	Aggregate data rate, bytes/sec.
Yes	Yes	Yes	Yes	Data Streaming
				CONTROL STORAGE
Static NMOS	Static NMOS	Bipolar RAM	Bipolar RAM	Storage type
45	—	20	20	Access time, nanoseconds
32	—	36	36	Word size, bits
4K	—	16K	2 x 16K	Minimum number of words
16K	—	32K	2 x 32K	Maximum number of words
Instruction microcode, operating system assist	Instruction microcode, operating system assist	Instruction microcode, operating system assist	Instruction microcode, operating system assist	Control storage usage
				PRICING & AVAILABILITY
$175,000 (system)	$215,000 (8MB system)	$195,800	$443,000	Purchase of CPU with min. memory
No	No	—	—	Lease terms offered
Yes	Yes	Yes	Yes	Vendor's
$8,400/mo. (2-yr.)	$10,320/mo. (2-yr.)	$9,400 (2-yr.)	$21,450 (2-yr.)	Third party
2MB	2MB	2MB	4MB	Lease of CPU with min. memory (1-yr.)
$13,000	$13,000	$15,000	$30,000	Memory increment size
				Memory increment purchase
Yes	Yes	$900/mo.	$1,765/mo.	Vendor offered maintenance
Yes	Yes	Yes	Yes	Prime time
No	No	Yes	Yes	Additional hours
No	No	Yes	Yes	24 hour
				Other plans
—	—	IPL	IPL	Manufacturer
Global-Ultimacc Systems	Global-Ultimacc Systems	IPL	IPL	Vendor

*As rated by the PCM vendor.

All About Plug-Compatible Mainframes

MODEL	National Advanced Systems AS/6620	National Advanced Systems AS/6630	National Advanced Systems AS/6650	National Advanced Systems AS/6660
SYSTEM PARAMETERS				
Date of introduction	January 1983	October 1982	October 1982	September 1984
Date of first delivery	July 1983	October 1983	November 1982	December 1984
Number installed to date	Information not available	Information not available	Information not available	Information not available
Production status	Active	Active	Active	Active
Operating systems				
DOS/VS	Yes	Yes	Yes	Yes
DOS/VSE	Yes	Yes	Yes	Yes
OS/VS1	Yes	Yes	Yes	Yes
SVS	Yes	Yes	Yes	Yes
MVS	Yes	Yes	Yes	Yes
MVS/XA	Yes	Yes	Yes	Yes
VM/370	Yes	Yes	Yes	Yes
VM/SP	Yes	Yes	Yes	Yes
Others	ACP	ACP	ACP	—
PROCESSING FEATURES				
Virtual storage capability	Standard	Standard	Standard	Standard
Processor arrangements				
Uniprocessor	Yes	Yes	Yes	Yes
Attached processor	—	—	—	—
Front end to	—	—	—	—
Back end to	—	—	—	—
Multiprocessor	—	—	—	—
Minimum in complex	Standard	Standard	Standard	—
Maximum in complex	Standard	Standard	Standard	—
Clock comparator	Standard	Standard	Standard	Standard
CPU timer	Standard	Standard	Standard	Standard
Control registers	Standard	Standard	Standard	Standard
CPU one-level addressing	Standard	Standard	Standard	Standard
Doubleword buffer	Standard	Standard	Standard	Standard
Interval timer	Standard	Standard	Standard	Standard
Machine check handling	Standard	Standard	Standard	Standard
Multiple bus architecture	Standard	Standard	Standard	Standard
Storage protection	Standard	Standard	Standard	Standard
Time-of-day clock	Standard	Standard	Standard	Standard
Channel command retry	Standard	Standard	Standard	Standard
Channel indirect addressing	Standard	Standard	Standard	Standard
Byte oriented operand feature	Standard	Standard	Standard	Standard
Extended precision floating point	Standard	Standard	Standard	Standard
High speed floating point	Optional	Optional	Optional	Optional
System/370 Universal Instruction set	Standard	Standard	Standard	Standard
Console audible alarm	Standard	Standard	Standard	Standard
Integrated console printer	Optional	Optional	Optional	Optional
Light pen	No	No	No	No
Remote console	Standard	Standard	Standard	Standard
Remote data link	Standard	Standard	Standard	Standard
Console file	Standard	Standard	Standard	Standard
CPU activity monitor	Standard	Standard	Standard	Standard
Extended control mode	Standard	Standard	Standard	Standard
Program event recording	Standard	Standard	Standard	Standard
Virtual machine assist	Standard	Standard	Standard	Standard
OTHER FEATURES & COMMENTS				

All About Plug-Compatible Mainframes

National Advanced Systems AS/6620	National Advanced Systems AS/6630	National Advanced Systems AS/6650	National Advanced Systems AS/6660	MODEL
				PROCESSOR PERFORMANCE
60	60	50	43	Machine cycle time, nanoseconds
IBM 4341-12	IBM 4381-1	IBM 4381-2	IBM 4381-2	Relative performance*
>1.0	>1.0	>1.0	>1.0	To
—	—	—	—	Performance of
—	—	—	—	To
—	—	—	—	Performance of
AS/6630	AS/6650	AS/6660	—	Field upgradable to
				MAIN STORAGE
Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Storage type
				Checking
Yes	Yes	Yes	Yes	Parity
Yes	Yes	Yes	Yes	Error detection & correction
1	1	1	—	No. of check bits per byte
—	—	—	—	No. of check bits per word
420	420	350	301	Read cycle, nanoseconds
420	420	350	301	Write cycle, nanoseconds
8	8	8	8	Bytes fetched per cycle
8M	8M	8M	8M	Minimum capacity, bytes
16M	16M	16M	16M	Maximum capacity, bytes
4M	4M	4M	4M	Increment size, bytes
Yes	Yes	Yes	Yes	Interleaving
2	2	2	2	Minimum number of ways
2	2	2	2	Maximum number of ways
				BUFFER (CACHE) STORAGE
Bipolar RAM	Bipolar RAM	Bipolar RAM	Bipolar RAM	Storage type
60	60	50	43	Cycle time, nanoseconds
8	8	8	8	Bytes fetched per cycle
64K	64K	64K	64K	Minimum capacity, bytes
64K	64K	64K	64K	Maximum capacity, bytes
				I/O CHANNELS
—	—	—	—	Selector channels standard
—	—	—	—	Selector channels optional
4	4	4	4	Block multiplexers standard
2	2	2 to 6	2 to 6	Block multiplexers optional
1	1	1	1	Byte multiplexers standard
1	1	1	1	Byte multiplexers optional
				Subchannels per channel
256	256	256	256	On a block multiplexer
256	256	256	256	On a byte multiplexer
—	—	—	—	On a selector
Optional	Optional	Optional	Optional	Channel to channel adapter
				Maximum channel data rates
3M	3M	3M	3M	Block multiplexer, bytes/sec.
80K	80K	100K	100K	Byte multiplexer, bytes/sec.
—	—	—	—	Selector channel, bytes/sec.
13M	13M	16M	22M	Aggregate data rate, bytes/sec.
Standard	Standard	Standard	Standard	Data Streaming
				CONTROL STORAGE
Bipolar RAM	Bipolar RAM	Bipolar RAM	Bipolar RAM	Storage type
18	18	18	18	Access time, nanoseconds
72	72	72	72	Word size, bits
16K	16K	16K	16K	Minimum number of words
16K	16K	16K	16K	Maximum number of words
Variable	Variable	Variable	Variable	Control storage usage
				PRICING & AVAILABILITY
$255,000	$341,500	$417,500	$475,000	Purchase of CPU with min. memory
				Lease terms offered
1, 2, or 4 years	1, 2, or 4 years	1, 2, or 4 years	1, 2, or 4 years	Vendor's
—	—	—	—	Third party
$8,950/mo.	$11,095/mo.	$13,815/mo.	$15,720/mo.	Lease of CPU with min. memory (1-yr.)
4MB	4MB	4MB	4MB	Memory increment size
$38,000	$38,000	$38,000	$38,000	Memory increment purchase
				Vendor offered maintenance
Not available	Not available	Not available	Not available	Prime time
—	—	—	—	Additional hours
$752/mo.	$833/mo.	$983/mo.	$1,135/mo.	24 hour
—	—	—	—	Other plans
—	—	—	—	Manufacturer
NAS	NAS	NAS	NAS	Vendor

*As rated by the PCM vendor.

All About Plug-Compatible Mainframes

MODEL	National Advanced Systems AS/8023	National Advanced Systems AS/8043	National Advanced Systems AS/8053	National Advanced Systems AS/8063
SYSTEM PARAMETERS				
Date of introduction	April 1984	May 1983	May 1983	May 1983
Date of first delivery	July 1984	May 1983	May 1983	December 1983
Number installed to date	Information not available	Information not available	Information not available	Information not available
Production status	Active	Active	Active	Active
Operating systems				
DOS/VS	Yes	Yes	Yes	Yes
DOS/VSE	Yes	Yes	Yes	Yes
OS/VS1	Yes	Yes	Yes	Yes
SVS	Yes	Yes	Yes	Yes
MVS	Yes	Yes	Yes	Yes
MVS/XA	Yes	Yes	Yes	Yes
VM/370	Yes	Yes	Yes	Yes
VM/SP	Yes	Yes	Yes	Yes
Others	—	ACP	ACP	ACP
PROCESSING FEATURES				
Virtual storage capability	Standard	Standard	Standard	Standard
Processor arrangements				
Uniprocessor	Yes	Yes	Yes	Yes
Attached processor	—	—	—	—
Front end to	—	—	—	—
Back end to	—	—	—	—
Multiprocessor	—	—	—	—
Minimum in complex	—	—	—	—
Maximum in complex	—	—	—	—
Clock comparator	Standard	Standard	Standard	Standard
CPU timer	Standard	Standard	Standard	Standard
Control registers	Standard	Standard	Standard	Standard
CPU one-level addressing	Standard	Standard	Standard	Standard
Doubleword buffer	Standard	Standard	Standard	Standard
Interval timer	Standard	Standard	Standard	Standard
Machine check handling	Standard	Standard	Standard	Standard
Multiple bus architecture	Standard	Standard	Standard	Standard
Storage protection	Standard	Standard	Standard	Standard
Time-of-day clock	Standard	Standard	Standard	Standard
Channel command retry	Standard	Standard	Standard	Standard
Channel indirect addressing	Standard	Standard	Standard	Standard
Byte oriented operand feature	Standard	Standard	Standard	Standard
Extended precision floating point	Standard	Standard	Standard	Standard
High speed floating point	Optional	Optional	Optional	Optional
System/370 Universal Instruction set	Standard	Standard	Standard	Standard
Console audible alarm	Standard	Standard	Standard	Standard
Integrated console printer	Optional	Optional	Optional	Optional
Light pen	No	No	No	No
Remote console	Standard	Standard	Standard	Standard
Remote data link	Standard	Standard	Standard	Standard
Console file	Standard	Standard	Standard	Standard
CPU activity monitor	Standard	Standard	Standard	Standard
Extended control mode	Standard	Standard	Standard	Standard
Program event recording	Standard	Standard	Standard	Standard
Virtual machine assist	Standard	Standard	Standard	Standard
OTHER FEATURES & COMMENTS				

All About Plug-Compatible Mainframes

National Advanced Systems AS/8023	National Advanced Systems AS/8043	National Advanced Systems AS/8053	National Advanced Systems AS/8063	MODEL
				PROCESSOR PERFORMANCE
40	40	40	35	Machine cycle time, nanoseconds
IBM 4381-2	IBM 3083EX	IBM 3083BX	IBM 3083JX	Relative performance*
				To
—	1.2	1.0	1.0	Performance of
—	—	—	—	To
—	—	—	—	Performance of
AS/8043	AS/8053	AS/8063	AS/8083	Field upgradable to
				MAIN STORAGE
Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Storage type
Yes	Yes	Yes	Yes	Checking
Yes	Yes	Yes	Yes	Parity
1	1	1	1	Error detection & correction
—	—	—	—	No. of check bits per byte
360	360	360	315	No. of check bits per word
360	360	360	315	Read cycle, nanoseconds
8	8	8	8	Write cycle, nanoseconds
8M	8M	8M	8M	Bytes fetched per cycle
32M	32M	32M	32M	Minimum capacity, bytes
8M	8M	8M	8M	Maximum capacity, bytes
Yes	Yes	Yes	Yes	Increment size, bytes
4	4	4	4	Interleaving
4	4	4	4	Minimum number of ways
				Maximum number of ways
				BUFFER (CACHE) STORAGE
Bipolar RAM	Bipolar RAM	Bipolar RAM	Bipolar RAM	Storage type
40	40	40	35	Cycle time, nanoseconds
8	8	8	8	Bytes fetched per cycle
32K	32K	64K	64K	Minimum capacity, bytes
32K	32K	64K	64K	Maximum capacity, bytes
				I/O CHANNELS
—	—	—	—	Selector channels standard
—	—	—	—	Selector channels optional
7	7	7	7	Block multiplexers standard
16	16	16	16	Block multiplexers optional
1	1	1	1	Byte multiplexers standard
5	5	5	5	Byte multiplexers optional
				Subchannels per channel
256	256	256	256	On a block multiplexer
256	256	256	256	On a byte multiplexer
—	—	—	—	On a selector
Optional	Optional	Optional	Optional	Channel to channel adapter
				Maximum channel data rates
3M	3M	3M	3M	Block multiplexer, bytes/sec.
100K	100K	100K	100K	Byte multiplexer, bytes/sec.
—	—	—	—	Selector channel, bytes/sec.
37M	37M	37M	40M	Aggregate data rate, bytes/sec.
Standard	Standard	Standard	Standard	Data Streaming
				CONTROL STORAGE
Bipolar RAM	Bipolar RAM	Bipolar RAM	Bipolar RAM	Storage type
7	7	7	7	Access time, nanoseconds
126	126	126	126	Word size, bits
16K	16K	16K	16K	Minimum number of words
16K	16K	16K	16K	Maximum number of words
Variable	Variable	Variable	Variable	Control storage usage
				PRICING & AVAILABILITY
$699,000	$1,067,000	$1,492,000	$1,905,000	Purchase of CPU with min. memory
1, 2, 4, or 5 years	1, 2, 4, or 5 years	1, 2, 4, or 5 years	1, 2, 4, or 5 years	Lease terms offered
—	—	—	—	Vendor's
$21,310/mo.	$32,875/mo.	$48,725/mo.	$63,795/mo.	Third party
8MB	8MB	8MB	8MB	Lease of CPU with min. memory (1-yr.)
$123,000	$123,000	$123,000	$123,000	Memory increment size
				Memory increment purchase
Not available	Not available	Not available	Not available	Vendor offered maintenance
—	—	—	—	Prime time
$3,250/mo.	$4,637/mo.	$4,821/mo.	$5,724/mo.	Additional hours
—	—	—	—	24 hour
				Other plans
—	—	—	—	Manufacturer
NAS	NAS	NAS	NAS	Vendor

*As rated by the PCM vendor.

All About Plug-Compatible Mainframes

MODEL	National Advanced Systems AS/8083	National Advanced Systems AS/9040	National Advanced Systems AS/9050	National Advanced Systems AS/9060
SYSTEM PARAMETERS				
Date of introduction	April 1984	September 1982	September 1982	May 1982
Date of first delivery	1st Quarter 1985	November 1982	September 1982	August 1982
Number installed to date	Information not available	Information not available	Information not available	Information not available
Production status	Active	Active	Active	Active
Operating systems				
DOS/VS	Yes	Yes	Yes	Yes
DOS/VSE	Yes	Yes	Yes	Yes
OS/VS1	Yes	Yes	Yes	Yes
SVS	Yes	Yes	Yes	Yes
MVS	Yes	Yes	Yes	Yes
MVS/XA	Yes	Yes	Yes	Yes
VM/370	Yes	Yes	Yes	Yes
VM/SP	Yes	Yes	Yes	Yes
Others	—	ACP	ACP	ACP
PROCESSING FEATURES				
Virtual storage capability	Standard	Standard	Standard	Standard
Processor arrangements				
Uniprocessor	No	Yes	Yes	Yes
Attached processor	No	—	—	—
Front end to	—	—	—	—
Back end to	—	—	—	—
Multiprocessor	Yes	—	—	—
Minimum in complex	2	—	—	—
Maximum in complex	2	—	—	—
Clock comparator	Standard	Standard	Standard	Standard
CPU timer	Standard	Standard	Standard	Standard
Control registers	Standard	Standard	Standard	Standard
CPU one-level addressing	Standard	Standard	Standard	Standard
Doubleword buffer	Standard	Standard	Standard	Standard
Interval timer	Standard	Standard	Standard	Standard
Machine check handling	Standard	Standard	Standard	Standard
Multiple bus architecture	Standard	Standard	Standard	Standard
Storage protection	Standard	Standard	Standard	Standard
Time-of-day clock	Standard	Standard	Standard	Standard
Channel command retry	Standard	Standard	Standard	Standard
Channel indirect addressing	Standard	Standard	Standard	Standard
Byte oriented operand feature	Standard	Standard	Standard	Standard
Extended precision floating point	Standard	Standard	Standard	Standard
High speed floating point	Optional	Standard	Standard	Standard
System/370 Universal Instruction set	Standard	Standard	Standard	Standard
Console audible alarm	Standard	Standard	Standard	Standard
Integrated console printer	Optional	Optional	Optional	Optional
Light pen	No	No	No	No
Remote console	Standard	Standard	Standard	Standard
Remote data link	Standard	Standard	Standard	Standard
Console file	Standard	Standard	Standard	Standard
CPU activity monitor	Standard	Standard	Standard	Standard
Extended control mode	Standard	Standard	Standard	Standard
Program event recording	Standard	Standard	Standard	Standard
Virtual machine assist	Standard	Standard	Standard	Standard
OTHER FEATURES & COMMENTS		Can be upgraded to an AS/9140 Vector Processor	Can be upgraded to an AS/9150 Vector Processor	Can be upgraded to an AS/9160 Vector Processor

All About Plug-Compatible Mainframes

National Advanced Systems AS/8083	National Advanced Systems AS/9040	National Advanced Systems AS/9050	National Advanced Systems AS/9060	MODEL
				PROCESSOR PERFORMANCE
35	38	38	30	Machine cycle time, nanoseconds
				Relative performance*
IBM 3081KX	IBM 3083BX	IBM 3083JX	IBM 3081GX	To
—	>1.0	>1.0	>1.0	Performance of
—	—	—	—	To
—	—	—	—	Performance of
—	AS/9050 or AS/9140	AS/9060, AS/9070, or AS/9150	AS/9080 or AS/9160	Field upgradable to
				MAIN STORAGE
Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Dynamic NMOS	Storage type
				Checking
Yes	Yes	Yes	Yes	Parity
Yes	Yes	Yes	Yes	Error detection & correction
1	1	1	1	No. of check bits per byte
—	—	—	—	No. of check bits per word
315	342	342	270	Read cycle, nanoseconds
315	342	342	270	Write cycle, nanoseconds
8	8	8	8	Bytes fetched per cycle
16M	8M	8M	16M	Minimum capacity, bytes
32M	48M	48M	64M	Maximum capacity, bytes
16M	8M	8M	8M	Increment size, bytes
Yes	Yes	Yes	Yes	Interleaving
8	8	8	8	Minimum number of ways
8	8	8	8	Maximum number of ways
				BUFFER (CACHE) STORAGE
Bipolar RAM	Bipolar RAM	Bipolar RAM	Bipolar RAM	Storage type
35	19	19	15	Cycle time, nanoseconds
8	8	8	8	Bytes fetched per cycle
2 x 64K	64K	64K	256K	Minimum capacity, bytes
2 x 64K	64K	64K	256K	Maximum capacity, bytes
				I/O CHANNELS
—	—	—	—	Selector channels standard
—	—	—	—	Selector channels optional
12	6	6	12	Block multiplexers standard
11	17	17	11	Block multiplexers optional
1	1	1	1	Byte multiplexers standard
5	5	5	5	Byte multiplexers optional
				Subchannels per channel
256	256	256	256	On a block multiplexer
256	256	256	256	On a byte multiplexer
—	—	—	—	On a selector
Optional	Optional	Optional	Optional	Channel to channel adapter
				Maximum channel data rates
3M	3M	3M	3M	Block multiplexer, bytes/sec.
100K	100K	100K	100K	Byte multiplexer, bytes/sec.
—	—	—	—	Selector channel, bytes/sec.
40M	60M	60M	75M	Aggregate data rate, bytes/sec.
Standard	Standard	Standard	Standard	Data Streaming
				CONTROL STORAGE
Bipolar RAM	Bipolar RAM	Bipolar RAM	Bipolar RAM	Storage type
7	7	7	7	Access time, nanoseconds
126	160	160	160	Word size, bits
2 x 16K	16K	16K	16K	Minimum number of words
2 x 16K	16K	16K	16K	Maximum number of words
Variable	Variable	Variable	Variable	Control storage usage
				PRICING & AVAILABILITY
$3,074,000	$1,492,000	$1,909,000	$2,308,000	Purchase of CPU with min. memory
				Lease terms offered
1, 2, 4, or 5 years	1, 2, 4, or 5 years	1, 2, 4, or 5 years	1, 2, 4, or 5 years	Vendor's
—	—	—	—	Third party
$103,525/mo.	$55,440/mo.	$66,990/mo.	$81,430/mo.	Lease of CPU with min. memory (1-yr.)
16MB	8MB	8MB	8MB	Memory increment size
$246,000	$123,000	$123,000	$123,000	Memory increment purchase
				Vendor offered maintenance
Not available	Not available	Not available	Not available	Prime time
—	—	—	—	Additional hours
$7,413/mo.	$4,821/mo.	$5,724/mo.	$6,662/mo.	24 hour
—	—	—	—	Other plans
—	NAS	NAS	NAS	Manufacturer
NAS	NAS	NAS	NAS	Vendor

*As rated by the PCM vendor.

All About Plug-Compatible Mainframes

MODEL	National Advanced Systems AS/9070	National Advanced Systems AS/9080	Nixdorf Computer Corporation 8890/10	Nixdorf Computer Corporation 8890/30
SYSTEM PARAMETERS				
Date of introduction	January 1982	May 1982	4th Quarter 1983*	*2nd Quarter 1982
Date of first delivery	September 1983	December 1982	4th Quarter 1983	2nd Quarter 1983
Number installed to date	Information not available	Information not available	**	See 8890/10
Production status	Active	Active	Active	Active
Operating systems				
DOS/VS	Yes	Yes	Yes	Yes
DOS/VSE	Yes	Yes	Yes	Yes
OS/VS1	Yes	Yes	Yes	Yes
SVS	Yes	Yes	Yes	Yes
MVS	Yes	Yes	Yes	Yes
MVS/XA	Yes	Yes	No	No
VM/370	Yes	Yes	Yes	Yes
VM/SP	Yes	Yes	Yes	Yes
Others	ACP	ACP	NIDOS/VSE, SSX/VSE, VSE/SP	NIDOS/VSE, SSX/VSE, VSE/SP
PROCESSING FEATURES				
Virtual storage capability	Standard	Standard	Yes	Yes
Processor arrangements				
Uniprocessor	No	No	Yes	Yes
Attached processor	No	No	—	—
Front end to	—	—	—	—
Back end to	—	—	—	—
Multiprocessor	Yes	Yes	—	—
Minimum in complex	2	2	—	—
Maximum in complex	2	2	—	—
Clock comparator	Standard	Standard	Standard	Standard
CPU timer	Standard	Standard	Standard	Standard
Control registers	Standard	Standard	Standard	Standard
CPU one-level addressing	Standard	Standard	Standard	Standard
Doubleword buffer	Standard	Standard	Standard	Standard
Interval timer	Standard	Standard	Standard	Standard
Machine check handling	Standard	Standard	Standard	Standard
Multiple bus architecture	Standard	Standard	Standard	Standard
Storage protection	Standard	Standard	Standard	Standard
Time-of-day clock	Standard	Standard	Standard	Standard
Channel command retry	Standard	Standard	Standard	Standard
Channel indirect addressing	Standard	Standard	Standard	Standard
Byte oriented operand feature	Standard	Standard	Standard	Standard
Extended precision floating point	Standard	Standard	Standard	Standard
High speed floating point	Standard	Standard	Standard	Standard
System/370 Universal Instruction set	Standard	Standard	Standard	Standard
Console audible alarm	Standard	Standard	Standard	Standard
Integrated console printer	Optional	Optional	Optional	Optional
Light pen	No	No	—	—
Remote console	Standard	Standard	Standard	Standard
Remote data link	Standard	Standard	Standard	Standard
Console file	Standard	Standard	Standard	Standard
CPU activity monitor	Standard	Standard	Standard	Standard
Extended control mode	Standard	Standard	Standard	Standard
Program event recording	Standard	Standard	Standard	Standard
Virtual machine assist	Standard	Standard	Standard	Standard
OTHER FEATURES & COMMENTS	Can be upgraded to an AS/9170 Vector Processor	Can be upgraded to an AS/9180 Vector Processor	*In U.S. only **Approximately 550 world-wide customers with 1 or more systems See 8890/30 Comments	*In U.S. only ***Integrated peripheral adapters for disk, tape, communications terminals, printers, card readers, diskettes

All About Plug-Compatible Mainframes

National Advanced Systems AS/9070	National Advanced Systems AS/9080	Nixdorf Computer Corporation 8890/10	Nixdorf Computer Corporation 8890/30	MODEL
				PROCESSOR PERFORMANCE
38	30	200	200	Machine cycle time, nanoseconds
				Relative performance*
IBM 3081KX	IBM 3084QX	IBM 4321	IBM 4331-1	To
>1.0	1.4	—	—	Performance of
—	—	—	—	To
—	—	—	—	Performance of
AS/9080 or AS/9170	AS/9180	8890/30-50-70	8890/50-70	Field upgradable to
				MAIN STORAGE
Dynamic NMOS	Dynamic NMOS	MOS	MOS	Storage type
				Checking
Yes	Yes	Yes	Yes	Parity
Yes	Yes	Yes	Yes	Error detection & correction
1	1	1	1	No. of check bits per byte
—	—	4	4	No. of check bits per word
342	270	870	870	Read cycle, nanoseconds
342	270	870	870	Write cycle, nanoseconds
8	8	8	8	Bytes fetched per cycle
16M	16M	1MB	1MB	Minimum capacity, bytes
64M	64M	1MB	2MB	Maximum capacity, bytes
16M	16M	—	1MB	Increment size, bytes
Yes	Yes	Yes	Yes	Interleaving
16	16	2	2	Minimum number of ways
16	16	2	2	Maximum number of ways
				BUFFER (CACHE) STORAGE
Bipolar RAM	Bipolar RAM	—	—	Storage type
19	15	—	—	Cycle time, nanoseconds
8	8	—	—	Bytes fetched per cycle
2 x 64K	2 x 256K	—	—	Minimum capacity, bytes
2 x 64K	2 x 256K	—	—	Maximum capacity, bytes
				I/O CHANNELS
—	—	Integrated	—	Selector channels standard
—	—	Integrated	—	Selector channels optional
12	12	Integrated	0	Block multiplexers standard
18	18	Integrated	1	Block multiplexers optional
2	2	Integrated	0	Byte multiplexers standard
6	6	Integrated	1	Byte multiplexers optional
				Subchannels per channel
256	256	Integrated	256	On a block multiplexer
256	256	Integrated	32	On a byte multiplexer
—	—	Integrated	—	On a selector
Optional	Optional	Integrated	Yes	Channel to channel adapter
				Maximum channel data rates
3M	3M	Integrated	1.5M	Block multiplexer, bytes/sec.
100K	100K	Integrated	140K	Byte multiplexer, bytes/sec.
—	—	Integrated	—	Selector channel, bytes/sec.
80M	96M	Integrated	5M	Aggregate data rate, bytes/sec.
Standard	Standard	—	—	Data Streaming
				CONTROL STORAGE
Bipolar RAM	Bipolar RAM	Multiple	Multiple	Storage type
7	7	Multiple	Multiple	Access time, nanoseconds
160	160	Multiple	Multiple	Word size, bits
2 x 16K	2 x 16K	Multiple	Multiple	Minimum number of words
2 x 16K	2 x 16K	Multiple	Multiple	Maximum number of words
Variable	Variable	Multiple	Multiple	Control storage usage
				PRICING & AVAILABILITY
$3,249,000	$4,140,000	$85,000-120,000 Avg. Sys.	$150,000-200,000 Avg. Sys.	Purchase of CPU with min. memory
				Lease terms offered
1, 2, 4, or 5 years	1, 2, 4, or 5 years	Contact vendor	Contact vendor	Vendor's
—	—	Contact vendor	Contact vendor	Third party
$118,545/mo.	$130,855/mo.	—	—	Lease of CPU with min. memory (1-yr.)
16MB	16MB	—	1MB	Memory increment size
$246,000	$246,000	Contact vendor	Contact vendor	Memory increment purchase
				Vendor offered maintenance
Not available	Not available	Contact vendor	Contact vendor	Prime time
—	—	Contact vendor	Contact vendor	Additional hours
$8,790/mo.	$10,437/mo.	Contact vendor	Contact vendor	24 hour
—	—	Contact vendor	Contact vendor	Other plans
NAS	NAS	Nixdorf	Nixdorf	Manufacturer
NAS	NAS	Nixdorf	Nixdorf	Vendor

*As rated by the PCM vendor.

All About Plug-Compatible Mainframes

MODEL	Nixdorf Computer Corporation 8890/50	Nixdorf Computer Corporation 8890/70		
SYSTEM PARAMETERS				
Date of introduction	*2nd Quarter 1982	*2nd Quarter 1982		
Date of first delivery	3rd Quarter 1983	1st Quarter 1984		
Number installed to date	See 8890/10	See 8890/10		
Production status	Active	Active		
Operating systems				
DOS/VS	Yes	Yes		
DOS/VSE	Yes	Yes		
OS/VS1	Yes	Yes		
SVS	Yes	Yes		
MVS	Yes	Yes		
MVS/XA	No	No		
VM/370	Yes	Yes		
VM/SP	Yes	Yes		
Others	NIDOS/VSE, SSX/VSE, VSE/SP	NIDOS/VSE, SSX/VSE, VSE/SP		
PROCESSING FEATURES				
Virtual storage capability	Yes	Yes		
Processor arrangements				
Uniprocessor	Yes	Yes		
Attached processor	—	—		
Front end to	—	—		
Back end to	—	—		
Multiprocessor	—	—		
Minimum in complex	—	—		
Maximum in complex	—	—		
Clock comparator	Standard	Standard		
CPU timer	Standard	Standard		
Control registers	Standard	Standard		
CPU one-level addressing	Standard	Standard		
Doubleword buffer	Standard	Standard		
Interval timer	Standard	Standard		
Machine check handling	Standard	Standard		
Multiple bus architecture	Standard	Standard		
Storage protection	Standard	Standard		
Time-of-day clock	Standard	Standard		
Channel command retry	Standard	Standard		
Channel indirect addressing	Standard	Standard		
Byte oriented operand feature	Standard	Standard		
Extended precision floating point	Standard	Standard		
High speed floating point	Standard	Standard		
System/370 Universal Instruction set	Standard	Standard		
Console audible alarm	Standard	Standard		
Integrated console printer	Optional	Optional		
Light pen	—	—		
Remote console	Standard	Standard		
Remote data link	Standard	Standard		
Console file	Standard	Standard		
CPU activity monitor	Standard	Standard		
Extended control mode	Standard	Standard		
Program event recording	Standard	Standard		
Virtual machine assist	Standard	Standard		
OTHER FEATURES & COMMENTS	*In U.S. only See 8890/30 Comments	*In U.S. only See 8890/30 Comments		

All About Plug-Compatible Mainframes

Nixdorf Computer Corporation 8890/50	Nixdorf Computer Corporation 8890/70			MODEL
				PROCESSOR PERFORMANCE
200	200			Machine cycle time, nanoseconds
				Relative performance*
IBM 4341-9	IBM 4341-10			To
—	—			Performance of
—	—			To
—	—			Performance of
8890/70	—			Field upgradable to
				MAIN STORAGE
MOS	MOS			Storage type
				Checking
Yes	Yes			Parity
Yes	Yes			Error detection & correction
1	1			No. of check bits per byte
4	4			No. of check bits per word
870	870			Read cycle, nanoseconds
870	870			Write cycle, nanoseconds
8	8			Bytes fetched per cycle
1MB	2MB			Minimum capacity, bytes
4MB	8MB			Maximum capacity, bytes
1MB	2MB			Increment size, bytes
Yes	Yes			Interleaving
2	2			Minimum number of ways
2	2			Maximum number of ways
				BUFFER (CACHE) STORAGE
—	MOS			Storage type
—	50			Cycle time, nanoseconds
—	8			Bytes fetched per cycle
—	64K			Minimum capacity, bytes
—	64K			Maximum capacity, bytes
				I/O CHANNELS
—	—			Selector channels standard
—	—			Selector channels optional
0	0			Block multiplexers standard
2	4			Block multiplexers optional
0	0			Byte multiplexers standard
1	2			Byte multiplexers optional
				Subchannels per channel
256	256			On a block multiplexer
32	32			On a byte multiplexer
—	—			On a selector
Yes	Yes			Channel to channel adapter
				Maximum channel data rates
2M	2M			Block multiplexer, bytes/sec.
140K	140K			Byte multiplexer, bytes/sec.
—	—			Selector channel, bytes/sec.
5M	5M			Aggregate data rate, bytes/sec.
Yes	Yes			Data Streaming
				CONTROL STORAGE
Multiple	Multiple			Storage type
Multiple	Multiple			Access time, nanoseconds
Multiple	Multiple			Word size, bits
Multiple	Multiple			Minimum number of words
Multiple	Multiple			Maximum number of words
Multiple	Multiple			Control storage usage
				PRICING & AVAILABILITY
$250,000-285,000 Avg. Sys.	$400,000-500,000 Avg. Sys.			Purchase of CPU with min. memory
				Lease terms offered
Contact vendor	Contact vendor			Vendor's
Contact vendor	Contact vendor			Third party
—	—			Lease of CPU with min. memory (1-yr.)
1MB	2MB			Memory increment size
Contact vendor	Contact vendor			Memory increment purchase
				Vendor offered maintenance
Contact vendor	Contact vendor			Prime time
Contact vendor	Contact vendor			Additional hours
Contact vendor	Contact vendor			24 hour
Contact vendor	Contact vendor			Other plans
Nixdorf	Nixdorf			Manufacturer
Nixdorf	Nixdorf			Vendor

*As rated by the PCM vendor.