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communications capabilities along with adding additional proprietary software from other suppliers. Furthermore, 10 respondents endorsed the NAS equipment with recommendations for other users while 3 respondents indicated that they would not recommend the system to potential users.

As part of the survey, the users were asked to rate their NAS equipment from excellent to poor. A weighted average was then calculated based on the total number of responses. A summary of these ratings is included in the following table.

	Excellent	Good	Fair	Poor	WA*
Ease of operation	6	6	1	0	3.38
Reliability of mainframe	11	1	0	1	3.69
Reliability of peripherals	6	5	1	0	3.42
Maintenance service:					
Responsiveness	8	4	1	0	3.54
Effectiveness	7	5	1	0	3.46
Technical support:					
Troubleshooting	4	9	0	0	3.31
Education	2	9	0	1	3.00
Documentation	2	9	1	0	3.08
Ease of programming	3	6	0	0	3.33
Ease of conversion	3	5	1	0	3.22
Overall satisfaction	4	5	0	0	3.44

*Weighted Average on a scale of 4.0 for Excellent.

Datapro talked with three NAS users to find out how well their systems performed. We first spoke with an individual in the petroleum industry who had converted to an AS/6650 from an IBM 4341. Stating that "there was nothing to it," the company spokesman indicated that the conversion went very smoothly. An hour after the old IBM equipment had been wheeled out and the new NAS equipment had been wheeled in, the system was up and running. Although this person had not yet encountered any performance problems with the NAS equipment, he had favorable impressions of NAS service representatives and therefore anticipated no drawbacks if a problem should occur.

We also received a favorable response from an NAS user at a government installation. This individual emphasized reliability as the major system strength. Unable to identify any significant system weaknesses, this government official wholeheartedly endorsed his NAS equipment and felt that technical support far surpassed that of IBM. Although they had converted from NAS AS/5000 equipment, they had IBM's DL/I data base management package and were not satisfied from both a performance and support viewpoint.

Another NAS user we interviewed was disappointed with the performance of the NAS 7000 system the company had installed and reported that there was a problem with the VM operating system. Stating that NAS was unable to solve the performance inefficiencies caused when using VM, the user was forced to use OS/VS1 and was actively seeking another machine which would enable them to utilize the processing power of VM. □

The AS systems include firmware that supports the following IBM operating system enhancements: System/370 Extended Facility (370 EF), which allows the use of the MVS/System Extensions (MVS/SE) and MVS/System Product (MVS/SP); OS/VS1 Extended Control Program Support (VS1:ECPS); Virtual Machine Assist (VMA); Virtual Machine Extended Control Program Support (VM:ECPS); and MVS/SP Assists, which consist of the Cross Memory Services Assist, Auxiliary Storage Management Assist, Real Storage Management Assist, and I/O Assist features. All of these enhancements improve system throughput by implementing a number of frequently used system routines in microcode. (See Table 1 for the microcode assist features available on the individual AS processors.)

The Advanced Systems in 370-XA model fully support MVS/SP Version 2 and its associated products collectively known as MVS/XA. They provide every feature of the comparable IBM processors in 370-XA mode.

Program products marketed by NAS include the Advanced Conversational Editing and Programming System (ACEP), Performance Monitor, Extend/SP, DP Technician, and a series of three performance monitors including QCM, Discern VS/1, and Discern VM.

ACEP is an on-line programming system that permits programmers to create, modify, and maintain programs and systems. ACEP can be used with IBM or IBM-compatible processors running under OS/VS1 or MVS. An optional System Productivity Facility (SPF) enables users to work with easy-to-understand screens and menus to arrive at programming decisions. The ACEP/SPF system includes capabilities for entering, editing, compiling, and saving source programs.

SP simulates the System/370 Extended Facility, substituting standard System/370 instruction set sequences for the machine instructions in the Extended Facility. SP is designed to enable System/370 users to take advantage of MVS/SP3 without making hardware modifications. According to NAS, EXTEND/SP, when used in conjunction with IBM's MVS/SE or MVS/SP operating systems, offers a 12 to 20 percent improvement in performance.

The DP Technician is a DASD management utility. Capabilities include volume configuration/dump/restore, catalog management, file management, file record retrieval, and DASD management. DP Technician can be used with all OS and OS/VS operating systems and supports IBM 3330, 3344, 3350, 3375, and 3380 disk subsystems. The IBM 3420 magnetic tape units are also supported.

The NAS Performance Monitors are a family of products designed to measure and report on the performance and use of NAS and IBM compatible processors running MVS, MVS/XA, OS/VS1, and VM/370 operating systems.

PRICING AND SUPPORT

The NAS Advanced Systems are available for purchase or for lease under 12-month, 18-month, 24-month, or 48-month operating lease terms. A new upgrade plan allows low-end AS/6600 Series users on a 48-month lease to upgrade at any time after the 24th month to a high-end AS/8000 or AS/9000 Series computer. An additional upgrade option enables users signing up to lease an AS/6600 computer to apply a percentage of the accrued AS/6600 lease payments toward the purchase of an AS/8000 mainframe at the end of the leasing term.

NAS offers two levels of software support. The Central Program Support Center function in Mountain View and San Diego, California, provides a Central Program Support Service, which includes telephone assistance 24 hours a day,

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7 days a week, customer guidance in IPAR (Incident Program Analysis Report) preparation, problem diagnosis advice, temporary fix or bypass service, and PTF selection and application assistance. The Local Program Support Service at the customer site includes problem diagnosis, IPAR preparation and submission assistance, local fix or bypass development and assistance, and PTF/PUT application problem assistance. The Local Program Support Service is available as an option. Customers can elect to pay a monthly program support charge or to pay hourly rates.

NAS has a Support Agency service for selected IBM Licensed Programs. Under the terms of an agreement between NAS and IBM, licensed users can select NAS as their support agent. The agreement permits NAS to use the IBM support centers on behalf of the users. NAS is offering a combined Central and Local Program Support Service for the designated IBM programs. A remote, first-level interface is provided via a toll-free telephone number, and local support is provided via local NAS Systems Support Representatives. The Support Agency service provides support for the following licensed programs: MVS/SP Version 1, VM/SP Release 1, DOS/VSE Advanced Functions Release 3, Data Facility/ Device Support, Data Facility/Extended Function, Data Facility/Data Set Services, RMF, SAM-E, ACF/VTAM, ACF/NCP, SPF, Information System, VSE/VSAM, VSE/POWER, VSE/OCCF, VSE/IPCS, VSE/IPF, VSE/ICCF, VSE/Fast Copy, VSE/DITTO, BTAM-ES, VM/IPCS, RSCS, SPF/CMS, and IPF.

EQUIPMENT PRICES

		Purchase ($)	Monthly Maint.* ($)	1-Year Lease ($)	2-Year Lease ($)
PROCESSOR COMPLEXES					
AS/6620	Processor with 8 megabytes of main memory, 64K bytes of buffer storage, 5 I/O channels, and a standalone operator console with color CRT	255,000	752	8,950	7,845
AS/6630	Processor with 8 megabytes of main memory, 64K bytes of buffer storage, 5 I/O channels, and a standalone operator console with color CRT	341,500	833	11,095	9,715
AS/6650	Processor with 8 megabytes of main memory, 64K bytes of buffer storage, 5 I/O channels, and a standalone operator console with color CRT	417,500	983	13,815	12,090
AS/6660	Processor with 8 megabytes of main memory, 64K bytes of buffer storage, 12 I/O channels, and a standalone operator console with color CRT	475,000	1,135	15,720	13,760
AS/8023	Compact processor with 8 megabytes of main memory, 64K bytes of buffer storage, 8 I/O channels, a single power distribution unit, and color CRT	699,000	3,250	21,310	18,885
AS/8043	Compact processor with 8 megabytes of main memory, 64K bytes of buffer storage, 8 I/O channels, a single power distribution unit, and color CRT	1,067,000	4,637	32,875	29,090
AS/8053	Compact processor with 8 megabytes of main memory, 64K bytes of buffer storage, 8 I/O channels, a single power distribution unit, and color CRT	1,492,000	4,821	48,725	42,850
AS/8063	Compact processor with 8 megabytes of main memory, 64K bytes of buffer storage, 8 I/O channels, a single power distribution unit, and color CRT	1,905,000	5,724	63,795	56,025
AS/8083	Compact processor with 16 megabytes of main memory, 64K bytes of buffer storage, 16 I/O channels, a single power distribution unit, and color CRT	3,074,000	7,413	103,525	90,675
AS/9040	Processor with 8 megabytes of main memory, 64K bytes of buffer storage, I/O processor, 8 I/O channels, and service processor console with dual 4-color CRTs, keyboards, and 2 floppy disk drives	1,492,000	4,821	55,440	48,695
AS/9050	Processor with 8 megabytes of main memory, 64K bytes of buffer storage, I/O processor, 8 I/O channels, and service processor console with dual 4-color CRTs, keyboards, and 2 floppy disk drives	1,909,000	5,724	66,990	58,820
AS/9060	Processor with 16 megabytes of main memory, 256K bytes of buffer storage, I/O processor, 16 I/O channels, and service processor console with dual 4-color CRTs, keyboards, and 2 floppy disk drives	2,308,000	6,662	81,430	71,460
AS/9070	Dual processors with 16 megabytes of main memory, 64K bytes of buffer storage per processor, 2 I/O processors, 16 I/O channels and 2 service processor consoles with dual 4-color CRTs, keyboards, and 2 floppy disk drives	3,249,000	8,790	118,545	103,910
AS/9080	Dual processors with 16 megabytes of main memory, 256K bytes of buffer storage per processor, 2 I/O processors, 16 I/O channels, and 2 service processor consoles with dual 4-color CRTs, keyboards, and 2 floppy disk drives	4,140,000	10,437	130,855	114,800
PROCESSOR OPTIONS					
AS/6600 Series:	Additional Memory Increment, 4 megabytes	38,000	56	1,190	1,040
	Additional Memory Increment, 8 megabytes	64,000	115	1,920	1,680
	Additional Block Channels Increment, 2 channels	20,000	40	800	700
	Additional Byte Channels, each	8,000	20	325	285
	Channel to Channel Adapter	20,000	25	790	690
	Direct Control	5,000	NC	195	170
	High-speed Arithmetic	80,000	250	3,355	2,885
	Hard Copy Printer	3,700	139	225	215
	AS/6620 to AS/6630 Upgrade	95,000	81	—	—
	AS/6630 to AS/6650 Upgrade	115,000	150	—	—
	AS/6630 to AS/6660 Upgrade	172,000	202	—	—
	AS/6650 to AS/6660 Upgrade	57,500	152	—	—
AS/8000 Series:	Additional Memory Increment, 8 megabytes	123,000	452	4,370	3,845
	Additional Channel Group, 8 channels	123,000	132	4,115	3,580
	Channel to Channel Adapter	14,000	56	575	510
	Additional Console	29,000	300	1,300	1,165
	Console Printer	6,000	139	315	290
	High-speed Arithmetic	200,000	300	5,975	5,220

NC—No charge.
**Complete service for 24 hours/day, 7 days/week.*

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		Purchase ($)	Monthly Maint.* ($)	1-Year Lease ($)	2-Year Lease ($)
PROCESSOR OPTIONS (Continued)					
	Preferred Machine Assist	50,000	NC	1,925	1,160
	Extended Architecture (AS/8023 only)	150,000	NC	5,770	5,000
	AS/8023 to AS/8043 Upgrade	390,000	387	—	—
	AS/8043 to AS/8053 Upgrade	425,000	164	—	—
	AS/8053 to AS/8063 Upgrade	413,000	903	—	—
	AS/8063 to AS/8083 Upgrade	923,000	1,689	—	—
AS/9000 Series:	Additional Memory Increment for AS/9040, AS/9050 and AS/9060; 8 megabytes	123,000	452	4,285	3,770
	Additional Memory Increment for AS/9070 and AS/9080; 16 megabytes	246,000	904	8,965	7,890
	Additional Channel Group, 8 channels	123,000	132	4,165	3,630
	Channel to Channel Adapter	14,000	56	575	510
	Console Printer	6,000	139	315	290
	Additional Console	29,000	300	1,300	1,165
	Direct Control	1,500	21	75	65
	Preferred Machine Assist	50,000	—	—	—
	9140 Vector Processors	1,792,000	6,329	67,930	59,720
	9150 Vector Processors	2,209,000	7,232	79,480	69,845
	9160 Vector Processors	2,608,000	8,170	93,920	82,480
	9170 Vector Processors	3,849,000	11,790	143,410	125,860
	9180 Vector Processors	4,740,000	13,453	155,730	136,760
	AS/9040 to AS/9050 Upgrade	417,000	903	—	—
	AS/9050 to AS/9060 Upgrade	153,000	938	—	—
	AS/9050 to AS/9070 Upgrade	1,094,000	3,066	—	—
	AS/9060 to AS/9080 Upgrade	1,832,000	3,775	—	—
	AS/9070 to AS/9080 Upgrade	891,000	1,647	—	—
	AS/9040 to AS/9140 Upgrade	300,000	903	—	—
	AS/9050 to AS/9150 Upgrade	300,000	938	—	—
	AS/9060 to AS/9160 Upgrade	300,000	3,066	—	—
	AS/9070 to AS/9170 Upgrade	600,000	3,775	—	—
	AS/9080 to AS/9180 Upgrade	600,000	1,647	—	—

NC—No charge.
**Complete service for 24 hours/day, 7 days/week.*

SOFTWARE PRICES

	One-Time License Fee ($)
ACEP (Advanced Conversational Editing and Programming System)	28,000
SPF (System Productivity Facility)	4,000
NAS Performance Monitor:	
SPI (System Performance Interrogator)	14,000
SPM (System Performance Module)	6,000
SPI and SPM	6,000
Performance Data Base for SAS Users:	
IMS Data Option	1,000
CICS Data Option	1,000
VM Data Option	1,000
JAB (Job Analysis and Billing):	6,000
IMS Option	7,000
CICS Option	2,000
VM Option	2,000
EXTEND/SP System/370 Extended Facility Simulator	5,000 to 15,000
DISCERN VS1 Performance Analyzer	6,500
DP Technician	12,000

LOCAL PROGRAM SUPPORT

	Category A ($)	Category B ($)
AS/6620	515	740
AS/6630	515	740
AS/6650	515	740
AS/8023	640	960
AS/8043	725	1,025
AS/8053	800	1,140
AS/8063	910	1,300
AS/8083	1,085	1,550
AS/9040	800	1,140
AS/9050	910	1,300
AS/9060	1,085	1,550
AS/9070	1,325	1,890
AS/9080	1,875	2,675 ■