Honeywell Bull DPS 8000 Series

MANAGEMENT SUMMARY

Honeywell Bull Inc. has addressed the growing power needs of its DPS 8 users with the announcement of the new DPS 8000 Series of large-scale mainframes, a DPS 8 follow-on series. The first two installments of the DPS 8000 Series, announced in June, include the single-processor DPS 8000 Model 81 and the dual-redundant Model 82, systems that provide a migration path for the heart of the Honeywell Bull customer base, the DPS 8 user. The Models 81 and 82 will be available by December 1987, while three- and four-processor versions will be announced at an undisclosed later date. The DPS 8 line, meanwhile, continues to be available for the time being. Current DPS 8 users planning to migrate to the DPS 8000 will have to swap-out their central processors to upgrade to the newer product line.

In the software area, the DPS 8000 Series will operate under Software Release 3000, the latest version of the standard Honeywell Bull GCOS 8 operating system used for all of the company's large-scale mainframe products. Initially, DPS 8000 systems will be supported by GCOS 8 SR2500 Update 6 until SR3000 becomes available in December 1987. Along with the announcement of a new GCOS release, Honeywell Bull unveiled Interel, a new relational data management system which uses the ANSI-standard SQL. Other significant software announcements include Infoedge and the Development Center Nucleus, end-user oriented facilities which contain tools for program development. Infoedge is used with Interel as a companion product.

In addition to GCOS 8, the DPS 8000 Series will also be able to work under the Control Program (CP) 6 operating system without any modifications to the hardware. A spokesperson said CP-6 should be available for the DPS 8000 line by the end of this year or the beginning of next year at the conclusion of a testing period. Roughly 75 users ▷

The two-processor Honeywell Bull DPS 8000 Series, offered as an upgrade path for DPS 8 Series users, are large-scale mainframes designed to handle interactive on-line and distributed processing.

MODELS: DPS 8000 Model 81 and Model 82.
CONFIGURATION: DPS 8000 Series features one or two CPUs, 16 megabytes to 256 megabytes of main memory, and 16 to 32 channels.
COMPETITION: Amdahl 580 Series, IBM 4381 and 3090 Model 120E and Model 150E, NAS AS/XL 50 and AS/XL 60, and NCR 8800 and 9800 Series.
PRICE: From $675,000 to $1,300,000.

CHARACTERISTICS

MANUFACTURER: Honeywell Bull Inc., Deer Valley Computer Park, 13430 North Black Canyon Highway, Phoenix, Arizona 85029. Telephone (602) 862-8000.

MODELS: Single-processor DPS 8000 Model 81 and dual-processor Model 82.

DATA FORMATS

BASIC UNIT: Information not available from vendor.

FIXED-POINT OPERANDS: Information not available from vendor.

FLOATING-POINT OPERANDS: Such operands may be represented as single-precision or double-precision binary floating point, or mixed with a range of $10 \pm {}^{38}$, and single- or double-precision hexadecimal floating point with a maximum range of $10 \pm {}^{153}$. ▶

The DPS 8000 Series, which provides a new migration path for DPS 8 users, features up to 256 megabytes of main memory and up to 32 channels.

Honeywell Bull DPS 8000 Series

▷ operating DPS 8 mainframes use CP-6, a multiuser software system designed to enhance distributed processing.

The future of Multics, a third Honeywell Bull operating system that has been available with the DPS 8 Series, continues to be uncertain. Multics will not be supported on the DPS 8000 Series and will be discontinued at some point, although Honeywell Bull has vowed to support Multics well into the 1990s. The company also continues to ship DPS 8/70M machines that run Multics. The 60 or so Multics users are hoping Honeywell Bull establishes a clear migration path perhaps to a Honeywell Bull machine that will incorporate Multics elements. The company maintains the Multics user base is too small to support further research and development efforts.

The new model line makes use of very-large-scale integration (VLSI), current mode logic (CML) gate arrays and one-megabit dynamic random access (DRAM) memory chips. The Model 81 can process up to 62 transactions per second or about 225,000 transactions per hour at an average of four physical I/Os per transaction. The Model 82 dual-processor version is 1.8 times more powerful than the Model 81 and processes more than 110 transactions per second. The DPS 8000 is positioned to compete against the high end of the IBM 4381 Series and the low end of the IBM 3090 Series. Within the Honeywell Bull world, both DPS 8000 processors are positioned above the DPS 8/70, the top-end model within the DPS 8 model line. The Model 81 is said to have 1.6 times the performance of the DPS 8/70 in commercial/scientific batch environments and 1.8 times within Data Management IV-Transaction Processor (DM-IV) environments. Jobs that use long floating-point operands and BCD jobs may have substantially slower performance, according to Honeywell Bull. Compared to the DPS 8/49, the Model 81 is said to have a relative performance range of 2.6 to 3.0.

The DPS 8000 Model 81 single-processor system features 16 megabytes of main memory, expandable to 128 megabytes, and one Input/Output Processor (IOP) which supports up to 16 physical channels. It's field upgradable to a DPS 8000 Model 82. The Model 82 features 32 megabytes of memory, expandable to 256 megabytes, and two IOPs which each support up to 16 physical channels. The Model 82 contains two of each major central system component to ensure maximum availability in the event of component failure.

Interel integrated relational data management software, announced with the DPS 8000, includes a Structured Query Language (SQL) interface and the Integrated Relational Dictionary System (IRDS). Interel's implementation of SQL is compatible with IBM's SQL/DS and DB2, Oracle from Oracle Corporation, Ingres from Relational Technology Inc., and the Teradata DBC/1012 data base computer. Interel will be available with GCOS 8 Software Release 3000 in December. License origination fees range from $8,000 to $14,000 depending on system size. Monthly license fees range from $950 to $2,100. ▷

▶ INSTRUCTIONS: Information not available from vendor.

INTERNAL CODE: nine-bit ASCII code is standard.

MAIN MEMORY

Main memory ranges from 16 megabytes to 256 megabytes. Memory supports internal memory interlacing to speed up data access and uses automatic error detection and correction. Memory can be expanded through the addition of memory boards.

STORAGE TYPE: Main memory uses one-megabit dynamic random access memory (DRAM) circuits obtained from another chip vendor.

CAPACITY: See Table 1.

CYCLE TIME: See Table 1.

CHECKING: Information not available from vendor.

RESERVE STORAGE: Information not available from vendor.

CENTRAL PROCESSORS

DPS 8000 complexes use Very-Large-Scale Integration (VLSI) gate arrays and make use of one-megabit chip, dynamic random access memory (DRAM). A gate-array chip consists of 1,500 bipolar gates and 399 internal logic cells using Current Mode Logic (CML). Gate-array circuit chips are contained in multilayered, ceramic Single-Chip Packages (SCP), which greatly reduce the number of required circiut boards compared to processors using previous circuit technology. A circuit board can contain up to 30 SCPs. The use of the newer circuit technology reduces space, power, and cooling requirements and improves performance and reliability. A central complex includes the central processing unit (CPU), System Control Unit (SCU), main memory component, Input/Output Processor (IOP), and Maintenance Subsystem (MS). The use of compact SCPs makes it possible to house these components in a single cabinet. The Model 82 dual-redundant system features two of every major central system component to insure a high degree of system availability. The dual system uses a tightly coupled configuration, with CPUs and other components sharing central processing load, I/O processing, communications processing, and all memory. In dual redundant configurations, a duplicate module will take over the functions of a failed module while continuing to maintain its existing work loads or functions.

The CPU makes use of instruction pipeline processing to speed up instruction execution. It also uses virtual memory addressing and contains an associative memory that holds the most recently referenced page table words. Descriptor-controlled access provides system security. Extended segment capability supports segment sizes up to four billion bytes. Execution control store holds up to 64K bytes of command information.

In addition to main memory, the DPS 8000 Series comes with 256 kilobytes of cache memory to provide high-speed access to the most recently used instructions and data.

The SCU component is the interface between the CPU and main memory and the input/output processor and connected peripherals. The SCU regulates data transfer traffic and controls system interrupts and demands for central memory. The SCU features eight connection ports and supports concurrent data requests from multiple ports. The SCU can ▶

Honeywell Bull DPS 8000 Series

TABLE 1. SYSTEM COMPARISON

MODEL	DPS 8000/81	DPS 8000/82
SYSTEM CHARACTERISTICS		
Date announced	June 1987	June 1987
Date first delivered	December 1987	December 1987
Field upgradable to	DPS 8000/82	—
Relative performance	—	—
Number of processors	1	2
Cycle time, nanoseconds	85	85
Word size, bits	36	36
Operating systems	GCOS 8, CP-6	GCOS 8, CP-6
MAIN MEMORY		
Type	1 megabit MOS	1 megabit MOS
Minimum capacity, bytes	16 megabytes	32 megabytes
Maximum capacity, bytes	128 megabytes	256 megabytes
Increment size, bytes	16 megabytes	16 megabytes
Cycle time, nanoseconds	—	—
BUFFER STORAGE		
Minimum capacity	256KB	256KB
Maximum capacity	256KB	256KB
Increment size	—	—
INPUT/OUTPUT CONTROL		
Number of channels:		
Byte multiplexer	—	—
Block multiplexer	—	—
Word	—	—
Other	Up to 16	Up to 32

▷ Other announced software products include Infoedge, a set of productivity tools for both technical and non-technical users, and Development Center Nucleus, containing products for DP professionals that addresses all stages of applications development. Infoedge products include an electronic spread sheet, a forms generator, and a menu system that integrates Infoedge optional packages into a single system.

GCOS 8 now features the Rapid Access Data System (RADS), a software disk cache buffer technique first offered last year. The RADS feature improves throughput by storing a larger body of information within main memory to reduce the number of disk fetches. When information for a given task is called for, the system first searches the RADS area before accessing a disk. This technique takes advantage of faster semiconductor memories on-board the mainframe and sidesteps problems associated with I/O bottlenecks.

COMPETITIVE POSITION

With the introduction of the DPS 8000 and the earlier introduction of the DPS 7000 supermini, Honeywell Bull, the newly formed corporate entity composed of Honeywell Inc., Groupe Bull of France, and NEC of Japan, has begun to refocus on established Honeywell markets, with renewed emphasis on some basic product advantages. Areas receiving particular attention are corporate-wide connectivity, on-line interactive processing, and friendlier end-user accessibility through the new Interel relational data management system and Infoedge productivity tools.

Honeywell Bull has positioned the DPS 8000 Series against the high end of the IBM 4381 Series and the low end of the IBM 3090 Series. The vendor claims to have a two-to-one advantage over IBM in interactive processing within mixed ▷

▶ process requests concurrently from up to five ports. Memory commands conform to either a high or low priority. Generally, read commands get a high priority while write commands get a low priority. Additionally, high-priority requests are given precedence during SCU port selection, and low-priority requests are considered when there are no high-priority requests.

The Maintenance Subsystem handles DPS 8000 maintenance and service chores, incorporating both local and remote maintenance. Users can obtain remote testing and diagnosis by optionally accessing the HBI Technical Assistance Center.

The Service Processor (SP), a microcomputer with its own operating system and storage units, handles all diagnostic testing for the CPU and SCU, while the Maintenance Console Adapter, under the control of the SP, provides similar functions for the IOP. The SP is required for hardware initialization, loading of firmware, and initialization of the bootload process. Additional SP functions include direct error diagnosis to capture intermittent errors; background CPU test, called Patrol, to handle areas not addressed by direct diagnosis; comprehensive native fault tests to diagnose steady-state failures; and on-line/off-line testing which includes functional and stress tests.

In addition to the basic central system hardware, each central system features one console that allows users to control and interact with the system. The console consists of a 14-inch display station, command keyboard, an IOP console channel connection, and optional 100-characters-per-second printer. A maximum of four consoles is allowed per IOP.

SPECIAL FEATURES: To address user access and security requirements, the CPU is designed to operate in three modes: slave, master, and privileged master modes. For general user applications, slave mode limits user access to memory and furnishes a restricted instruction set. Privileged master mode lets users access certain memory domains, but protects them against alteration while also protecting the GCOS 8 operating system from corruption. ▶

Honeywell Bull DPS 8000 Series

work load environments involving both batch and interactive processing, with batch being about equal. In May, IBM announced four new 4381 models that are more powerful than existing 4381 models, and also announced a new low-end 3090, the Model 120E. In the hardware pricing area, the new Honeywell Bull machines are priced competitively against the high end of the IBM 4381 Series and the low end of the IBM 3090 line. For instance, the newly announced IBM 4381 Model Group 23 with 16 megabytes of main memory sells for $530,000. The Honeywell Bull Model 81, also with 16 megabytes of main memory, sells for $675,000. A single-processor IBM 3090 Model 150E with 32 megabytes of memory sells for $1,250,000 while a dual-processor Honeywell Bull Model 82 with 32 megabytes of memory sells for $1,300,000. Although it appears IBM systems cost less, other required system components, such as power units, processor controllers, system consoles, and additional components are priced separately.

In addition to price/performance issues, both IBM and Honeywell Bull are addressing hardware/software connectivity concerns. Honeywell Bull announced its Integrated Information Architecture (IIA), a framework that lets users working within mainframe, mini, or micro environments access data at different computing levels within an organization. In conjunction with this concept, the new Interel relational data management system is designed to make it easier for end users to access data bases and find the information they need. Interel, using an SQL interface, can access both relational and nonrelational data structures. The Personal Computer Interconnect product lets PC users access mainframe data and download the data to the PC for incorporation into popular PC-based application packages, such as Lotus 1-2-3, dBASE III, MultiMate Advantage, and WordStar Professional. Honeywell Bull is also reemphasizing distributed processing and compatibility with the Open Systems Interconnection (OSI) standard. Additionally, the GCOS 8 operating system runs on all Honeywell Bull large-scale mainframes beginning at the DPS 8 and now the DPS 8000 level, making it possible for applications written for one large machine to work with minimal or no modification on other Honeywell Bull large-scale hardware running GCOS 8.

Likewise, during the last year especially, IBM has been offering hardware- and software-based connectivity products to let PC, mini, and mainframe users operating under incompatible hardware and operating systems share information. Unlike Honeywell Bull which offers GCOS 8 as the primary operating environment for its large-scale mainframes, IBM continues to cope with problems of having to support incompatible operating systems. To encourage 4381 VSE users to migrate to MVS/XA, IBM announced in May the Migration System (MVS-MS) product, which is intended to reduce the time and cost required to convert from VSE/SP Versions 1, 2, and 3 to an MVS operating environment. MVS-MS was announced with the May 11 introduction of the four new 4381 mainframes.

PHYSICAL SPECIFICATIONS: The dimensions and weights for Honeywell Bull mainframes are listed in the following chart:

	Width (in.)	Ht. (in.)	Depth (in.)	Wt. (lb.)
Honeywell Bull Mainframes				
DPS 8000 Model 81; one processor	71	71	32	2300
DPS 8000 Model 82; two processors	174	71	32	4700

The operating environment for DPS 8000 systems should hold to between 68 degrees and 78 degrees Fahrenheit at a relative humidity of 40 percent to 60 percent, noncondensing. The systems can operate on 200, 208, 220, 380, 415 VAC, three-phase power at a frequency of 60 Hz. Models operating on 50 Hz are also available. The DPS 8000 consumes 10.7 kVA, operating on 208 VAC, 60 Hz. The systems have a heat output of 31.4k Btus per hour operating on 208 VAC, 60 Hz.

CONFIGURATION RULES

The DPS 8000 Model 81 is a single-processor complex consisting of one CPU with 16 megabytes of main memory, one System Console, one System Control Unit (SCU), one Maintenance Subsystem (MS), one Input/Output Processor (IOP) supporting up to 16 physical channel connections, and one modem for remote maintenance. Memory can be expanded to 16, 32, 64, or 128 megabytes in 16-megabyte increments. Users can also configure three additional consoles per IOP for a maximum of four, an optional 23-inch large screen monitor for the system console, and an optional system console printer.

The DPS 8000 Model 82 is a fully redundant processor complex consisting of two CPUs, 32 megabytes of main memory, two SCUs, two MSs, two IOPs, each supporting up to 16 physical channels, and two modems for remote maintenance. Main memory is expandable to 128 megabytes per SCU for a total of 256 megabytes. Memory per SCU can be expanded to 16, 32, 64, or 128 megabytes in 16-megabyte increments. Users can also configure the system with up to six additional system consoles or a maximum of four consoles per IOP and up to eight per system. Additionally, users can configure an optional 23-inch large screen monitor for a system console and an optional system console printer.

INPUT/OUTPUT CONTROL

The DPS 8000 IOP handles data transfers between connected peripheral subsystems and network processors and the SCU. An IOP supports up to 16 physical channels and 64 logical channels, which are the number of channels seen by software. Up to 128 logical channels per IOP are supported. Under this arrangement, a single physical channel accepts data from multiple logical channels. Concurrent input and output operations are possible through channel pipelining. Maximum transfer speed is three megabytes per channel. Each IOP has an aggregate throughput rate of up to 17.8 megabytes per second.

MASS STORAGE

Please refer to Table 2 for information about mass storage devices.

Honeywell Bull DPS 8000 Series

▷ In the software pricing area, both IBM and Honeywell Bull have implemented new pricing structures based on processor size. IBM now charges graduated one-time fees for selected MVS and VM products based on one of four processor group categories. Likewise, Honeywell Bull has begun to develop a GCOS pricing scheme also based on central processor size. GCOS 8 Release 3000 and other recently announced new products, such as Interel, are among the first software products to carry a license origination fee and a monthly license fee. The license origination fee, really an initial license fee, will vary by processor size. DPS 88 and DPS 90 processors fall within the highest pricing range, while the DPS 8000 and the high-end of the DPS 8 Series will fall within an intermediate pricing range. Large-scale mainframe users will be charged the most because bigger machines can take advantage of the software's full capabilities and experience its greatest benefits, according to a Honeywell Bull spokesperson. Intermediate and small system users, on the other hand, may not be able to take advantage of a product's full benefits by virtue of machine size and power. As such, they will be charged commensurately less.

Besides IBM, the Honeywell systems also compete against the low-end of the NAS AS/XL Series of IBM plug-compatible systems and the NCR 9800 and 8800 systems. Similar to Honeywell Bull, NCR has targeted its product line towards the fault-tolerant and on-line transaction processing market, a niche market NCR has exploited successfully over the years.

ADVANTAGES AND RESTRICTIONS

Of all the Honeywell Bull offerings announced within the last year, the introduction of the DPS 8000 Series may prove to be the most critical. By Honeywell Bull's own estimation, DPS 8 installations make up about 80 percent of the company's 10,000 worldwide user base. The two-processor DPS 8000, the apparent follow-on series for the eight-year-old DPS 8 product line, is aimed squarely at this substantial user base. The announcement of a new processor series employing the latest logic gate and memory technology is long overdue, of course. According to market estimates compiled by International Data Corporation, the Framingham, Massachusetts computer industry market research firm, 1,082 Honeywell Bull users worldwide are using DPS 8/70 machines, the top-end product within the existing DPS 8 line. This represents more than a third of the entire worldwide DPS 8 user base. Before the introduction of the DPS 8000 Series, DPS 8/70 users looking for more room to grow could jump to a DPS 88 model with a starting price of $1.7 million, or they could move to a Honeywell Bull DPS 90 which carries a starting price of $3.55 million. The DPS 8000 Series, however, represents a potentially less costly move. The cost of a basic system ranges from $675,000 for an entry-level Model 81 to $1.3 million for a two-processor Model 82.

The DPS 8000 Series extends the power range of the DPS 8 Series using architectural features and circuit technology that are similar to Honeywell Bull's newer products such as ▷

▶ **INPUT/OUTPUT UNITS**

Please refer to Table 3 for information about magnetic tape and printer products.

TERMINALS

Please refer to Table 4 for information about terminals.

COMMUNICATIONS

Datanet 8 Series front-end network processors handle communications functions for the DPS 8000 mainframes. The Datanet 8 Series includes the 8/10, 8/20, and 8/30, which operate within Honeywell Bull's Distributed Systems Architecture (DSA), an open communications architecture. Up to eight Datanet processors can be configured per system.

The DPS 8000 Series is designed to accommodate distributed processing and conforms to the Open Systems Interconnection (OSI) standard for connecting Honeywell Bull equipment and hardware from other vendors.

The Datanet 8 Series of network processors operate under the control of the Distributed Network Supervisor (DNS) software executive. These processors manage data communications traffic for Honeywell Bull DPS 7, DPS 7000, DPS 8, DPS 8000, DPS 88, or DPS 90 large systems operating under GCOS 8 or GCOS, or DPS 7 and DPS 7E, and DPS 7000 medium systems operating under GCOS 7.

Features common to all network processors in the DATANET 8 Series include:

• Capability to interconnect systems using private networks that use High-Level Data Link Control data communications links

• Capability to connect to PDNs, to VANs, using the CCITT X.25 interface, and to most types of standard digital or analog, leased or switched data communications lines

• Capability to attach terminal devices

• System Control Facility for remote maintenance

• Console access for network management functions

• Integrated 5¼-inch diskette drive for executive software maintenance functions

In addition, all DATANET 8 Series processors require a visual display console.

Physical connections between DATANET 8 Series network processors and central systems are made through network processor channel options which include Peripheral Subsystem Interface (PSI) for DPS 7 and DPS 7000 systems or Direct Interface Adapter (DIA) channels for DPS 8, 8000, 88, and 90 systems. The options are determined by the central system. The network processor provides support for one to four connections to large systems, or two connections to medium systems.

The DATANET 8 processor series includes the DATANET 8/10, 8/20, and 8/30. All three network processors are expandable from a basic to maximum configuration and use the same executive software, Distributed Network Supervisor. ▶

Honeywell Bull DPS 8000 Series

TABLE 2. MASS STORAGE

MODEL	MSU0451	MSU0500	MSU0501	MSU3380/82	MSU3381/83
Cabinets per subsystem	16	8-15	8-15	8	8
Disk packs/HDAs per cabinet	1	2	2	2	2
Capacity	157MB	626MB	1.1GB	2.52GB	5.04GB
Tracks/segments per drive unit	815	1630 per surface	1686 per surface	13,275	—
Average seek time, msec.	30	25	25	15	17
Average access time, msec.	38.3	33.3	33.3	23.3	25.3
Average rotational delay, msec.	8.3	8.3	8.3	8.3	8.3
Data transfer rate	716K bps	1065K bps	1065K bps	3M bps	3M bps
Controller model	MSP0611/0612	MSP0611/0612	MSP0611/0612	MSP3880/3884	MSP3882/3886
Comments	Removable	Fixed	Fixed	Fixed	Fixed

the DPS 90 and DPS 88. The company's medium-to-large scale offerings now employ VLSI Current Mode Logic circuitry and one-megabit memory chips compared to the larger models of the DPS 8 Series which use LSI MSI Schottky TTL logic and 16K-bit and 64K-bit memory chips. The DPS 8000 Series can be configured with 16 megabytes to 256 megabytes of main memory compared to the DPS 8 Series which can be configured with 8 megabytes to 64 megabytes of main memory.

In the auxiliary storage area, Honeywell Bull now offers the MSU3381 and MSU3383 double-capacity disk units, which feature unformatted capacities of 5.04 gigabytes. Last year, Honeywell Bull made the MSU3380/3382 disks available to its DPS 8 users. These units each have an unformatted capacity of 2.52 gigabytes. Both the MSU3380/3382 and the MSU3381/3383 are purchased from IBM on an OEM basis.

In the peripheral area, DPS 8 users planning to migrate to a DPS 8000 will be able to move most of their existing disk, tape, printer, and card unit peripherals over to the DPS 8000 Series. To make it possible to attach peripheral devices to DPS 8000 machines, users must purchase channel connection exchange features to connect peripherals to the DPS 8000 IOP. In addition, users who want to attach older peripherals, such as the MSU0451 mass storage unit, MTU610 magnetic tape unit, and the PRU1600 line printer, will have to obtain special permission from Honeywell Bull.

In the software area, Honeywell Bull's new Interel data management software, using an SQL interface, can access relational as well as non-relational files, including UFAS and DM-IV in retrieval mode only. The vendor claims it is one of the few data management products that has this capability. Honeywell Bull's other data management offering continues to be DM-IV, a CODASYL-type offering that features on-line transaction processing and query/reporting in addition to data management. ☐

DATANET 8/10 is a single processor system which provides support for a maximum of 31 data communications lines. The basic system includes one megabyte of central memory expandable to a maximum of two megabytes. A 5¼-inch diskette drive for executive software support is also included with the basic system. A second 5¼-inch diskette drive is optionally available. A console visual display terminal is required with each DATANET 8/10. In addition, a hard copy printer may be required.

Three RS-232-C asynchronous data communications ports are included with each 8/10. Data communications interface adaptors and line interface module options make it possible to expand data communications ports to a maximum of 31 lines. These options accommodate line characteristics such as data transmission speed, asynchronous/synchronous operation, and physical interfaces such as RS-232-C, V.35, and X.21.

DATANET 8/20 is a single-processor system with cache memory and one megabyte of central memory. To increase 8/20 performance, users may add a second processor and its associated cache memory. Central memory may be expanded to two megabytes by adding a one megabyte memory option. A basic system also includes a 5¼-inch diskette drive for executive software support. A second 5¼-inch diskette drive is optionally available. A console visual display terminal is required with each 8/20, and a hard copy console printer may be required. Three RS-232-C asynchronous data communications ports are included with each DATANET 8/20. The basic system provides support for up to 31 data communications ports, expandable to 127 ports with power and line expansion module options. Expansion of individual data communications ports is accomplished by ordering various communications interface adaptors and line interface module options. These options accommodate line characteristics such as data transmission speed, asynchronous/synchronous operation, and physical interfaces such as RS-232-C, V.35, and X.21.

DATANET 8/30 is a single-processor system with cache memory and two megabytes of central memory. To increase 8/30 performance, users may add a second processor and its associated cache memory. Central memory may be expanded to four megabytes by adding a two-megabyte memory option. A 5¼-inch diskette drive is included for executive software support, while a second 5¼-inch diskette drive is optionally available. A console visual display terminal is required with each 8/30 and a console hard copy printer may be required. Three RS-232-C asynchronous data communications ports are included with each 8/30. The basic system provides support for 159 data communications ports expandable to 255 ports with a line expansion module option. Data communications interface adaptors and line interface module options make it possible to expand individual data communications ports. These options specify line characteristics such as maximum speed, asynchronous/synchronous operation, and physical interfaces such as RS-232-C, V.35, and X.21.

DATANET 8/10, 8/20, and 8/30 processors are fully upward compatible with each other and prior DATANET 8 DSA product offerings. These network processors can coexist with pre-DSA products making it possible for a user to migrate to a DSA network environment and retain pre-DSA network products.

Line options common to all three DATANET models include:

Honeywell Bull DPS 8000 Series

TABLE 3. INPUT/OUTPUT UNITS

Magnetic Tape Units	Number of Tracks	Recording Density, Bits/Inch	Encoding	Tape Speed, Inches/Sec.	Transfer Rate, Bytes/Sec.
MTU0610	9	800/ 1600/ 6250	NRZI/ PE/ GCR	200	100K/200K/1250K
MTU0630	9	800/ 1600/ 6250	NRZI/ PE/ GCR	75 or 125	60-100K/120-200K/ 468.7-781.2K
MTU8205	9	800/ 1600/	NRZI/ PE	125	100-200K
MTU8206	9	1600/ 6250	PE/ GCR	125	200-780K
MTU8208	9	1600/ 6250	PE/ GCR	200	320-1250K
MTS8225	9	800/ 1600/	NRZI/ PE	125	100-200K
MTS8226	9	1600/ 6250	PE/ GCR	125	200-780K
MTS8228	9	1600/ 6250	PE/ GCR	200	320-1250K

Printers	Printing Speed	Print Positions	Horizontal Spacing, Chars./Inch	Vertical Spacing, Lines/Inch	Form Size, Inches
PRU0903	900 lpm	136	10	6 or 8	4-to-19 width x 3-to-11 length
PRU1203	1200 lpm	136	10	6 or 8	4-to-19 width x 3-to-11 length
PRU1600	1600 lpm	136 or 160	10	6 or 8	4-to-22 width x 3-to-22 length

▶ • Multiline Communications Controller-16 (DCF8052). It accommodates up to four Communications Interface Adaptors.

• RS-232-C Asynchronous/Character Synchronous Integrated Communications Interface Adaptor (DCF8073). The adaptor has four RS-232-C communications ports, includes four 50-foot cables (DCE to DTE) for device attachment, and has a maximum data transfer rate per port to 19.2K bps.

• RS-232-C Bit Synchronous HDLC Integrated Communications Interface Adaptor (DCF8049) The adaptor has two RS-232-C communications ports, includes two 50-foot cables (DCE to DTE) for device attachment, and has a maximum data transfer rate per port to 19.2K bps.

• Low/Medium Speed Asynchronous/Character Synchronous Communications Interface Adaptor (DCF8053). This adaptor is a nonintegrated adaptor which requires a minimum of one line interface module. It will accommodate up to four line interface modules. Maximum data transmission rate per line interface module is 19.2K bps.

The following line interface modules are allowed with DCF8053:

• RS-232-C/V.24 Asynchronous/Character Synchronous Line Interface Module (DCF8055). This module has one RS-232-C/V.24 data communications port, includes one 50-foot cable (DCE to DTE) for device attachment, and has a maximum data transmission speed to 19.2K bps.

• MIL-188-C Asynchronous/Character Synchronous Line Interface Module (DCF8059). This module has one MIL-

188-C data communications port, includes one 50-foot cable (DCE to DTE) for device attachment, and has a maximum transmission speed to 19.2K bps.

• Medium/High Speed Character Synchronous/Bit Synchronous Communications Interface Adaptor (DCF8061). This option is a nonintegrated adaptor capable of supporting one medium speed (to 19.2K bps) or one high speed (to 64K bps) data communications line via one of the following line interface modules.

The following line interface modules are allowed with DCF8061:

• RS-232-C/V.24 Bit Synchronous HDLC Line Interface Module (DCF8062). This module has one RS-232-C/V.24 data communications port, includes one 50-foot cable (DCE to DTE) for device attachment, and has a maximum data transmission rate to 19.2K bps.

• X.21 Bit Synchronous HDLC Line Interface Module (DCF8064). This module has one X.21 data communications port, includes one 50-foot cable (DCE to DTE) for device attachment, and has a maximum data transmission rate to 64K bps.

MIL-188-C Bit Synchronous HDLC/Character Synchronous Line Interface Module (DCF8067). This module has one X.21 data communications port, includes one 50-foot cable (DCE to DTE) for device attachment, and has a maximum data transmission rate to 64K bps.

• V.35 Bit Synchronous HDLC/Character Synchronous Line Interface Module (DCF8069). This module has one V.35 data communications port, includes one 50-foot cable ▶

Honeywell Bull DPS 8000 Series

(DCE to DTE) for device attachment, and has a maximum data transmission rate to 64K bps.

- Bell 301/303 Bit Synchronous/Character Synchronous Line Interface Module (DCF8071). This module has one Bell 301/303 data communications port, includes one 50-foot cable (DCE to DTE) for device attachment, and has a maximum data transmission rate to 64K bps.

SOFTWARE

OPERATING SYSTEM: GCOS 8 Software Release 3000 is the latest version of the company's primary operating system for large-scale mainframes. Included in the new release is support for relational data management software, improved transaction processing, and new, larger capacity disk drives. Additionally, Software Release 3000 includes the Rapid Access Data System (RADS), a feature for improving system throughput. Through RADS, users can access a larger percentage of data held in a special section of main memory rather than disk memory to improve response times, particularly within interactive environments.

In addition to GCOS 8, DPS 8000 mainframes will also operate under the Control Program (CP) 6 operating system without modification to hardware. Introduced in 1979 with the DPS 8 systems, GCOS 8 General *Comprehensive Operating Supervisor 8* is a product with a genesis dating back to the early 1960s. GCOS 8 is a multiprocessing, multiprogramming, communications-oriented operating system that supports distributed systems requirements. Honeywell Bull's objective is to keep the operating system dynamic by a series of planned releases which capitalize on new technology while preserving the user's investment in software. Honeywell Bull's direction for distributed systems is toward the eventual linking of an organization's entire complex of physically separate data processing systems into a single logical network system regardless of physical boundaries.

With the introduction of the DPS 8000, Honeywell Bull announced Integrated Information Architecture, which divides Honeywell Bull systems into three different operating levels that range from the enterprise level at the top of a computing organization, departmental level at the middle, and workstation level at the bottom. Users can access information pertinent to an entire organization at the enterprise level. Data that serves the specialized needs of separate groups within an organization can reside at the departmental level. Workstation-level processing meets the informational needs of individuals. Each level can be interconnected in two or three tiers to meet specific user requirements.

GCOS 8 Software Release 3000 is offered for all Honeywell large-scale processor lines from the DPS 8, DPS 8000, and DPS 88 to the top-end DPS 90. Migration to the new release from Release 2500, the former GCOS 8 version, can be accomplished without the need to recompile application software. Generally, applications written for GCOS 8 can run on any Honeywell Bull large system running GCOS 8 without modification.

GCOS 8 is a user-defined and user-oriented virtual operating system, with multidimensional capabilities. GCOS 8 balances the use of system resources, and gives multiple options for customizing the system for each user's needs. GCOS 8 concurrently supports 1) batch processing, 2) remote job entry (RJE), 3) interactive remote job entry (IRJE), 4) timesharing, 5) transaction processing, 6) direct program access, 7) on-line test and diagnostics, 8) on-line program test and development, and 9) decision support for end users.

Additionally, the operating system features multiprogramming, multiprocessing, and flexible job entry capabilities.

GCOS 8 also has file protection and file sharing, testing and diagnostics, communications, timesharing, data management facilities, language processors, diagnostic and system protection facilities, and various system utilities. Batch, timesharing, transaction processing, and other activities can be individually tailored and dynamically varied throughout the day. Peripherals are allocated before memory so that processing is not delayed by operator or mechanical delays.

GCOS 8 is a flexible operating system that features hardware transparency, meaning that the user has no need to know the particular architecture of the system, its hardware, I/O devices, or processor types. All processors can access all of memory and can execute any program. GCOS 8 can address up to 256 megabytes of real memory. Up to 477 user programs can be executed concurrently. GCOS 8 can use up to 256 megabytes of real memory for all dimensions. It provides high throughput by efficient and rapid scheduling of all activities, which reduces operator intervention.

GCOS 8 memory management is flexible. The system architecture with GCOS 8 provides dynamic memory management, descriptor-controlled access, and shared access to both data and procedures. Each of these functions is based on a hardware-protected memory segment. The memory segment is defined by a segment descriptor that contains the logical address of the beginning of the segment, the size of the segment, and the permissions that control its use.

Dynamic memory management permits programmers to develop software as if there were an unlimited logical memory. The available physical memory, on the other hand, depends on the system configuration and the work load.

GCOS 8 controls the physical organization of up to 512 work spaces of up to four million pages of virtual storage each, with each page consisting of 4096 bytes. Up to 477 separate working spaces (out of 512 total working spaces) are available for user processes.

Any available page of main memory can be used for any page-sized block of logical memory. Although pages may be located anywhere in memory, they can be accessed as if they were physically contiguous. With memory access, segment descriptors and page table words translate the virtual address to a main memory address.

Operating system security is provided through built-in protection features, which other vendors may obtain through optional or third-party software. These features include log-on controls, file access controls, control of TP user access to applications, and control of data base access to the data item (field) level through schemas/subschemas.

Hardware and software system security is provided in several ways. The operating system will abort an activity if an illegal operation is received. The File Management Supervisor provides a common file system for all processor operating dimensions as well as protective and restorative functions to ensure file integrity. Access to files is controlled through several levels. Files are grouped in a hierarchical order by user name, access restrictions, and resource control. File names are qualified by comparing them to the user names under which they are cataloged. Passwords may be required as an additional form of user identification. Access to files is under the originator's discretion and control. Each user can have a multilevel, hierarchical subcatalog structure, with the ability to assign access controls and passwords at each subcatalog level. Another safeguard is a hardware implementation that controls access to sets of memory segments called domains. This structure protects programs and files from intentional access by unauthorized personnel and unintentional access during debugging procedures.

Honeywell Bull DPS 8000 Series

TABLE 4. TERMINALS

MODEL	VIP 7816/7826	VIP 7817/7827	HDS 7101/ 7102	HDS 7302/ 7304	HSD 7403/ 7404	HDS 7807/ 7808
DISPLAY PARAMETERS						
Max. chars./screen	2000	2000	2000	2000	2000, 3300	2000, 3300
Screen size (lines x chars.)	25 x 80	25 x 80	25 x 80	25 x 80	25 x 80, 25 x 132	25 x 80, 25 x 132
Symbol formation	7 x 8 upper/ 7 x 9 lower	7 x 8 upper/ 7 x 9 lower	10 x 14	9 x 12	10 x 10 (80 col.)	10 x 14, 6 x 14
Character phosphor	P31 green	P31 green	Green or amber	Green or amber	Green or amber	Green or amber
Total colors/no. simult. displayed	—	—	—	—	—	—
KEYBOARD PARAMETERS						
Style	Typewriter	Typewriter	Typewriter	Typewriter (multifunc., low-profile)	Typewriter	Typewriter (multifunction)
Character/code set	128 ASCII	128 ASCII	128 ASCII	190 ASCII/30 spec.	190 ASCII	190 ASCII/30 spec.
Detachable	Standard	Standard	Standard	Standard	Standard	Standard
Program function keys	12 standard	—	10 standard	12 standard	14 standard	12 standard
OTHER FEATURES						
Buffer capacity	3 pages	—	—	—	—	—
Tilt/swivel	Adj. keyboard (7826)	Adj. keyboard (7827)	Optional	Standard	Standard	Standard
Graphics capability	—		—	—	—	—
TERMINAL INTERFACE	RS-232-C; RS-422-A	RS-232-C; RS-422-A	RS-232-C; RS-422-A	RS-232-C; RS-442	RS-232-C; RS-422	RS-232-C; RS-422-A

GCOS 8 SR3000 supports additional security features. Interel, the Honeywell Bull relational data management product, includes the Information Resource Dictionary System (IRDS), which adds fine grain access controls to relational data bases. The optional System Security Manager (SSM) will be available with an update of SR3000 and will be based on the capabilities previously provided to the World Wide Military Command and Control System (WWMCCS).

The SSM will provide levels of classification; categories of access; audit trail of all system logons, file accesses; security breaches; project identification; person identification; strong enforcement; and centralized administration. The SSM will be available to commercial customers in late 1988.

The IRDS, an ANSI-standard active data dictionary, provides execution time controls including access controls down to fields that are one character wide. The IRDS security features include Data Administrator functions, session management, and access controls. Session management includes authentication of person, password, project, process, schema/content, session type, account, and natrual language. Session types can be development, administrative, or user. Access controls include limits, permissions, and levels. Limits can be public, private, semi-private, and system software only. Permissions can be applied to session type, schemas/centents, processes, and commands. Access control enforcement can be applied at table level, column level, value level, where clause, and content object.

PROGRAMMING LANGUAGES: The language processors available for use on Honeywell Bull large systems running under GCOS 8 are Cobol-74, Cobol-68, Cobol-85, Fortran-66, Fortran-77, PL/1, GMAP, GPSS, Basic, data Basic, Simscript, Pascal, Compiler "B," Lisp, APL, RPG II, C, and Ada Compilation System.

DATA BASE MANAGEMENT: The *DM-IV Data Manager* component of *Data Management-IV* handles the data base management functions on Honeywell Bull mainframes. In addition to the DM-IV CODASYL-style product, Honeywell Bull also offers Interel, which provides a relational view of the data base. (Please refer to the DATA MANAGEMENT section for more details.) The Data Manager component of DM-IV, also referred to as *Integrated Data Store/II (I-D-S/II)*, administers the creation of the physical and logical structures of the data base and controls the creation of the application-specific views of that data base

which are used in processing. It further serves as the interface between the data base and the various DM-IV processors that access the data base and perform operations upon it.

The I-D-S/I and I-D-S/II systems are enhanced versions of I-D-S, a data base management system originally developed by GE. I-D-S/II is based on the CODASYL Data Base Facility specifications. I-D-S/II is fully integrated with Honeywell Bull's Cobol-74 compiler, and user interfaces are also implemented for Fortran.

Relational Access Manager, which allows interfacing to many standard file types, adds a relational access to nonrelational data bases. The facility accomplishes this without restructuring data files or programs. The facility is a user-friendly facility that lets nontechnical and technical users access data through a simple command structure.

DATA MANAGEMENT: Data management on Honeywell Bull systems is handled through Data Management-IV (DM-IV), a product containing a collection of facilities to handle data base management, transaction processing, querying and report processing in addition to providing batch and interactive data base capabilties. (Data base management capabilities are detailed in the DATA BASE MANAGEMENT section above.) In addition to the CODASYL-style data base product included with DM-IV, Honeywell Bull now offers Interel as its relational data management facility. Interel will be available with GCOS 8 Software Release 3000 in December. Other facilities under data management include the Data/Dictionary/Directory System (DD/DS), File Management Supervisor, Indexed Sequential Processor, Unified File Access System (UFAS), Management Data Query System, TOTAL Central, and Common Files Facility (CFF).

DM-IV has evolved from earlier software systems such as Integrated Data Store-I, Transaction Processing System, Transaction Driven System and Management Data Query System. DM-IV is a fully operational on-line, integrated data base management system. Data extraction and updating from data bases with various file organizations and data structures can be directly performed by non-data processing professionals. DM-IV consists of the following functional modules: the Data Manager (described in the Data Base Management section), the Transaction Processor, the ►

Honeywell Bull DPS 8000 Series

Query and Reporting Processor, and the Procedural Language Processor. It also supports batch and timesharing programs.

The DM-IV Transaction Processor (TP) provides the facility for rapid, efficient, on-line data base processing. It is most effectively used in applications where the end user has little or no knowledge of the operating system or storage structure, or data processing in general. Its internal design is optimized for high-volume transaction processing where extremely fast response and fast, automatic restart/recovery are required. The TP system includes both on-line software components for processing the actual transaction and a wide variety of support software products for program testing, library updating, and TP system generation. Within DM-IV/TP, there are five major functional components: Transaction Manager, Database Manager, Integrity Manager, Message Manager, and Executive Manager.

The *Executive Manager* schedules and coordinates all Transaction Processor activities. It manages the allocation of system resources for transaction processing.

The *Transaction Manager* controls and coordinates all activities during the processing of a transaction. It initiates each transaction control task which TP processes and controls the communication between application routines.

The *Database Manager* controls all data base activities for on-line files assigned to TP. The executive software also provides for dynamic allocation and deallocation of data base files to TP for uninterrupted, continuous operation.

The *Integrity Manager* provides for fast, automatic recovery and restart after any type of application or system failure. This includes everything from rollback of the data base after an application program abort to the complete reconstruction of a destroyed data base.

The *Message Manager* is the executive software component that actually handles the communications interface with the terminal network supported by the Front-end Network Processor (FNP). The Message Manager provides both the physical and logical interface to the on-line network of terminals and handles the acceptance and delivery of input and output messages.

The *Data Dictionary/Directory System (DD/DS)* is a comprehensive set of software modules that can implement a centralized data dictionary/directory. Data is entered into the dictionary database via either batch or interactive operations. The DD/DS supports up to 19 entity-types such as fields, records, files, programs, procedures, jobs, schemas, reports, etc. Multiple versions and status of each entity-type, alias names, narrative, and attributes unique to the entity type are also supported.

Several report generation facilities are available to the DD/DS user. The reporting system extracts information from the data dictionary and presents it to the user in various formats. Included is an extensive cross-reference (where used) reporting capability for all entity-type occurrences and an Impact Analysis Report which analyzes and reports the effect of change to an entity-type occurrence. A complete set of utilities is provided to assist in the maintenance of the data dictionary system and its database.

The *DM-IV Query and Reporting Processor (QRP)* provides the user with several different subsystems which act to access the defined data base and its structure and to generate reports on the results of the requested access. The DM-IV QRP end-user facilities provide access to the data base by non-computer-oriented personnel. Within QRP, simple,

straight-line procedures may be written to explicitly retrieve the desired data and process exception conditions such as no data qualifier and end of retrieval conditions.

The *Personal Computing Facility (PCF)* is a screen-oriented, interactive system that provides a user-friendly application environment. A person without knowledge of conventional computer programming can use PCF to create any type of VDU or CRT form as a basis for interactive problem solving.

Example Query (EQ) is an end-user facility consisting of an easy-to-learn language and support program. EQ aids application-oriented users in the queuing of data through the Relational Access Manager, which is included. User interface is through CRT devices (VIP7800), and alternatives to CRT display include printed output and file output. The interactive language facilities are designed for fast and simple formulation of requests which provide answers to application questions. The language has minimal syntax which is easily constructed into graphic representation of user processing requests.

Interactive Query (IQ) is an end-user facility that allows users to interface in nonforms mode with any type of terminal. Included with IQ is the Relational Access Manager, which allows interface to many standard file types.

The *Comprehensive Report Examination/Display Option (CREDO)* is an optional Personal Data Query (PDQ) facility that can format report data generated through the EQ and IQ facilities into refined, individualized reports. CREDO reports are defined, created, examined, and distributed according to user-specified or system-default options.

The *Transaction Application Test System (TATS)* is a software tool that provides an interactive timesharing environment for writing, compiling, testing, and debugging Transaction Processing Routines (TPRs) using a DM-IV (IDS-II) database. TATS also provides a TPR program skeleton generator, and forms mode support is currently provided for the DM-IV TP Forms Option (TPFO). The TATS package can also be used to interactively verify database updates and to integrate completed TPRs into the production system.

The *Transaction Screen Management System (TSM)* is a set of tools designed to enhance the development of application programs in a DM-IV TP environment. This system enables the developer to design, develop, test, and implement screen formats for application systems. Little or no knowledge of the communications network or the DM-IV TP operating environment is required.

The *File Management Supervisor (FMS)* provides powerful file management capabilities, including multilevel user catalogs, file sharing, and access control. The system employs a hierarchical, "tree-structured" design. A System Master Catalog lists the various user Master Catalogs, and each user may, in turn, define one or more levels of subcatalogs. Users may permit general sharing of their files or specify individual users who may access them on either a read/write or read-only basis. Password access control can be imposed at any or all levels of the file structure. Security is also provided by the optional logging of file access attempts and by a timesharing command allowing a user to encrypt his or her file using a predefined algorithm.

The *Indexed-Sequential Processor (ISP)* supports the widely used indexed-sequential file organization and access method, which permits mass storage files to be accessed in either random or sequential fashion. For each logical file, ➤

Honeywell Bull DPS 8000 Series

ISP maintains a data file and an independent key file, which serves as an index. The key file can be placed on a faster random-access device to speed up the access process.

The *Unified File Access System (UFAS)* provides automatic management for file processing, including record location and automatic blocking and deblocking. File organizations supported include sequential, relative, indexed, and integrated files. UFAS also includes facilities for error checking and initiation of error processing as defined by ANSI Cobol-74, and file integrity protection for normal and abort processing.

The *Management Data Query System (MDQS)* is a data management system that permits interrogation of sequential, indexed sequential, or I-D-S/I file organizations. MDQS operates as a subsystem to GCOS in both batch and timesharing environments and is available in two versions: MDQS/II, a database retrieval and report generation system, and MDQS/IV, a system that offers all MDQS/II capabilities plus database creation and maintenance features.

The *Common Files Facility (CFF)* controls the sharing of user program and data files between GCOS III and GCOS 8 as well as between GCOS 8 hosts without requiring manual partitioning of data or mass storage devices. The CFF allows a Level 66, DPS 8, DPS 8000, DPS 88, and DPS 90 system(s) share disk files on a single common group of disk drives.

CFF allows up to four computer systems share common disk drives. Concurrent access to files is controlled by lock bytes in the mass storage processor that supervises disk drive operation. Locking occurs at the single file level, which ensures that only one computer system in the cluster can update a file at one time. CFF clusters can also exist within communications networks based on Honeywell Bull's DSA.

Interel, announced with the DPS 8000, is an integrated relational data management product. Interel includes Structured Query Language (SQL) and the Integrated Relational Dictionary System (IRDS), both conforming to ANSI standards. Interel's implementation of SQL is compatible with IBM's SQL/DS and DB2, Oracle from Oracle Corporation, Ingres, from Relational Technology Inc., and the Teradata DBC/1012 data base computer. Interel's SQL language accesses both non-relational and relational data bases.

Interel uses English-like commands to create, update, or delete tables or authorize access to system users. Interel automatically creates table definition and data base table space, establishes the necessary controlling information, and deposits this information in the IRDS central dictionary.

Interel accesses storage data through the Data Manager. Using this component, full relational files can be added to existing non-relational models, and information can be merged through SQL. This functionality provides users with a seamless interface from third-generation data base technologies to newer fourth-generation technologies and allows users to migrate to relational data base functions without the need to duplicate information through copy management.

A software product also required with the installation of Interel is Infoedge. Infoedge contains a set of productivity tools for both experienced data processing professionals, technical end users, and non-data processing professionals. The product contains integrated facilities which end users can access through terminals and professional workstations. The product includes a spread sheet, a forms generator, and a menu system. Infoedge features include Infoedge-Menu Services, which provide a consistent menu selection regardless of terminal or workstation types, systems, function sets, or user sophistication. Menu selections include the Resource Dictionary Services, which allow access to the Information Resource Dictionary System within Interel.

Infoedge-Personal Computing, a facility which interfaces with Interel, lets users create and maintain forms. The facility allows users to define forms with variable text and results fields. The facility also supports data storage and retrieval functions, math and logic functions, editing and graphics, and an on-line help facility.

Options available with Infoedge include decision support services, query facilities, and workstation facilities. Decision support facilities include Infoedge-Graph for interactive facilities and Infoedge-Financial Planner for financial modeling and business planning. Query Facilities include *Example Query*, an end-user request facility, and *Reporter*, a facility for formatting data obtained from Example Query and SQL into report form. Workstation facilities include *Infoedge-Mail*, a distributed electronic message facility, and *Infoedge-Meetings*, a facility that permits authorized users to attend "meetings" through a terminal device.

DATA COMMUNICATIONS: *Distributed Network Supervisor (DNS)* has been designed specifically for use in the Datanet 8 Processor, and is part of a set of communication software products based on Honeywell Bull's Distributed Systems Architecture (DSA). DNS supports up to four DPS 88 Host connections enabling one Datanet 8 to serve multiple hosts.

DNS operates in the Datanet 8 in conjunction with a GCOS 8-based host to provide support for transaction processing, distributed transaction processing, distributed terminal concentration, timesharing, remote job entry, direct program access, and networks made up of DPS 90s, DPS 88s, DPS 8000, DPS 8s, DPS 7s, DPS 7000s, and DPS 6s in any combination. DNS supports private networks, Public Data Networks (PDNs) and Value Added Networks (VANs), including X.25 packet switched and X.21 circuit switched networks.

The administrative functions distributed throughout the various systems that make up the DSA network include network monitoring, cross-network software loading, dumping, data logging for statistics, billing and maintenance, in-line tests, and software generation.

DNS supports a variety of Honeywell Bull terminals and also supports the DPS 6-DSA software package that allows a DPS 6 or Level 6 system to function as a distributed processor and to communicate with a DPS 8000 host in a DSA network.

The *Network Processing Supervisor* and the DPS 8000 support five types of remote processing in any combination: remote job entry (RJE), transaction processing, timesharing, message switching, and direct program access. RJE is supported by four standard interfaces for remote computers: remote computer interface, remote network processor multimessage interface, BSC interface, and HDLC interface.

The information network is controlled by a combination of the Datanet Front-end Network Processor and the NPS software, and can range in size from several terminals to a comprehensive, distributed information network with multiple host processing facilities.

NPS supports a variety of remote terminals, computers, and communications facilities, such as the Honeywell Bull TWU/PRU 1003 and 1005, Teletype Models ▶

Honeywell Bull DPS 8000 Series

28/33/35/37/38, GE TermiNet 300/1200, Hazeltine 2000, IBM 2741 and 2780, and Honeywell Bull VIP 765/776/786, VIP 7100/7200, VIP 7700/7700R/7760/7800, RNP 702/707, and RNP 6/DPS 6 minicomputers. NPS also provides customization and parameterization facilities to implement additional terminal types and network protocols into the system, journalization of message traffic on mass storage, restart/recovery capability, supervisory control through one or more Network Control Supervisory Stations, statistical recording and reporting, and a high level of line/terminal control through parameterization.

The *Remote Terminal Supervisor II (GRTS-II)* provides controls for five types of remote processing: remote job entry, transaction processing, timesharing, message concentration, and direct program access. RJE supports the same standard interfaces as NPS. Programming subsystems supported under timesharing are the same as for NPS. GRTS-II does not support the direct program access communications-queued (DAC-queued) mode provided in NPS, nor does it support any host interface which makes use of the DAC-queued method.

GRTS-II includes a *Communication On-Line Test System (COLTS)* and support for remote terminals and devices with speeds from 75 to 56,000 bps. GRTS-II may coexist with NPS or DNS, each residing and executing in a different network processor. Host-to-host file transmission is supported through the Data Link System.

The *Transaction Processing System (TPS)* invokes the loading and execution of the appropriate application programs for processing transactions received from remote terminals. The Transaction Processing System requires a front-end network processor and can accept transactions from various terminals.

TPS is modular in design and consists of the Transaction Processing Executive (TPE), user-written Transaction Processing Applications Programs, the Transaction Input Interface at each remote terminal, and the Interslave Communication (INTERCOM) Facility. Transaction Processing Applications Programs (TPAPs) can be written in any language processor supported by GCOS 8 including Cobol, Fortran, or GMAP, and are stored in the GCOS file system for activation as required.

The *Transaction Input Interface* provides simplified procedures for entering transactions from either teletypewriter or keyboard/display consoles. The INTERCOM facility permits data to be exchanged between the Transaction Processing Executive and applications programs through direct buffer-to-buffer transfers. The Transaction Processing Executive operates as a privileged slave program under the GCOS 8 operating system and is activated by an operator command.

Transaction Driven System (TDS) is designed for high-volume, on-line transaction processing. TDS differs substantially in internal architecture from the GCOS Transaction Processing System (TPS), but it complements TPS by giving a total DPS 88 transaction processing capability. The TDS internal design is optimized for high-volume transaction processing where extremely fast response and fast, automatic restart/recovery are required.

The TDS Executive program executes under GCOS 8 much like the Time-Sharing System Executive. It is an executive operating under GCOS 8 with the major responsibilities of scheduling and coordination of all TDS activities and tasks. TDS manages the allocation of system resources for transaction processing and handles all communications between TDS and GCOS 8.

The *Time-Sharing System (TSS)*, in connection with a Datanet front-end processor, provides time-sharing computing services to multiple users at remote terminals. The system resources allocated to time-sharing can be dynamically varied under operator control. The time-sharing executive, operating as a slave activity under GCOS 8, suballocates storage and dispatches the processor to the programs of individual time-sharing users. Time-sharing on GCOS 8 utilizes the GCOS 8 memory architecture to permit any desired amount of system memory to be allocated to time-sharing. A single copy of TSS can support up to 600 users, assuming enough memory, I/O, and communications facilities are provided. In multiple-processor systems, the time-sharing users' programs can simultaneously use as many processors as desired by the site. A separately priced Multicopy Support Option allows from two to four copies of the time-sharing executive to run on one DPS 88 system, thereby increasing the number of users that can be supported.

GCOS timesharing users have a choice of six major programming languages: Cobol-74, Extended Basic, Pascal, Time-Sharing Fortran-66, Fortran-77, and APL. Time-sharing users can communicate directly with batch-mode facilities, permitting the development and testing of programs, data entry, control of batch program execution, and manipulation of results from remote terminals.

Interactive Integrated Data Store/II (I-D-S/II) provides the ability to interactively update and retrieve information from an I-D-S/II database. Access is a conversational file management system for creating, deleting, and maintaining catalogs and files and for assigning passwords and accessing criteria. The *FDUMP* facility can be used for inspection and maintenance of permanent files. The *LODT* routine permits execution of experimental user subsystems, including trace analysis and debugging of user programs from remote terminals. The *Time-Sharing Activity Report* provides reports on the accumulated utilization of the time-sharing system resources. *Personal Computing Facility* is now available under timesharing, offering spread sheet capability.

TP-8, a transaction processing facility, is said to enhance productivity within organizations with heavy transaction processing work loads. The product can be a growth path for DM-IV/TP users who need increased transaction processing performance and functionality, according to Honeywell Bull. TP-8 is compatible with DM-IV/TP and the Transaction Processing Executive *(TPE-II)* (described in the DATA COMMUNICATIONS section), while also offering several improvements. Using the product, users can tailor transaction processing applications to specific needs. Applications can be implemented through routines and programs written in several languages including Cobol 74 or Fortran. While in execution, each routine or program is processed independently and can access the range of facilities available in GCOS 8.

To enhance connectivity, Honeywell Bull introduced *Personal Computer Interconnect (PCI)* for MS-DOS-based personal computers. With PCI, users can access data from the mainframe and download the data to a personal computer. PCI features a window manager, graphics, VIP terminal emulation, file transfer, and script processing. PCI can work with Lotus 1-2-3, dBASE III, MultiMate Advantage, and WordStar Professional.

PROGRAM DEVELOPMENT: Honeywell Bull offers a number of products that can be put to use as program development tools. These include the *Text Executive Processor, (TEX),* DM-IV Procedural Language Processor (PLP), the Transaction Application Test System (TATS), the Transaction Screen Management System (TSM), the ➤

Honeywell Bull DPS 8000 Series

▶ DM-IV Query and Reporting Processor (QRP), and the Personal Computing Facility (PCF). TEX and PLP are described in the following paragraph while these other products were described in other parts of the SOFTWARE section.

The *Text Editor* permits terminal users to create a body of text, edit it, save it, and print it in a specified format. *TEX* is an interpretive language that integrates the capabilities of the Text Editor with text processing, providing additional verbs and subroutine calls. The optional DM-IV Procedural Language Processor (PLP) is an extension of QRP which provides a high-level, procedure-oriented language for use by application and system programmers. When using the Query and Reporting Processor end-user facilities, the user need not be concerned with the database structure or access methods.

Syntax Directed Editor (SDE) is a productivity tool designed to support the creation or modification of Cobol-74 programs. SDE reduces the amount of code that a programmer must enter and immediately checks for format and syntax errors.

System-80 is designed to reduce the time and effort of coding, maintenance, and documentation normally associated with Cobol program development. It includes several functional programs and associated files that interact with the user to acquire needed information about files, fields, screen formats, and validations and edits.

Softool is a set of software tools designed for cost-effective management, development, and maintenance of application software. The Softool Development Environment Product Set offered by Honeywell Bull consists of the Cobol Programming Environment (Cobol-74) and the Change and Configuration Control.

Simscript provides the user with a simulation-oriented language that permits the translation of complex mathematical and logical models into meaningful simulation sequences. It is an event-oriented language with a timing routine that allows the analysis of activities in a controlled sequence in simulated time.

The *General-Purpose Simulator System (GPSS)* is a simplified, simulation-oriented language that establishes mathematical models in order to provide results for further analysis.

The *General Macro Assembler Program (GMAP)* enables the programmer to code either in an open-ended macro language or directly in machine-oriented symbolic instructions.

The *Debug Support System (DSS)* supports batch or on-line debugging of user programs, and can trace programs, display memory contents, and modify memory locations. Object-level debug can be performed with any language. Symbolic debug is supported by Cobol-74, Fortran-77, and PL/1.

UTILITIES: System utilities include a Sort/Merge Facility, the File Generation Facility, FMS Utilities, Visual Information Display for Efficient Operation, Comprehensive System Utilities Facility, System Utility 8, General Loader, Bulk Media Conversion, and Source and Object Library Editor.

OTHER SOFTWARE: Honeywell Bull offers application programs that address Finance, Management Sciences,

Manufacturing, Health Care, and Banking. A rundown of some of the packages for each area follows.

Financial applications include Accounts Receivable, Accounts Payable, General Ledger, and Payroll systems. Other packages include Payroll Tax Update, Accounts Receivable On-line, General Ledger On-line, Honeywell Bull Cashflow Management System, Honeywell Bull Financial & Corporate Planning System, HFCS Hierarchical Consolidation Option, HFCS Risk Analysis Option, and HFCS Graphics Option.

Management packages include TEX Application & Demonstration Library, MPS Common File Management System, General Purpose Simulator System, Concordance Generator Program, Coordinate Geometry, MPS Basic System, MPS Mixed Integer Feature, MPS Generalized Upper Bound, Time Sharing Application, Simscript, PMCS Network Processor, PMCS Resource Scheduler, PMCS Interactive Input Processor, and PMCS Interactive On-line Reporting Processor. Others include Slave Program Activity Monitor/II, APT Postprocessors, types A and B, APT Automatically Programmed Tools, Applications Services Library, and Interactive Mathematical Programming System.

Manufacturing packages include APT Automatically Programmed Tools, HMS Inventory Record Management, HMS Manufacturing Data Control, HMS Material Requirement Planning, HMS Master Production Scheduling, HMS Statistical Forecasting, HMS Capacity Requirements Planning, and HMS Purchased Material Control. Products packaged under the Anvil-4000 name include Basic System, Extended Geometry, Drafting, Numerical Control, Analysis, and Complete Package.

Health Care packages include HHS Foundation System, HHS General Ledger/Responsibility Reporting, HHS Preventive Maintenance, HHS Property Ledger, HHS Accounts Payable, HHS Cost Allocation, and HHS Medical Records.

Banking packages include DES Document Entry Subsystem, CHECS Proof & Transit Subsystem, CHECS, and CHECS On-line Balancing and Item Correction.

PRICING & SUPPORT

POLICY: DPS 8000 equipment is available for purchase or for rental under a one-year or four-year lease.

SUPPORT: Honeywell Bull offers several maintenance plans falling under basic hardware maintenance, extended maintenance converage, and premium services. Basic monthly hardware maintenance provides for contracted on-call remedial maintenance service during the Principal Period of Maintenance (PPM). PPM covers a period between 8 a.m. and 6 p.m., Monday through Friday, excluding locally observed Honeywell Bull holidays. Basic service includes toll-free access to the National Response Center, 24 hours a day, seven days a week, and remote mainframe maintenance access. Other features include the services of specialist personnel from the Technical Assistance Center, Customer Service Engineer visits when necessary, and remedial and preventive maintenance services.

Extended Maintenance service provides coverage for hours outside the PPM. Under this coverage plan, the user pays an additional charge which is a fixed percentage of the base maintenance charge. The percentage varies by day and number of extended hours beyond the regular maintenance period. Customers requesting service outside the PPM will be billed at published contract-customer hourly rates. The ▶

Honeywell Bull DPS 8000 Series

current rate is $159 per hour for all times Monday through Sunday. Customers who do not have a maintenance contract will be billed at a time and materials rate of $185 per hour at a minimum of four hours.

Premium service provides maintenance coverage on a 24-hours-per-day, seven-days-per-week basis. Coverage includes guarenteed response time credits, preventive maintenance, equipment installation, field change order installation, and equipment malfunction protection credits.

System engineering falls into one of five billable support categories, as described in the following table. Field engineering managers are responsible for the degree of skill required to perform the job.

	Hourly Rates ($)	Monthly Rates ($)
Principal or senior technical consultant	138	19,174
Project supervisor or technical consultant	112	15,653
Technical specialist	100	14,088
Systems analyst/senior programmer	85	11,739
Programmer	59	8,218

Hourly charges are for a four-hour minimum. The monthly rates do not include supplies.

GCOS 8 is delivered as two separate products. The Basic System is licensed at no separate charge to customers who acquired their central systems from Honeywell Bull and for a separate license fee to customers who acquired their central systems from sources other than Honeywell Bull. The GCOS Executive is separately licensed for the same tiered fee to all customers regardless of how they acquired their central system. All other facilities, such as job management, file systems, conversion aids, language processors, utilities, applications packages, communications software, system maintenance, and system performance analysis are separately priced.

EDUCATION: Education services include standard courses, advanced professional training, multimedia self-instruction courses permitting customers to self-train as often as needed, site surveys to determine educational requirements, on-site classes, and clustered on-site classes to accommodate a group of users from an area.

TYPICAL CONFIGURATIONS: Sample configurations for the DPS 8000 Series are shown below. Complete equipment and software prices follow these configurations.

SMALL CONFIGURATION:

DPS 8000/81: Central System Complex includes CPU, 16 megabytes of main memory, one system control unit, one input/output processor with 16 channels, one system console, one maintenance unit, and one modem	$675,000
60 VIP 7816 Terminals	168,000
One MSP3880 Mass Storage Processor	74,270
One MSU3380 Head of String Mass Storage Unit	88,800
Three MSU3382 Mass Storage Slave Units	193,350
One MTS8206 Magnetic Tape Subsystem	45,000
Seven MTU8206 tape units; 125 ips, 1600/6250 bpi	129,500
One MTF8200 1 x 8 switch	No charge
One URP8602 Embedded Unit Record Processor	4,500
Two 1203 high-speed belt printers	76,550
TOTAL PURCHASE PRICE:	**$1,454,970**

LARGE CONFIGURATION:

DPS 8000/82: Central System Complex includes two CPUs, 32 megabytes of main memory, two system control units, two input/output processors with 32 channels, two system consoles, two maintenance units, and two modems	$1,300,000
90 VIP 7816 Terminals	252,000
One MSP3880 Mass Storage Processor	74,270
Two MSU3380 Head of String Mass Storage Units	177,600
Six MSU3382 Mass Storage Slave Units	386,700
Two MTS8206 Magnetic Tape Subsystems	90,000
Fourteen MTU8206 tape units; 125 ips, 1600/6250 bpi	259,000
One MTF8201 2 x 8 switch	6,130
One URP8602 Embedded Unit Record Processor	4,500
Two 1203 high-speed belt printers	76,550
TOTAL PURCHASE PRICE:	**$2,626,750**

Honeywell Bull DPS 8000 Series

EQUIPMENT PRICES

	Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	4-Year Lease ($)
PROCESSORS				
CPS8681 DPS 8000/81 Central System Complex features one CPU, 16 megabytes of main memory, one Input/Output Processor (IOP) with 16 physical channels, one System Console with large screen monitor interface, 14-inch CRT, Keyboard, one Service Processor w/related storage devices, one Monitor, and one Modem	675,000	850	45,000	33,750
CPS8682 DPS 8000/82 fully redundant System Complex features two CPUs; two System Control Units each with 16 megabytes of main memory; two IOPs each with 16 physical channels; two System Consoles with large-screen interfaces, 14-inch CRTs, keyboard, and IOP connections; two Service Processes, two Modems	1,300,000	1,600	87,850	65,000
System Upgrades:				
CPK8681 DPS 8000/81 to DPS 8000/82	675,000	750	45,000	33,750
CMM8601 Additional 16 megabytes of memory	120,000	210	8,000	6,000
System Consoles and Console Options:				
CSU8600 Additional System Console	10,000	50	480	400
CSF8600 Optional printer for system console; 100 characters per second	1,225	50	121	103
CSF8603 Optional Printer Pedestal for CSF8600	395	NA	NA	NA
CSF8601 Optional 23-inch Large Screen Monitor for System Console	2,358	16	157	135
CSF8602 Optional Ceiling Mount for CSF8601	195	NA	NA	NA
MASS STORAGE				
MSP3880 Mass Storage Processor; includes two storage directors and two channels	74,270	200	4,400	3,745
MSP3882 3880 Mass Storage Subsystem includes mass storage processor; two-channel, FIPS-compliant system supports up to two MSU3380/81s and six MSU3382/83s	74,270	200	4,400	3,745
MSP3884 Mass Storage Processor; includes two storage directors and four channels	88,270	224	5,230	4,450
MSP3886 3880 Mass Storage Subsystem includes mass storage processor; four-channel, FIPS-compliant system supports up to two MSU3380/81s and six MSU3382/83s	88,270	224	5,320	4,550
MSP0611 Freestanding Single-Channel Mass Storage Processor	50,000	132	1,828	1,507
MSP0612 Freestanding Dual Channel Mass Storage Processor	64,375	181	2,133	1,761
MSK0612 Upgrade Kit, MSP0611 to an MSP0612	23,000	65	861	711
PSS8001 Capacitor Ridethrough Option for MSP0611, 0612	3,120	14	124	104
Mass Storage Units:				
MSU3380 Head of String Mass Storage Unit; includes four actuators	88,800	295	4,780	4,070
MSU3381 Mass Storage Unit; head-of-string double-capacity system provides 3.697 giga-bytes of formattted capacity	122,500	295	7,100	6,500
MSU3382 Mass Storage Slave Unit; includes four actuators	64,450	215	3,470	2,960
MSU3383 Mass Storage Unit, secondary double-capacity system; up to three may be added to each MSU3380/3381	98,150	215	5,750	5,200
MSU0451 Removable Disk Mass Storage Unit, 200M bytes, unformatted; requires MSF007	18,500	122	1,140	950
MSF0006 Dual Access Feature for MSU0451	2,070	14	89	76
MSF0007 Rotational Position Sensing Option for MSU0451	500	14	87	76
MSU0500 Dual Fixed Disk Mass Storage Unit, 626 megabytes of capacity	38,850	198	1,412	1,180
MSU0501 Dual Fixed Disk Mass Storage Unit; 1101 megabytes of capacity	43,850	227	1,777	1,482
MSK0501 Upgrade kit; MSU0500 to MSU0501	5,000	25	361	297
MSF0011 Dual Access Feature for MSU0501/0500	4,140	23	163	136
MSA1140 Unit Addressing for up to four MSU04xx Units for MSP0611/0612	3,500	17	157	131
MSA1141 Unit Addressing for up to two MSU05xx Units for MSP0611/0612	3,500	17	220	181
MSA1142 Dual Addressing for up to four MSU04xx Units	4,500	19	147	123
MSA1143 Dual Addressing for up to two MSU05xx Units	4,500	19	216	178
MSF0500 Spare Head Disk Assembly for MSU0500	12,340	—	—	—
MSF0501 Spare Head Disk Assembly for MSU0501	15,808	—	—	—
MSF1140 Single channel device adapter for MSU04xx devices on MSP0611/0612	3,500	—	109	89
MSF1141 Device Adapter for configuring MSU04xx devices (max 16) to MSP0612	6,000	—	187	152
MSF1142 Unit expansion for configuring additional MSU05xx devices (max 7) to MSP0612	4,000	—	125	105
MSF1143 Nonsimultaneous (Switched) Datanet Channel for MSP0611/0612	8,237	16	284	234
MSF1150 Second Nonsimultaneous (Switched) Datanet Channel for MSP0611/0612	8,237	16	284	234
Mass Storage Exchange Features:				
MSF8030 Primary Disk Channel Connection Feature for MSP8021/22/23; each connection feature provides one IOP channel, cables, and associated interface logic in the mass storage processor	6,000	10	360	305

NC—No charge.
NA—Not available.

Honeywell Bull DPS 8000 Series

		Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	4-Year Lease ($)
MSF8031	Switched Disk Channel Connection Feature for MSP8021/22/23; each connection feature provides one IOP channel, cables, and associated interface logic in the mass storage processor	4,850	8	290	245
MSF3882	Upgrade from MSP3882 to MSP3886; upgrade kit includes two switched general disk channel connections to the IOP	15,000	24	920	805
	Mass Storage Exchange Features:				
MXF8622	Channel Exchange Feature for MSP0607/0609	5,000	NA	NA	NA
MXF8624	Channel Exchange Feature for MSP0611/0612	5,000	NA	NA	NA
MSF8626	Channel Exchange Feature for MSF8012/8013/8016/8017 channel connections	5,000	NA	NA	NA
MXF8636	Channel Exchange Feature for MSP3880	18,350	NA	NA	NA
MXF8638	Channel Exchange Feature for MSP3884	36,700	NA	NA	NA

MAGNETIC TAPE SUBSYSTEMS

		Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	4-Year Lease ($)
MTS8205	Magnetic Tape Subsystem; includes tape processor, one MTU8205 tape unit, and one IOP channel	48,000	410	2,913	2,516
MTS8206	Magnetic Tape Subsystem; includes tape processor, one MTU8206 tape unit, and one IOP channel	45,000	410	2,774	2,395
MTS8208	Magnetic Tape Subsystem; includes tape processor, one MTU8208 tape unit, and one IOP channel	47,000	515	2,876	2,484
MTS8225	Magnetic Tape Subsystem; FIPS-compliant, 125 inches per second (ips), 800/ 1600 bits per inch (bpi) supports up to eight tape devices and requires either MTF8200 or MTF8201	48,000	410	2,913	2,516
MTS8226	Magnetic Tape Subsystem; FIPS-compliant, 125 ips, 1600/6250 bpi supports up to eight tape devices and requires either MTF8200 or MTF8201	45,000	410	2,774	2,395
MTS8228	Magnetic Tape Subsystem; FIPS-compliant, 200 ips, 1600/6250 bpi supports up to eight tape devices and requires either MTF8200 or MTF8201	47,000	515	2,876	2,484
MTP0611	Magnetic Tape Processor for MTU0610/0630; supports up to eight tape units	29,400	191	1,093	918
MTF8030	Primary Tape Channel Connection Feature for MTP8021/8022/8023; each connection feature provides one IOP channel, cables, and associated interface logic in the magnetic tape processor	5,000	9	300	255
MTF8031	Switched Tape Channel Connection Feature for MTP8021/8022/8023	4,850	8	290	245
MTF8209	Switched General Tape Channel Connection for MTS8225/26/28	8,000	12	421	364
MTF8200	Magnetic Tape Subsystem 1 x 8 Switch; either this feature or MTF8201 required for each MTS82xx	NC	NC	NC	NC
MTF8201	Magnetic Tape Subsystem 2 x 8 Switch	6,130	14	323	279
MTF8202	Magnetic Tape Subsystem Switched Channel; includes IOP or CBU channel	8,000	12	421	364

Magnetic Tape Units:

		Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	4-Year Lease ($)
MTU8205	Magnetic Tape Unit; 125 ips, 800/1600 bpi	19,050	240	1,038	897
MTU8206	Magnetic Tape Unit; 125 ips, 1600/6250 bpi	18,500	240	1,061	916
MTU8208	Magnetic Tape Unit; 200 ips, 1600/6250 bpi	21,000	342	1,163	1,005
MTU0610	Magnetic Tape Unit; includes cartridge load, requires speed/density feature	21,000	188	814	690
MTU0630	Magnetic Tape Unit	14,815	161	604	516

Features for the MTU0610:

		Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	4-Year Lease ($)
MTF0607	800/1600 bpi, 200 ips feature for MTU0610	6,090	81	306	266
MTF0608	1600/6250 bpi, 200 ips feature for MTU0610	13,319	124	520	441
MTK0678	Upgrade Kit; MTF0607 to MTF0608 performance	10,784	52	215	176

Features for the MTU0630:

		Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	4-Year Lease ($)
MTF0634	75 ips, PE/NRZI feature	4,725	151	297	268
MTF0635	75 ips, PE/GCR feature	7,110	129	351	309
MTF0636	125 ips, PE/NRZI feature	9,805	170	472	410
MTF0637	125 ips, PE/GCR feature	10,330	148	470	408
MTK0630	Performance upgrade MTF0634 to MTF0635	2,385	21	76	61
MTK0631	Performance upgrade MTF0636 to MTF0637	1,700	27	57	47
MTK0632	Performance upgrade MTF0634 to MTF0636	5,080	21	176	146
MTK0633	Performance upgrade MTF0635 to MTF0637	3,220	21	121	101
MTK0634	High Altitude Adapter	240	—	8	6
	Magnetic Tape Channel Exchange Features:				
MXF8616	Channel Exchange Feature for MTP0610; each exchange feature provides one IOP channel connection to connect tape processor that was previously attached to a Level 66 or DPS 8 system to a DPS 8000 system	5,000	NA	NA	NA
MXF8618	Channel Exchange Feature for MTP0611 Magnetic Tape Processor; provides one IOP channel connection to connect existing processor previously attached to a Level 66 or DPS 8 to a DPS 8000 system	5,000	NA	NA	NA

NC—No charge.
NA—Not available.

Honeywell Bull DPS 8000 Series

		Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	4-Year Lease ($)
MSF8620	Channel Exchange Feature for MTF8012/8013/8016/8017 channel connections; provides one IOP channel connection to attach existing systems previously connected to a Level 66 or DPS 8 to a DPS 8000 system	5,000	NA	NA	NA
MXF8634	Channel Exchange Feature for MTS8205/8206/8208 and MTF8202; provides one IOP channel connection to attach existing system previously attached to a DPS 8 to a DPS 8000 system	9,175	NA	NA	NA

LINE PRINTERS

PRU0903	High-speed belt printer; 900 lpm	34,975	453	2,097	1,752
PRU1203	High-speed belt printer; 1200 lpm	38,275	503	2,375	1,955
PRU1600	High-speed belt printer; 1600 lpm, 136 print positions	64,940	538	2,910	2,472

PRU0903/1203 Options:

PRB3213	64-character Uppercase ASCII Print Belt, optimized	NC	NC	NC	NC
PRB3300	96-character Upper/Lowercase ASCII Print Belt, optimized	NC	NC	NC	NC
PRB3500	64-character Series 400/600/6000/L66 Print Belt	NC	NC	NC	NC
PRB3501	64-character Standard IBM Print Belt	NC	NC	NC	NC
PRB3513	64 character Uppercase ASCII Print Belt	NC	NC	NC	NC
PRB3524	64-chacacter OCR-A Numeric Print Belt	NC	NC	NC	NC
PRB3549	64-character OCR-A Alphanumeric Print Belt	NC	NC	NC	NC
PRB3600	96-character Upper/Lowercase ASCII Print Belt	NC	NC	NC	NC
PRB3703	64-character Series 200/2000 Print Belt	NC	NC	NC	NC
PRK0903	Upgrade PRU903 to PRU1203	5,000	54	304	229
PRK0907	Exchange of PDSI to DAI interface for 0903.1203; includes control panel	3,000	NC	NC	NC

PRU1600 Options:

PRB0500	63-character OCR-B Print Belt	2,460	97	186	171
PRB0524	63 character OCR A/B Print Belt	2,460	97	186	171
PRB0532	63-character Puerto Rico Print Belt	2,460	101	186	171
PRB0549	63-character OCR-A Alphanumeric Print Belt	2,460	97	186	171
PRB0600	94-character ASCII Belt; upper-/lowercase	2,567	97	191	173
PRF0022	24 additional print positions; 136 to 160	2,610	17	113	94

UNIT RECORD PROCESSORS

URP8600	Embedded Unit Record Processor; supports up to two CRU050/1050, PCU0120/0121, or CCU0401 card units	4,500	8	300	225
URP8601	Embedded Unit Record Processor; supports up to two PRU0903/1201/1203 printers	4,500	8	300	225
URP8602	Embedded Unit Record Processor; supports up to two PRU1600 printer	4,500	8	300	225

PUNCH CARD EQUIPMENT

CRU0501	Card Reader (500 cpm); requires URA0056	19,500	129	694	578
URA0056	Addressing capability for CRU0501	256	NC	9	6

		Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	3-Year Lease ($)

TERMINALS

VIP7816	Synchronous/Asynchronous Multiple Mode Terminal with 12-inch CRT, green phosphor, high profile keyboard, 25-foot RS-232-C cable; includes VIP7800 and VIP7700 modes	NA	—	—	—
VIP7817	Synchronous/Asynchronous Multiple Mode Terminal with 15-inch CRT, green phosphor, high-profile keyboard, 25-foot RS-232-C cable; includes VIP7800 and VIP7700 modes	NA	—	—	—
VIP7826	Synchronous/Asynchronous Multiple Mode Terminal with 12-inch CRT, green phosphor, low profile multifunctional keyboard, RS-232-C and RS-422-A interface, and 25-foot RS-422-A cable; includes VIP7800 and VIP7700 modes	NA	—	—	—
VIP7827	Synchronous/Asynchronous Multiple Mode Terminal with 15-inch CRT, green phosphor, low-profile multifunctional keyboard, 25-foot RS-422-A cable; includes VIP7800 and VIP7700 modes	NA	—	—	—

NC—No charge.
NA—Not available.

Honeywell Bull DPS 8000 Series

		Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	4-Year Lease ($)
DATANET 8 SERIES NETWORK PROCESSORS AND OPTIONS					
DCU8110	DATANET 8/10 Network Processor system with 1MB of memory expandable to 2MB; supports a maximum of 31 data communications ports and includes 3 RS-232-C/V.24 asynchronous/character synchronous ports	23,900	130	1,195	795
DCU8120	DATANET 8/20 Network Processor system with cache memory, 1MB of memory expandable to 2MB. System is upgradable to dual-processor system with dual-cache memory; supports 31 data communications ports extendable to 127 ports, and includes 3 RS-232-C/V.24 asynchronous/char. synchronous ports	38,000	215	1,900	1,275
DCU8130	DATANET 8/30 Network Processor system with cache memory and 2MB of memory expandable to 4MB. System is upgradable to dual-processor system with dual- cache memory; supports 159 data comm. ports expandable to 255 ports, and includes 3 RS-232-C/V.24 asynchronous/char. synchronous ports	80,000	350	4,000	2,675
DATANET OPTIONS					
	OPTIONS FOR THE DATANET 8/10 ONLY:				
DCM8110	One-megabyte Memory Expansion Module	7,000	50	350	230
	OPTIONS FOR DATANET 8/20 ONLY:				
DCP8120	Extended Performance Option; includes second processor and associated cache memory	14,000	115	700	475
DCM8120	One-megabyte Memory Expansion Module	7,000	50	350	235
DCE8121	First Line Expansion Module; provides support for up to 32 additional data communications ports (max. 63 ports per DATANET 8/20)	2,500	5	125	85
DCE8122	Second Line Expansion Module; provides support for up to 64 additional data communications ports (max. 127 ports per DATANET 8/20); requires DCM8120 and DCE8121	5,000	10	250	170
	OPTIONS FOR DATANET 8/30 ONLY:				
DCP8130	Extended Performance Option; includes second processor and associated cache memory	27,000	220	1,350	900
DCM8130	Two-megabyte Memory Expansion Module	14,000	100	700	470
DCE8131	Line Expansion Module; provides support for up to 96 additional data communications ports (max. 255 ports per DATANET 8/30); requires DCM8130	7,500	15	375	250
	OPTIONS FOR DATANET 8/10, 8/20, AND 8/30:				
DCF8002	Visual Display Terminal Console, 24-by-80 character screen; one required for each DATANET 8/10, 8/20, or 8/30	795	20	40	30
DCF8003	Hard Copy Console Receive Only Printer (100 cps); one required for each system that uses DATANET 8, 8/10, 8/20, or 8/30 Network Processors	1,195	22	60	40
DCF8004	Console Table for Console Components	750	NA	40	25
DCF8005	Second 5¼-inch Diskette Drive	800	16	40	25
DCE8106	Network Processor Channel Connection to DPS 8 with Input/Output Multiplexer	8,000	65	339	288
DCE8109	Network Processor Channel Connection to DPS 88 System with Channel Adapter Unit	8,000	65	339	288
DCE8111	Network Processor Channel Connection to DPS 90 System with Input/Output Processor	8,000	65	339	288
DCF8052	Multiline Communications Controller-16 (MLC-16) accommodates up to four Communications Interface Adapters; maximum of 16 data communications ports per MLC-16	2,700	15	135	90
	LOW- AND MEDIUM-SPEED OPTIONS:				
DCF8073	RS-232-C Asynchronous/Character Synchronous Integrated Communications Interface Adapter with four RS-232-C/V.24 data communications ports; includes four 50-ft. cables. Maximum port speed is 19.2K bps	2,000	16	100	70
DCF8049	RS-232-C Bit Synchronous HDLC Integrated Communications Interface Adapter with two RS-232-C/V.24 data communications ports; includes two 50-ft. cables. Maximum port speed is 19.2K bps.	3,200	26	160	110
DCF8053	Low- and Medium-Speed Asynchronous/Character Synchronous Communications Interface Adapter; accommodates up to four Line Interface Module Connections; any combination of DCF8055, DCF8057, and DCF8059 is allowed	1,000	7	50	35
DCF8055	RS-232-C/V.24 Asynchronous/Character Synchronous Line Interface Module with one RS-232-C/V.24 data communications port; includes one 50-ft. cable. Maximum port speed is 19.2K bps	275	3	15	10
DCF8059	Mil-188-C Asynchronous/Character Synchronous Line Interface Module with one Mil-188-C data communications port; includes one 50-ft. cable. Maximum port speed is 19.2K bps	275	3	15	10

NC—No charge.
NA—Not available.

Honeywell Bull DPS 8000 Series

		Pur-chase Price ($)	Monthly Maint. ($)	1-Year Lease ($)	4-Year Lease ($)
	MEDIUM- AND HIGH-SPEED OPTIONS:				
DCF8061	Medium- and High-Speed Character Synchronous or Bit Synchronous Communications Interface Adapter accommodates one Line Interface Module Connection (DCF8062, DCF8063, DCF8064, DCF8065, DCF8067, DCF8069, or DCF8071)	2,200	16	110	75
	MEDIUM-SPEED OPTIONS FOR DCF8061				
DCF8062	RS-232-C/V.24 Bit Synchronous (HDLC) Line Interface Module with one RS-232-C/V.24 data communications port; includes one 50-ft. cable. Maximum port speed is 19.2K bps.	275	3	15	10
	HIGH-SPEED OPTIONS FOR DCF8061				
DCF8064	X.21 Bit Synchronous (HDLC) Line Interface Module with one X.21 data communications port; includes one 50-ft. cable. Maximum port speed is 64K bps	450	3	25	15
DCF8067	Mil-188-C Bit Synchronous (HDLC)/Character Synchronous Line Interface Module with one Mil-188-C data communications port; includes one 50-ft. cable; Maximum port speed is 64K bps.	450	3	25	15
DCF8069	V.35 Bit Synchronous (HDLC) Character Synchronous Line Interface Module with one V.35 data communications port; includes one 50-ft. cable; Maximum port speed is 64K bps.	450	3	25	15
DCF8071	Bell 301/303 Bit Synchronous (HDLC)/Character Synchronous Line Interface Module with one Bell 301/303 data communications port; includes one 50-ft. cable; Maximum port speed is 64K bps.	450	3	25	15
	OTHER OPTIONS FOR DATANET 8, 8/10, 8/20, AND 8/30:				
DCF8024	Direct Connect Capability for one Asynchronous or Character Synchronous Line with RS-232-C Physical Interface	350	2	14	12
DCF8026	Universal Modem Bypass; character synchronous to 19.2K bps. RS-232-C physical interface	415	2	16	13

NETWORK PROCESSOR CHANNEL CONNECTIONS

DCE8020	Datanet 8 Network Processor Channel Connection Feature; each connection feature provides one IOP channel, cables, and associated interface in the Datanet 8	8,000	72	346	295
DCE8119	Datanet 8/10, 8/20, 8/30 Network Processor Channel Connection Feature; provides one IOP channel, cables, and associated interface in the Datanet systems	8,000	72	346	295
	Network Processor Channel Exchange Features:				
MXF8628	Channel Exchange Feature for Datanet 8 and PPS	3,500	NA	NA	NA
MXF8641	Channel Exchange Feature for Datanet 8/10, 8/20, and 8/30	3,500	NA	NA	NA
MXF8630	Channel Exchange Feature for Datanet 6641/6651/6661/6678; provides one IOP host connection feature to connect Datanet 66 processor previously connected to a Level 66 or DPS 8 system to the DPS 8000 system	3,500	NA	NA	NA
	Hyperchannel Connections:				
MXF8640	DPS 8000 Series Hyperchannel Connection Feature A161	14,000	111	1,111	745
MXF8632	DPS 8000 System Channel Exchange Feature for connecting existing A161 Hyperchannel Subsystem previously attached to a Level 66 or DPS 8 to an IOP	5,300	NA	NA	NA
MXF8639	Power Sequence for FIPS channel/subsystem	3,200	5	200	149

NC—No charge.
NA—Not available.

Honeywell Bull DPS 8000 Series

SOFTWARE PRICES

GCOS 8 SYSTEM RELEASE 3000		Monthly License Fee ($)	Ex- panded Support Charge ($)	Initial License Fee ($)	License Orig. Fee ($)	Annual Basic Support ($)
	Operating System Executives:					
SVS8053	GCOS 8 Operating System Executive	2,800	NSC	—	8,000	—
SVS8059	GCOS 8 OP Exec for DPS 8000	2,800	NSC	—	8,000	—
SVS8050	GCOS 8 Basic System	NSC	(1)	—	8,000	—
	Operating System Extensions:					
SVE8000	FMS Catalog Cache Facility	81	16	—	—	—
SVE8001	FMS Test Access Facility	82	10	—	—	—
SVE8002	Password Encryption Facility	68	6	—	—	—
SVE8038	Console Manager	235	30	—	—	—
SVE8039	NP Operator Console	112	6	—	—	—
SVE8040	Console Journal	165	12	—	—	—
SVJ8000*	Parametric JCL	44	7	—	—	—
SVP8000*	System Maintenance Facility	107	53	—	—	—
SVP8001	Software Management Facility	93	15	—	—	—
SVP8002	System Performance Analysis	343	31	—	—	—
SVS8014	Six Processor Support	73	14	—	—	—
SVP8081	Composition System Maintenance Facility; DPS 8000	683	126	—	—	
	Operating Systems Utilities:					
SNU0471	PPS Utilities	31	5	—	—	
SNU0472*	PPS Off-line	NSC	—	—	—	
SNU0473*	PSS On-line	NSC	—	—	—	
SVU8000*	System Utilities	63	7	—	—	
SVU8001	File Generation Facility	59	5	—	—	
SVU8002*	Sort/Merge Facility	131	21	—	—	
SVU8012*	File Management System Utility	386	56	—	—	
SVU8018	VIDEO	25	5	—	—	
SVU8025	Comp System Utility Facility	185	30	—	—	
SVU8026	UTL8	175	—	—	—	
	System Administration:					
SVE8043T	HAPS 8 Basic System	850	—	20,000	—	3,000
SVE8044T	HAPS 8 On-Line	250	—	5,500	—	—
SVU8041T	Tape Management System	675	—	22,000	—	2,600
SVP8012*	PARS	354	37	—	—	—
SVU8016	Mass Store I/O Analyzer	—	—	2,500	—	—
SVU8017	CAPSUL	329	37	—	—	—
SVU8022	FACTS	—	—	14,500	—	—
SVU8023	SARA	—	—	14,800	—	—
SVU8024	TRS	—	—	6,950	1,045	
	Time Sharing Facilities:					
SVE8008	TSS File Management Option	133	13	—	—	
SVE8009	TSS Adv. Application Support Option	197	39	—	—	
SVE8010	TSS Media Input Option	65	13	—	—	
SVE8013	TEX	383	76	—	—	
SVE8014	TSS Editing Option	119	26	—	—	
SVE8015	TSS Document Format Option	60	13	—	—	
SVE8016*	TSS Electronic Mail Option	200	39	—	—	
SVE8017	TSS Sort Interface Option	83	13	—	—	
SVE8018	TSS DM-IV Option	96	16	—	—	
SVE8019	TSS Administration Option	139	19	—	—	
SVE8020	Multicopy TSS Support Option	656	129	—	—	
SVS8005	TSS Facility	98	26	—	—	
	Languages and Compilers:					
SEL6012	Lisp	—	—	3,825	—	—
SEL6013	Pascal	—	—	8,609	—	—
SEL6014*	Compiler B	—	—	5,739	—	—
SVD8004	TSS Databasic	179	28	—	—	—
SVE8011	TSS Cobol-74	65	13	—	—	—
SVE8012	TSS Fortran-66	60	13	—	—	—
SVE8022	TSS Fortran-77	65	13	—	—	—
SVL8000	Cobol-74 C and R Facility	328	33	—	—	—
SVL8001	Fortran-66 Compiler	417	59	—	—	—
SVL8002	PL/1 C and R Facility	336	59	—	—	—

NA—Not available.
NSC—No separate charge.
NC—No charge.

SEPTEMBER 1987

Honeywell Bull DPS 8000 Series

		Ex-panded Support Charge ($)	Initial License Fee ($)	License Orig. Fee ($)	Annual Basic Support ($)
		Monthly License Fee ($)			

		Monthly License Fee ($)	Ex-panded Support Charge ($)	Initial License Fee ($)	License Orig. Fee ($)	Annual Basic Support ($)
SVL8003	RPG-II Facility	159	5	—	—	—
SVL8007	TSS Basic	238	45	—	—	—
SVL8008	Cobol-68 Compiler	381	49	—	—	—
SVL8010	Fortran-77 C and R Facility	251	18	—	—	—
SVL8011	Fortran-77 Hex Exp. Option	NSC	—	—	—	—
SVL8012	Fortran-66 Compatibility	NSC	—	—	—	—
SVL8013	Cobol-74 RQ	106	12	—	—	—
SVL8015	C Programming Language	340	—	8,000	—	800
SVL8016	Fortran-77 ESV C and R	534	40	—	—	—
SVR8000	Cobol-74 Runtime Facility	106	11	—	—	—
SVR8002	PL/1 Runtime Facility	92	13	—	—	—
SVR8004	Fortran-77 Runtime Facility	71	5	—	—	
SVR8005	Fortran-77 ESV Runtime Facility	161	17	—	—	
SVL8024	DPS 8000 Cobol-85 Compiler and Runtime Facility	358	54	716	—	—
SVL8030T	DPS 8000 Ada Compiler and Runtime Facility	—	1,815	40,000	—	—
	Data Management Facilities:					
SVD8006*	DD/DS Basic Facility	343	43	—	—	
SVD8007*	DD/DS On-line Option	153	19	—	—	
SVD8000	DM-IV Standard Facility	1,225	215	—	—	—
SVD8001	DM-IV Fortran Subschema Trans.	141	12	—	—	—
SVD8002	I-D-S/I Facility	1,341	137	—	—	—
SVD8003	Index Sequential Processing Facility	36	8	—	—	—
SVD8011	Multicopy DM-IV/TP Concurrency	366	37	—	—	—
SVD8067	Interel for DPS 8000	1,500	210	9,800	—	—
SVU8004	Comprehensive Archival System	665	1,920	16,000	—	—
	End-User Facilities:					
SVE8025	Mail 8 Server	105	15	—	—	—
SNM7804	Personal Computer Interconnect	—	495	—	—	75
SVH8047	Infoedge for DPS 8000	700	100	—	—	—
SVH8053	Inforedge-Reporter for DPS 8000	275	40	—	—	—
SVH8058	Inforedge-Example Query for DPS 8000	425	50	—	—	—
SNU8000	TGRAF-05	395	—	—	—	3,500
SVU8035	Dr TEK 4010	—	—	750	—	113
SVU8036	Dr TEK 4105	—	—	750	—	113
SVU8037	Dr TEK 4107/4109	—	—	1,250	—	188
SVU8038	Dr TEK 4115/4125	—	—	1,750	—	263
SVU8039	Dr Matrix QCC	—	—	1,250	—	118
SVU8040	Dr HP 7475/Sweet-P	—	—	750	—	113
AFF0001*	Management Support Center; annual license fee, $72,500	—	—	150,000	—	15,000
SNM7800	PC7800 Emulator	295	—	—	—	
SNM7803	PC7800 for Macintosh	295	—	—	—	
SVD8005	I-D-S/I DQ	215	41	—	—	
SVE8023	Forum 8	180	33	—	—	
SVE8046	EDIT 8	415	—	10,000	—	1,500
SVH8000*	PCF	207	35	—	—	—
SVH8001*	EQ	420	48	—	—	—
SVH8002*	IQ	324	36	—	—	—
SVH8003*	Credo	252	31	—	—	—
SVH8004	Texto	—	—	35,000	—	3,500
SVH8005	Texto Logotel	—	—	13,200	—	1,320
SVP8003	DM-IV QRP	458	72	—	—	—
SVP8004	DM-IV PLP	321	56	—	—	—
SVP8006	MDQS/II	734	141	—	—	—
SVP8007	MDQS/IV	1,269	254	—	—	—
SVP8020	Syntax-Directed Editor	225	25	—	—	—
SVU8020*	Grafmaster	—	1,650	11,000	—	
SVU8027*	Solution Center Menu	200	24	—	—	
SVU8028	DI-Textpro	4,250	—	—	—	638
	Programmer Productivity Facilities:					
SVH8006	Magna 8	—	—	120,000	—	14,400
SVP8008	Debug Support System	124	24	—	—	—
SVP8009	Cobol-74 Debug Support	219	32	—	—	—
SVP8010	Fortran-77 Debug Support	268	12	—	—	—
SVP8014	Softool Cobol	1,400	—	33,500	—	8,375
SVP8015	Softool CCC	1,500	—	30,000	—	7,500
SVP8016	Complete Softool	2,500	—	60,000	—	15,000
SVP8018	System-80 Cobol	780	—	18,400	—	1,840
SVP8021	Auditec	—	—	18,000	—	2,700

NA—Not available.
NSC—No separate charge.
NC—No charge.

Honeywell Bull DPS 8000 Series

		Monthly License Fee ($)	Ex- panded Support Charge ($)	Initial License Fee ($)	License Orig. Fee ($)	Annual Basic Support ($)
SVP8022	System-80 DM-IV Optional	500	—	12,000	—	1,800
SVP8023	System-80 Cobol with DM-IV Optional	1,280	—	30,400	—	3,640
SVU8029	Business-Graf	—	—	27,750	—	4,163
SVU8021*	Scientific/Engineer	—	1,575	10,500	—	—
SVU8050	UW Tools	500	—	10,500	—	1,050
	Transaction Processing:					
SVD8015	CTP	321	32	—	—	—
SVE8033	DM-IV/TP ELQ	275	55	—	—	—
SVP8013	TATS	500	—	10,800	—	1,620
SVP8017	TSM	980	—	24,000	—	1,920
SVS8002	DM-IV/TP Facility	1,714	207	—	—	—
SVS8006	TDS	2,025	266	—	—	—
SVS8007	TPE	710	70	—	—	—
SVS8017	TP8	2,140	243	—	—	—
SVU8003	DM-IV/TP Forms Facility	339	64	—	—	—
	Special Packages:					
SVD8024	DDE Basic System	1,828	290	—	—	—
SVD8028	DDE Comp package for TDS	4,208	596	—	—	—
SVD8031	DDE Comp package for TPE	3,955	551	—	—	—
SVD8033	DDE Management Facility for TDS	1,746	287	—	—	—
SVD8034	DDE Management Facility for TPE	1,632	269	—	—	—
SVS8003	DM-IV/TP Comp Facility	3,395	476	—	—	—
SVS8009	DM-IV/TP System Management Facility	1,260	259	—	—	—
	Other Software:					
SVS8012	GCOS 8 SR2000 P	45	—	—	—	—
SVS8013	GCOS 8 SR2000 SER DB	38	—	—	—	—
SVS8015	GCOS 8 SR2300 P	57	—	—	—	—
SVS8016	GCOS 8 SR2300 SER DB	45	—	—	—	—
SVS8019	GCOS 8 SR2500 P	62	—	—	—	—
SVS8020	GCOS 8 SR2500 SER DB	52	—	—	—	—
SVS8057	GCOS 8 SR3000 P	70	—	—	—	—
SVS8058	GCOS 8 KP and C	60	—	—	—	—
	GCOS 8 Communications Facilities:					
SVC8000*	GRTS-II Facility	345	58	—	—	—
SVC8001*	GRTS-II HDLC Support	166	14	—	—	—
SVC8002*	NPS Facility	1,232	265	—	—	—
SVC8003*	NPS HDLC Support	166	14	—	—	—
SVC8004	Extended NP Support	176	36	—	—	—
SVC8006	FTF66	21	7	—	—	—
SVC8040*	Inter Bisync-GRTS-II	97	18	—	—	—
SVC8048*	GRTS	569	139	—	—	—
SVC8049	HYPERchannel Support	135	25	—	—	—
SVC8050*	Inter Bisync-NPS	97	18	—	—	—
SVC8051	UFT8	200	72	—	—	—
SVC8052	DSANET	125	20	—	—	—

		Monthly License Fee ($)	Optional Monthly Support Charge ($)
DATANET 8 Distributed Network Supervisor Software			
SNC8120	Distributed Network Supervisor 300	560	99
SNC8121	Network Operator Interface	11	5
SNC8123	Host Connect Support for DPS 8, 88, and 90	60	11
SNC8131	HDLC Data Link Control point to point	95	18
SNC8122	Value Added Network Support, X.25, PAD, PBX, and LAN	185	33
SNC8126	Primary Network Support, X.21	185	33

*Not available for new orders.
(1) Charge varies relative to hardware central power.
NA—Not available.
NSC—No separate charge.
NC—No charge.

Honeywell Bull DPS 8000 Series

		Monthly License Fee ($)	Optional Monthly Support Charge ($)
SNC8127	Interactive Binary Synchronous Terminal Support (3270)	90	17
SNC8128	Remote Batch Binary Synchronous (2780/3780) Workstation Support	80	14
SNC8129	Remote Computer Interface (RCI) Terminal Support	50	9
SNC8130	Logical High-Level Data Link Control	125	22
SNC8190	Host Administrative Facilities	155	28
SNC8193	Network Administration Facility	35	6
SVC8051	Unified File Transfer 8	200	72
SNC8195	Distributed Network Supervisor/Entry GCOS 8	450	80
SNC8197	Remote Switch/Concentrator	375	66
SNC8118	Eight-Inch Diskette Software Updates for DN8	10	NC
SCC3209	Remote Batch Facility/6 (RBF/6)	32	6
SCC3210	Distributed Job Processing	67	14 ■