Bull DPS 7000

OVERVIEW

At the annual Paris SICOB computer fair in April, Groupe Bull introduced the DPS 7000, a series consisting of five models aimed at the "midframe" market. By midframes, Bull means departmental systems falling within the price range of FF 0.6 million to 3 million. Simultaneous announcements of the DPS 7000 were made in all countries covered by Groupe Bull's international sales network and by the sales network of the recently formed Honeywell Bull, Inc., a joint venture of Bull, NEC and Honeywell Information Systems. Honeywell Bull, Inc. markets GCOS 7 systems, such as the DPS 7000, in North America, Italy, and the United Kingdom.

The DPS 7000 represents the first processor line introduced by Groupe Bull and Honeywell Bull, Inc., a new company formed in March 1987 under an agreement entered into by Compagnie des Machines Bull, Honeywell, and NEC. Incorporated under U.S. law, Honeywell Bull, Inc. comprises the assets of Honeywell Information Systems (HIS), previously a subsidiary of Honeywell, except for the Federal Systems Division which markets systems directly to the U.S. government. Honeywell Bull, Inc. is owned by Compagnie des Machines Bull (42.5 percent), Honeywell (42.5 percent), and NEC (15 percent).

Bull's investment amounted to $131 million. Honeywell has received a total of $527 million, including $131 million from Bull, $46 million from NEC, and $350 million from Honeywell Bull, Inc. (financed by a loan negotiated by the

The Model 30 of the DPS 7000 range is configured with eight 500-megabyte mass storage units, a 900 lines-per-minute printer, and a 1600/6250 bits-per-inch magnetic tape subsystem.

PRODUCT ANNOUNCED: Groupe Bull and Honeywell Bull, Inc. have released the DPS 7000, a Bull-manufactured product line that includes five models positioned as medium-scale organizational and departmental machines.

COMPETITION: CDC 930; Digital Equipment VAX 8200, 8300; IBM 9370 Information Systems and System/38; NCR 9800; Unisys 2200, A 3, and A 5.

DATE ANNOUNCED: April 1987.

SCHEDULED DELIVERY: Immediately following announcement.

BASIC SPECIFICATIONS

MANUFACTURER: Bull, 121, avenue de Malakoff, 75116 Paris, Cedex 20, France. Telephone: (01) 360 0222.

MODELS: Models 10, 20, 30, 40, 50.

MAIN MEMORY: Main memory (dynamic RAM), equipped with 256K-bit packages, can have a capacity of up to 16MB.

CENTRAL PROCESSOR: DPS 7000 processors are 32-bit systems using very large scale integration (VLSI) complementary metal oxide semiconductor (CMOS) chips within the CPU, input/output processors, and system memory. The components feature 22,000 ports per chip. The CPU, packaged with 10 VLSI chips, has an internal transfer rate of 27 megabytes per second and a clock cycle time of 150 nanoseconds. The CPU also features a 64-kilobyte cache memory and 192 kilobytes of control memory.

The CPU contains arithmetic and logic units divided into sub-units that perform different logic functions. To promote a form of parallel processing, five functions can operate simultaneously in firmware.

INPUT/OUTPUT SUBSYSTEM: The DPS 7000 I/O processors offer a transfer rate ranging from 1.25 megabytes per second to 2.5 megabytes per second for each individual processor channel. Processor models can feature from four to eight channels depending on model. The I/O processors include 64 kilobytes of memory for channel program execution and data buffering. For transaction processing environments, DPS 7000 systems can handle from 9,000 to 52,000 transactions per hour using the TP1 industry-standard benchmark. A fully configured top-end Model 50 can handle up to 600 terminals.

CONFIGURATION: The DPS 7000 line features five models. Memory ranges from four megabytes to 16 megabytes, and channel capacity ranges from four to eight channels depending on model. The low-end Model 10, offered as a packaged system, features a central processor with four megabytes of memory packaged with a 700-megabyte mass storage unit and 1600-bits-per-inch (bpi) magnetic tape unit. A configuration can also include a Datanet 8/05 front-end network processor.

Models 20, 30, and 40 feature a central processor with eight megabytes of memory, four I/O channels, and a service processor which includes a 5¼-inch diskette, a 20-megabyte hard disk, system console, printer, diagnostic interface, and remote maintenance attachment.

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new company). At the end of a two-year period, Bull will buy an additional stake from Honeywell, thereby increasing its share to 65.1 percent. At that time, Honeywell will own 19.9 percent and NEC, 15 percent.

Bull has a majority voice on the Board of Directors of the new company in which it holds five of the nine seats. In 1986, Honeywell Bull, Inc. (on the basis of its new structures), generated revenues of $1,892 million, including 48 percent from sources outside the United States, and employed 20,500 people, 9,000 of these outside the United States.

Honeywell Bull, Inc. maintains four industrial facilities and research and development teams in the United States, United Kingdom, and Italy. In 1986, approximately $226 million was devoted to research and development. Its sales network covers North America, the United Kingdom, Italy, Australia, and some countries in Southeast Asia.

Groupe Bull reported revenues of FF 17.8 billion in 1986. It employs 26,800 people, principally in Europe, as well as in Africa and Latin America. Bull views the control of Honeywell Bull, Inc. as an outstanding opportunity to enhance its European presence and to gain access to the U.S. market by capitalizing on the close ties enjoyed by Bull and Honeywell during the past 17 years.

None of the three firms involved in the creation of Honeywell Bull, Inc. is a stranger to the others. Each of the three companies has experienced close technological and marketing relationships with the others throughout the years. The Honeywell and Bull cooperative alliance began in 1970 when Honeywell purchased General Electric's computer business, which included GE's 66 percent interest in Bull, resulting in the creation of Compagnie Honeywell Bull. At that time, Compagnie Honeywell Bull began marketing and distributing the Honeywell Series 16 computer and the Series 200/2000 business computers, along with its own line of machines. In 1974, Honeywell and Compagnie Honeywell Bull introduced a range of 10 computer models, called the Series 60. Responsibility for the models was assigned as follows: France—Levels 61 and 64; HIS Italy—Level 62; U.S.—Levels 6 and 66.

In 1976, Compagnie Internationale pour l'Informatique and Compagnie Honeywell Bull merged to form CII-Honeywell Bull. In 1982, CII-Honeywell Bull at St. Gobain was nationalized, and Honeywell sold 27.1 percent of its 47 percent interest in CII-Honeywell Bull to the French government, retaining 19.9 percent. Under the terms of the agreement, Honeywell and CII-Honeywell Bull continued to develop a common product line of computer systems and to cooperate in the development of the DSA network architecture.

The birth of Groupe Bull occurred after CII-Honeywell Bull took control of related computer and information companies—Sems from Thomson, Transac from CGE, and R2E, all of which contributed to the formation of Groupe Bull. The most recent cooperative venture between

A Model 50 features two central processors and eight megabytes of main memory, expandable to 16 megabytes and four I/O channels expandable to eight channels.

ARCHITECTURE: The architecture of the Bull DPS 7000 systems is based on the distribution of processing operations. The systems offer high throughput via a 27MB per second central bus.

PERIPHERALS: Bull has designed a variety of peripherals for the DPS 7000 including 0.35 or 0.5 billion byte fixed disks, 1600 or 6250 bpi tape drives, remote printers, belt printers, and the Bull MP9060 magnetographic printer known as Mathilde. Communications processors can handle up to 600 terminals.

OPERATING ENVIRONMENT: The models in the DPS 7000 range can operate in normal office temperatures ranging from 15 to 32 degrees Celsius with a relative humidity of 30 to 70 percent without special air conditioning. Heat dissipation and noise levels correspond to Class B environment standards. Most configurations do not require raised flooring for installation.

COMMUNICATIONS: GCOS 7-based BlueGreen solutions implement Bull ISO/DSA network architecture communication protocols which are open to international communications standards. The GCOS-7 BlueGreen solutions also implement videotex techniques and can support interoperation between central applications and the interconnection of Groupe Bull workstations, Bull SPS, or Bull Micral 30, 40, or 60 microcomputers.

In addition to peer networking, the DPS 7000 systems permit micro-to-mainframe links. PC users running MS-DOS can connect directly to a DPS 7000 machine. Through a personal computer, PC users can access PC functions and all DPS 7000 functions. Users can also download GCOS 7 operating system data to the PC for use with software packages such as Lotus 1-2-3 or Framework.

To handle networking and data communications functions, users can configure DPS 7000 systems with Datanet 8 front-end communications processors. Using a Honeywell Bull DPS 6 minicomputer, Datanet processors can handle line, protocol, and message management and, in general, manage the network load for the central DPS 7000 processor. Depending on DPS 7000 model, the Datanet front-end can handle from three to 255 lines and up to 600 terminals.

OPERATING SYSTEM: The DPS 7000 series runs under the GCOS 7-AS operating system. A Bull DPS 7000 model used as a departmental system can be controlled and managed from another GCOS 7 site. The GCOS 7-AS is entirely compatible with all other versions of GCOS 7, namely those used on the large Bull DPS 7 systems. GCOS 7-AS was designed to integrate all the basic functions required for information and production applications and as an applications platform at a price adapted to each of the models in the series. Through arrangements with third-party software houses, Bull offers complete GCOS 7 solutions.

DISTRIBUTED OFFICE AUTOMATION SYSTEM: Bull has introduced a distributed office automation system, DOAS, for use throughout the entire GCOS 7 range. DOAS provides methods for creating, storing, querying, and circulating company documents. The DOAS-DESK AND FILING application supports the coexistence of word processing applications on Bull Questar 400 stations and data processing applications under GCOS 7.

DOAS MAIL SERVER 7 supports integration into a distributed message system that conforms to the X.400 standard. DOAS DEVELOPMENT TOOLS provides access to these functions from all other central processing applications. For the management of text, Bull offers a new version of MISTRAL V5.2, which integrates a micro interface and essentially provides a simplified query process (tutorial mode) and a bridge for DOAS and user applications.

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Honeywell and Bull, which preceded the creation of Honeywell Bull, Inc., involved the development of the latest release of Distributed Systems Architecture (DSA).

The relationship between Honeywell and NEC dates back twenty-four years. In 1962, Honeywell and NEC entered into a ten-year agreement granting each other access to specific technology and products developed by their respective companies. In 1968 and 1972, the companies renewed these agreements. In 1984, Honeywell and NEC concluded agreements for cross-licensing of patents and copyrights, and for the provision of manufacturing and distribution rights to NEC System 1000 mainframe computers and its follow-up series for a minimum of ten years. In 1986, Honeywell announced the incorporation of NEC System 2000 technology into the follow-up products of Honeywell's DPS 90 mainframe.

Bull has enjoyed a 14-year relationship with NEC, dating from an initial joint endeavor involving the technology of Current Mode Logic integrated circuits. In 1973, under a technology licensing agreement, Bull supplied NEC with two prototypes of the Series 60 Level 64 computer system along with technical manufacturing information and source and object software for the GCOS 64 operating system. NEC produced this series in Japan under the name ACOS/S-400 in 1975, using the GCOS 64 operating system as the foundation for the development of the ACOS-4 operating system. In 1985, Bull and NEC signed an agreement in which Bull offered DPS 7 computers made up of a central subsystem of NEC's ACOS S-750 and subsystems produced by Bull running under GCOS 7.

With the release of the DPS 7000, Bull hopes to position itself in the forefront of designers and manufacturers of medium and high-power computer systems. The DPS 7000, designed, developed, and manufactured by Bull Systèmes teams in Paris and Angers, consists of five models which, according to Groupe Bull, offer an improvement in price/performance ratios by a factor of 2 over the previous lower-level models in the Bull DPS 7 range running under the GCOS operating system.

To achieve gains in power and compactness, Bull used CMOS technology for the central subassembly. High-level VLSI integration produced a density of up to 25,000 logic functions per chip, which Bull compares at the level of each VLSI component to the power of a logic pack of a Bull DPS 7.

The five models in the DPS 7000 series include Models 10, 20, 30, 40, and 50. System memory can range from 4 megabytes to 16 megabytes, and channel capacity can range from 4 to 8 I/O channels. The DPS 7000 can use most of the newer vintage DPS 7 disk, tape, and printer products. Each system can be upgraded on site to a more powerful model.

Transaction processing power can range from 9,000 to 52,000 transactions (of the TP1 debit-credit standard type) per hour. For example, the Model 40 can manage up to 400 terminals, making it comparable to IBM's System 9377-90 and Digital Equipment Corporation's VAX 8530. The

VIDEOTEX SOFTWARE: To the GAV 7 videotex applications server software, Bull has added support for synchronous terminals and the Minitel 1B. This software, which can interface with existing applications, now has tools to assist in the creation of graphics.

INFO-LINK: This system establishes a link between IQS language applications and Bull Micral microcomputers.

DATABASE MANAGEMENT: GCOS 7 uses Bull's Integrated Data Store/II (I-D-S/II) network data base management system which is tailored to large volume transaction processing environments. To satisfy customer demands for a relational data base system, Bull also offers the Oracle relational data base management system from Oracle Corporation. According to Bull, Oracle is well adapted to query and decision-making systems.

PROGRAM DEVELOPMENT: To facilitate applications development, the operating system features fourth-generation language capabilities and data dictionaries. Specifically, Honeywell Bull offers the following third-party software:

- **Sindia 7, a transaction code generator from Steria Diffusion.**
- **Mantis, an online fourth-generation application generator from Cincom Systems Inc.**
- **IQS, a fourth-generation language with relational views, and**
- **SQL, the industry-standard language used with Oracle.**

OTHER SOFTWARE: Application packages available for the DPS 7000 Series include the Honeywell Bull Manufacturing System/7 (HMS/7) and Patient Care Management System. The integrated packages address two established Honeywell Bull niche markets, manufacturing and the health industry.

HMS/7 is a Manufacturing Resource Planning (MRP II) system for integrated inventory and production control. The package contains six application modules: Inventory Record Management, Manufacturing Data Control, Material Requirements Planning, Master Production Scheduling, Statistical Forecasting, and Capacity Requirement Planning. HMS/7 can be integrated with the Honeywell Bull Factory Data Collection system using the new Host Application Interface for monitoring the shop floor.

The Patient Care Management System, a Honeywell Bull package developed for the DPS 7000 Series, is said to be the first component of the company's Comprehensive Hospital System, an online, modular hospital information product featuring an integrated data base, productivity tools, patient care accounting and financial management applications. Patient Care Management is composed of 10 modules that handle patient admission, discharge, transfer and registration processing, patient scheduling, staff scheduling, order entry and results reporting, pharmaceutical processing, patient chart review, point-of-service billing, medication administration, patient acuity information processing, and care planning.

PRICING

FRANCE: Prices for Bull DPS 7000 central processors vary from FF 0.3 million to FF 1.4 million. A configuration of a Model 20 with 8MB of main memory, two 500MB disk drives, a 1600 bpi streaming tape drive, and one communications processor with three synchronous lines for remote connections costs approximately FF 900,000.

A Model 40 configuration with 8MB of main memory, four 500MB disk drives, one 6250 bpi streamer, one 700 lpm printer, one communications processor with 1 HDLS line and 7 synchronous lines sells for approximately FF 2 million.

Bull offers free maintenance for one year. Quantity order pricing policies have been established.

UNITED STATES: Prices for Honeywell Bull, Inc. DPS 7000

products are on page M11-105-701.

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Model 30 can support up to 600 terminals, making it also comparable to IBM's 9377-90 and Digital Equipment Corporation's VAX 8350, as well as ICL's 39-30 Binodal Systems.

The new systems share all the qualities and functional capabilities of Bull's general-purpose mainframes running under GCOS 7, but they also can satisfy the horizontal growth requirements of companies that have chosen a distributed or decentralized approach to improve productivity. The new product line will continue to address manufacturing and health industry markets, two established Honeywell Bull niche markets. Software products addressing these market segments include the Honeywell Bull Manufacturing System/7 (HMS/7), now available for the DPS 7000, and the Patient Care Management System, the first component of Honeywell Bull's Comprehensive Hospital System.

RELATIONSHIP TO CURRENT PRODUCT LINE: The five-model DPS 7000 processor line replaces the three remaining models of the DPS 7 model line. The new DPS 7000 line extends processing power beyond the range of the DPS 7 line through the use of additional main memory capacity, faster internal throughput, and faster I/O transfer rates. This increase will be particularly beneficial for DPS 7 users now running out of capacity.

The DPS 7000 line ranges from four megabytes to 16 megabytes, while the DPS 7 line ranges from two megabytes to eight megabytes. Published MIPS (millions of instructions per second) ratings for the DPS 7000 range from 0.65 MIPS to 3.8 MIPS. Ratings for the DPS 7 range from 0.66 to 1.36 MIPS. The DPS 7000 can also handle up to 52,000 transactions per hour compared with the DPS 7 which handles up to 22,500 transactions per hour, according to Bull.

To improve performance and throughput over the DPS 7 line, the new product line uses a new semiconductor technology, according to Bull. The very-large-scale integration (VLSI) complementary metal oxide semiconductor (CMOS) is used in central processors, I/O processors, and system memory. I/O throughput now ranges from 1.25 megabytes per second to 2.5 megabytes per second per channel. The DPS 7 features a throughput rate ranging from 1.25 megabytes per second to 1.81 megabytes per second. The DPS 7 also uses both 64K-bit and 256K-bit memory chips, depending on the age of the installed processor, while the DPS 7000 line uses 256K-bit chips and at some later point will use one-megabit chips.

To ease migration to the new processor line, DPS 7 users can move most of their disk, tape, and printer peripherals over to the DPS 7000 line using special reconnect kits. Peripherals that can be moved over to the DPS 7000 include the MSU1007, MSU0452, MSU0555, MSU0390, all disk drives; the MTU0537 tape drive; the PRU0906, PRU0909, PRU1205, PRU1209, all high-speed line printers.

Older DPS 7 peripherals, which Bull considers obsolete, such as card machines and some older printer families, cannot be moved to the DPS 7000. Many of these older products are now considered old enough to be replaced. Users not ready to write off their hardware, however, can cluster DPS 7000s within installed DPS 7 configurations. Under this arrangement, a DPS 7000 can be loosely coupled with a DPS 7 through crossbaring, dynamic switching, and cabling. Loose coupling allows two versions of GCOS 7 to run simultaneously on both systems. Users can readily share files and peripherals within the joined systems. This arrangement can be beneficial to sites requiring additional power and system redundancy.

The new product line runs under Version 3 of the GCOS 7 operating system, which is compatible with the previous version, making it possible for DPS 7 users to port existing applications over to the DPS 7000. Both the DPS 7 and DPS 7000 operating under GCOS 7 continue to feature peer-to-peer networking capabilities and PC-to-mainframe links. Additionally, both product lines can run the Oracle relational data base from Oracle Corporation. Mantis and IQS fourth-generation languages are also available to both product lines.

COMPETITIVE POSITION: While on the surface the DPS 7000 appears to offer the performance capabilities of a supermini, Bull prefers to call the new product line a midrange 32-bit mainframe. The model line is positioned to compete against the new IBM 9370 Information System supermini and the IBM System/38 minicomputer. The DPS 7000 is marketed as an enterprise-wide system featuring applications software addressing manufacturing and health-industry applications. As with its other mini and mainframe products, Bull stresses transaction processing capabilities.

Bull's Distributed Systems Architecture (DSA) is an open architecture supporting peer-to-peer networks and conforms to ISO's Open Systems Interconnection (OSI) model for interconnecting equipment from other vendors. Lately, IBM has also been moving in a similar data communications direction with new software products that support peer-to-peer networking and OSI. The newly announced IBM Systems Application Architecture (SAA) will also let users develop a consistent software interface among IBM PCs, S/3X minis, 9370 superminis, and S/370 mainframes. The 9370 is a 370-compatible system that brings the mainframe operating environment to the departmental level. The 9370 addresses some of the shortcomings of the System/36 and System/38 which operate under incompatible operating systems.

Similar to the S/3X, DPS 7000 users cannot readily migrate to larger GCOS/8 systems without code rewriting and recompilation. Both GCOS 7 and GCOS 8, however, use a similar I-D-S/II data base and TDS transaction processing system common file structures. Over the years, a company spokesperson said, most of its medium-scale users have not found a need to migrate to the larger operating environ-

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ment, although there have been sites that rapidly outgrew medium-scale offerings and needed to move up to larger systems. These customers are usually the exception.

Similar to the 9370, the DPS 7000 is designed to function in an office environment and does not require a separate computer room or special air-conditioning facilities. To enhance system throughput, Bull developed VLSI CMOS chips. The DPS 7000 now uses a faster I/O 2.5-megabyte-per-second transfer speed. IBM, meanwhile, enhanced throughput rates on the S/38 with the introduction of the 9332 disk, which operates at 2.5 megabytes per second, and the 9335, which operates at 3 megabytes per second. □

EQUIPMENT PRICES

		Purchase Price ($)	Maint. Price ($)
DPS 7000 Processors			
Model 10	System includes central processor with four megabytes of main memory, 700 megabytes of mass storage, 1600 bits-per-inch magnetic tape subsystem, service processor, remote maintenance attachment, console CRT, printer, and diagnostic interface.	112,400	491
Model 20	System includes central processor with eight megabytes of main memory, four I/O channels, service processor, remote maintenance attachment, console CRT, printer, and diagnostic interface.	70,000	230
Model 30	System includes central processor with eight megabytes of main memory, four I/O channels, service processor, remote maintenance attachment, console CRT, printer, and diagnostic interface.	100,000	320
Model 40	System includes central processor with eight megabytes of main memory, four I/O channels, service processor, remote maintenance attachment, console CRT, printer, and diagnostic interface.	140,000	415
Model 50	System includes two central processors with eight megabytes of main memory, four I/O channels, service processor, remote maintenance attachment, console CRT, printer, and diagnostic interface.	193,200	525

SOFTWARE PRICES

	Initial Software License Fee ($)
GCOS 7 Operating System Software*	
Model 10	25,500
Model 20	25,500
Model 30	47,700
Model 40	47,700
Model 50	66,600

**With the introduction of the DPS 7000, Honeywell Bull announced graduated GCOS 7 initial license fees based on processor size and power.* ■