

Preface

The Personal System/2 (PS/2), Operating System/2 (OS/2), and Advanced Function Printing were each designed to make the benefits of substantial advances in hardware technologies more available for customer applications. This issue of the *IBM Systems Journal* presents insights into these products, their development, and their problem-solving capabilities.

The opening paper, by Kogan and Rawson, highlights the design, architecture, and new features of OS/2, and defines some of its specific terminology. This operating system was designed to support the operation of the new generation of workstations with their enhanced processor speeds and increased amounts of memory. OS/2 provides a solution, with a well-defined architecture, for the needs of personal workstations to run existing IBM PC DOS applications, while gaining the productivity advantages of multiprogramming and multitasking. The authors describe the interapplication protection provided by OS/2, as well as its management of virtual memory, processes, and threads.

As the fixed disk is becoming essentially standard on personal workstations and local area networks are providing fast and reliable access to even greater amounts of data, the role of the personal workstation for database management is increasing. Application developers and users have been inhibited from fully exploiting these technologies by the unavailability of database management software built on an architecture having wide acceptance and support and providing necessary levels of performance and data integrity. The paper by Chang and Myre describes the OS/2 Extended Edition (EE) Database Manager. This product is based on Structured Query Language (SQL), which was developed at IBM Research and has been supported by IBM's larger operating system environments for many years. SQL is included in IBM's Systems Application Architecture (SAA) as a standard across the major IBM computing environments.

The OS/2 EE Database Manager allows users to create new data tables and subsequently add, change, and delete data. Users can also produce formatted reports for viewing and printing using the facilities of the OS/2 Query Manager. The paper by Watson presents an overview of the OS/2 Query Manager, with emphasis on its prompted query and report capabilities.

It is apparent that most major applications now operating under IBM PC DOS will be enhanced and ported to OS/2 in versions that capitalize on its new features and capabilities. The paper by Cook et al. describes application programming for the new system, including a discussion of *Family Applications* that can be run under either IBM PC DOS or OS/2. The authors have included sample pieces of code written in C to illustrate OS/2 programming concepts.

Because OS/2 systems are a logical fit for organizations with existing large and midrange systems having data processing applications programmed in COBOL, it is imperative that OS/2 fully support this language. The IBM COBOL/2 compiler, developed by the Micro Focus Group PLC and discussed in the paper by Sales, provides features for compatibility with the popular IBM OS/VS COBOL and IBM VS COBOL II compilers, as well as a powerful interactive symbolic debugger, called *Animator*.

OS/2 utilizes specialized routines called *device drivers* to support input and output for specific hardware devices. The single-task design approaches used in IBM PC DOS could not provide the higher levels of performance demanded by the OS/2 multiprogramming and multitasking environment. The paper by Mizell provides detailed insight into the interrupt-driven design utilized for OS/2 device drivers which support the greater levels of performance needed by users of this system. These software components must be *bimodal* in order to function in a system with DOS real-mode applications running concurrently with multiple protect-mode applications.

In his paper, Thompson discusses the design of the PS/2 Video Graphics Array (VGA) video subsystem. This is a standard feature on PS/2 Models 50 and above which eliminates the need for a separate video adapter card. Besides providing expanded color options and sharper characters, the VGA has essentially eliminated the need for programmers to be concerned about whether their software is writing to a monochrome or color adapter. Thompson describes the *color summing* technique used to present color images on monochrome displays, along with the hardware design decisions incorporated in the development of the VGA.

Personal System/2s are destined to be used in many multiple-port communications applications ranging from multiuser business applications to gateways and shop-floor control roles. The Realtime Interface Co-Processor Multiport/2 adapter for the PS/2 provides eight ports and a high-performance coprocessor on a single card. This adapter card is capable of supporting a mix of asynchronous and synchronous ports, and includes an Intel 80186 coprocessor which can be programmed using standard C and Assembler language facilities on the PS/2. In her paper, Sykes describes the capabilities and operation of this device.

Computer-based printing technologies now offer solutions to printing and page-mastering applications ranging over two orders of magnitude of printing speed. Understandably, the needs of users with IBM 3800-3 laser printers producing output at 20 000 lines per minute are different from those of users desiring a single-page master from a personal publishing application using a desktop IBM laser printer. The software support for this range of printer capabilities is built on a common base of digital typographic font concepts and resources. The paper by Griffie and Casey introduces typographic fonts and discusses selection of appropriate type designs and emphasis techniques to produce documents. The authors review the terminology of typography and highlight the range of decisions that must be made to compose attractive pages when image and effective communications are both important.

IBM's Advanced Function Printing (AFP) is built upon software products and architectures that permit IBM's laser printers to meet differing user needs. These range from producing high-speed output for applications such as monthly billing, to supporting the mixed graphics and text requirements that characterize such publishing applications as product manuals, to creating finely detailed executive reports.

An introduction to AFP is provided in the paper by deBry and Platte. They discuss *systems printing*, which is supported by AFP facilities to enhance traditional printing applications. Also discussed are the production and use of electronically defined overlay forms, and the placement of multiple logical pages on one physical page. The authors present aspects of *document publishing* that allow considerable latitude in composing multiple-font documents for printing on either local or remote printers.

The final paper, by deBry et al., offers a discussion of three architectures that support the capabilities of Advanced Function Printing. These architectures allow existing applications to utilize the new printer technologies, to provide a device-independent interface to applications, and to support a two-way link between printer and computer for effective control of font resources and error recovery.

The products and architectures discussed in this issue of the *Systems Journal* represent building blocks with which a new generation of applications will be built. These applications will combine the proven enterprise-serving capabilities of larger systems with the best productivity features that workstations can offer. When the capabilities of the new PS/2 workstations and operating system software are combined with IBM's growing family of laser printing products, it will be possible to capture information, process it, and present the results in printed form, all within a consistent family of products.

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