

# Powerful Multiuser Multitasking

*Concurrent*<sup>™</sup>  
DOS

# Operating Systems



 DIGITAL RESEARCH<sup>®</sup>

# Concurrent

## DOS FAMILY OF OPERATING SYSTEMS

### ▶ Introduction

Welcome to the family of Concurrent DOS: Concurrent DOS™ 386 and Concurrent™ DOS XM (Expanded Memory). Concurrent DOS is a multiuser, multitasking operating system for computer systems based on the Intel® 8086 series of microprocessors. Concurrent DOS offers features normally found only in mainframe operating systems. It is architected to support multiuser and multitasking operations: true simultaneous processing is achieved, thereby out-performing "shell products" over a single-user PC DOS/MS-DOS® environment that simulate multitasking operations.

### ▶ PC DOS/MS-DOS Compatibility

The members of the Concurrent DOS family will run the most popular PC DOS applications, such as Lotus® 1-2-3®, Framework®, dBase® II and III, Symphony®, SuperCalc™, and many others. The GEM® (Graphics Environment Manager) software team of publication and presentation graphics products developed by Digital Research, and other GEM-based applications, are also supported by Concurrent DOS.

### ▶ Concurrency

The members of the Concurrent DOS operating system family are both multiuser and multitasking. A single user can run multiple DOS programs; multiple users can use the same multiuser application; or several users can run different programs, all at the same time. Each program on the system console runs in a separate window, which can be edited to change its size, shape, or color. True concurrency means several application programs run simultaneously in the system; programs do not terminate when control is switched to other programs. Concurrent DOS utilizes a sophisticated priority scheduling mechanism guaranteeing timely response to both high- and low-priority jobs in the system. It allows you to prioritize the tasks you wish to run concurrently.

### ▶ Networking/Multiuser Capability

Multiple users can share applications, files, and peripherals, with integrity maintained through file-locking and record-locking features. Concurrent DOS also provides powerful networking capabilities through the DR NET™ networking extension.

### ▶ Multiuser Applications

Digital Research has a growing list of multiuser applications that run on Concurrent DOS, such as Dataflex®, Excalibur®, Bravo®, Income II®, Inmass II®, Medical Manager™, Pegasus™ and Omicron™.

### ▶ System Management

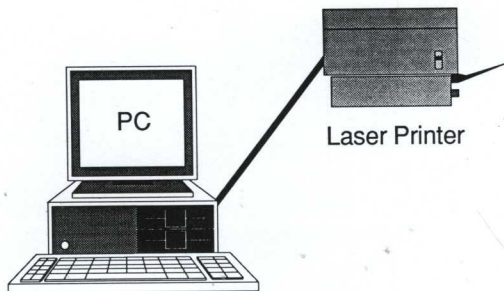
With the Concurrent DOS menu system, you can perform standard operating system functions, such as copying files, printing, and changing directories, without having to remember and enter a series of commands. Menus are also customizable to include the functions that are used the most. Each member of the Concurrent DOS operating system family comes with a wide range of utility programs, including a file manager, a quick reference cardfile program, and an editor.

### ▶ Media Support

Concurrent DOS reads and writes to both PC DOS/MS-DOS and CP/M-86® disk formats. You can use both DOS hierarchical directories and CP/M-86 user areas, transferring data from one format type to another. Differences between file formats and their related disk media are transparent to users and applications.

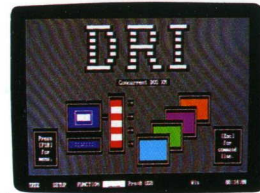
### ▶ Dependability

Another strength of the Concurrent DOS operating systems is that, besides being easy-to-use, they are very dependable. The software has been tried and tested over the past five years by users all over the world. This experience and field-testing has helped make Concurrent DOS XM and Concurrent DOS 386 solid, problem-free operating systems.



Multitasking PC Workstation

# Concurrent DOS XM



## ▶ Concurrent DOS XM Multiuser Support

Concurrent DOS XM can be customized for either single-user or multiuser microcomputer systems through easy-to-use configuration utilities. Users can set up to six-user systems by connecting serial terminals to the main console. The multitasking functions of Concurrent DOS XM, especially when combined with expanded memory, allow multiple users to take advantage of this low-cost alternative to networking with all the benefits of a shared environment.

## ▶ Expanded Memory Features

Concurrent DOS XM works with conventional memory and/or expanded memory. It uses a memory banking mechanism, EEMS (Enhanced Expanded Memory Specification), that maps expanded memory into 8086 addressing range. Through the memory bank switching scheme, Concurrent DOS XM accesses the memory on up to four expanded memory boards. This means existing applications can run in expanded memory with multiple applications accessing up to 8 Mbytes of memory. Concurrent DOS XM performs its own memory management, assigning pages of memory to running applications. EEMS is totally transparent to application programs. Concurrent also provides expanded memory board compatibility for applications that conform to LIM-EMS.

## ▶ Native Mode vs. DOS Mode

Concurrent DOS does not reside on top of PC DOS like shell programs do—it is a complete, comprehensive operating system. It executes programs in either of two modes: native mode or DOS mode. In native mode, Concurrent DOS provides file and record locking, queue management, memory-management functions, and process priority assignment. DOS mode is used to run standard PC DOS programs in the Concurrent DOS XM and Concurrent DOS 386 multitasking environments.

## ▶ Other Features

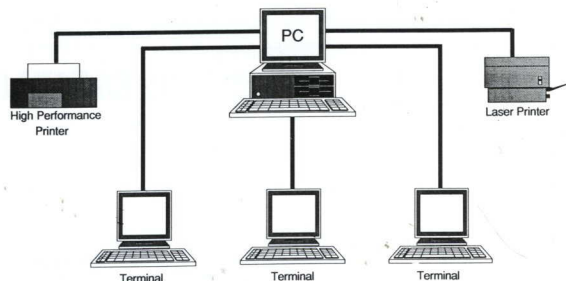
Concurrent DOS XM includes several additional features:

- window management
- configurable menu system
- on-line HELP
- hard disk backup
- math coprocessor support
- integrated programmable function keys and keyboard macros
- command line editing and recall
- support for conditionals in the BATCH processor
- input/output redirection to more than one target

## ▶ Hardware/Memory Requirements

Concurrent DOS XM requires the following:

- IBM PC, PC/XT, PC/AT, or 100 percent compatible (a hard disk is recommended for increased performance and for multiple users).
- Minimum of 256 Kbytes memory, when used in conjunction with an EEMS expanded memory board. Otherwise 512 Kbytes required.
- Monochrome and/or color display monitors can be used. The operating system supports IBM® Color Graphics and Enhanced Graphics Adaptor or EGA-compatible cards.



Multiuser or Departmental System

# Concurrent DOS 386



## ► Concurrent DOS 386

**A**s the newest member of the Concurrent DOS family, Concurrent DOS 386 takes advantage of the speed of the Intel 80386 microprocessor in protected virtual 8086 mode. It is extremely easy to install and use. This operating system uses the 386 memory paging scheme to its full capacity. A large number of multiuser, multitasking applications are available for use in the Concurrent DOS 386 environment. This operating system can be configured to support up to ten users by connecting serial terminals to the main console. OEMs and System Integrators can extend the number of users by purchasing a Concurrent DOS System Builder's Kit.

## ► Memory

Concurrent DOS 386 employs a powerful memory paging scheme that fully supports the Expanded Memory Specification (EMS-LIM) without the need for additional hardware or software. Under Concurrent DOS 386, the operating system uses 80386 internal registers to provide logical-to-physical memory translation. The variously dispersed pages of memory all appear to be part of an application's address space, thus providing for normal retrieval of data and execution of program code. Because no copying within memory is involved, data retrieval, program execution, and task switching are performed at full processor speed.

Concurrent DOS 386 is capable of addressing up to 4000 Mbytes of linear physical memory, though for practical purposes, the amount of memory that can be fitted into a particular microcomputer will be the limiting factor. Concurrent DOS 386 fully supports memory banking without the need for special memory hardware.

## ► Networking

The DR NET networking extension provides powerful networking capabilities to Concurrent DOS users. Workstations can simultaneously act as servers or requesters in a Local Area Network (LAN), sharing expensive peripherals such as hard disks and laser printers, while maintaining full local processing capabilities. DR NET is particularly suited to users who want or need to share databases and program files. Concurrent DOS 386 can fully communicate with both the Concurrent DOS XM and DOS Plus operating systems via DR NET.

## ► Other Features

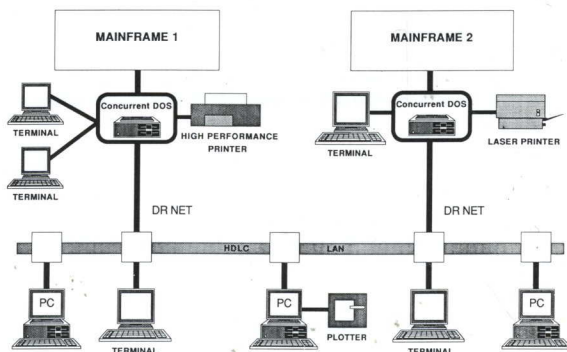
Concurrent DOS 386 also offers these features:

- window management
- configurable menu system
- on-line HELP
- hard disk backup
- math coprocessor support
- integrated programmable function keys and keyboard macros
- command line editing and recall
- support for conditionals in the BATCH processor
- input/output redirection to more than one target
- MS-DOS-style device driver support

## ► Hardware/Memory Requirements

Concurrent DOS 386 requires the following:

- Intel 80386-based microcomputer (a hard disk is recommended for increased performance and for multiple users).
- Minimum of 512 Kbytes memory for single-user system. About 1 Mbyte of additional memory is required for each group of 3 additional users in multiuser system environments.
- Monochrome and/or color display monitors can be used. The operating system supports IBM® Color Graphics and Enhanced Graphics Adaptor or EGA-compatible cards.



Fully Integrated Network Gateway

# QUESTIONS AND ANSWERS

## **W**hat is concurrency?

Concurrency allows multiple users to share system resources and execute the same programs simultaneously.

## How much memory do I need to run Concurrent DOS 386 and Concurrent DOS XM?

You need a minimum of 512 Kbytes of memory to run Concurrent DOS. However, if you are using an EEMS Expanded Memory Board with Concurrent DOS XM, you need only 256 Kbytes of conventional memory.

## What kind of hardware do I need?

For Concurrent DOS 386, you need a Compaq® Deskpro® 386 or compatible. For Concurrent DOS XM you need an IBM PC, PC/AT, PC/XT or 100% compatible. Memory boards to take full advantage of the expanded memory capabilities of Concurrent DOS XM are optional.

## How do I install Concurrent DOS?

Concurrent DOS practically installs itself. The installation process is entirely menu-driven. You are prompted for all installation options and told when to change disks. Just boot Concurrent DOS from the system floppy and follow the menu instructions.

## Do I need to reformat my hard disk to install Concurrent DOS?

There is no need to reformat your disk if you already have DOS installed. Concurrent DOS creates its own subdirectory for its system utilities and gives you the option of loading Concurrent DOS or regular DOS at boot time. If Concurrent DOS is the only system installed, it has its own utilities for formatting, partitioning and activating Concurrent DOS directly from the hard disk.

## What is unique about Concurrent DOS?

It is a real-time, multiuser, multitasking operating system offering DOS-compatibility available today for the Intel 8086 family of processors.

## How many programs can I run at once?

Concurrent DOS can support up to 255 simultaneous tasks.

## How many users does Concurrent DOS support?

Concurrent DOS XM will support a maximum of six users while Concurrent DOS 386 supports up to ten users. With a Concurrent DOS System Builder's Kit, you can extend the number of users, limited only by memory or disk space.

## Will the DOS programs I have now run on Concurrent DOS?

Yes, most DOS programs will run on Concurrent DOS including such popular programs as Lotus 1-2-3, dBase II and III, Symphony, SuperCalc, Framework, and many others. GEM presentation and publication graphics applications and other GEM-based programs also run on Concurrent DOS.

## What about CP/M-86 programs?

CP/M-86 programs also run in native mode on Concurrent DOS.

## What control does a programmer have over programs running on the system?

Concurrent DOS provides for prioritization, timing and parent/child process control as part of the system service calls. Programs may also transfer and communicate information with each other.

## Can programs share files?

Yes, the programming interface provides for file sharing as well as a full-featured file and record-locking scheme.

## Are there any multiuser applications available that are specifically designed to run under Concurrent DOS?

There are hundreds of applications available that take advantage of the unique properties of Concurrent DOS such as background processing, file sharing, intertask communication and process synchronization. There are packages for accounting systems, point of sale, office automation, database systems, real-time process control and communications. A catalog of these applications can be obtained from your Authorized Dealer or directly from Digital Research.

# PROGRAMMING TOOLS

## ▶ System Builder's Kit

**T**he XIOS is the software interface between Concurrent DOS 386 or Concurrent DOS XM and the physical hardware. With the Concurrent DOS System Builder's Kit, Original Equipment Manufacturers (OEMs) and Value Added Resellers (VARs) can modify the XIOS software to tailor it to almost any 8086-, 80186-, 80286- or 80386-based computer system. They can also modify the XIOS to support additional users as well as custom add-on boards and unique peripherals.

DR NET, Digital Research's Networking utility, is included in the System Builder's Kit. A System Guide and Programmer's Utilities Guide for your particular version of Concurrent DOS are also included.

## ▶ Programmer's Toolkit

Independent Software Vendors (ISVs) and VARs can use Concurrent DOS to support and write sophisticated vertical market applications in single-user, or multiuser environments. Applications written to the Concurrent DOS environment will work unmodified on DR NET, providing application transparent networking solutions. Developers can provide complete software solutions at the microprocessor level without losing PC DOS/MS-DOS compatibility. The programming interfaces of both Concurrent DOS XM and Concurrent DOS 386 are fully compatible with each other, providing a flexible system environment for pre-existing and new applications.

A System Guide, Programmer's Guide, and Programmer's Utilities Guide are included with the Programmer's Toolkit.

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All registered users of Concurrent DOS XM and Concurrent DOS 386 will be offered product upgrades at a nominal charge directly by Digital Research.

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