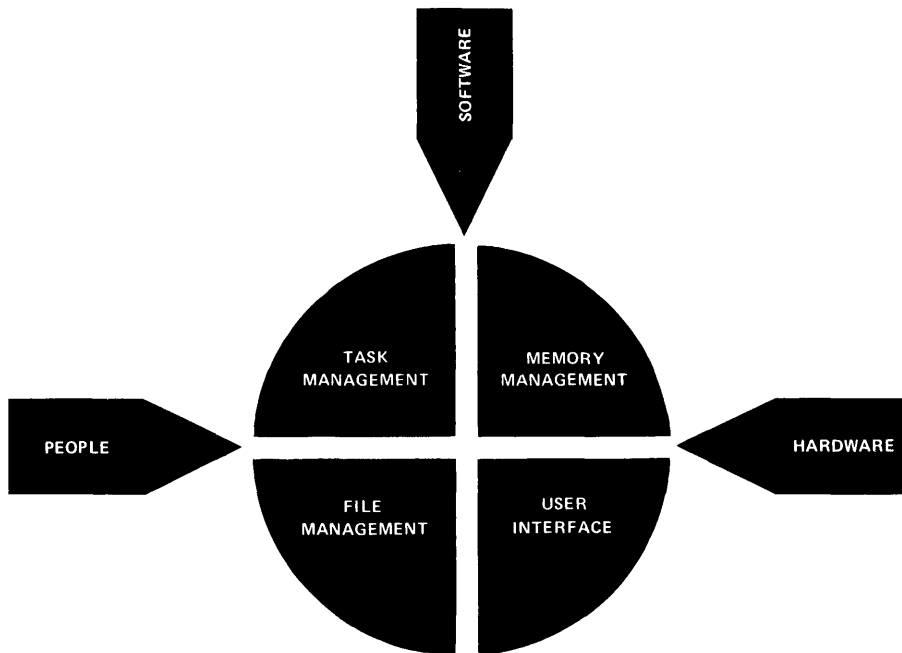


OS/16 MT2**Real-Time
Multi-Task
Operating
System****PRODUCT DESCRIPTION**

OS/16 MT2, Interdata's Real-Time Multi Tasking Operating System, provides efficient and powerful means for using the resources of Interdata 16-bit processors in real-time, program development, and computational environments.

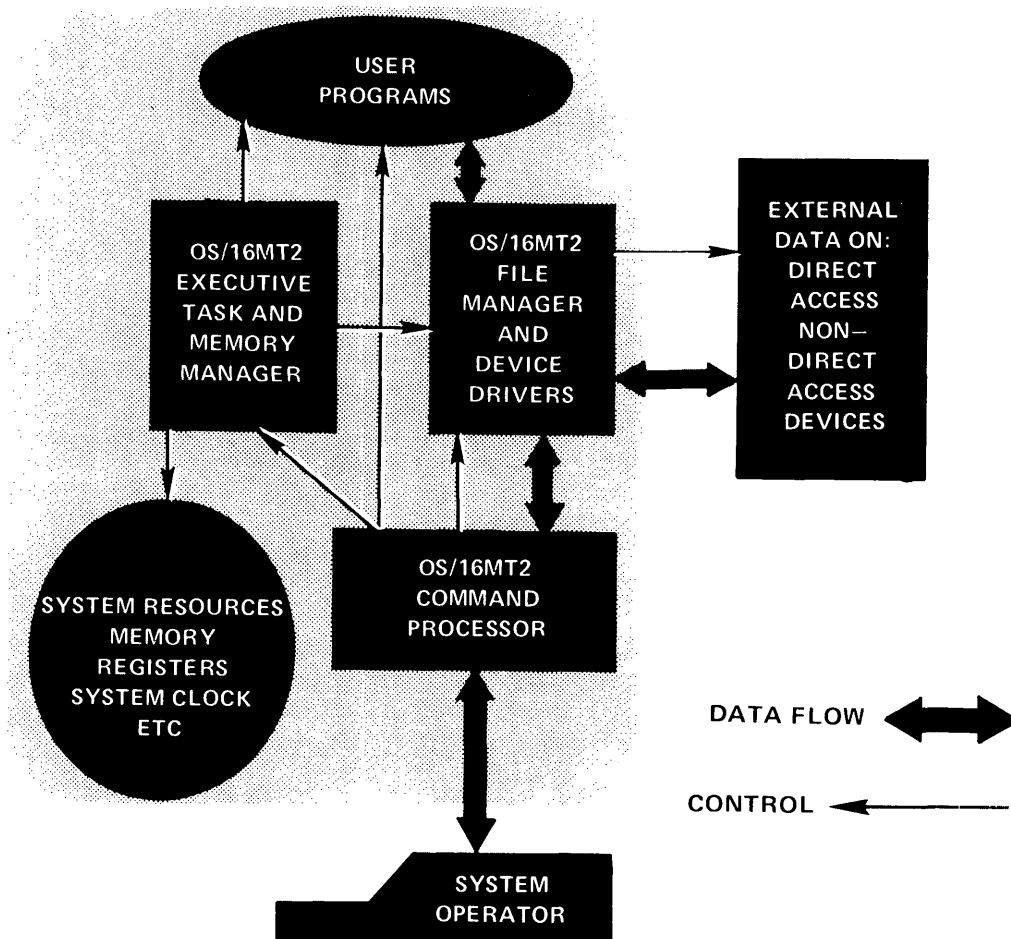
By providing extensive and easy to use system control, program control, and data management services, OS/16 MT2 frees the user to concentrate on problem solving rather than system management.

OS/16 MT2 is designed and optimized around the requirements of a real time applications environment that demands instantaneous response to real-time events while allowing the user to minimize memory requirements by using disc memory to store non-time critical OS functions.

OS/16 MT2 is a fully compatible subset of OS/32 MT, the operating system of the larger and even more powerful Interdata 32 bit minicomputers. Thus, growth from Interdata 16-bit to 32-bit products can be achieved without extensive retraining and reprogramming.

FEATURES

- Complete Task Management
 - Up to 256 Task Priorities
 - Task Scheduling
 - Intertask Communications
 - Task Handled Traps
- Extensive Memory Management
 - Partitioned System with Foreground, Background, Task Common, and Resident Library
 - Task Establisher Utility
 - Up to 126 Tasks in Memory
 - Roll-In/Roll Out
 - Overlay Facilities
- Powerful File Management
 - Indexed and Contiguous Files
 - File Protection at File and Task Levels
 - Device Independent I/O
 - Named and Protected Devices
- Convenient User Interface
 - Operator Communication through the Command Substitution System
 - Program Interface through Supervisor Calls



TASK MANAGEMENT

Task Management is the overall process by which a task is created, scheduled, and executed.

The foreground of OS/16 MT2 supports user written tasks with up to 256 priorities. These tasks have access to the full range of operating system services. Several tasks may share the same priority, with processing being accomplished on a round-robin basis. Round-robin is a sysgenable option.

Task Scheduling

Task Scheduling is carried out on a priority basis, an individual task being activated by any of four events.

- Operator Request. Through the command console, the operator can request tasks to be run at any time.
- Hardware Interrupt. The full range of ISA process control event facilities is provided at the task level (CONNECT, THAW, FREEZE, UNCONNECT).
- Time Scheduled Tasks. Tasks can be scheduled to run at a particular time of day or after an elapsed period of time.
- Inter-task Events. Tasks can communicate with and activate other tasks.

Intertask Communications

By means of a Supervisor Call (SVC), foreground tasks are provided with a wide range of Intertask Communications capability which enables the user to build a well structured system of tasks. The supervisor call permits a user task to load, start, suspend, or cancel a task and to queue a parameter or send a block of data to tasks. Other capabilities of the Supervisor Call permit the changing of a task's priority and the ability of a task to respond to an external interrupt.

Task Handled Trap

This powerful task level facility permits a task to be interrupted from its normal execution sequence by any one of a number of software or hardware causes. Task handled traps can occur as a result of an external interrupt, completion of an I/O proceed request, termination of a specified time, receipt of a data block from another task, or from an illegal instruction. Task handled traps are invaluable for the real-time systems programmer dealing with an environment of multiple asynchronously occurring events.

MEMORY MANAGEMENT

Partitioned Memory

OS/16 MT2 provides complete supervisory services for Foreground, Background, Task Common, and Resident Library partitions. As tasks are loaded, executed, or terminated, the OS/16 MT2 Executive performs all checks, status changes, loading, and clearing of partitions. OS/16 MT2 partition management facilities provide a flexible and reactive system that is easily adjusted to user needs.

Task Establisher Utility

Object modules produced from compilations and assemblies are established using the Task Establisher (TET/16). TET/16, a user level task which operates in batch or conversational mode, automatically builds a load module in memory image format suitable for execution under control of OS/16 MT2. Establishment includes the satisfying of all external references, setting task priority and defining overlay structure. Other parameters include such items as task size, whether Task Common or Resident Library is used, or whether a task should be considered resident.

Roll-In/Roll-Out

While up to 126 tasks may be resident in memory, because of space requirements it may be necessary for the Executive to roll-out a low priority task to execute a higher priority task. The rolled-out task is stored on disc file and, upon completion of higher priority level processing, is rolled-in and restarted at the point that its execution was suspended.

Overlay Facilities

OS/16 MT2 has multi-level task overlay facilities which are defined for a task via the Task Establisher TET/16. Additionally, several sections of OS/16 MT2 may be optionally overlaid. The system planner can choose to make OS/16 MT2 completely memory resident to enhance real time response or to overlay such portions as the File Manager or Command Processor to minimize memory usage.

FILE MANAGEMENT

Indexed and Contiguous Files

Files in OS/16 MT2 are identified by a three part file descriptor consisting of volume name, file name, and extension. An example of a file descriptor is DSK1:1:ORT.SCR, which specifies a disc known as "DSK1" to the system and a file containing FORTRAN source.

The indexed file structure provides the user with a file organization that allows the manipulation of logical records that are automatically blocked and deblocked. These logical records can be accessed either sequentially or randomly by specifying a logical record number. The indexed file is

open ended, does not require pre-allocation of disc space, and allows new data to be appended to it.

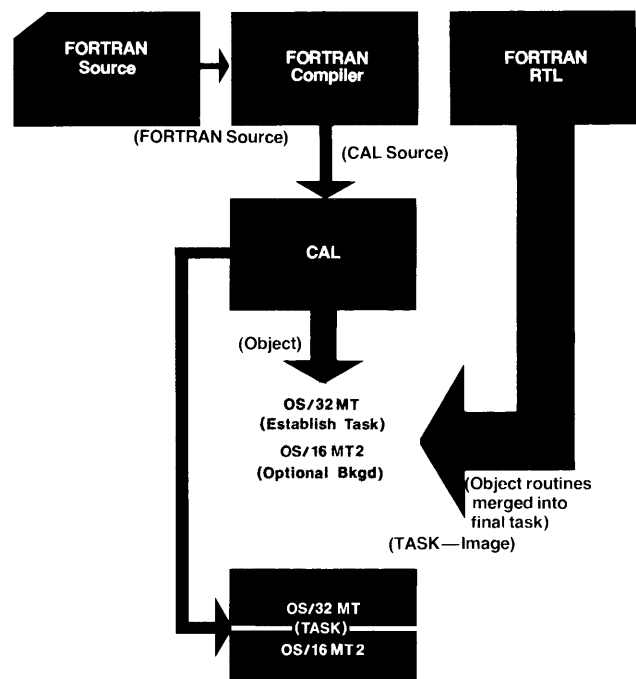
Contiguous file organization is designed for those applications in which the behavior of the file in terms of growth and activity is fixed and the user wants to apply his own particular algorithms or logic for file management with minimal system overhead. Contiguous files are particularly useful for real-time data acquisition applications where data must be obtained and stored rapidly for later analysis. The file consists of pre allocated, contiguous sectors which are to be read or written using relative sector numbers for either sequential or random access.

File Protection

Files and devices can be protected in one of two ways: statically or dynamically.

For static file protection the read/write keys are made part of the file itself. The read and write access privileges, e.g., shared read-exclusive write, are defined when the file is opened.

For dynamic file protection, the user can ask for exclusive access privileges, either read or write, at assignment time. Dynamic file protection, by which a task prevents other tasks from accessing a file while it is being used, remains in effect only while the file is assigned.



USER INTERFACE

OS/16 MT2's interface simplifies communication between the user and his system at both program and operator level.

Program Interface

Program Interface is provided through Supervisor Call instructions. Supervisor Call instructions are executed by programs to request OS/16MT2 services. The parameters associated with the request are passed to the OS in a parameter block. Most console services are available through Supervisor Call instructions.

Operator Interface

The operating system is controlled by the operator through a system console, typically a CRT, Carousel, or Teletype. The operating system reads commands from the console and writes system messages to it. Tasks may write messages to the system console.

An extension to OS/16 MT2, the Command Substitution System (CSS) allows commonly performed operations to be executed with one command. The user establishes files of commands that can be called from the console and executed in a defined sequence. In this way complex operations are carried out with a few operator commands. These commands are analogous to macro instructions in assembly language.

To simplify the use of OS/16 MT2, Interdata has developed a library of commonly used operator command sequences. CSS commands including:

- FORTCLG – Performs a FORTRAN compile and go sequence
- RUN – Executes a program
- ESTAB – Established a task in OS/16 MT2

SYSTEM CONFIGURATION

Minimum hardware configuration to support OS/16 MT2 requires the following Interdata products:

- Interdata 16-Bit Processor
- 32 KB Memory for OS Operation
- 64 KB Memory for System Assembly of OS/16 MT2
- Console Turnkey Panel
- Console Device
- Binary Input Device

MINIMUM SYSTEM HARDWARE

- ASCII I/O Device
- ASCII I/O Device
- Binary I/O Device
- 64 KB Memory

Interdata can supply in-house system for users without minimum hardware requirements.



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The information contained herein is intended to be a general description and is subject to change with product enhancement.

SOFTWARE SUPPORT

Language Processors

- Extended FORTRAN IV ANSII standard with extensions.
- FORTRAN V, Level 1 Comprehensive compiler supporting ISA/Purdue real-time extensions
- Extended BASIC Dartmouth standard plus extensions, including string and matrix manipulations.
- CAL (Common Assembly Language) Assembler Allows user to target object code to either 16 bit or 32-bit processors.
- CAL/16 Subset of CAL; allows assembly of 16-bit, non-FORTRAN source programs.

Software Utilities

- OS EDIT Interactive character editor allowing update of either ASCII or binary files.
- OS AIDS Comprehensive interactive debugging program.
- OS Library Loader Provides user with tools to create, maintain, update, and load from program libraries.
- OS Copy Binary or ASCII copy of file volume for peripheral conversion, reproduction, or data retention.
- ITAM/16 Provides the user with a simple device-independent method for data transmission over synchronous or asynchronous communications lines.
- CUP Generates assembly code required to customize OS/16 MT2.
- GET Provides simple establishment of user tasks.
- Disc Compress Provides for maintaining and copying user discs.
- Disc Integrity Checker Gives user double check of disc validity.

SUPPORTED INTERDATA OPTIONS

Display Panels
Power Fail-Auto Restart
7 and 9-Track Magnetic Tape
Discs, 2.5, 10 and 40 Megabyte
High Speed Paper Tape Reader/Punch
INITIATAPE Cassette
Line Printer (60 to 600 LPM)
Card Reader (400 to 1000 CPM; Hollerith to ASCII Code Conversion)
Carousel Terminal
TTY
Video Displays
Mini Input/Output System (A/D, D/A)
Universal Clock Module
Single and Multi-Line Asynchronous Communications Adapters – PALS, PASLA
Memory Protect