HEWLETT PACKARD

RTE-6/VM

Index and Glossary

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Printing History

The Printing History below identifies the edition of this manual and any updates that are included. Periodically, update packages are distributed that contain replacement pages to be merged into the manual, including an updated copy of this printing history page. Also, the update may contain write-in instructions.

Each reprinting of this manual will incorporate all past updates; however, no new information will be added. Thus, the reprinted copy will be identical in content to prior printings of the same edition with its user-inserted update information. New editions of this manual will contain new information, as well as all updates.

To determine which manual edition and update is compatible with your current software revision code, refer to the Manual Numbering File or the Computer User's Documentation Index. (The Manual Numbering File is included with your software. It consists of an "M" followed by a five digit product number.)

First Edition ..... Dec 1983 .....
Second Edition ..... Jun 1993 .....

Table of Contents

Preface

This manual provides documentation maps of the RTE-6/VM Operating System, descriptions of the operating system manuals, a glossary of terms used throughout the manual set, and an index to the operating system manuals.

The documentation maps show the manuals needed by the users of the RTE-6/VM system. Typically, there are four groups of system users:

- New users who are using RTE-6/VM for the first time
- General users: terminal operators, test technicians, and so forth
- Programmers and system analysts
- System managers or those who are thoroughly familiar with RTE-6/VM

Brief descriptions of each of the RTE-6/VM manuals (except the driver and language manuals) follow the documentation maps.

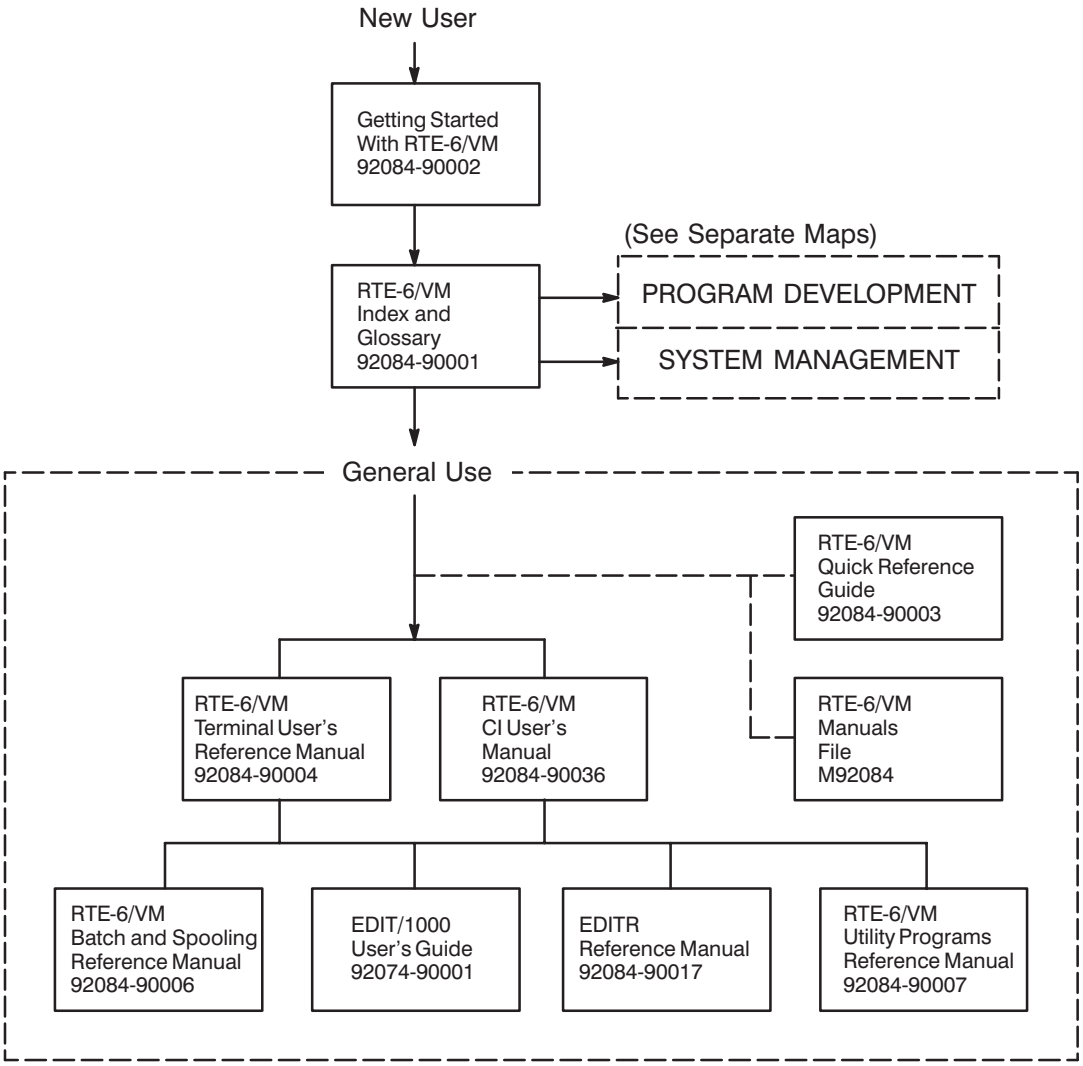
The index tells you what manual contains the information you want. You can then refer to the table of contents or the index of that manual to find the information.

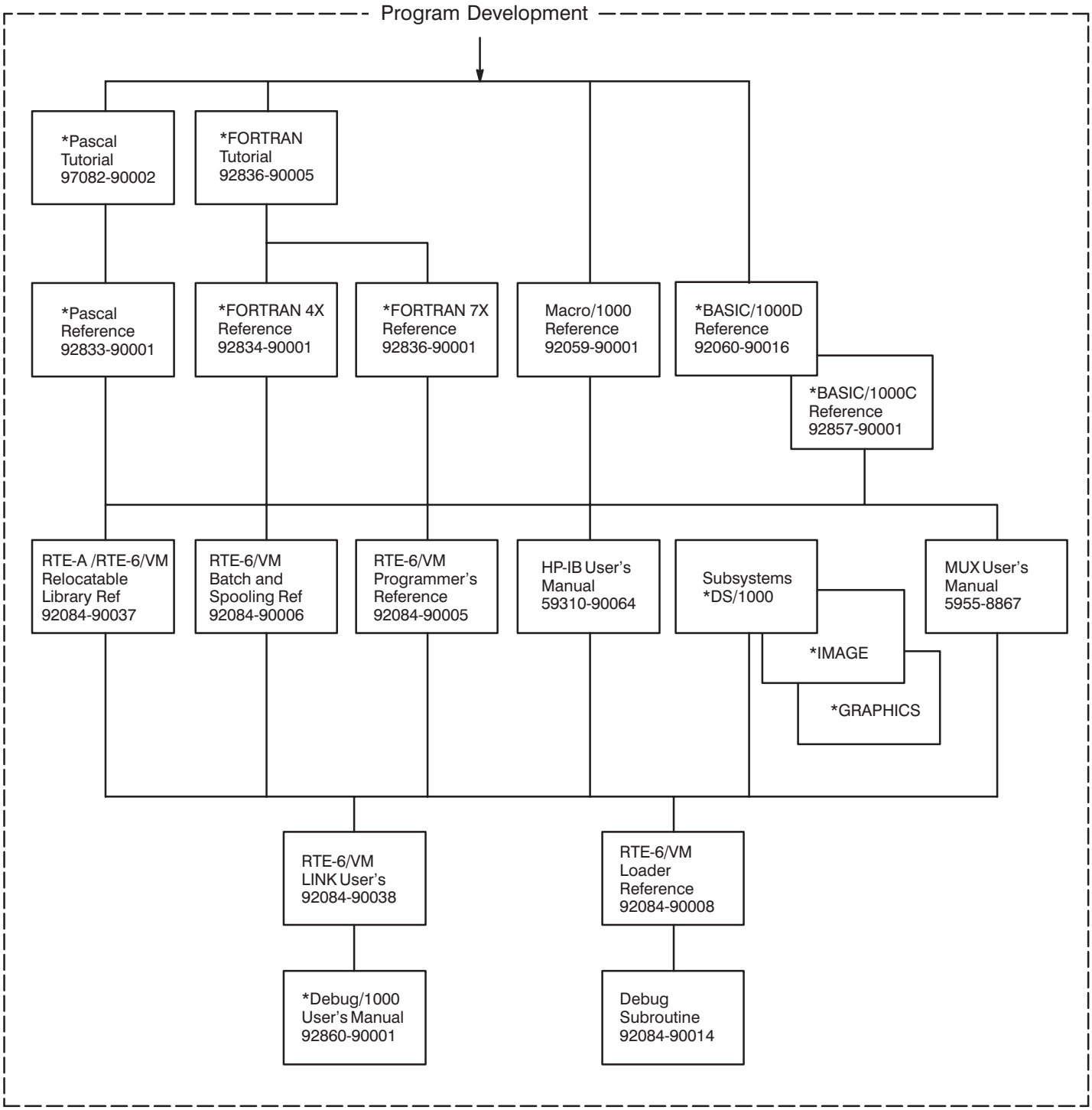
The index is in alphabetic order. Each topic is followed by one or more manual mnemonic and page number. For example,

ICD disk surface organization: *SMM* 4-5, A-13
.
.
.
RMPAR subroutine: *BSP* 3-2; *LODR* 4-31; *PROG* 5-41; *REL* 5-24

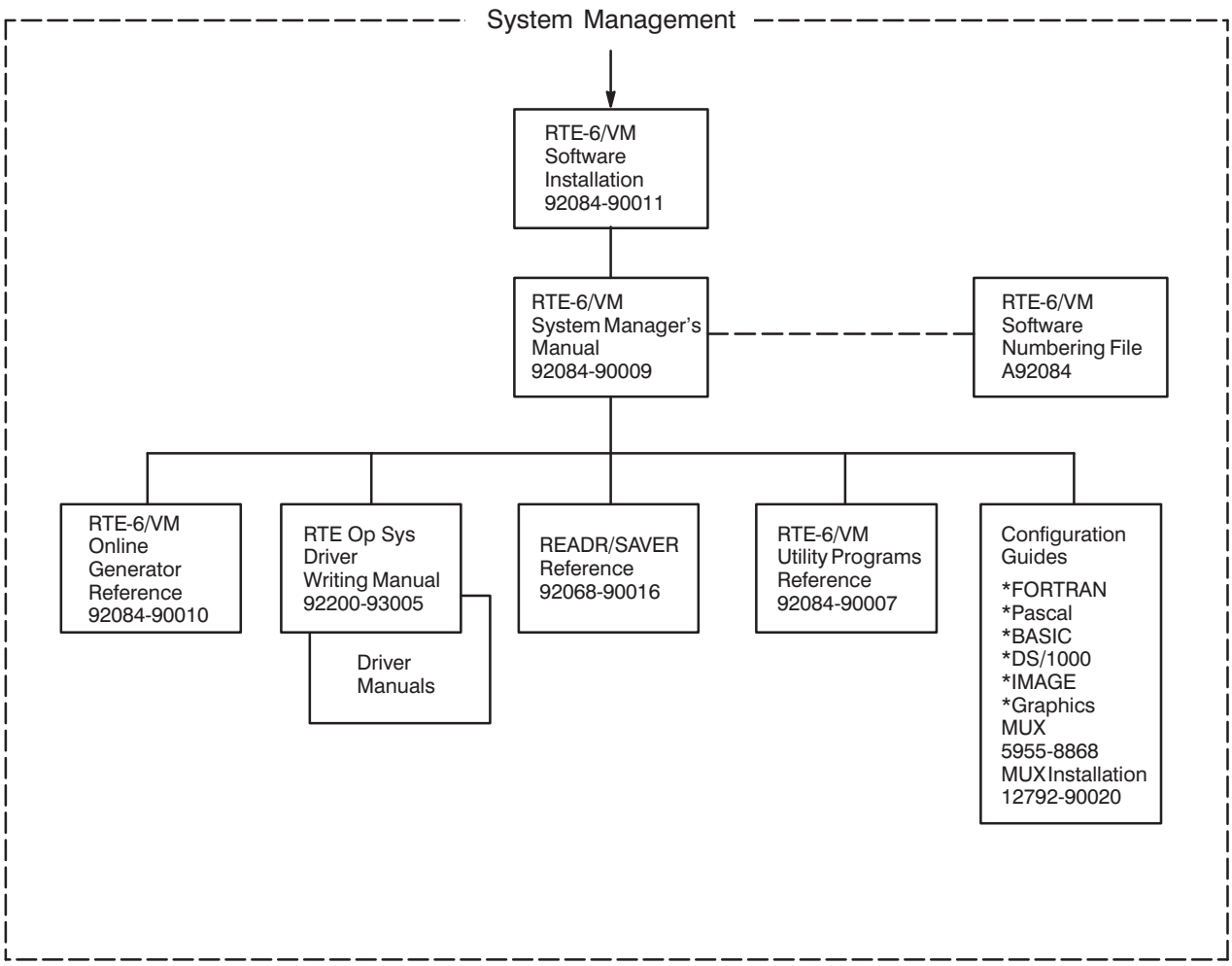
The first entry above refers to pages 4-5 and A-13 of the System Manager's Manual. The second example refers to page 3-2 of the Batch and Spooling Reference manual, page 4-31 of the Loader Reference Manual, and so on. The manual mnemonics are listed at the beginning of the index.

RTE-6/VM Operating System Documentation Maps





* Indicates products not included in RTE-6/VM.



* Indicates products not included in RTE-6/VM.

Manual Descriptions

Title: HP 12792B/C 8-Channel Asynchronous Multiplexer User's Manual
Part Number: 5955-8867
Manual Mnemonic in Master Index: CMUX

This manual is a technical reference for the HP 12792B/C Eight-Channel Asynchronous Multiplexer subsystem for M/E/F-Series HP 1000 Computers. It also provides general information concerning the multiplexer subsystem and its interrelationships with HP 1000 products.

Title: HP-IB in HP 1000 Computer Systems User's Guide
Part Number: 59310-90064
Manual Mnemonic in Master Index: HPIB

This manual describes the hardware and software interface between HP 1000 computers under the RTE operating system. It explains briefly how to prepare and connect the hardware, describes HP-IB programming in detail for FORTRAN, BASIC/l000D, and BASIC/l000C, and provides loading information for RTE-6/VM and other RTE Operating Systems.

Title: Macro/1000 Reference Manual
Part Number: 92059-90001
Manual Mnemonic in Master Index: MAC

This manual describes the Macro/1000 Assembly Language programming under RTE-6/VM and other RTE systems. It provides information on assembler instructions and source file generation and assembly, including conditional assembly. It also describes macro creation and macro libraries.

Title: READR/SAVER Reference Manual
Part Number: 92068-90016
Manual Mnemonic in Master Index: RDSV

This manual describes the backup utility programs SAVER and READR. READR/SAVER is a utility package that can be used as a means to distribute software updates or to back up and restore user files.

Title: EDIT/1000 User's Guide
Part Number: 92074-90001
Manual Mnemonic in Master Index: EDIT

This is a tutorial and reference manual for the screen editor program EDIT. It guides new users from the basic editing concepts of creating, modifying, and manipulating text files to detailed descriptions of EDIT's powerful features such as masking and regular expressions. For advanced users, it includes descriptions of all the EDIT commands given in alphabetic order. It also explains how to load EDIT into an RTE operating system.

Title: **RTE-A • RTE-6/VM Relocatable Libraries Reference**
Part Number: **92077-90037**
Manual Mnemonic in Master Index: **REL**

This manual is a collection of relocatable library subroutines. It describes the subroutines and call sequences and lists the subroutines for reference.

Title: **RTE-6/VM Manuals File (M92084)**
Part Number: **92084-17998**
Manual Mnemonic in Master Index: **(none)**

This is a listing of RTE-6/VM software manuals for the current revision (date code) by title, part number, and print date. Also included are all the applicable update numbers. It is provided as a file on the software medium supplied.

Title: **RTE-6/VM Software Numbering File (A92084)**
Part Number: **92084-17999**
Manual Mnemonic in Master Index: **(none)**

This is a listing of RTE-6/VM software modules by title, part number, and software revision (date) code. Only a file is provided on the product medium. Users must obtain their own hard copy if desired.

Title: **Getting Started with RTE-6/VM**
Part Number: **92084-90002**
Manual Mnemonic in Master Index: **(none)**

This manual introduces the RTE-6/VM Operating System with Session Monitor. It illustrates the ease with which you can do the following:

- Communicate with the system
- Create and modify files, using the screen editor (EDIT)
- Develop and run programs
- Execute system commands (or run programs) from a procedure file

It is a tutorial guide for the first-time user.

Title: **RTE-6/VM Quick Reference Guide**
Part Number: **92084-90003**
Manual Mnemonic in Master Index: **(none)**

This manual provides a quick reference to RTE-6/VM interactive commands, syntax of selected program commands, system tables, and error messages.

Title: **RTE-6/VM Terminal User's Reference Manual**
Part Number: **92084-90004**
Manual Mnemonic in Master Index: **TUSR**

This manual describes the interactive use of RTE-6/VM through the File Manager program FMGR. It is the primary source of information for those performing data entry, file manipulation, program development, and other interactive tasks managed by FMGR.

Title: RTE-6/VM Programmer's Reference Manual
Part Number: 92084-90005
Manual Mnemonic in Master Index: PROG

This manual describes the features provided by the RTE-6/VM Operating System that allow programmatic use and/or control of the system resources. This manual also includes detailed descriptions of the calling sequences that invoke system action and examples in FORTRAN and Macro/1000, whenever applicable.

Title: RTE-6/VM Batch and Spooling Reference Manual
Part Number: 92084-90006
Manual Mnemonic in Master Index: BSP

This manual describes the initialization, use, and requirements of the Batch Spool Monitor subsystem. It is a reference manual for those who wish to use the batch processing and the spooling features of the RTE-6/VM system.

Title: RTE-6/VM Utility Programs Reference Manual
Part Number: 92084-90007
Manual Mnemonic in Master Index: UTIL

This manual describes most of the utility programs available as part of the RTE-6/VM Operating System. Some utilities are included with the CI File System enhancement that are to be used with the CI file system. These are described in the RTE-6/VM CI User's Manual.

Title: RTE-6/VM Loader Reference Manual
Part Number: 92084-90008
Manual Mnemonic in Master Index: LODR

This manual describes the MLLDR and LOADR loaders and the program segmentation and loading tools, SGMTR, SXREF, and INDXR. It provides reference material for the experienced users as well as descriptive information about the loading process.

Title: RTE-6/VM System Manager's Manual
Part Number: 92084-90009
Manual Mnemonic in Master Index: SMM

This manual describes the planning, generation, and maintenance of the RTE-6/VM Operating System. It is to be used in conjunction with the Online Generator Reference Manual to provide complete system generation information.

Title: RTE-6/VM Online Generator Reference Manual
Part Number: 92084-90010
Manual Mnemonic in Master Index: GEN

This manual describes in detail the procedures for generating a new RTE-6/VM Operating System without shutting down the existing system. Complete examples of each phase and annotated worksheets are provided. It is intended for use by the System Manager and system programmers who are involved in the design and maintenance of total system configurations.

Title: RTE-6/VM Software Installation Manual
Part Number: 92084-90011
Manual Mnemonic in Master Index: INST

This manual provides installation procedures for the RTE-6/VM software on the HP 1000 Model 60/65 Computer Systems. It is to be used by the HP Customer Engineer and the System Manager to install the preconfigured Primary System.

Title: Debug Subroutine Manual
Part Number: 92084-90014
Manual Mnemonic in Master Index: DBGS

This manual describes the DBUGR utility program used for debugging programs loaded with LOADR or MLLDR to be run on the HP 1000 series computers.

Title: RTE-6/VM CI User's Manual
Part Number: 92084-90036
Manual Mnemonic in Master Index: CUSR

This manual introduces interactive use of RTE-6/VM through the Command Interpreter program CI. This manual also describes the programmatic use of the CI file system subroutines and utilities. For new CI file system users, a tutorial section starts with simple system information requests and advances to program control and more sophisticated tasks such as mask request and directory manipulation. For the experienced CI users, a reference section lists and describes the CI commands.

This manual is the primary source of information for interactive and programmatic tasks performed through the Command Interpreter program.

Title: RTE-6/VM LINK User's Manual
Part Number: 92084-90038
Manual Mnemonic in Master Index: LINK

This manual guides a new user from a sample load session illustrating how LINK operates to a detailed functional description of the features of LINK. For experienced users, it describes special performance optimization methods and provides a reference section of all LINK commands. It also includes error messages and an installation guide for loading LINK on RTE-6/VM.

Title: RTE-6/VM Serial Driver User's Manual
Part Number: 92084-90050
Manual Mnemonic in Master Index: DMUX

This manual describes the RTE-6/VM serial drivers supported by the HP 12792C Multiplexer using Revision D firmware. It also contains a comparison between the Revision D Multiplexer and the Revision C Multiplexer described in the *HP 12792B/C 8-Channel Multiplexer User's Manual*, part number 5955-8867.

Title: **RTE Operating System Driver Writing Manual**
Part Number: **92200-93005**
Manual Mnemonic in Master Index: **DRVW**

This manual is a reference for HP-supported software driver development. It describes I/O characteristics of the RTE systems and presents the techniques and requirements for writing device drivers.

Title: **Symbolic Debug/1000 User's Manual**
Part Number: **92860-90001**
Manual Mnemonic in Master Index: **DBUG**

This manual describes the basic debugging rules and how to use the Symbolic Debug/1000 program. It includes a reference section describing all Debug commands and a special feature, profiling. This manual is a tutorial guide for new users and a reference for experienced users of the Symbolic Debug/1000 program.

Glossary

absolute program

A program that has been relocated and is capable of being loaded into main memory for subsequent execution. “Absolute program” is synonymous with “relocated program”. Examples of such programs are those relocated by the LINK loader, which are also known as type 6 files.

absolute system

The binary memory image of an RTE system (stored on logical unit 2).

account file

A disk-resident file created and maintained by the System Manager. It contains information on all authorized session users and other session related information.

address space

See logical memory or physical memory.

asynchronous device

A device that can perform I/O operations that are independent of time considerations but operates simultaneously with program execution. Interaction with the computer is through request/response circuitry.

auxiliary disk subchannel

An optional subchannel that is treated as a logical extension of the system disk subchannel, logical unit 2. If used, it is assigned to logical unit 3. The binary memory image of RTE-6/VM may not reside on the auxiliary subchannel.

background partition (BG partition)

The name of one of two types of partitions in RTE (real time and background), generally used for lower priority programs whose responses to interrupts are not time-critical. Any type of program that will fit in a background partition may run in one. Partition types are defined during generation and may be changed by reconfiguration.

background program

Type 4 (or type 3) program specified in the NAM record; a program loaded with the BG loader option; or a program loaded with LINK which defaults to type 4.

backing store file

A file on disk that contains all of the VMA data except the working set. It can contain up to 65536 pages of VMA data.

base page

A 1024-word area of memory corresponding to logical page 0. It contains the System Communication Area, driver links, trap cells for interrupt processing, and system and/or user program links.

base page fence

A hardware register that divides a logical base page into a portion containing the user's base page and a portion of the system's base page.

BG

See background.

bit bucket

Logical unit number pointing to Equipment Table entry number zero, which, in turn, does not point to an existing device. An I/O request directed to the bit bucket terminates immediately.

block

Two logical disk sectors of 128 bytes each, totaling 256 bytes.

For CS/80 disks, a block is the smallest unit of information that can be addressed on the disk. It is 128 words in length and corresponds to a cylinder, head, sector address.

boot extension

An absolute program that resides on the first two sectors of logical track 0 of the system subchannel (LU 2). The Boot Extension is first loaded into memory by the Bootstrap Loader or ROM Loader.

boot file

An optional file in which the Bootstrap Loader produced by the Online Generator is stored. This may be a disk file or a logical unit (for example, a mini-cartridge or magnetic tape).

bootstrap loader

A loader produced by the Generator and stored in the boot file. The Bootstrap Loader loads the Boot Extension into memory and then transfers control to the Boot Extension.

boot-up

The process of bringing the Bootstrap Loader or ROM Loader contents into memory. Control is then transferred to the Boot Extension to begin the initialization process.

buffer

An area of memory (main-memory, mass memory, or local peripheral memory) used to temporarily store data.

capability level

An integer from 1 to 63 that defines the FMGR, System, and Break-Mode commands a session user may execute.

cartridge

A set of contiguous tracks or cylinders on a disk unit maintained by the operating system. Used by the FMGR file system, cartridges contain disk files with a directory of the files stored on each cartridge. All files on the same cartridge must have unique names.

The system disk on LU 2 contains the RTE operating system and swap area and may contain FMP files. Each cartridge has a corresponding LU number.

This term is not applicable to the CI file system. See directory, subdirectory, and disk volume for the CI file system equivalent.

chaining

A technique for coordinating sequential execution of independent programs in the same portion of main memory.

chunk

A file size unit used in the CI directory file entry to designate a size of 128 blocks.

class I/O

A means of buffering data transfers between devices and user programs, and between programs themselves, that permits a user program to continue execution concurrently with its own I/O. The term "I/O without program wait" is a commonly used term.

close file

A method of terminating program access to a file so that no further read/write operations may be performed to the file until the file is opened.

closed file

A file that is not available for read and write access by a program. Compare open file.

Command Interpreter (CI)

A file management program that allows a hierarchical file directory structure. It allows the operator to manipulate files and manage disk storage, run and terminate programs, modify certain system parameters, and gain access to a number of operating system features.

common

An area of memory that can be accessed by a program and its subprograms. Usually used to pass data from a program to a subprogram. In RTE, system COMMON may be used to pass data from one program to another.

configuration table

A set of default logical units associated with the station at which a session user logs on.

configurator

A two-part program that allows reconfiguration of an RTE system's I/O and physical memory structure without going through a new system generation. The configurator is initiated as an option during the boot process.

CS/80 - Command Set/80

A Hewlett-Packard convention for mass storage devices, and the disk drives and tape drives that conform to it.

current directory

See working directory.

current page

The memory page in which the executing instruction is located. Some HP 21MX memory reference instructions can only directly reference locations in two pages: current page and base page.

cylinder

The disk surface area that passes under all heads during one revolution of the disk.

data control block (DCB)

A buffer within an executable program that contains information used by the File Management Package (FMP) in performing disk accesses.

DCPC

See dual channel port controller.

default directory

See working directory.

device down

Relates to the state of a peripheral device or I/O controller. When the device is down, it is no longer available for use by the system. The term also refers to the DN operator command.

device independence

Refers to the ability of a program to perform I/O without knowing which physical device is being accessed (see also Logical Unit Number).

device reference table (DRT)

A table created during system generation corresponding to logical units 1 through 255. The contents of the Device Reference Table include a pointer to the associated EQT entry, subchannel number of the device, and information as to whether or not the device is locked. The table may be modified by the user through a system LU command.

device timeout

A time interval associated with a specific I/O device. If the system expects a response from such a device and this response does not occur within the timeout period, the device is assumed to be inoperative by the system. This feature is necessary to prevent a program from getting "hung up" (suspended) because it is waiting for a response from a non-functioning peripheral device.

direct memory access

See dual channel port controller.

directory

A list of files currently stored on a disk subchannel that can be displayed by the user. In the CI file system, a directory is a data structure that contains the names of subdirectories and files on a disk volume (LU). Each directory contains information about the subdirectories and files within it, including file lengths, file types, and location on the disk.

directory search path

The path through the CI hierarchical directory structure to find a file or a group of files. Also referred to as the path name.

disk

Strictly speaking, the term means the platter(s) with the storage medium only; however the term is also loosely used to mean the entire peripheral including the drive.

disk-based

Refers to an operating system that uses a disk storage device as an integral part of the operating system or to a program stored on disk while it is running. Disk-based systems and programs take up less memory than memory-based systems, but execution speed is traded for the memory gain, because time is spent loading sections of the system (or program) into memory as they are needed. A disk-based system also describes a real-time system that permits programs to be swapped between disk and memory to let other programs run.

disk formatting

The process by which physical track and sector addresses are written on the disk. Disk formatting may be performed by the appropriate disk diagnostic program. After formatting is complete, the SWTCH program and disk backup utilities may perform subchannel initialization.

disk-resident

A term applied to programs or subroutines in executable form (absolute) that are stored on disk and brought into main memory for execution by the system in response to a program or operator request, time-of-day schedule, or an I/O interrupt.

disk ROM boot

A loader residing in Read-Only Memory that loads (offline) the Boot Extension from disk storage and transfers control to the Boot Extension. (See also boot extension and startup.)

disk volume

A group of contiguous tracks or cylinders on a disk unit identified by a logical unit number. Used by the CI file system for file storage. CI file organization is maintained by the use of directories and subdirectories.

dismount

Remove a disk or tape volume or cartridge (LU) from the system, either logically or physically. Compare mount.

dispatcher

An RTE system module that selects, from the scheduled list, the highest priority program to be executed next. The dispatcher module loads the program into memory from disk (if the program is not already in memory) and transfers control to the program.

A Dispatcher is also a system routine that selects from the scheduled programs list the program to be executed, according to program priority, time scheduling, and availability of I/O devices. If the selected program is not already in main memory, the dispatcher loads it from the disk and begins execution.

DMA

Direct memory access (see DCPC) or dynamic memory area.

DMS

See dynamic mapping system.

dormant program

A dormant program is one that is inactive. More specifically, in RTE, it is a program that is neither executing, suspended nor scheduled. A dormant program is in state 0.

down

Status of a device controller EQT or LU that is not available for use. Devices can be down for a number of reasons, including a device timeout or execution of the DN operator command. Compare up.

driver

- A software module that interfaces a device and its controller to an operating system. Drivers specified by EQT definitions will go into either a driver partition or into the System Driver Area of memory

driver partition

A section of memory that contains one or more drivers. In RTE-6/VM, all drivers are in physical memory; however, only the driver partition containing the driver currently being used is included (mapped) in the logical address space.

DRT

See device reference table.

dual channel port controller (DCPC)

A hardware accessory that permits an I/O process to transfer data to or from memory directly, or access memory, thus providing a much faster transfer of data. The operating system controls access to the DCPC channels.

dynamic buffer space

Additional buffer space allocated to a program after the program code itself. The additional size is determined by the user. Typically used only by assembly language program.

dynamic mapping system (DMS)

A hardware accessory allowing partitioned memory systems to address memory configurations larger than 32K words of physical memory.

dynamic memory allocation

Creating a memory partition in the dynamic memory area for a program or shareable EMA. The process is dynamic because the area is allocated as it is needed, and the memory is subsequently freed. The dispatcher controls dynamic memory allocation.

dynamic memory area

The area of physical memory in which the dispatcher performs dynamic memory allocation.

EB

See extended background program.

EMA

See extended memory area.

EQT

See equipment table.

EQT extension

Provides a method for increasing the size of an Equipment Table entry's buffer space, during system generation, that gives the specified I/O driver more words of storage space than are available in the EQT temporary storage area.

equipment table (EQT)

A table in memory associating each physical I/O device controller with a particular software processing routine (driver). For a given device, the EQT provides status information, temporary storage and parameter passing services (see also Device Reference Table and Interrupt Table).

EXEC

One of the RTE system modules that interfaces user programs to the operating system.

executable program

A program with an assigned ID segment that can be scheduled and executed. Executable programs are present in the operating system's program lists.

executing program

The highest priority scheduled program. Programs can be moved from the scheduled, dormant, and suspended program lists to the executing program state provided the proper conditions are met. Refer to the Programmer's Reference Manual for more information.

extendable file

An FMP file that is automatically extended in response to a write request to point beyond the range of the currently defined file. An extent is created with the same name and size as the main, and the access is continued.

extended background program

A program loaded with the EB loader option. The program has only a base page and program code mapped in the user logical program space. It is also referred to as a type 6 program.

extended memory area (EMA)

An area of physical memory that may extend beyond the user's program space. It is used as a large data area. The whole EMA area resides in physical memory but only parts of it are mapped into the logical program space. The EMA area may exist in the physical memory after a program's code in the program partition or in a separate partition if it is a shared EMA area.

external reference

A reference to a declared symbolic name not defined in the software module in which the reference occurs. An external reference is satisfied by another module that defines the reference name by an entry point definition.

file

A series of records on a mass storage device that contains data, a program, or text.

file descriptor

The various parameters that specify a particular file. Refer to the Terminal User's Reference Manual for a definition of the FMGR file descriptor and to the CI User's Manual for the CI file descriptor definition

The FMGR file descriptor consists of the following parameters:

```
filename[:sc[:crn[:type[:size[:reclen]]]]]
```

The CI file descriptor consists of the following parameters:

```
dir/subdir/filename.typex[.qual:::[type[:size[:reclen]]]]
```

file extents

See extendable file.

file management

The operating system functions associated with maintaining disk files (translating file names to physical disk memory areas, maintaining a directory, checking for security codes, and so forth.)

file management package (FMP)

A collection of subprograms used to access, control, and maintain files.

file manager (FMGR)

A program that provides FMP file creation, access, and manipulation services through FMGR commands entered by the user.

file mask

A feature in the CI file system used to specify several files at once. It includes wildcard characters in filename and file type extension and other file information in a qualifier field appended to the file type extension separated by a period.

file type extension

A field of up to four characters that specifies the type of information in the file. This field is appended to filename in the CI file descriptor separated by a period.

filedescriptor

A parameter in a subroutine specifying a file descriptor.

filename

A file descriptor parameter that identifies the name of a file on a mass storage device. For FMGR files, it consists of 1 to 6 characters, subject to RTE file naming conventions as defined in the Programmer's Reference and Terminal User's Reference Manuals. For CI files, it consists of one to 16 uppercase or lowercase letters, numerals, or symbols subject to the CI file naming conventions as defined in the CI User's Manual.

firmware

Code stored in Read Only Memory (ROM), including microcode and machine language programs.

FMGR

See file manager.

FMP

See file management package.

foreground partitions

Another term for real-time partitions.

generation

Creation of an operating system that meets specific Input/Output (I/O) and memory mapping needs. The primary operating system shipped with the computer system was created with a general I/O configuration that works for many applications; it may need to be changed for some applications.

global tracks

Global tracks are a subset of system tracks and are accounted for in the track assignment table. Any program can read/write or release a global track (that is, programs can share global tracks).

HI file

See user HI file.

HP-IB (Hewlett-Packard Interface Bus)

Hewlett-Packard's enhanced version of IEEE 488-1978, Digital Interface for Programmable Instrumentation. The HP-IB is an eight-bit parallel interface bus that facilitates communication among computers and peripherals.

ID segment

A program table entry in physical memory that identifies an executable program; it includes information such as program name, priority, current scheduling status and other characteristics, disk address and address of swap area on disk. Every program must have its own ID segment. The number of available ID segments in the system is fixed at generation.

ID segment extension

A method for increasing the size of an ID segment to save additional information about its associated program. The extensions are used only for EMA programs (see EMA). ID segment extensions are automatically allocated by the generator or loader, but only if sufficient ID segment extensions were specified during system generation.

indexed library

A subroutine library that has been indexed by the LINDX or INDXR utility (for LINK and MLLDR respectively). Indexed libraries can be scanned faster by the relocating loader, which reduces loading time.

integrated controller disks (ICD)

Disks that have their own controller in each disk drive are ICD disks. They use the HP 12821A interface card and the DVA32 disk driver. The HP 7906H, 7920H, 7925H and 9895 disk models are ICD Disks.

interrupt

A signal to the device driver, the system clock, or the powerfail/auto-restart system to indicate the need to initiate or complete an I/O transfer, update the system time, or respond to a power failure.

interrupt location

A memory location in the base page that contains an instruction to be executed in response to an interrupt. There is one instruction for each select code; each instruction is a branch to the interrupt table entry for the select code with the following exceptions:

- The interrupt location for a privileged driver contains a branch to the driver. Privileged drivers process their own interrupts. See privileged driver and privileged interrupt.
- The interrupt locations for the time base generator (TBG) and the powerfail/auto-restart system are branches to operating system routines for those devices. Interrupt locations are also called trap cells.

interrupt table (INT)

A table that associates interrupt links with the octal select codes of peripheral devices to specific EQT entries or programs.

I/O

A general term referring to any data transfer between a computer and its peripheral devices.

I/O controller

A combination of interface card(s), cable, and (for some devices) controller box used to control one or more I/0 devices.

I/O device

A physical unit defined by an EQT entry (I/O controller) and a subchannel.

I/O without wait

See class I/O.

keyword table

A table of ID segment addresses.

LG (Load and GO) area

A group of tracks on LU 2 used temporarily to store relocatable code that can be accessed by the File Manager.

library

A collection of relocatable subroutines that perform commonly-used (for example, mathematical) functions. Subroutines are appended to referencing programs or are placed in the memory-resident library for access by memory-resident programs.

loader

A program that converts the relative addresses of relocatable programs to absolute addresses compatible with the memory layout of a particular system.

local common

An area of COMMON appended to the beginning of a program and accessible only by that program, its subroutines, or segments. This type of COMMON can be specified only during online relocation by LOADR or MLLDR.

locked device

See logical unit lock.

locked file

A file opened exclusively to one program and, therefore, not currently accessible to any other program.

logical memory

Logical memory is the 32K-word (maximum) address space described by the currently enabled memory map. If the System Map is enabled, it describes those areas of physical memory necessary for system operation. When the user map is enabled, it describes those areas needed by the currently executing program. DCPC maps describe the address space to/from which the transfer is taking place.

logical unit (LU)

A positive integer (O to 255) associated with a device used to identify an I/O device.

logical unit lock

A mechanism for temporarily acquiring exclusive use of an I/O device or devices by a program to ensure its I/O completion before being preempted by a another program.

log off

The process by which a session is terminated.

log on

The process by which a session is initiated. The logon process involves checking the session user's identification to allow access to the system, and the creation of the user's operating environment through the user HELLO File and Session Control Block.

LU

See logical unit.

mailbox I/O

A class I/O term applied to a protected buffer that keeps track of the "sender" and "receiver" program for each block of data in the buffer used in program-to-program communication.

main program

The main body of a user program (as opposed to the whole program, which may include subroutines or segments).

map

This term applies to a set of 32 registers that point to 32 pages of physical memory. A map defines a 32K-word logical address space.

mapping segment (MSEG)

The part of a program's logical address space located in EMA or VMA. The mapping segment size is the maximum EMA/VMA size in number of pages available to the program.

medium

The material on which software is recorded for transportation, such as magnetic tape, cartridge tape, disk, or flexible disk.

memory page

One of the 32 sets of 32 map registers which is approximately lK word in size.

memory protect

A hardware accessory that allows an address (memory protection fence) to be set so that when in protected mode, the locations below that address cannot be accessed by writes or JSB/JMP instructions.

memory-resident library

A collection of reentrant or privileged library routines available only to memory-resident programs. These routines are included in the disk-resident relocatable library.

memory-resident program

A program that executes from a designated area in physical memory and remains in memory, as opposed to a disk-resident program that may be swapped out to the disk or loaded from the disk to another area in memory. Memory-resident programs are loaded only during system generation, and usually are high priority programs with short execution times.

module

A unit of code, usually a subroutine.

mother partition

A partition that may be larger than the 32K words and that may consist of a group of subpartitions. The subpartitions allow many smaller programs to use the memory when the mother partition is not active.

mount

To add a disk cartridge, magnetic tape unit, or a disk volume to a list of available mass storage units. These units must be mounted before they can be accessed.

MSEG

See mapping segment.

Multiple Access Controller disks

Disk drives that use the HP 13037B/C disk controller are MAC disk drives. They use the DVR32 disk driver. The HP 7906M, 7920M, and 7925M disk models are MAC disks.

multiprogramming

An interleaving process that allows execution of two or more programs within the same period of time, giving the appearance of concurrent execution. Multiprogramming improves the efficiency of a computer by making use of the time a program is idle. The computer executes another program as soon as the current program is in a state waiting for resource or completion of data transfer.

Multi-Terminal Monitor

A system software module that provides for interactive program development and editing in a multi-terminal environment controlled by a single computer. RTE-6/VM systems run under either the Multi-Terminal Monitor or the Session Monitor.

namr

A logical unit number or a file descriptor.

offline

Refers to the use of the computer and/or I/O devices without the RTE-6/VM Operating System. Some hardware and software can be used either stand-alone or with a special-purpose operating system. For example, the use of FORMC or FORMF to format a disk is an offline operation.

online

Refers to software or I/O devices connected to and controlled by the operating system.

online generator

A program that permits use of an existing RTE operating system's services to generate a new system from relocatable software modules found in FMP files. System control can then be transferred to the new operating system through use of a program called SWTCH. (Refer to the *RTE-6/VM Online Generator Reference Manual*.)

online loading

The relocation of programs through use of one of the relocating loaders: LINK, LOADR or MLLDR (see relocation).

open file

A file that has been made available for read and write operations by a program. Compare closed file.

operator's console

See system console.

operating system

An organized collection of programs designed to optimize the usage of a computer system. The operating system performs memory management, file management, interrupt handling, program scheduling, and I/O operations. In general, these operations are transparent to the system users but they can be accessed through the File Manager, Command Interpreter program for interactive operations, or the File Management Package for programmatic access.

overlays

Also called segments; these are program modules that share the same portions of a program's logical address space. A segment is called into memory prior to the execution of the routines within the segment.

page

The largest block of memory (1024 words) that can be directly addressed by the address field of a one-word memory reference instruction.

page table

A list of the VMA data pages currently in the working set, and the locations of the pages.

partition

A predefined block of memory with a fixed number of pages (redefinable at system boot) allocated for program execution. The user may divide the disk-resident program area into as many as 64 partitions that can be classified as a mixture of real-time and background, all real-time, or all background.

path name

A directive for finding one file or a group of files in the CI file system, specified in the file directory to show the search order of directory/subdirectories for locating the file(s). For example, in the following file descriptor, the path name precedes file name CI.STK:

```
directoryA/subl/sub5/sub6/ci.stk
```

peripheral disk subchannel

A disk subchannel available for read or write operations but for which RTE-6/VM does not manage nor maintain a track assignment table. These subchannels may be managed by the File Management Package or by the user. A peripheral subchannel must have a logical unit number assignment greater than 3.

physical memory

Physical memory is the total amount of memory defined at generation or reconfiguration time. It refers to the actual memory in the computer that the operating system can manage and use.

powerfail/auto-restart

A system in the HP 1000 computer that saves the current state of the system in memory when power is lost, to restore the system to a predefined condition when power returns.

priority

A numbering system designating the order of importance. Usually applies to program execution. The priority number assigned to a program determines whether it runs immediately or waits for higher priority programs to complete or become suspended. Program priorities are represented as integers between 1 (highest) and 32767 (lowest).

privileged drivers

I/O drivers that process the interrupts generated by devices under their control. Privileged drivers offer improved response time but they must perform their own housekeeping tasks, such as saving status upon interrupt, that are normally performed by the operating system.

privileged interrupts

Interrupts that bypass normal interrupt processing to provide faster response time. Privileged interrupts are used when the interrupt must be processed immediately. They are processed by privileged drivers.

privileged subroutine

A subroutine that can execute with the interrupt system off (and, therefore, bypasses the operating system). It allows high-speed processing at the cost of losing use of operating system housekeeping services and real-time response.

program management

Handling of the dormant, scheduled, and suspended programs lists and control of programs as they execute and move between the lists. Refer to the *RTE-6/VM Programmer's Reference Manual* for a description of the lists.

program state

The current status of an executable program; it may be one of the following: dormant, suspended for I/O, suspended waiting for general resource, suspended waiting for memory, suspended waiting for disk space, and suspended by operator.

program swapping

See swapping.

purge

Refers to the act of instructing the operating system to delete a file or program from its directory. Usually used with reference to disk files and the interactive PU command.

Real-Time Executive (RTE)

The operating system of the HP 1000 computer. It is made up of software modules and a number of tables in memory through which the modules communicate. In RTE-6/VM documentation, the terms operating system, RTE, and RTE-6/VM are synonymous.

HP 1000 operating systems are called real-time to differentiate them from time-shared systems in which all programs are given an equal share of the CPU processing time. In a time-shared system, the system steps from one task to the next. In a real-time system, CPU time is allocated according to priority and the operating system can respond immediately to asynchronous events.

Real-Time (RT) partition

A name for one of the two types of partitions in RTE; generally used for higher-priority programs. The real-time area is synonymous with the “foreground” area.

record

A logical subdivision of a file. Records in a file are either fixed-length or variable-length and are terminated by an end-of-record mark.

re-entrant routine

A routine that can be shared by a number of programs simultaneously. A higher priority program can suspend a lower priority program and take over the use of the routine. The lower priority program can later re-enter the routine at the point where it was interrupted.

relocatable code

A compiled program containing instructions with relative addresses that must be replaced with absolute addresses before the program can be loaded into memory and executed. The relocating loader LINK (LOADR or MLLDR) relocates (replaces the addresses) the code and creates a type 6 file that can be loaded and executed.

relocatable libraries

A collection of commonly-used relocatable subroutines. The RTE system libraries and the FORTRAN formatters are examples of relocatable libraries containing often used subroutines. The use of relocatable libraries simplifies and standardizes programming. Libraries are usually indexed to improve search time.

relocating loader

An HP-supplied program that sets up communication links and forms an absolute load module from a relocatable program. The loader creates the relocated program in conformance with current system constraints and loader commands entered by the user.

reserved partition

A fixed area in memory that contains a program while it is executing. The size of reserved partitions is defined at generation or at boot time.

resource

See system resources.

resource management

A feature that allows the user to manage resources that can be shared by a set of programs.

resource numbers

A set of numbers determined at system generation. The resource numbers are used for synchronizing programs that use the same system resource. If the resource is a device, locking the device (LU lock) requires a resource number.

response time

The total amount of time required to bring a real-time program or routine into execution in response to an interrupt, interval timer, call from another program, or operator call. Response time is usually measured in microseconds to milliseconds.

restore a program

Setting up an ID segment for a program. All type 6 (program) files begin with a block of information used by the operating system to create an ID segment. Programs can be restored by the operator with the RP, RU, or XQ command or by another program with a call to the operating system subroutine FmpRunProgram. If the ID segment is set up by RU or XQ, it is released automatically after the program completes. If it is set up by RP or FmpRunProgram, it must be released by the OF command.

ROM boot

A loader residing in Read-Only Memory that online loads the Boot Extension from disk storage and transfers control to the Boot Extension. The Boot Extension must reside on the disk physical unit 0, track 0, sector 0. (See also Boot Extension and Startup definitions.)

RTE

See Real-Time Executive.

SAM

See System Available Memory.

SCB

See Session Control Block.

scheduler

A system routine that manages the movement of programs from one program state to another. For example, when a program is run with the RU command, the scheduler is called to move the program from the dormant state to the scheduled state. When there is no higher priority scheduled program, the dispatcher moves the program to the executing state.

scheduling a program

Entering a program in the schedule list for execution, either at the next entry into the dispatcher, or at the appropriate time when the program's priority is high enough.

segmenting programs

A technique for accommodating programs larger than the available logical memory. "Segment" refers to those slices of the program that are brought into main memory as required, and overlay the previous segment.

select code

An octal number (10 through 77) that specifies the address of an I/O device interface card.

Session Control Block (SCB)

A variable-length table built in physical memory by the logon processor for each session. It contains user related information and is used by the system to check validity of user requests and the system access restrictions for that user.

session identifier

A number that identifies each session to the system. Typically, it is the system logical unit number of the terminal on which the session user has logged on.

Session Switch Table (SST)

A table that defines a session's total I/O addressing range. It provides a mapping between session logical unit numbers which the user addresses and system logical unit numbers which is where the system processes the call.

shareable EMA

An area of memory containing program data that is available to up to 63 programs. The area occupies its own partition in physical memory. Shareable EMA is described in detail in the *RTE-6/VM Programmer's Reference Manual*.

Simultaneous Peripheral Operations OnLine (SPOOL)

This is an RTE feature generally associated with batch operations. There are both in-spooling and out-spooling . In-spooling consists of a program and data being first read in from some peripheral device and placed on the disk. Program reads are translated to disk reads instead of reads from the peripheral device. Program writes are also translated to disk writes instead of peripheral device writes, so that program output is on disk. Out-spooling is the process of taking the program's output from disk to the appropriate peripheral device. Spooling is quite useful for doing I/O with slow devices.

snap file

A type 3 file created at system generation time that lists and locates entry points, indicates which libraries are to be searched by the relocating loader, and other loader information. The snap file is required by LINK to load programs.

spare cartridge pool

A set of cartridges defined by the System Manager as being available to session users for temporary use.

SPOOL

See Simultaneous Peripheral Operations Online.

SSGA

See subsystem global area.

SST

See Session Switch Table.

startup

The startup process is initiated by the Boot Extension. During the startup process, the tables, registers and pointers required by the system are established. Control is then transferred to the Configurator.

station

A terminal and its associated peripheral devices.

subchannel

One of a group of I/O devices connected to a single I/O controller. For example, RTE driver DVR23 can operate more than one magnetic tape drive through subchannel assignments. In the case of moving head disks, contiguous groups of tracks are treated as separate subchannels. For example, an HP 7905 disk platter may be divided into four subchannels. Each subchannel is referenced by an LU number.

subchannel initialization

The process of preparing a disk subchannel for use by the RTE operating system.

subchannel numbers

Decimal numbers (0 through 63) associated with the LU numbers of devices with multiple functions on the same device. Each subchannel number is associated with a specific subchannel; for example, an HP 2645A terminal could have four subchannels: one for the keyboard, one each for the right and left tape channels, and one for an optional line printer.

subdirectory

A CI file directory contained in another directory or subdirectory. Subdirectories can be nested to any level. There is always a top-level (global) directory for any set of subdirectories.

subpartition

A partition that is an optional subdivision of a mother partition. Subpartitions have the same type (RT or BG) as the mother partition. Subpartitions are treated like other partitions except that they cannot be used while the mother partition contains an executing program.

Subsystem Global Area (SSGA)

An area of memory that consists of all Type 30 modules loaded at generation time. The area is included in the system address space and in the address spaces of programs that access it (Types 17-20 and Types 25-28). The area may be used for data (that is, COMMON).

suspended program

A program that has been taken out of its executing state by the operating system. Programs are suspended when a higher priority program is scheduled, when making an I/O request that cannot be executed immediately, or when the operator issues the SS command. The executing program is swapped out of main memory, the suspension point is recorded in its ID segment, and the program is entered in the suspended programs list.

swap area

An area on disk (LU 2 and LU 3) used for swapping information to/from main memory. (See also LG area.)

swap file

A file used to store suspended programs on disk.

swapping

A process in which an executing program is suspended and transferred to mass storage so that another program can occupy the memory partition. When the interrupting program has terminated, becomes suspended, or is waiting for I/O, the previously swapped program is reloaded into memory and resumes execution at the point where it was suspended.

SWTCH

A system utility program that transfers a disk-based RTE-6/VM Operating System to a specific disk area from which it can be booted.

synchronous device

An I/O device that transmits or receives data at the same rate as the computer or other I/O devices. Special characters are included for error detection.

System Available Memory (SAM)

A temporary storage area in physical memory used by the system for Class I/O, reentrant I/O, automatic buffering, and parameter string passing.

system base page

An area of memory that contains system tables, special system variables, and trap cells for interrupt processing.

system common

An area of memory that can be shared by programs.

system console

The interactive console or terminal (LU 1) used primarily for controlling system operation; it is where all system and utility error messages are issued. In a multi-terminal environment, a system console is distinguished from peripheral "user consoles".

system disk subchannel

The disk subchannel assigned to LU 2 that contains the memory image of the RTE-6/VM system.

system driver area (SDA)

An area for privileged drivers, very large drivers, drivers that do their own mapping, or drivers not included in driver partitions. It is included in the system's address space, in the address space of RT and Type 3 BG programs, and, optionally, in the address space of memory-resident programs.

system library

A group of subroutines available to user programs that perform operating system functions. These subroutines are independent of the system itself, permitting user programs to perform system functions without calling the operating system.

system map

The 32K-word address space used by the operating system during its own execution.

system resources

Elements within the system that can be accessed by a system or user program, for example, I/O devices, files, programs, an area in memory, memory tables, or subroutines.

system tables

Lists of information maintained by RTE-6/VM. Examples of system tables are the device table (DVT), ID segments table, interrupt table, and the dormant, scheduled, and suspended program lists.

system tracks

All subchannel tracks assigned to RTE-6/VM for which a track assignment table is maintained. These tracks are located on LU 2 (system) and LU 3 (auxiliary).

table area I

An area of memory that is included in all address spaces (maps) and that includes the EQTs, device reference table, interrupt table, track map table, all type 15 modules, and some system entry points.

table area II

An area of memory that contains the system tables, ID segments, all type 13 modules, and some system table and entry points. Table area II is included in the address space of the system, real-time programs, type 3 background programs, and (optionally) memory-resident programs.

tape block

The smallest unit of information that can be addressed by a CS/80 tape unit. It is 512 words in length.

Time Base Generator (TBG)

A hardware module (real-time clock) that generates an interrupt, called a "TBG tick", in 10-millisecond intervals. It is used to trigger execution of time-scheduled user programs at predetermined intervals, to control time-slicing for multiprogramming, and to determine device timeouts.

time scheduling

Placing programs on the time-scheduled programs list for automatic execution at a preset time of day and, if desired, at regular intervals afterwards. Programs are time-scheduled with the IT command using the system clock.

time slicing

A method of resolving CPU usage conflicts among programs of equal priority. When several such programs contend for processing time, the system gives each a fixed period of time (called a time-slice quantum) to execute before another gets its turn. If a higher priority program is scheduled, it supersedes the time slicing. Without time slicing, one program could monopolize the CPU until it completes. The time-slice quantum is specified at generation time and can be changed by the System Manager with the QU command.

timeout

The time limit that the operating system will wait for a device to respond to an I/O request. If the system tries to access a device and the device does not respond within its timeout period, the system assumes that the device is inoperative and makes the device unavailable (down). The timeout feature prevents programs from waiting unnecessarily for devices that malfunction or awaiting services such as mounting tape or replenishing paper.

track

For non CS/80 disks, a subdivision of a disk LU as defined by the EXEC interface.

trap cell

See interrupt location.

up

The state of a device that is available for use by the system. A down device can be declared available with the UP command.

user base page

The first page of a user program partition, containing a number of special storage registers and links to the other memory areas in the system, such as the system common.

user HI file

A File Manager or CI procedure file executed when the session user logs on to the system. It is also referred to as the user hello file. The procedure file may contain commands to perform tasks required by that session user, for example, changing terminal timeout, setting terminal softkeys, and so forth.

user logical memory

The memory space used by a user program during execution.

user map

The 32K-word address space used by a user program during its execution.

Virtual Memory Area (VMA)

An area on disk (the backing store file) used as an extension of physical memory and an area of physical memory (the working set) used to permit program access to the data in the backing store file. The EMA/VMA feature allows programs to manipulate data structures as large as 65536 pages. The EMA/VMA operations are transparent to user programs.

Virtual Memory Mapping Segment (VSEG)

The last two pages of a program's logical address space, used by the EMA/VMA firmware to map data in the EMA and VMA.

volume

For CS/80 disks, a separately addressable portion of the storage media on a given unit. This corresponds to a fixed or removable platter of a disk unit, or to a tape drive. When used in file management descriptions, the term volume is synonymous with a disk LU.

In the CI file system description, a disk volume refers to the disk storage space addressable by the system with a logical unit number, comparable to a disk cartridge in the FMGR file system.

working directory

The CI file directory designated to be the default directory when no directory is specified in a file descriptor.

working set

Data transferred from the backing store file into physical memory for access by a program. The complete VMA data does not reside on disk at all times. The part that is on disk is located in the backing store file. The remainder is the working set. The working set addresses are stored in the page table.

Manual Mnemonics

BSP	RTE-6/VM Batch and Spooling Reference Manual (92084-90006)
CUSR	RTE-6/VM CI User's Manual (92084-90036)
CMUX	HP 12792B/C 8-Channel Asynchronous Multiplexer User's Manual (5955-8867)
DBUG	Symbolic Debug/1000 User's Manual (92860-90001)
DBGS	Debug Subroutines Manual (92084-90014)
DMUX	RTE-6/VM Serial Driver Reference Manual (92084-90050)
DVRW	RTE Operating System Driver Writing Manual (92200-93005)
EDIT	EDIT/1000 User's Guide (92074-90001)
HPIB	HP-IB in HP 1000 Computer Systems User's Guide (59310-90064)
LODR	RTE-6/VM Loader Reference Manual (92084-90008)
LINK	RTE-6/VM LINK User's Manual (92084-90038)
MAC	Macro/1000 Reference Manual (92059-90001)
GEN	RTE-6/VM Online Generator Reference Manual (92084-90010)
PROG	RTE-6/VM Programmer's Reference Manual (92084-90005)
REL	RTE-A • RTE-6/VM Relocatable Libraries Reference Manual (92077-90037)
RDSV	READR/SAVER Reference Manual (92068-90016)
INST	RTE-6/VM Software Installation Manual (92084-90011)
SMM	RTE-6/VM System Manager's Manual (92084-90009)
TUSR	RTE-6/VM Terminal User's Reference Manual (92084-90004)
UTIL	RTE-6/VM Utility Programs Reference Manual (92084-90007)

Symbols

Numbers

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z