



RTE-A

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 which 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 what manual edition and update is compatible with your current software revision code, refer to the Manual Numbering File. (The Manual Numbering File is included with your software. It consists of an "M" followed by a five digit product number.)

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Preface

This is the Index and Glossary for the RTE-A manual set. In it are three sections:

1. A guide to the manuals in the set, with a document map to help you find the right manual (or manuals) quickly and a legend of codes used to identify the manuals in the glossary and index.
2. A glossary that defines the most important RTE-A terms. After each entry, a list of codes points to other manuals that use or describe the term.
3. A combined index for the entire manual set. It goes beyond the glossary manual codes to help you find every reference to all special RTE-A terms. Note that the index also has appropriate references to manuals for subsystems such as Mail/1000, Symbolic Debug, FORTRAN, and so on.

How you use this Index and Glossary is determined by how you want to use RTE-A and by how much experience you have with RTE operating systems. New users can begin in the Guide to RTE-A Manuals section, and work from left to right through the document map to learn more about the system and the languages or subsystems they need. Advanced users will usually begin with the glossary or index, and use the document map to identify manuals related to their work.

The following codes are used throughout the Index and Glossary to identify the RTE-A manuals. In the glossary, several manual codes are listed after the definitions to point to manuals that explain or use the terms. To get more information about a term, refer to the manuals listed after its definition. In the index, instead of only chapter and page numbers for each entry, manual codes *plus* chapter and page numbers are given.

Manual Code	Manual Title (and Part Number)
BKUP	RTE-A Backup and Disk Formatting Utilities Reference Manual (92077-90249)
DATA	Datapair/1000 Reference Manual (92050-90001)
DEBUG	Symbolic Debug/1000 Reference Manual (92860-90001)
DDM	RTE-A Driver Designer's Manual (92077-90019)
DRM	RTE-A Driver Reference Manual (92077-90011)
EDIT	EDIT/1000 User's Manual (92074-90001)
FTN	FORTTRAN 77 Reference Manual (92836-90001)
GSA	Getting Started With RTE-A (92077-90039)
HPIB	The HP-IB in HP 1000 Computer Systems User's Manual (59310-90064)
LINK	LINK User's Manual (92077-90035)
MAC	Macro/1000 Reference Manual (92059-90001)
MAIL	Mail/1000 User's Manual (92511-90001)
PRIM	RTE-A Primary System Installation Manual (92077-90038)
PRNT	RTE-A Print and Spooling Reference Manual (92077-90248)
PROG	RTE-A Programmer's Reference Manual (92077-90007)
REL	RTE-A Relocatable Libraries Reference Manual (92077-90037)
SCSI	SCSI Host Bus Adapter Card Installation and Reference Manual (12016-90001)
SDM	RTE-A System Design Manual (92077-90013)
SGI	RTE-A System Generation and Installation Manual (92077-90034)
SMM	RTE-A System Manager's Manual (92077-90056)
USER	RTE-A User's Manual (92077-90002)

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Index to RTE-A Manuals

Guide to RTE-A Manuals

Descriptions

The following are brief descriptions of the manuals included with the RTE-A Operating System. The descriptions are sorted by HP part number. After the descriptions, there is a map of the RTE-A manuals. The “neighborhoods” on the map group the manuals by the kinds of system functions they describe. The “roads” are paths that you might use to other manuals when you need more information than is available in the manual you are reading.

12016-90001 HP 12016A SCSI Host Card Installation and Reference Manual

Describes the hardware and software interface between SCSI devices and HP 1000 A-Series computers under RTE-A. It explains how to install the SCSI hardware and software, and how to use the product.

59310-90064 The HP-IB in HP 1000 Computer Systems User's Guide

Describes the hardware and software interface between HP 1000 computers under RTE operating systems, including A-Series computers under RTE-A. It explains briefly how to prepare and connect the hardware, and describes HP-IB programming in detail for FORTRAN, BASIC/1000D, and BASIC/1000C. It includes detailed loading information for all RTE operating systems.

92050-90001 Datapair/1000 Reference Manual

Describes the Datapair/1000 paired disk system that allows the user to duplicate the contents of one disk onto a second disk so that both disks continually contain identical data. Describes how to generate Datapair/1000 into the RTE-A system and boot the system with mirrored disks.

92059-90001 Macro/1000 Reference Manual

Explains Macro/1000 Assembly Language programming under a range of RTE operating systems, including RTE-A. It describes the Macro/1000 machine and assembler instructions, source file generation and assembly, including conditional assembly. It also describes macro creation and macro libraries.

92074-90001 EDIT/1000 User's Manual

Guides new EDIT/1000 users from the basic editing concepts of creating, modifying, and manipulating ASCII files to detailed descriptions of EDIT/1000's powerful commands. For advanced users, it includes an alphabetic listing of descriptions of the complete EDIT/1000 command set and special editing characters. It also explains how to load EDIT/1000 into an RTE operating system.

92077-90002 RTE-A User's Manual

Introduces interactive use of RTE-A through the Command Interpreter program, CI, and the File Manager program, FMGR. It also describes the RTE-A optional VC+ Virtual Code feature package. For new RTE-A users, a tutorial section starts with simple system information requests and advances to program control and multi-user functions. For experienced RTE-A users, a reference section lists and describes the CI and FMGR commands.

92077-90007 RTE-A Programmer's Reference Manual

An advanced manual for programmers who wish to access the RTE-A Operating System directly from their programs. Describes I/O and device control, resource management, and program scheduling from other programs. It also explains use of the optional VC+ features of RTE-A from user programs. Program use of the file management package (FMP) subroutines is also described.

92077-90011 RTE-A Driver Reference Manual

For programmers who wish to use the RTE-A interface and device drivers to control I/O peripherals. All of the available drivers are described. For all of the drivers, the EXEC calls that give user programs access to the drivers are described in detail.

92077-90013 RTE-A System Design Manual

Explains the RTE-A Operating System with special emphasis on helping the system manager configure a new system, troubleshoot a problem system, or alter the existing system. It describes RTE-A data structures, system memory use, internal system routines, and some system generation and installation considerations.

92077-90019 RTE-A Driver Designer's Manual

For advanced programmers who want to write new interface or device drivers, or alter existing drivers for special purposes. Describes the I/O conventions and operating system interface considerations that must be followed to design a driver that cooperates with the others and with the system and its peripherals.

92077-90020 RTE-A Quick Reference Guide

Lists and briefly describes the commands for CI, FMGR, EDIT/1000, LINK, and the interactive RTE-A utilities; lists and describes the FMP and FMGR file-handling subroutines, system library subroutines, EXEC calls, and VMA/EMA subroutines; describes the RTE-A boot-up procedure; shows the system tables; and explains the error messages generated by the operating system and its utilities, routines, and subsystems.

92077-90034 RTE-A System Generation and Installation Manual

Helps the system manager generate a new RTE-A Operating System and install it in an A-Series HP 1000 Computer System. It explains how to use the RTAGN generator program, how to create a generator answer file, and lists the generator program commands. Finally, it describes installation of the newly-generated system.

92077-90035 LINK User's Manual

Guides a new user from a sample loader session to illustrate how LINK takes a relocatable file and creates a type 6 program file that can be run on an RTE-A system to a detailed functional description of the features of LINK, and special performance optimization methods. For experienced users, it includes a reference section of the LINK commands. There is also an error messages list, and an installation guide for loading LINK on an RTE-A system.

92077-90036 RTE-A Index and Glossary

You've got it in your hands. A roadmap to the RTE-A manual set. It describes the manuals, defines the terms they use, and cross references their indexes.

92077-90037 RTE-A Relocatable Libraries Reference Manual

For programmers who need to use the system library from their programs. It describes the library routines and call sequences, lists the subroutines for reference, and explains the feature routines available with the RTE-A optional VC+ package.

92077-90038 RTE-A Primary System Installation Manual

Explains how to install a newly purchased RTE-A Operating System, boot the new system, and prepare it for use. It explains the installation procedure from any of the media on which HP software is shipped.

92077-90039 Getting Started With RTE-A

Takes the first timer from starting up the system and logging on, through the beginning CI commands for file handling, into the editor to learn how to create a program or text file, and on to how to create and run simple programs. It tells how to find help or additional information, and makes it easy to become comfortable with the RTE-A system.

92077-90050 RTE-A Software Entry Point Directory

Lists all the entry points and the modules in which they reside in the RTE-A Operating System and Virtual Code (VC+). This manual also contains entry points names for all HP 1000 languages, data communication and data management products. RTE Profile Monitor, Symbolic Debug/1000, Forms/1000, Control/1000, PMC/1000, QDM/1000, and PCIF/1000 entry points are listed also.

92077-90056 RTE-A System Manager's Manual

Describes the duties of a system manager. It complements the RTE-A System Generation and Installation Manual and refers particularly to the System Design Manual, the Driver Reference Manual, and the Programmer's Reference Manual. The manual also describes the Group and User Management Program (GRUMP), Security/1000, and the SECTL, SESLU, and KILLSSES utilities.

92077-90248 RTE-A Print and Spooling Reference Manual

Describes the programs available on RTE-A to print or spool files. It contains usage information for the RTE-A user as well as information required by the system administrator to set up the spooling system.

92077-90249 RTE-A Backup and Disk Formatting Utilities Reference Manual

Describes the use of backup and disk formatting utilities available on RTE-A. The detailed description of each of the utilities is organized alphabetically in Chapter 2.

92511-90001 Mail/1000 User's Manual

Describes the Mail/1000 message system, how it works, and the tasks you can perform. The manual is a reference document with a task-oriented format. Commands are described in terms of specific tasks, in a generalized form accompanied by specific examples as needed.

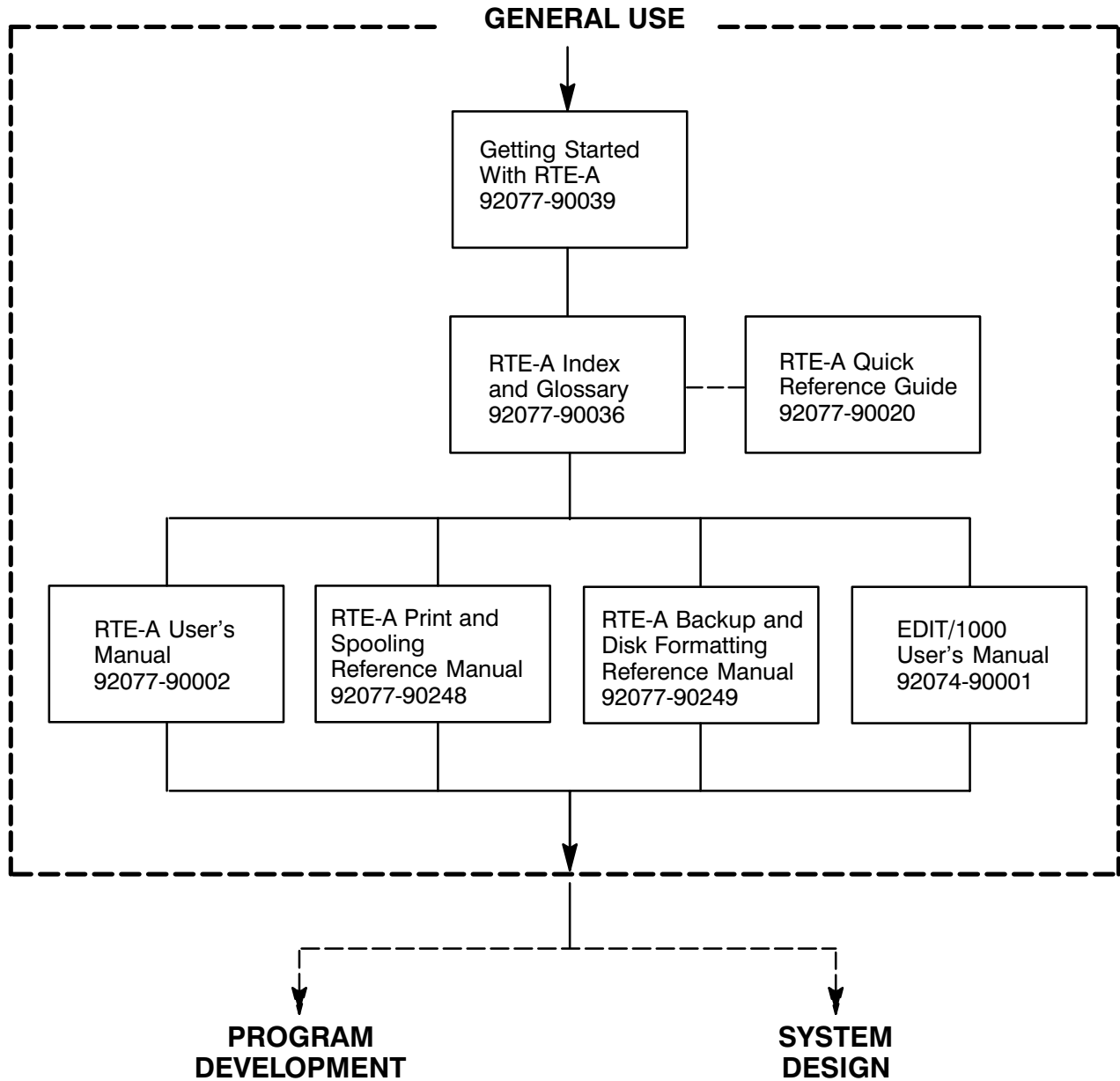
92836-90001 FORTRAN 77 Reference Manual

This is the reference manual of the FORTRAN 77 programming language for the HP 1000 Computer System. The compiler for the FORTRAN 77 language operates under both the RTE-6/VM and the RTE-A operating systems.

92860-90001 Symbolic Debug/1000 User's Manual

This manual is a tutorial guide and reference for the Symbolic Debug/1000 program. The manual gives installation and configuration information, describes the steps necessary to prepare a program for debugging, and describes how to use the Debug program.

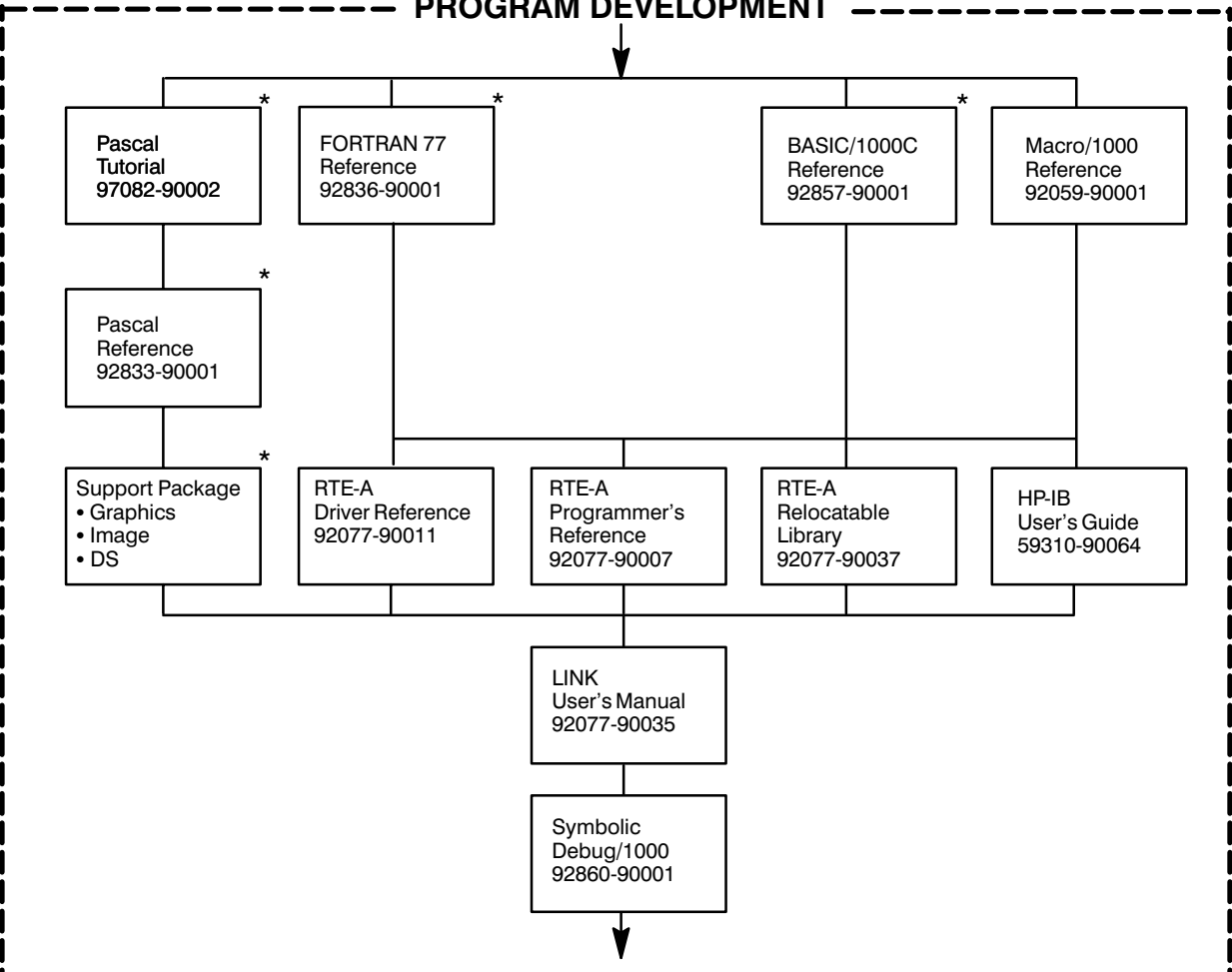
RTE-A OPERATING SYSTEM DOCUMENTATION MAPS



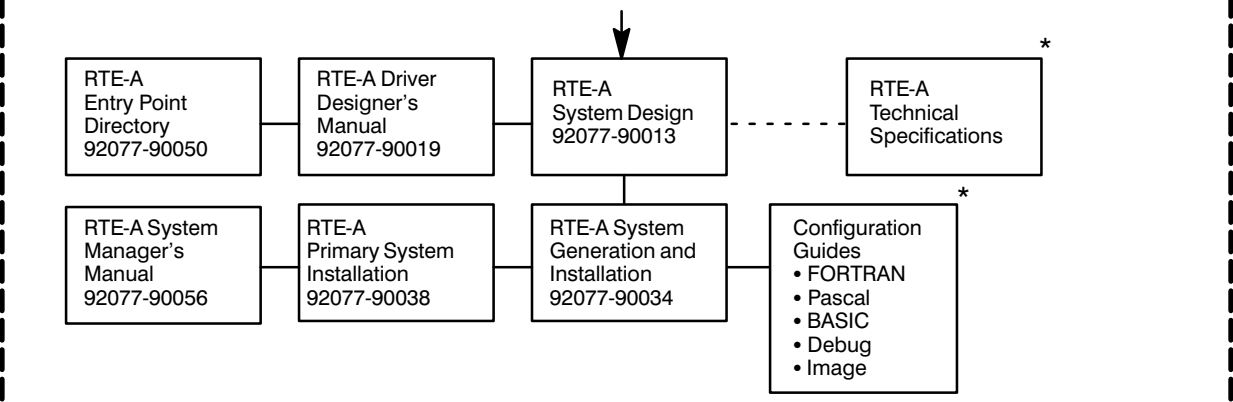
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RTE-A OPERATING SYSTEM DOCUMENTATION MAPS (continued)

PROGRAM DEVELOPMENT



SYSTEM DESIGN



* These manuals are included in other HP products and are not included in RTE-A.

Glossary of RTE-A Terms

Abbreviations

CDS	– Code and Data Separation
CI	– Command Interpreter
CRN	– Cartridge Reference Number
CTD	– Cartridge Tape Drive
CTU	– Cassette Tape Unit
DCB	– Data Control Block
DMA	– Direct Memory Access
DMS	– Dynamic Mapping System
DVT	– Device Table
EMA	– Extended Memory Area
EVB	– Environment Variable Block
FMGR	– File Manager
FMP	– File Management Package
IFT	– Interface Table
INT	– Interrupt Table
LU	– Logical Unit
LUT	– Logical Unit Table
MSEG	– Mapping Segment
SAM	– System Available Memory
TBG	– Time Base Generator
UDSP	– User-Definable Directory Search Path
VCP	– Virtual Control Panel
VMA	– Virtual Memory Area
VSEG	– Virtual Memory Mapping Segment

Definitions

absolute program

A program that has been relocated by the LINK loader. The relative addresses in the program have been replaced with absolute addresses: the program can be loaded directly from a disk or other mass storage device into memory for execution. Absolute programs are usually called relocated programs, binary memory images, or type 6 files. Some absolute programs can be run stand-alone (offline) without the RTE-A Operating System. See *offline*. PROG, MAC

absolute system

The RTE-A Operating System in the form of an absolute program that can be loaded directly from a disk or other mass storage device into main memory. See *boot up*. MAC

account

In the multiuser environment, users and sets of users (groups) are assigned to accounts. Accounts enable the operating system to maintain the multiuser environment that allows users and groups to tailor their use of system resources. SMM, USER

answer file

A file that contains commands for defining system parameters and configuring supported I/O devices; an answer file is provided with the Primary System and may be customized to generate a new system. SGI

asynchronous device

An I/O device that transmits characters synchronized by handshaking or start/stop characters passed between the device and the computer. Compare *synchronous device*.

back up

Copy the contents of a set of disk volumes, usually onto magnetic tape, but often onto another disk. Disks should be backed up periodically to prevent loss of data from hardware, software, or operator errors. SGI

backing store file

A file on disk that contains all of the VMA data except the working set. The backing store file can contain up to 65536 pages of VMA data. See *virtual_memory area* and *working set*. PROG

base page

See *system base page* and *user base page*.

binary memory image

See *absolute program*.

bit bucket

An I/O address at which I/O requests are completed by ignoring the data. I/O requests directed to a bit bucket complete immediately. LU zero is an example of a bit bucket. USER

block

Two logical CS/80 disk sectors of 128 bytes each, totaling 256 bytes, or 128 words. The block is used to express the size of files or data transfers. The actual sectoring of a physical disk may or may not be the same as the logical sectoring of a disk. USER

BOOTEX

The boot up extension program, located at the beginning of the system disk, outside of the user file area. Its main job is loading the operating system into main memory, but it also mounts disk LUs, defines program partitions, sets up the swap file, and restores programs to be included in the operating system. SGI, PRIM

boot up

Load the operating system into main memory from a disk or other storage device. SGI, PRIM

buffer

An area in main memory or on a peripheral device used to store data temporarily, especially for I/O. SDM

capability level (CPLV)

An integer ranging from 0 – 31 assigned by the system manager to users, system level routines, system level commands, and programs for the purpose of governing function and resource use. SMM

cartridge reference number (CRN)

An integer from 0-32767 or two ASCII characters used to identify a FMGR disk cartridge. USER

cartridge tape drive (CTD)

The unit into which a cartridge tape can be inserted for the purpose of loading data from the tape to the disk or making a tape back-up of the disk. The CTD may be either stand-alone or part of a CS/80 disk drive. SGI

cassette tape unit (CTU)

Tape unit in a 264x terminal for data storage and retrieval. DRM

class I/O

A method of buffering data transfers between programs or between devices and programs that lets the program continue executing while the I/O takes place. Class I/O is also called I/O without wait, or mailbox I/O. SDM

closed file

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

code and data separation (CDS)

An optional RTE-A feature that lets the operating system support large programs or programs that share code. In a CDS program, the code (instructions) and data are stored in separate areas of memory. USER, SDM, SGI, MAC

code block

A subdivision of the code partition of a CDS program. Each code segment of a CDS program is loaded from disk into a code block as the program is executed. PROG, SDM

code partition

An area of memory that contains the code portion of a CDS program while the program executes. Compare *data partition*. PROG, SDM

code segment

A subdivision of the code portion of a CDS program. The LINK loader divides the code portion of large CDS programs into a number of segments, each up to 31 pages long. There may be as many as 128 code segments in a CDS program. PROG, SDM, LINK, USER, MAC

Command Interpreter (CI)

A program to process operator commands for RTE-A. CI lets the operator manipulate files and manage disk storage, run and terminate programs, modify system parameters, and gain access to a number of operating system features. CI is identified by the CI> prompt. CI is the primary RTE-A file management program. Compare *File Manager*. USER

common

A reserved area of memory used to pass data between a main program and its subprograms. In RTE-A, system common memory can be used to pass data between programs. SDM, MAC

configuration

The I/O and memory mapping structures of the operating system, and the modifications made to the operating system to create the structures. There are two main steps in system configuration: generation and modification by BOOTEX. SGI, SDM

CRN

The Cartridge Reference Number, either an integer from 0 through 32767 or two ASCII characters, identifies an FMGR cartridge. USER

CS/80

Command Set/80, a Hewlett-Packard instruction convention for mass storage devices, and the disk drives and tape drives that conform to it. BKUP, PROG, SGI, SDM

current directory

See *working directory*.

current page

The memory page in which the currently executing instruction is located. Some memory reference instructions can refer directly only to locations in the current page and the base page. SDM

cylinder

A collection of tracks, one from each disk surface. See *track*. SGI

data control block (DCB)

A buffer within an executable program that contains information used by the File Management Package (FMP) for file accesses. PROG, SDM

data partition

An area in memory that contains the data portion of a CDS program. Compare *code partition*. PROG, USER, SDM

data segment

The data portion of a CDS program, up to 31 pages long without the EMA/VMA feature or longer with EMA/VMA. PROG, SDM, MAC

default directory

See *working directory*.

device driver

A software module that passes data and control information between the operating system and an interface driver. The device driver processes I/O request data for a particular device so that the information matches the requirements of the device. Device drivers are always associated with an interface driver. A typical device driver and interface driver pair is ID.37 and DDC12. ID.37 is the interface driver for the HP-IB. DDC12 is the device driver for the 2608S printer when it is controlled by the HP-IB. DDC12 prepares data for the printer and passes it to ID.37. Compare *interface driver*. SGI, SDM, DRM, DDM

device-independent

A program that refers to an I/O device by its LU number without regard to the type of device represented by the number.

device table (DVT)

A table created during system generation for each LU in the system. It contains the device type, time-out value, and driver type, if there is a device driver. Device LUs are associated with DVTs in the logical unit table (LUT). Each DVT refers to an entry in the interface table (IFT). SDM

direct memory access (DMA)

An I/O method that permits data to be transferred directly from memory to an interface card without CPU intervention. PROG, SDM, DDM

directory

A data structure containing the names of subdirectories and files on a disk LU. The directory contains information about the subdirectories and files within it, including file lengths, file types, and location on the disk. See *working directory*. PROG, USER

disk-based

A program stored, in part or completely, on disk while it is running or waiting to run. 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 into memory as they are needed. This term is also used for an operating system which supports such programs.

Disk-based also describes a real-time system that permits programs to be swapped between disk and memory to let other programs run. SGI

disk formatting

Defining track, block, and sector address information for a disk, and writing it to the disk. disk formatting usually includes verification and bad-track sparing. BKUP, SGI

disk-resident

Stored on a disk, usually referring to absolute programs or subroutines that are stored on disk and loaded into memory for execution in response to a program or operator request, a time schedule, or an I/O interrupt.

disk volume

See *volume*.

dismount

Remove a disk or tape volume from the system, either logically or physically. Compare *mount*. USER

dispatcher

An RTE-A system routine that selects, from the scheduled programs list, the program to be executed. The dispatcher is central to RTE-A multiprogramming. It selects 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. SDM

dormant program

An executable program that is not executing, scheduled, or suspended. A program becomes dormant when it is restored by the RP operator command but not scheduled or when it aborts or completes and the ID segment is not released. See *program management*, *executing program*, *scheduled program*, and *suspended program*. PROG

down

The state of a peripheral device or I/O controller that is not available to the system. Devices can be down for a number of reasons, including a device time-out or execution of the FMGR command DN. Compare *up*. USER

driver partition

An area of memory that contains an interface or device driver during execution. SGI, SDM, DDM

dynamic buffer space

Buffer space allocated to a program, located in memory after the program itself. The buffer size can be altered by the program. SDM

dynamic mapping system (DMS)

A hardware feature that lets the 16-bit A-Series computer address up to 32 megabytes of physical memory. PROG, SDM, MAC

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 freed afterwards. The dispatcher controls dynamic memory allocation. PROG, SDM

dynamic memory area

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

environment variable block

Environment variables allow programs within a session to share variables. Any program in the session can be allowed to access the value of an environment variable. The environment variables are stored in a memory space called the Environment Variable Block (EVB). USER

EXEC

An RTE-A system module that permits user programs to use operating system functions, such as I/O operations, program scheduling, and system time requests. Programs can access these functions through calls to EXEC. PROG, REL

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. See *executing program*, *restored program*, and *ID segment*. PROG, USER

executing program

The highest priority scheduled program. Given below are some of the conditions that move programs from the scheduled, dormant, and suspended program lists to the executing program state.

A dormant program cannot be executed until it has been scheduled (placed in the scheduled programs list).

A suspended program executes when either of the following occur:

1. The unavailable resource that suspended it becomes available.
2. The operator issues a GO command, after the program was suspended by the SS command.

A scheduled program executes when either of the following is true:

1. It is scheduled for immediate execution.
2. The system time matches the program's scheduled execution time.

See *program management*, *dormant program*, *scheduled program*, and *suspended program*.
PROG

extended file

A file that has been made larger in response to a write request beyond the end of the file. An extent (additional space on the disk) is created by the operating system to contain the new data, and the write request continues. USER

extended memory area (EMA)

An area of physical memory that extends beyond the logical space of a program, and it can be used as a large data area. The EMA is contained entirely in physical memory, and it can occupy all the free physical memory in a partition. EMA areas can be shared by two or more programs, as described in the Programmer's Reference Manual. Compare *virtual memory area*. PROG

extended system available memory (XSAM)

XSAM is temporary storage in physical memory used by the system for requests that typically stay around longer than I/O requests: signals, UDSPs, LU access tables, and prototype ID segments. XSAM is very similar to SAM and it is possible to have SAM and XSAM use the same block of memory. SDM, SGI

file

A series of records on a mass-storage device that contains data or a program and identification information. The storage device contains at least one file, called the directory, that lists all the files on the device. USER, MAC

file descriptor

The various parameters that specify a particular file. Refer to the RTE-A User's Manual for a definition of the file descriptor.

The CI file descriptor consists of the following parameters:

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

USER, EDIT, PROG

file extents

See extended file.

file management

The operating system functions associated with maintaining disk files, such as translating file names to disk addresses, maintaining directories and subdirectories, and checking for file security. see *file manager* and *command interpreter*. PROG, USER

file management package (FMP)

A collection of RTE-A routines that perform file management. See *file management*. PROG

File Manager (FMGR)

An RTE-A program that helps create and use files. FMGR is the secondary RTE-A file management program, used to maintain files from other versions of the RTE operating system. Compare *command interpreter*. PROG

file mask

A feature in the file system used to specify several files at once. It includes wildcard characters in the file name and file type extension and other file information in a qualifier field. USER

file type extension

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

filedescriptor

A parameter in a subroutine specifying a file descriptor. USER, PROG

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. 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 User's Manual. USER, EDIT, PROG

firmware

Code stored in ROM, including microcode and machine language programs. The ROM loader, self-test, and VCP programs are firmware.

function

An activity carried out by the system on behalf of the user.

generation

Creation of an operating system that meets specific 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. See *configuration*.

group

In a multiuser system, a group is a set of system users – usually users who will share common functions, applications, and/or resources – for which a unique configuration file may be created and modified. USER, SMM

GRUMP utility

The GRoup and User Management Program is a command driven utility for managing a multiuser account system. It is part of the VC+ multiuser product. USER, SMM

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 lets computers and peripherals communicate. HPIB, DRM

ID segment

A program table entry in physical memory that identifies an executable program. It is similar to the task control block in other operating systems, and contains information such as the program name, priority, location on disk, and so on.

The number of available ID segments in the system is fixed at generation, and each ID segment can identify only one program at a time. See *restoration* and *executable program*. SDM

IFT extension

Extra buffer space added to an interface table entry during system generation. The IFT extension gives more storage space for buffering I/O data. See *interface table*. SDM

indexed library

A subroutine library that has been indexed by the LINDX utility. Indexed libraries can be scanned faster by LINK, which speeds up program loading time. LINK

interface driver

A software module that passes data and control information from the operating system or a device driver to an interface card. If there is a device driver, the interface driver processes I/O requests for the interface card. If there is no device driver, the interface driver processes requests for the card and for the devices attached to the card. Compare *device driver*. SDM, SGI, DRM, DDM

interface table (IFT)

A system table set up at generation time for each interface card. This table lists the interface driver type, time-out queuing, and driver parameters for the card, and includes an extension for buffering I/O data. Refer to the RTE-A System Design Manual for the IFT format. SDM

interrupt

A raised flag on an interface card, the system clock, or the power fail/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. SDM

interrupt location

A location in the base page that contains an instruction to be executed in response to an interrupt. There is one interrupt location for each select code. The instruction in the interrupt location 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 power fail/auto restart system are branches to operating system routines for those devices.

Interrupt locations are also called trap cells. SDM

interrupt table (INT)

A table set up at generation that matches IFTs to select codes. When an interrupt is generated by an interface card, the interrupt handling system routine performs a branch to the trap cell corresponding to the select code of the interface card. The trap cell contains a branch instruction to the INT entry for the select code. The INT entry points to the address of the IFT for that select code. The IFT contains the name of the interface driver that should be called to process the interrupt. SDM

I/O (Input/Output)

A general term for any transfer of data between a computer and its peripheral devices.

I/O controller

An interface card, used to control one or more I/O devices. SGI, SDM, DDM

I/O device

Any peripheral device that receives data from the computer or sends data to it. Printers, modems, terminals, and disk drives are I/O devices. SGI, SDM

I/O management

Control of all I/O by the operating system. RTE-A takes control of I/O transfers to facilitate multiprogramming. SDM

I/O without wait

See *class I/O*.

library

See *relocatable libraries*.

LINK

The RTE-A loader. LINK converts the relative addresses of relocatable programs to absolute addresses. LINK produces type 6 files, ready to be loaded into memory and executed. LINK

locked file

A file opened exclusively to one program and therefore not available to any other program. Compare *open file*. USER

locked LU

An I/O device available for exclusive access by one program, to prevent multiple requests on the device. PROG

logical memory

The memory area (up to 64k bytes) defined by the currently enabled memory map. See *system map*, *user maps*, and *port maps*. SDM

logical unit (LU) number

A number used to identify I/O devices in RTE-A. Programs refer to I/O devices by their LU numbers, which are match to devices in the logical unit table (LUT). SDM, SGI

logical unit table (LUT)

A system table that links logical unit numbers with device table (DVT) entries. The operating system uses the LUT in I/O request processing to identify peripherals. SDM

log off

Terminate operations in the multiuser environment. USER

log on

Supply identification information to the system to establish a session and use the system. USER

mailbox I/O

See *class I/O*.

main program

The main body of a program, excluding any subroutines or program segments.

mapping segment (MSEG)

The part of a program's logical address space that is used for mapping into the EMA or VMA area. The mapping segment size is the maximum window size into EMA/VMA, expressed in pages, that the program uses without remapping. SDM, MAC

memory image

See *absolute program*.

memory map

One of the 32 sets of 32 map registers used by the dynamic mapping system. See *dynamic mapping system*. SDM

memory page

See *page*.

memory protect

A hardware feature that protects pages of physical memory against unauthorized access.
SDM

module

A unit of code, usually a subroutine. MAC

mount

Add a disk volume or magnetic tape unit to a list of available mass storage units. disk and tape drives must be mounted before they can be accessed. The term evolved from the physical mounting of a magnetic tape on a tape unit or a disk cartridge in a disk drive.
USER

multiprogramming

An interleaving technique that lets two or more programs appear to run at the same time. Multiprogramming improves the efficiency of a computer by taking advantage of the fact that most programs only use part of the computer's resources while they run.

In a real time multiprogramming system, several programs can be active at the same time. Each program has a priority number that determines when it can run. The highest priority active program always runs until it completes or makes a request for a system resource that is not available. While the highest priority program waits for the resource, the second priority program runs. If the second priority program also must wait for a resource, then the computer runs the third priority program, and so on. When any higher priority program becomes ready again, the computer suspends the low priority program, and continues running the higher priority program. See *timeslicing* and *real-time executive*. SDM

multiuser environment

An operating system that can support several users at a time. USER

namr

In FMGR file descriptions, the representation of a file descriptor or an LU number. See *logical unit (LU) number*, *file*, and *file descriptor*. PROG, EDIT

offline

Used without RTE-A. Some A-Series software and hardware can be used without the RTE-A Operating System, either stand-alone or with a special-purpose operating system. The disk formatting utility FORMF is an offline utility.

online

Refers to programs that are run with RTE-A. These programs are disk-resident and require the RTE-A operating system to schedule and execute them.

open file

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

operating system

A collection of software designed to make best use of a computer system. It is the main software interface between user programs and the computer hardware. The operating system performs memory management, file management, interrupt handling, program scheduling, and I/O operations. In general, these functions are transparent to the user of the system, but they can be accessed through a command interpreter (CI) or through program calls (EXEC). See *Real-Time Executive*, *Command Interpreter*, and *EXEC*. SDM

overlays

See *program overlay*.

page

The largest area of memory (1024 words) that can be directly addressed by a one-word memory reference instruction. SDM

page table

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

partition

An area of physical memory allocated to contain a program while it is executing. There are two partition types: reserved and dynamic. Reserved partitions are defined at boot up, and their sizes are fixed. Dynamic partitions are defined in an area of free memory when a program is run; the size is set by the dispatcher. See *dynamic memory allocation*. PROG, SDM, MAC

physical memory

Physical memory is the entire memory area defined at generation and available to the operating system. RTE-A, with the dynamic mapping system, can access up to 32M bytes of physical memory. SDM

port maps

Sets of map registers that describe the physical memory areas to and from which I/O is taking place. SDM

positional variables

Up to nine values that can be passed to a command file as parameters of the TR command. The command file can recall a value by referencing \$1 through \$9, according to the position of the parameter in the runstring. USER

power fail/auto restart

A system in the HP 1000 that lets it save the current state of the system in memory when power is lost, and to restart the system to a predefined condition when power returns. SGI

predefined variables

Session-management variables initialized by CI at the start of each session. These variables have names starting with a \$ sign, like \$session. You cannot change the name or delete a variable, but you can change its value with the SET command, or display its value with the ECHO command. USER

primary

The Primary System is a tested, factory preconfigured operating system providing a starter system that can be used to regenerate a customized operating system. SGI

priority

The number assigned to a program that 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. See *multiprogramming*. USER

privileged drivers

I/O drivers that process the interrupts generated by the interface cards under their control (see *privileged interrupts*). Privileged drivers offer improved interrupt response time, but they must save the status of the interrupted program and restore the program after processing the interrupt, functions normally performed by the operating system. SDM

privileged interrupts

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

program management

Maintenance of the dormant, scheduled, and suspended program lists, and control of programs as they execute and move between the lists. The program lists are diagrammed in the RTE-A Programmer's Reference Manual. See *dormant program*, *executing program*, *scheduled program*, and *suspended program*. PROG, USER

program overlay

A technique for accommodating non-CDS programs that are larger than the available logical memory. The data portion of a large non-CDS program can be divided into a main program section and several smaller sections, which fit into the available memory. The main program section remains in memory while the overlays are copied from disk into memory as they are needed. Each new overlay is copied into the same memory area as the previous one. PROG, USER

program state

The current status of an executable program. Programs may be dormant, executing, scheduled, or suspended. See *dormant program*, *executing program*, *scheduled program*, *suspended program*, and *program management*. USER

prototype ID segment

A skeleton program ID segment stored in a list in XSAM which is used to quickly create a program ID segment when that program is scheduled. Also referred to as proto ID. PROG, SDM

purge

Instruct the operating system to delete a file from a mass-storage device directory. It is usually used to describe deletion of disk files by the PU operator command. USER

Real Time Executive (RTE)

The operating system of the HP 1000 computer. The operating system is made up of software modules (routines) and a number of tables through which the modules communicate. In RTE-A documentation, the terms operating system, real-time executive, and RTE-A are synonymous.

The RTE-A operating system is called real-time to differentiate it from time-shared systems. In a time-shared system, all programs are given an equal share of the CPU processing time. The system simply steps from one program task to the next. In a real-time system, priority numbers determine how much processing time is allotted for each program. See *priority*. Real-time also means that the operating system can respond immediately to asynchronous events. PROG, SDM

record

A logical subdivision of a file terminated by an end-of-record mark. USER

reentrant routine

A routine that can be used by a number of programs at the same time. A high priority program can suspend a low priority program and take over use of the routine. When the high priority program is finished, the original program can reenter the routine at the point where it was interrupted. SDM, USER

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 LINK loader relocates (replaces the addresses) the code and creates a type 6 file that can be loaded and executed. LINK, MAC

relocatable libraries

A collection of often used relocatable subroutines. For example, the \$FMP library contains file management subroutines. Libraries of often used subroutines, such as math routines, simplify and standardize programming. Libraries are usually indexed with the LINDX utility. SGI, SDM, REL

relocating loader

See *LINK*.

reserved partition

A fixed area in memory that contains a program while it is executing. The size of reserved partitions is defined at boot up time. PROG, SDM, DDM

response time

The total amount of time required to bring a program or routine into execution in response to an interrupt, an interval timer, a call from another program, or an operator request.

restore

Set up a real ID segment or a prototype 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 commands, or by another program with a call to the operating system routine FmpRpProgram. 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 FmpRpProgram, then it may need to be released by the OF command. See *ID segment* and *executable program*. PROG, USER

ROM-resident

Program storage in read-only memory (ROM). Programs in ROM can be run as soon as the system is turned on, without having to load them from a disk. As a result, self-test and boot up programs, and often operating system or language subsystem programs are ROM-resident, so that the computer is ready to run as soon as it is turned on.

RTE-A

See *real-time executive*.

scheduled program

A program that has been entered in the scheduled programs list, but has not yet begun execution. Programs are entered in the scheduled programs list in response to an operator request for immediate or delayed execution of the program, or a request from another program. See *program management*, *dormant program*, *executing program*, and *suspended program*. USER

scheduler

An RTE-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 operator command, the scheduler is called to move the program from the dormant state to the scheduled state. When there are no higher priority scheduled programs, the dispatcher moves the program to the executing state. See *dormant program*, *executing program*, *scheduled program*, *program management*, and *dispatcher*. SDM

SCSI (Small Computer System Interface)

An industry-standard hardware and software interface protocol that allows computer peripherals from different manufacturers to be used on a single interface bus. SCSI

sector

A 128-byte area on a disk. disk memory is divided into logical units, cartridges, cylinders, tracks, blocks, logical sectors, records, bytes, and bits. The sector is one-half of the smallest division that most disks can address. In RTE-A, disk access is always to blocks which are two sectors long. The block is the smallest addressable division on HP disk drives. Access to the smaller divisions, down to the individual bits, must be performed by software. SGI

security table

Contains the set of rules based on capability levels, categories, and functions as the system manager defines them.

segmented program

The code portion of a large CDS program that has been divided into segments by the LINK loader. The data portion is never segmented. Each code segment can be up to 31 pages long. There may be up to 128 code segments in a segmented program, but only one data segment. The data segment can be expanded to more than 31 pages if the VMA/EMA feature is used. Segmentation permits programs that are larger than the available logical memory to run under RTE-A. MAC

select code

An octal number (20 through 77) that specifies the address of an I/O device interface card. SGI, SDM, MAC

session

For each user of the system, a set of records are set up when he or she logs in. The session keeps track of various information about the user and his or her tasks. Each session is identified by a session number. USER

shared code

The code portion of a CDS program that can be executed by several users at once. PROG

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, and is described in detail in the RTE-A Programmer's Reference Manual. See *EMA*. PROG

signals

A functionality which provides a means for programs to react to externally generated asynchronous events through the use of a "software interrupt" routine. The three types of signals are program violation (MP, VI, CS06, and so on), timer events, and class I/O completion. PROG

SNAP file

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

SPOOL

Simultaneous peripheral operations online, an RTE-A feature that speeds up I/O operations. In a SPOOL output operation, output data from a program is written to a disk, then transferred from the disk to a peripheral while the program continues to execute. Spooling is useful for performing I/O with slow devices, because disk I/O is much faster than most other peripheral I/O. The program that performs spooled I/O completes its I/O operations sooner than if it performed I/O directly to the slow device. PROG, USER

subdirectory

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

superuser

A user that has access to all functions and resources in the system. A superuser is not subject to file system protection, system routine and command protection, CI command protection, and so on. In most instances, only the system manager is given superuser capabilities. USER

suspended program

A program that has been put aside by the operating system. Programs are suspended when a higher-priority program is scheduled, when an I/O request that cannot be executed immediately is made, or when the SS command is issued by the operator. The suspension point is recorded in its ID segment, and the program name is entered in the suspended programs list. See *dormant program*, *executing program*, *scheduled program*, and *program management*. USER

swap file

Programs that are swapped out of physical memory are stored in a swap file while they are suspended. The swap file is defined at boot up. SDM

swapping

In a multiprogramming system, suspending a program and transferring it to mass storage so that a higher priority program can occupy the same memory partition. When the higher priority program completes or is suspended by an I/O wait, the original program can be swapped back into the partition to continue at the point where it was suspended. See *suspended program*. SDM

synchronous device

An I/O device that transmits or receives characters at the same rate that the computer or other device receives or sends them. Error detection is performed by transmission of checking characters.

system available memory (SAM)

A temporary storage area in physical memory used by the system for class I/O (mailbox I/O), re-entrant I/O, automatic buffering, and parameter string passing. PROG, SDM, SGI

system base page

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

system common memory

An area of memory that can be shared by programs to pass parameters. See *common*. SDM, SGI

system library

A group of subroutines available to user programs that perform operating system functions, but are independent of the system itself. The subroutines permit user programs to perform operating system functions without calling the operating system. SDM, SGI

system logical memory

See *logical memory*.

system map

A set of registers that describe the areas of physical memory restricted for operating system use. SDM

system tables

Lists of information kept by RTE-A, such as the interface tables (IFTs), device tables (DVTs), ID segments, interrupt table (INT), and the dormant, scheduled, and suspended program lists. SDM

tape block

The smallest unit of information that can be addressed by a CS/80 tape unit, 1024 bytes (512 words) in length. BKUP

time base generator (TBG)

A hardware clock that generates an interrupt, called a TBG tick, every 10 milliseconds. It is used to trigger execution of time scheduled programs, to control timeslicing for multiprogramming, and for determining device timeouts.

timeout

A 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. The timeout feature prevents programs from being hung by malfunctioning devices. USER

time-scheduling

Placing a program on the time-scheduled programs list for execution at a preset time of day and, if desired, at regular intervals afterwards. Programs are time-scheduled with the AT command. USER, PROG

timeslicing

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 to execute before another gets its turn. If a higher priority program becomes active, it supersedes the timeslicing. Without timeslicing, one program could monopolize the CPU until it completed. SDM, USER

track

An addressable unit of a disk surface. It is the area of a single disk surface at a particular distance from the center of the disk that passes under a head in one revolution. Compare *cylinder*. SGI, REL

trap cell

See *interrupt location*.

up

The state of a device that is available for use by the system. UP refers to the system UP command. Compare *down*. USER

user base page

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

user logical memory

The 64k-byte memory space used by a user program during execution. CDS programs require two areas: one for code, another for data. SDM

user-definable directory search path (UDSP)

The order in which you want the system to search directories for a file. Use the PATH command, either interactively or in your LOGON file, to specify up to eight different UDSPs for your session. USER

user-defined variables

CI variables with both names and value defined by the SET command. To reference a variable after it has been defined, use the name preceded by a \$ sign. USER

user maps

Sets of map registers that describe the areas of physical memory available to user programs. SDM

virtual control panel (VCP)

A ROM-resident program in the A-Series computer that replaces the hardware front panel of earlier computers. One terminal can be defined as the VCP terminal. The VCP program is activated by pressing the BREAK key on the VCP terminal or the RESET switch on the CPU, or by turning the system on (refer to the Computer Reference Manual for startup options). The VCP display shows the contents of the CPU registers and the VCP prompt:

```
P 001604 A 000000 B 000000 RW 100003 M 001603 T 100020
VCP>
```

The VCP program lets you change the contents of the registers, as with a hardware front panel. The operating system can be booted up from the VCP prompt. GSA, PROG, SGI

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 lets programs manipulate data structures as large as 65536 pages. The VMA/EMA operations are transparent to the user program. See *working set* and *backing store file*. PROG, SDM

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. PROG

volume

For a disk, an addressable portion of the storage media on a given unit. When the term is used in file management descriptions, it is synonymous with a disk LU. USER, PROG

working directory

The directory used by default when no other directory is specified in a file descriptor. In the multi-user environment, each user can have a different working directory. The working directory is also called the default directory or current directory.

working set

Data transferred from the backing store file into physical memory for access by a program. Not all VMA data reside at all times on disk. The part that is on disk is located in the backing store file. The remainder is the working set. The working set page addresses are stored in the page table. See *virtual memory area*. PROG, USER, SDM

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