



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.)

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Table of Contents

RTE-6/VM Operating System Documentation Maps	1
Manual Descriptions	4
Glossary	9
Manual Mnemonics	31
Index	32

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,

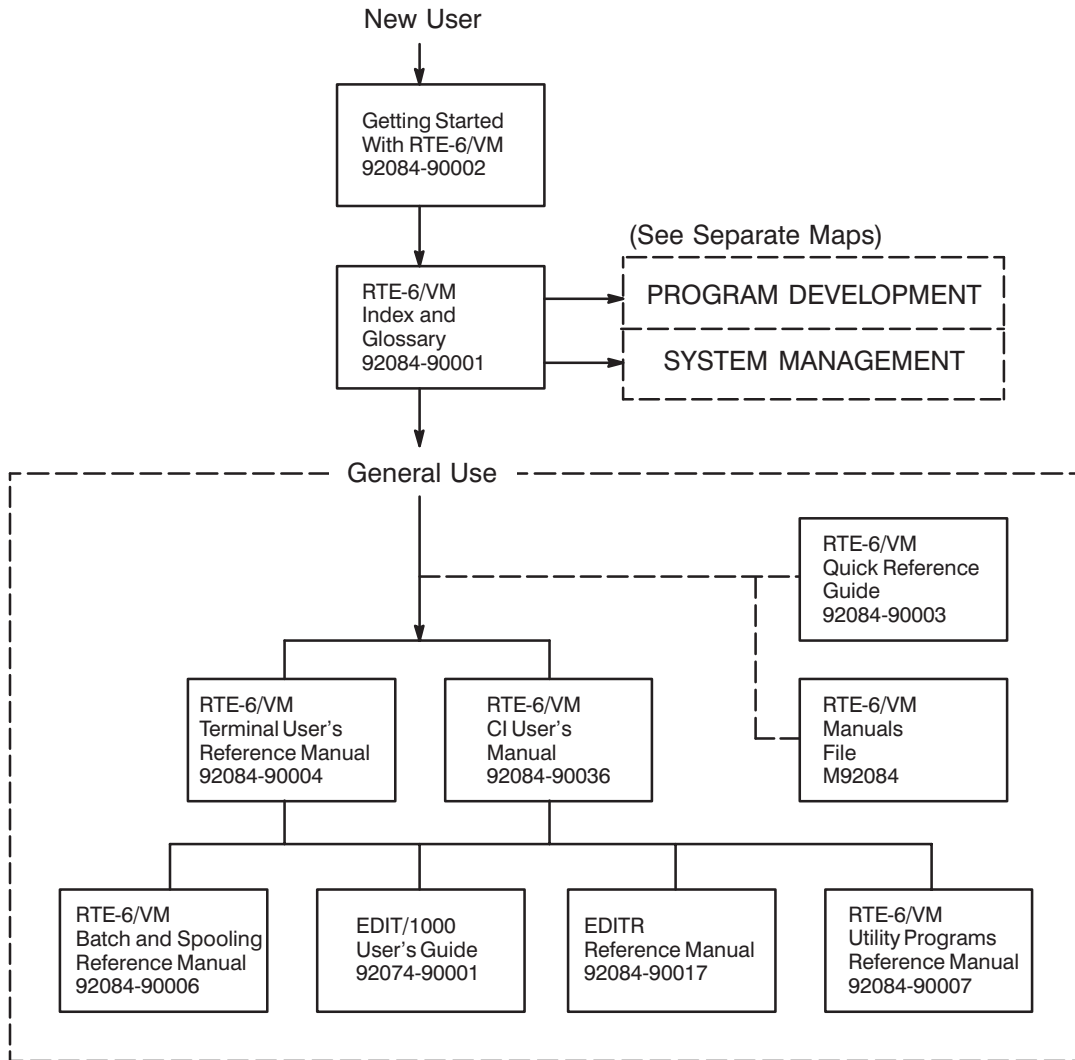
ICD disk surface organization: *SMM* 4-5, A-13

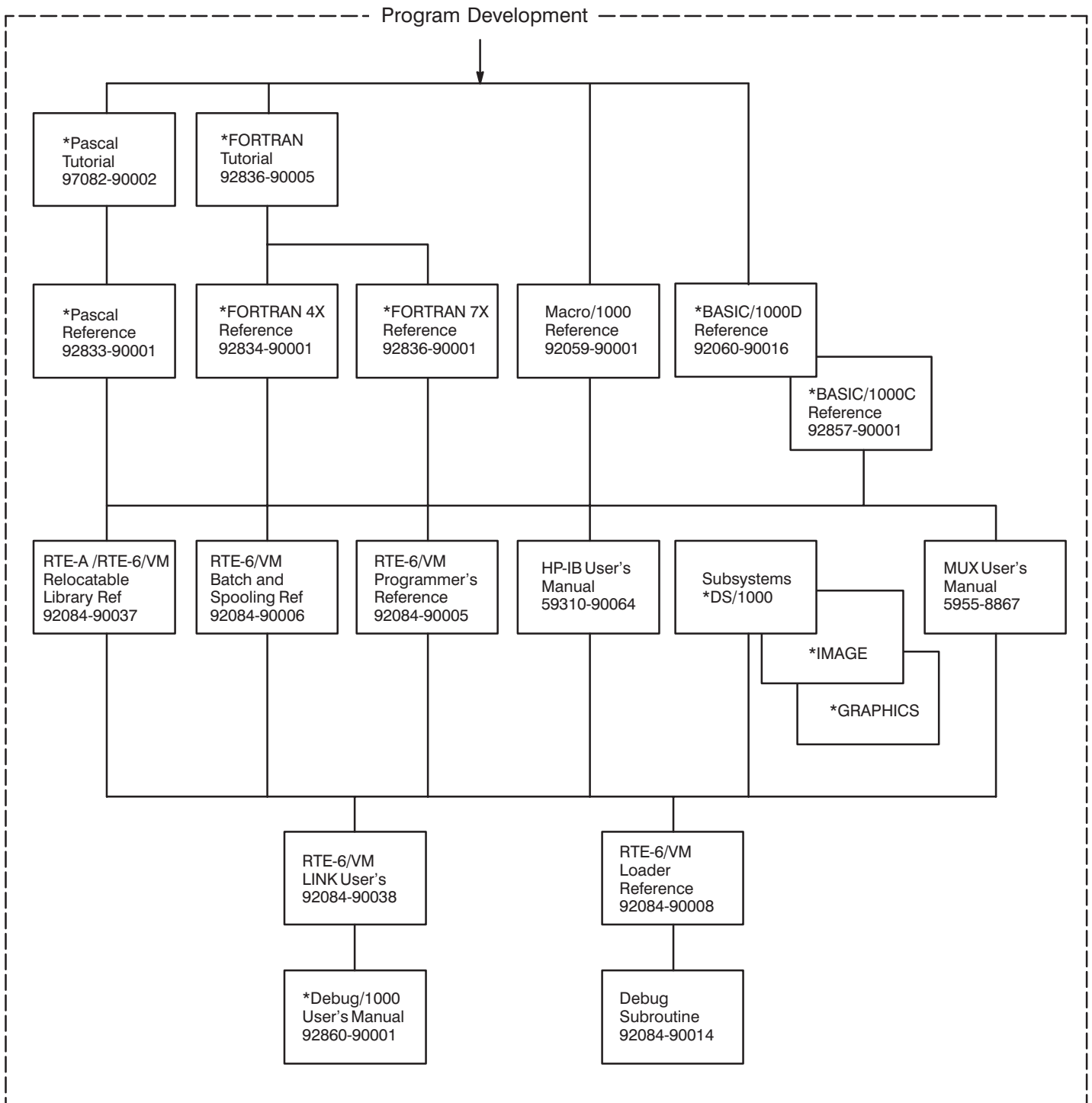
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RMPAR subroutine: *BSP* 3-2; *LODR* 4-31; *PROG* 5-41; *REL* 5-24

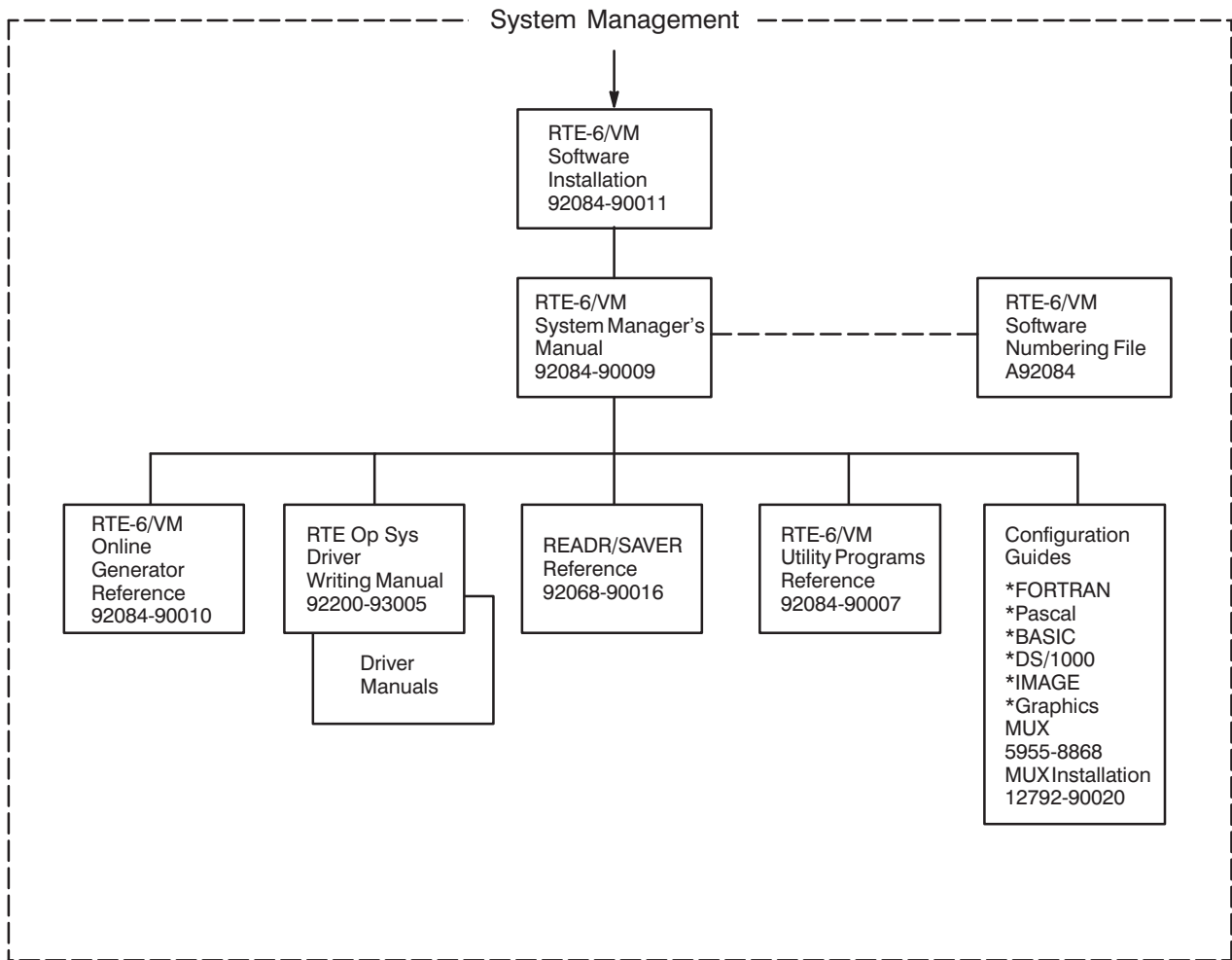
The first entry above refers to pages 4-5 and A-13 of the System Manager's Manual. The second example refers to page 3-2 of the Batch and Spooling Reference manual, page 4-31 of the Loader Reference Manual, and so on. The manual mnemonics are listed at the beginning of the index.

RTE-6/VM Operating System Documentation Maps





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



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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/1000D, and BASIC/1000C, 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/O 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 (0 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 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 1K 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/sub1/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

..CCM: *REL* 3-131
..DCM: *REL* 3-132
..DLC: *REL* 3-133
..FCM: *REL* 3-134
..MAP: *REL* 5-40
..TCM: *REL* 3-135
.ABS: *REL* 3-61
.ATAN: *REL* 3-62
.ATN2: *REL* 3-63
.BLE: *REL* 3-64
.CADD: *REL* 3-65
.CDBL: *REL* 3-66
.CDIV: *REL* 3-67
.CFER: *REL* 3-68
.CHEB: *REL* 3-69
.CINT: *REL* 3-70
.CMPY: *REL* 3-71
.CMRS: *REL* 3-72
.COS: *REL* 3-73
 no error return, /COS: *REL* 3-166
 range reduction, /CMRT: *REL* 3-167
.CPM: *REL* 3-74
.CSUB: *REL* 3-75
.CTBL: *REL* 3-76
.CTOI: *REL* 3-77
.DADS: *REL* 4-2
.DBG file extension: *DEBUG* 2-4
.DCO: *REL* 4-3
.DCPX: *REL* 3-78
.DDE: *REL* 4-4
.DDI, .DDR: *REL* 4-5
.DDS: *REL* 4-6
.DFER: *REL* 3-79
.DIN: *REL* 4-7
.DINT: *REL* 3-80
.DIS: *REL* 4-8
.DMP: *REL* 4-9
.DNG: *REL* 4-10
.DRCT: *PROG* 5-82
.DTBL: *REL* 3-81
.DTOD: *REL* 3-82
.DTOI: *REL* 3-83
.DTOR: *REL* 3-84
.EMIO: *PROG* 4-50, B-14
.ENTC: *REL* 5-27
.ENTN: *REL* 5-27
.ENTP: *REL* 5-28
.ENTR: *REL* 5-28
.ENTR call sequence: *REL* 2-1
.ESEG: *PROG* 4-49, B-11
.EXP: *REL* 3-85
 no error return, /EXP: *REL* 3-168
 range reduction, /CMRT: *REL* 3-167
.FAD: *REL* 3-86
.FDV: *REL* 3-87
.FIXD: *REL* 4-11
.FLTD: *REL* 4-12
.FLUN: *REL* 3-88
.FMP: *REL* 3-89
.FMUI: *REL* 5-31
.FMUO: *REL* 5-31
.FMUP: *REL* 5-31
.FMUR: *REL* 5-33
.FPWR: *REL* 3-90
.FSB: *REL* 3-86
.GOTO: *REL* 5-34
.ICPX: *REL* 3-91
.IDBL: *REL* 3-92
.IENT: *REL* 3-93
.IMAP: *PROG* 4-44, B-4
.IRES: *PROG* 4-45, B-6
.ITBL: *REL* 3-94
.ITOI: *REL* 3-95
.JMAP: *PROG* 4-46, B-7
.JRES: *PROG* 4-47, B-8
.LBP: *PROG* 4-49, B-12
.LBPR: *PROG* 4-49, B-12
.LOG: *REL* 3-96
 no error return, /LOG: *REL* 3-170
.LOG0: *REL* 3-97
 no error return, /LOG0: *REL* 3-171
.LPX: *PROG* 4-50, B-13
.LPXR: *PROG* 4-50, B-13
.MANT: *REL* 3-98
.MAP: *REL* 5-35
.MAX1: *REL* 3-99
.MIN1: *REL* 3-99
.MOD: *REL* 3-100
.MPY: *REL* 3-101
.NGL: *REL* 3-102
.OPSY: *REL* 5-36
.PACK: *REL* 3-103
.PAUS: *REL* 5-37
.PCAD: *REL* 5-38
.PWR2: *REL* 3-104
.RTOD: *REL* 3-105
.RTOI: *REL* 3-106
.RTOR: *REL* 3-107
.RTOT: *REL* 3-108
.SIGN: *REL* 3-109
.SIN: *REL* 3-110
.SQRT: *REL* 3-111
 no error return, /SQRT: *REL* 3-173
.STIO: *PROG* 5-48
.TADD: *REL* 3-112
.TAN: *REL* 3-113
 no error return, /TAN: *REL* 3-174
 range reduction, /CMRT: *REL* 3-167
.TANH: *REL* 3-114
 range reduction, /CMRT: *REL* 3-167
.TAPE: *REL* 5-39
.TCPX: *REL* 3-115
.TDBL: *REL* 3-116
.TDIV: *REL* 3-112
.TENT: *REL* 3-117
.TFTD: *REL* 4-13
.TFXD: *REL* 4-14
.TINT: *REL* 3-118, 3-175
.TMPY: *REL* 3-112
.TPWR: *REL* 3-119

.TSUB: *REL* 3-112
.TTOI: *REL* 3-120
.TTOR: *REL* 3-121
.TTOT: *REL* 3-122
.XADD: *REL* 3-123
.XCOM: *REL* 3-124
.XDIV: *REL* 3-125
.XFER: *REL* 3-126
.XFTD: *REL* 4-15
.XFXD: *REL* 4-16
.XMPY: *REL* 3-127
.XPAK: *REL* 3-128
.XPLY: *REL* 3-129
.XSUB: *REL* 3-123
.YINT: *REL* 3-130
!! (abort) command: *GEN* 2-8
!BCKOF
 backup example: *INST* F-3
 offline utility: *INST* D-4
!MTLDR, magnetic tape loader: *INST* D-4
? RM (help on recovery): *EDIT* 3-47
? command: *CUSR* 5-1; *DEBUG* 2-14, 5-19; *EDIT*
 2-20, 4-92, 4-94; *GEN* 2-7; *RDSV* 2-12, 3-4
?? command: *BSP* 4-4, 4-5; *DEBUG* 5-32; *EDIT*
 4-92, 4-95; *RDSV* 3-11; *TUSR* 3-32
,, (default a parameter): *EDIT* 3-36
; (semicolon): *DEBUG* 2-12
:AND: (logical AND): *MAC* 4-61
:ASH:: *MAC* 4-59
:L: (length attribute): *MAC* 4-55
:LSH:: *MAC* 4-59
:MOD:: *MAC* 4-59
:NOT:: *MAC* 4-55
:OP:: *MAC* 5-11
:OR: (logical OR): *MAC* 4-61
:ROT:: *MAC* 4-59
:S: (substring): *MAC* 4-55
:T: (type attribute): *MAC* 4-55
:TR function: *UTIL* 12-6, 12-9
:UC: (uppercase attribute): *MAC* 4-55
“.” and “..” directory specifiers: *CUSR* 3-9
”MACLB library: *MAC* E-11
() space command: *EDIT* 3-32
&.DATE: *MAC* K-2
&.ERROR: *MAC* K-1
&.PARM: *MAC* K-3
&.PCOUNT: *MAC* K-3
&.Q: *MAC* K-1
&.REP: *MAC* K-3
&.RS1 and &.RS2: *MAC* K-2
&.RS1=: *MAC* E-5
&.RS2=: *MAC* E-5
&FFL module: *UTIL* 8-4, 8-5
&Q: *MAC* 5-8
#COS: *REL* 3-136
#EXP: *REL* 3-137
#LOG: *REL* 3-138
#MACRO: *MAC* E-11
#n directory specifier: *CUSR* 3-10
#SIN: *REL* 3-139
\$ (end-of-file): *EDIT* 2-21
\$ALC: *GEN* B-3
\$ASC6: *GEN* B-3
\$CVT1 (KCVT): *PROG* 5-80
\$CVT3 (CNUMD,CNUMO): *PROG* 5-80
\$DVTB: *CMUX* 2-31, 4-12
\$EMA statement: *PROG* 4-13
\$EMCLB library: *PROG* 4-13
\$EXP: *REL* 3-140
\$FNEWF: *SMM* 4-102
\$FOLDF: *SMM* 4-102
\$HpZideca: *REL* 12-87
\$LIST: program scheduling: *DRVW* 3-27
\$LOG: *REL* 3-141
\$LOGT: *REL* 3-142
\$OPSY: *DRVW* 3-30; *PROG* 5-65
\$PARS subroutine: *PROG* 5-87
\$SETP: *REL* 5-41
\$SQRT: *REL* 3-143
\$SUBC: *DRVW* 3-35
\$TAN: *REL* 3-144
\$TRN6: *GEN* B-3
\$VISUAL environment variable: *DEBUG* 7-3
\$XDMP: *DRVW* 3-31
\$XSIO (system I/O): *CMUX* 4-4, 4-10
 control zero request: *CMUX* 4-5
%ABS: *REL* 3-145
%AN: *REL* 3-146
%AND: *REL* 3-147
%ANH: *REL* 3-148
%BS: *REL* 3-149
%FIX: *REL* 3-150
%IGN: *REL* 3-151
%IN: *REL* 3-152
%INT: *REL* 3-153
%LOAT: *REL* 3-154
%LOG: *REL* 3-155
%LOGT: *REL* 3-156
%MDMLB (MODEM library): *CMUX* 2-25
%NT: *REL* 3-157
%OR: *REL* 3-158
%OS: *REL* 3-159
%OT: *REL* 3-160
%QRT: *REL* 3-161
%SIGN: *REL* 3-162
%SSW: *REL* 5-42
%TAN: *REL* 3-163
%XP: *REL* 3-164
@ character. See indefinite (@) character
@ default character: *MAC* E-4
@SGLD, *LODR* 9-1
+ option. See append (+) option
+n, -n. See line specification
- default character: *MAC* E-4
-B option: *DEBUG* 2-6
-B runstring option: *EDIT* 3-3
-D option: *DEBUG* 2-7
-d option (Xdb): *DEBUG* 7-2
-I option: *DEBUG* 2-7
-L option: *DEBUG* 2-8
-L runstring option: *EDIT* 3-3
-M option: *DEBUG* 2-8

- P option: *DEBUG* 2-9
- p option (Xdb): *DEBUG* 7-2
- Q runstring option: *EDIT* 3-4
- r option (Xdb): *DEBUG* 7-2
- R runstring option: *EDIT* 3-4, C-2
- RB option: *DEBUG* 2-10
- S runstring option: *EDIT* 3-4, 3-47, C-2
- V option: *DEBUG* 2-10
- W option: *DEBUG* 2-10
- * (line specification character): *EDIT* 3-15
- * command: *GEN* 2-6
- ** command: *GEN* 2-6; *TUSR* 3-34
- / (command stack): *CUSR* 5-2; *EDIT* 2-35, 4-92
- / (EDIT prompt): *EDIT* 2-7, 3-32
- /A command: *RDSV* 3-11
- /ATLG: *REL* 3-165
- /CMRT: *REL* 3-167
- /COS: *REL* 3-166
- /E command: *RDSV* 3-5, 3-11
- /EXP: *REL* 3-168
- /EXTH: *REL* 3-169
- /LOG: *REL* 3-170
- /LOG0: *REL* 3-171
- /SCRATCH directory: *MAC* E-6
- /SIN: *REL* 3-172
- /SQRT: *REL* 3-173
- /TAN: *REL* 3-174
- /TINT: *REL* 3-175
- ^ character. *See* anchor (^) character
- ^ B command: *EDIT* 3-32
- ^ C command: *EDIT* 2-20, 2-21, 3-31
- ^ D command: *EDIT* 2-37
- ^ F command: *EDIT* 2-15, 2-21
- ^ I command: *EDIT* 3-31
- ^ K command: *EDIT* 2-28
- ^ Q command: *EDIT* 2-17
- ^ R command: *EDIT* 2-37, 3-31
- ^ S command: *EDIT* 2-16, 3-31
- ^ T command: *EDIT* 2-15, 3-32
- ^ U command: *EDIT* 2-17, 2-21
- ^ X command: *EDIT* 2-16, 3-32
- | (command separator). *See* command separator
- <\$> (break line metacharacter): *EDIT* 5-18

Numbers

- 212 versus V.22 mode: *CMUX* 2-23
- 7900 subchannel initialization: *SMM* 5-16
- 7906 Disk Drive: *SMM* 4-19
- 7906/7920 Disk restoration: *INST* D-7
- 7906H/7920H Disk restoration: *INST* D-7
- 7920 Disk Drive: *SMM* 4-24
- 7925 Disk Drive: *SMM* 4-27
- 9895 Disk Unit: *SMM* 4-37

A

- A command: *EDIT* 1-7, 1-8, 1-13, 2-8, 4-2
- A option: *MAC* E-1
- AB command: *BSP* 2-38, 4-3, 4-5, 4-14; *LINK* 3-4; *LODR* 5-2; *TUSR* 2-13, 2-16
- A_B Registers: *REL* 12-1
- A_Register: *REL* 12-1
- A- and B-Registers, ABREG: *REL* 5-1
- A2 to decimal conversion, SA2DE: *REL* 10-31
- ABI chip: *HPIB* 2-3, 4-5
- abnormal termination messages: *SMM* 5-21
- abort
 - and save work file: *EDIT* 1-7
 - EDIT program: *EDIT* 1-7, 1-8, 1-13, 2-24
 - executing batch job: *TUSR* 2-13, 2-16
- Abort and Save (AS) command. *See* AS command
- ABORT statement: *HPIB* 4-18
- aborted data transfer: *HPIB* 6-4
- aborting
 - INDXR: *LODR* 6-42
 - LOADR: *LODR* 4-32
 - MLLDR: *LODR* 4-32
 - READR: *RDSV* 3-3, 3-11, B-11
 - SAVER: *RDSV* 2-3, 2-11, B-11
 - SGMTR: *LODR* 6-7
 - SXREF: *LODR* 6-24
- ABREG subroutine: *PROG* 2-13; *REL* 5-1, 12-1
- ABRT subroutine: *HPIB* 4-18
- ABS: *MAC* 4-40, 4-42, B-16; *REL* 3-1
- ABS entry (call-by-name), %BS: *REL* 3-149
- absolute
 - assembly: *MAC* E-1
 - code: *MAC* 1-1
 - expressions: *MAC* 2-10
 - programs: *MAC* 2-10, 4-7, 4-13
 - record formats: *PROG* I-23
 - tape format: *PROG* I-24
 - time mode: *PROG* 2-65
 - value: *MAC* 4-42
- absolute value
 - double real: *REL* 3-61
 - extended real: *REL* 3-19
 - integer: *REL* 3-42
 - of a real: *REL* 3-1
 - of complex (real): *REL* 3-11
 - routine
 - DVABS (double precision): *REL* 8-13
 - DWABS (EMA double precision): *REL* 8-13
 - VABS (single precision): *REL* 8-13
 - WABS (EMA single precision): *REL* 8-13
- AC command: *TUSR* 3-18, 3-35
- AC option: *EDIT* 3-25
- access to FMGR and CI files: *UTIL* 1-1
- accessing
 - a file: *EDIT* 3-8, 3-11
 - another subroutine: *DEBUG* 3-12
 - EDIT: *EDIT* 1-6
 - FMGR files: *CUSR* B-11
 - next screen: *EDIT* 2-15

previous screen: *EDIT* 2-15
 screen mode: *EDIT* 2-10
 AccessLU, check for LU access: *REL* 6-1
 account
 command file formats: *SMM* 8-32
 directory: *SMM* 8-4
 entry
 group: *SMM* C-11
 user: *SMM* C-10
 file: *TUSR* 2-1, 2-10
 directory: *SMM* C-9
 header: *SMM* C-6
 structure: *SMM* C-5
 file header: *SMM* 8-2
 SST definition: *SMM* 7-1
 system: *SMM* 3-4
 accounting limits, user and group, SetAcctLimits:
 REL 6-17
 accounts
 adding new: *SMM* 8-13
 NEW,GROUP: *SMM* 8-13
 NEW,USER: *SMM* 8-14
 clear
 RESET,GROUP: *SMM* 8-19
 RESET,USER: *SMM* 8-20
 modify
 ALTER,GROUP: *SMM* 8-17
 ALTER,USER: *SMM* 8-18
 PASSWORD: *SMM* 8-20
 program operation: *SMM* 8-5
 setup program (ACCTS): *SMM* 8-1
 system maintenance: *SMM* 8-27
 ALTER,ACCT: *SMM* 8-27
 LOAD: *SMM* 8-30
 PURGE,ACCT: *SMM* 8-29
 UNLOAD: *SMM* 8-29
 ACCTS
 command syntax: *SMM* 8-9
 error messages: *SMM* 8-33
 general commands: *SMM* 8-9
 ABORT: *SMM* 8-12
 EXIT: *SMM* 8-12
 HELP: *SMM* 8-9
 TELL: *SMM* 8-10
 TRANSFER: *SMM* 8-11
 help file entries: *SMM* 8-35
 acknowledge control character: *EDIT* 3-26
 Activate Breakpoint command: *DEBUG* 5-3
 active program status: *UTIL* 2-11
 active session table: *SMM* 8-2
 actual address, array element, .MAP: *REL* 5-35
 actual macro parameters: *MAC* 5-3, 5-9
 ADA: *MAC* 3-2, B-2
 ADB: *MAC* 3-2, B-2
 add
 complex to complex: *REL* 3-65
 double integer: *REL* 4-2
 DVADD (double precision): *REL* 8-9
 DWADD (EMA double precision): *REL* 8-9
 extended real: *REL* 3-123
 real: *REL* 3-86

VADD (single precision): *REL* 8-9
 WADD (EMA single precision): *REL* 8-9
 ADD (system macro): *MAC* L-10
 adding text: *EDIT* 2-12
 adding text to end of lines: *EDIT* 5-22
 address
 actual, array element, .MAP: *REL* 5-35
 and LU numbers: *HPIB* 3-1
 and symbol, definition: *MAC* B-16
 array element, .MAP: *REL* 5-40
 ASCII representation: *HPIB* 2-5, 4-1
 assignment table: *HPIB* 2-6
 definition: *HPIB* 1-4, 4-1
 instructions: *MAC* 4-1, 4-40, B-16
 device: *HPIB* 2-5
 dual-address devices: *HPIB* 2-5
 HP 12009A interface card: *HPIB* 2-3
 HP 59310B interface card: *HPIB* 2-1
 listen: *HPIB* 1-3
 operators: *DEBUG* 4-10
 pointers: *DBGS* 2-7
 range: *DBGS* 5-2
 search, effective: *DBGS* 5-4
 secondary: *HPIB* 1-4
 subchannels: *HPIB* 3-1
 switches: *HPIB* 2-3
 talk: *HPIB* 1-3
 translation: *PROG* F-1
 true, of parameter, .PCAD: *REL* 5-38
 address table: *CMUX* 4-11
 example: *CMUX* 4-21
 address transfer
 .ENTC: *REL* 5-27
 .ENTN: *REL* 5-27
 .ENTP: *REL* 5-28
 .ENTR: *REL* 5-28
 address:unit;volume specification: *SMM* 5-12
 address/unit/platter specification: *SMM* 5-11
 addressable mode devices: *HPIB* 2-6
 addressed commands: *HPIB* 4-5
 addressing: *HPIB* 4-1
 automatic: *HPIB* 3-3, 4-22
 direct: *HPIB* 3-3, 4-2, 4-17
 secondary: *HPIB* 4-2, 4-22
 AddressOf: *REL* 7-1
 adjusting system parameters: *SMM* 9-1
 advanced user: *RDSV* B-1
 ADX: *MAC* 3-9, B-7
 ADY: *MAC* 3-9
 AELSE: *MAC* 4-63, B-17
 AELSEIF: *MAC* 4-63, B-17
 AENDIF: *MAC* 4-63, B-17
 AENDWHILE: *MAC* 4-63, B-17
 AG command: *CUSR* 5-10; *TUSR* 4-22
 aggregate throughput: *CMUX* 1-3
 AIF: *MAC* 4-63, B-17
 AIMAG: *REL* 3-2
 AINT: *REL* 3-3
 AINT entry, %INT: *REL* 3-153
 AL command: *RDSV* 3-4

ALARM program, setting ID segment address:
CMUX 2-21

ALF: *MAC* 3-5, B-4

alias: *MAC* 4-19, 4-21

All (A) option: *EDIT* 2-32, 3-24

ALLOC: *MAC* 4-19, 4-22, 4-23, 4-41, B-14

ALLOC command: *MAC* 4-9

ALLOCATE - see also NOALLOCATE

ALLOCATE, *LODR* 4-19; *MAC* H-8

allocate cartridge: *TUSR* 3-35

allocate class number CLRQ: *PROG* 5-13

allocating memory to a program: *CUSR* 4-11

alphanumeric ASCII printout: *DBGS* 2-5

alphanumeric mode: *DBGS* 2-5

ALOG: *REL* 3-4

ALOG entry (call-by-name), %LOG: *REL* 3-155

ALOGT: *REL* 3-5

ALOGT entry (call-by-name), %LOGT: *REL* 3-156

ALR: *MAC* 3-5, B-4

ALS: *MAC* 3-5, B-4

alter-skip group: *MAC* 3-8, B-6

alternate returns: *REL* 2-3

alternate variable display: *DEBUG* 4-12

AMAX0: *REL* 3-6

AMAX1: *REL* 3-7

Amigo standard: *HPIB* 2-5, 5-7, 5-16

AMIN0: *REL* 3-6

AMIN1: *REL* 3-7

AMOD: *REL* 3-8

amount of disk space used by owners: *UTIL* 6-21

AN command: *TUSR* 3-38

anchor: *EDIT* B-1

anchor (^) character: *EDIT* 1-15, 2-33, 3-18, 3-25, 5-2

AND: *MAC* 3-2, B-2

AND entry, logical (call-by-name), %AND: *REL* 3-147

answer file

- naming convention: *INST* D-11
- sample: *GEN* E-1

APOSN call: *CUSR* B-8; *PROG* 3-64

append (+) option: *EDIT* 4-41

appending

- a file: *EDIT* 4-41
- a line: *EDIT* 4-97
- text: *EDIT* 3-6, 4-92, 4-97

Application Migration Package (AMP/9000):
UTIL 7-1

applications (VIS): *REL* 9-11

arctangent

- extended real: *REL* 3-20
- of a real: *REL* 3-9
- quotient of two double reals: *REL* 3-63
- quotient of two extended reals: *REL* 3-21
- quotient of two reals: *REL* 3-10

arithmetic

- double real: *REL* 3-112
- negation: *MAC* 4-55
- operators: *DEBUG* 4-9; *MAC* 2-10, 4-51, 4-59, 4-63

routines: *REL* 8-9

arrays

- assembly time: *MAC* 4-49
- in memory: *REL* 8-2
- initialization (VIS): *REL* 9-12

ARS: *MAC* 3-5, B-4

AS command: *CUSR* 4-12, 5-11; *EDIT* 1-7, 3-47, 4-3; *LINK* 3-4; *LODR* 5-2; *TUSR* 4-25

AS option: *EDIT* 3-25

ASC: *MAC* 4-35, B-15

ASCII

- address strings: *HPIB* 4-2, 4-5
- characters: *MAC* 4-35
- digit to internal numeric conversion, .FMUI: *REL* 5-31
- mode read: *DMUX* 2-1
- parse subroutine

 - \$PARS: *PROG* 5-87
 - PARSE: *PROG* 5-87

- to double integer conversion
- DecimalToDint: *REL* 7-16
- OctalToDint: *REL* 7-29
- to single integer conversion
- DecimalToInt: *REL* 7-17
- OctalToInt: *REL* 7-29
- versus binary read modes: *DMUX* 2-5

ASHIFT (system macro): *MAC* L-15

ASK command: *CUSR* 5-12

Asking (AS) option: *EDIT* 1-14, 3-25

ASL: *MAC* 3-12, B-11

ASMB assembly language: *MAC* 1-2

ASR: *MAC* 3-12, B-11

assembler

- control instructions: *MAC* 4-1, 4-2, 4-3
- instructions: *MAC* 1-10, B-14
- pseudo ops: *MAC* 4-1

assembling the bus: *HPIB* 2-7

assembly: *LODR* 9-9

language

- constructs: *MAC* M-3
- programming: *MAC* M-1

listing control instructions: *MAC* 4-25

time

- arrays: *MAC* 4-49
- global variable: *MAC* 4-48
- local variables: *MAC* 4-49
- variable declaration: *MAC* 4-1, 4-47, B-16
- variable value substitution: *MAC* 4-47
- variables (ATVs): *MAC* 1-12, 2-7, 4-47, 4-48, K-1

assigning

- memory partitions: *CUSR* 4-12
- program partitions: *GEN* 2-82, 3-17; *TUSR* 4-25
- shareable EMA partitions: *SMM* 10-14
- symbol to an address just printed, *DBGS* 2-13

assignment, priority: *BSP* 2-32

asterisk: *MAC* 2-7

asterisk (*) command. See comment (*) command

asterisk (*) line specification: *EDIT* 3-15

ATACH, attach to session: *REL* 6-2

ATAN: *REL* 3-9

ATAN entry (call-by-name), %TAN: *REL* 3-163
 ATAN2: *REL* 3-10
 ATCRT, attach a CRT: *REL* 6-3
 ATN bus management line: *HPIB* 1-7
 attach a CRT, ATCRT: *REL* 6-3
 attach to session, ATACH: *REL* 6-2
 attribute operators: *DEBUG* 4-9
 attributes: *BSP* 2-14
 auto-answer mode: *CMUX* 2-21
 auto-dial: *CMUX* 2-24
 auto-home bit, read request: *DMUX* 2-3
 autoboot: *INST* 3-1
 specification: *SMM* 5-18
 automatic
 buffering: *PROG* 1-18
 output buffering: *SMM* 4-47; *TUSR* 4-11
 track switching: *PROG* 2-86
 AUTOR: *DRVW* 3-27
 auxiliary
 disk subchannel: *GEN* 2-21, 3-8
 disk subchannel tracks: *UTIL* 2-15
 system cartridges: *PROG* 3-12
 AWHILE: *MAC* 4-63, 4-65, B-17

B

B command: *EDIT* 2-31, 3-18, 4-4
 B option: *MAC* E-2
 B_Register: *REL* 12-1
 background
 COMMON: *GEN* 2-63, B-2; *PROG* 1-12
 changing: *GEN* 2-62
 disk residents: *GEN* 2-70
 map: *GEN* B-5
 memory lock: *GEN* 2-22
 partitions: *TUSR* 1-3
 program: *LINK* 3-4; *LODR* 2-15; *TUSR* 1-3
 backing store file: *LODR* 2-18; *PROG* 4-2, 4-3, 4-5
 close: *PROG* 4-38
 create: *PROG* 4-35
 initialized: *PROG* 4-37
 open: *PROG* 4-36
 purge: *PROG* 4-38
 backing up disk cartridges to magnetic tape: *UTIL*
 5-1
 backslash: *MAC* 2-14
 backspace: *DMUX* 2-4; *EDIT* 3-31
 backspace tape, .TAPE: *REL* 5-39
 backup and file interchange utilities: *UTIL* 4-1
 File Copy (FC): *UTIL* 4-2
 File Storage to Tape (FST): *UTIL* 4-2, 4-3
 Logical Interchange Format HP Systems File
 Copy (LIF): *UTIL* 4-2
 Tape Filer (TF): *UTIL* 4-2
 backup, disk: *TUSR* 1-10
 backup utilities: *INST* D-16
 FC: *UTIL* 4-113
 FST: *UTIL* 4-3
 TF: *UTIL* 4-55
 backward compatibility: *MAC* 1-2, B-18, J-1
 constructs: *MAC* J-1
 option: *MAC* E-2
 bad pages, exclusion: *SMM* 10-9
 bad track information: *SMM* 5-21
 bad tracks: *TUSR* 3-13, 3-54, 3-98
 base line specification. *See* line specifications
 default: *EDIT* 3-15
 base page: *GEN* B-1
 and logical memory: *PROG* F-3
 communications area: *DRVW* 2-3
 data: *MAC* 4-9
 linking: *UTIL* 10-1
 links: *LODR* 2-3, 2-4, 4-10, 4-24, 6-6, 7-2, E-2;
 PROG 1-10; *UTIL* 10-3
 overflow, *LODR* 6-6, 8-5, 8-7
 mapping and organization: *GEN* B-13
 relocatable space: *MAC* 1-11, 4-3
 rotating: *LODR* 4-24
 shared: *LODR* 4-24
 BASIC arrays: *DEBUG* 4-7
 BASIC/1000C: *PROG* 1-26
 and BASIC/1000D strings: *HPIB* 4-20
 automatic addressing: *HPIB* 4-22
 CHARACTER variable type: *HPIB* 4-20
 device control: *HPIB* 4-14
 I/O specifiers: *HPIB* 4-13
 secondary addressing: *HPIB* 4-3, 4-22
 service requests: *HPIB* 5-9
 syntax: *HPIB* 4-12
 BASIC/1000D: *PROG* 1-26
 automatic addressing: *HPIB* 4-22
 device control: *HPIB* 4-14
 secondary addressing: *HPIB* 4-3, 4-22
 strings: *HPIB* 4-20
 syntax: *HPIB* 4-12
 batch
 and spooling FMGR errors: *BSP* A-3
 checking: *BSP* 3-5
 device, job entered from: *BSP* 2-40
 environment: *BSP* 2-1
 input checking flag: *BSP* 3-7
 job: *BSP* 1-3, 1-4
 abort execution: *TUSR* 2-13
 processing: *TUSR* 1-7
 running: *BSP* 2-40
 spooling: *BSP* 2-1
 jobs in session: *BSP* 2-32
 mode: *EDIT* 3-3, 3-49
 operation: *EDIT* 1-10
 processing: *BSP* 1-3, 2-25
 setup: *BSP* 2-31
 spooling: *BSP* 2-28
 batch-spool error codes: *BSP* A-1
 batch-spool system components: *BSP* 1-1
 baud rate
 generator: *CMUX* 1-3
 setting: *CMUX* 2-19
 group: *DMUX* 2-14
 default (DV800 only): *DMUX* 2-21
 resetting: *DMUX* 2-29

selection: *CMUX* 2-20
 selection bits: *DMUX* 2-21
 support: *CMUX* 2-20; *DMUX* 2-14
 BC command: *EDIT* 4-6
 BCD-ASCII conversion (HP 7970B): *DMUX* E-6
 BCKOF program: *UTIL* 3-1, 3-27, 3-30, 3-32
 BE option: *EDIT* 3-25
 Bell (BE) option: *EDIT* 3-25
 BG. *See* background program
 BG command: *LINK* 3-4
 binary
 bit
 read request: *DMUX* 2-3
 write request: *DMUX* 2-10
 codes: *MAC* D-1
 length, setting: *CMUX* 2-32
 mode bit: *CMUX* 2-3
 to ASCII conversion subroutines: *PROG* 5-80
 BINRY subroutine: *PROG* 5-49
 bit
 bucket: *TUSR* 4-45
 change: *REL* 7-2
 check: *REL* 7-2
 find free bits: *REL* 7-3
 map: *CUSR* 3-35
 map manipulation routines: *REL* 7-2
 ChangeBits: *REL* 7-2
 CheckBits: *REL* 7-2
 ClearBitMap: *REL* 12-2
 FindBits: *REL* 7-3
 GetBitMap: *REL* 12-8
 HpZDumpBitMap: *REL* 12-53
 PutBitMap: *REL* 12-88
 SetBitMap: *REL* 12-90
 Test_SetBitMap: *REL* 12-92
 TestBitMap: *REL* 12-91
 map/free space table: *UTIL* 6-23
 processing: *MAC* 3-3
 bits per character: *CMUX* 2-19
 BK command: *EDIT* 4-8
 BL command: *CUSR* 5-14; *TUSR* 4-27
 black box considerations: *CMUX* 5-2
 blank
 COMMON. *See* COMMON
 ID extensions: *GEN* 3-14
 ID segments: *GEN* 3-14
 long ID segments: *GEN* 2-67
 short ID segments: *GEN* 2-68
 sign: *DBGS* A-1
 BlankString subroutine: *REL* 7-4
 BLF: *MAC* 3-5, B-4
 block: *TUSR* 3-3; *UTIL* 9-5
 and sector to track and sector: *REL* 7-4
 associated address: *UTIL* A-2, A-4
 copy: *EDIT* 4-6
 data subprogram: *LODR* 6-8, 6-9, 6-10
 data subroutines: *LINK* 4-8
 defective: *UTIL* 9-5, 9-11, A-2
 disk: *UTIL* A-1
 mode: *CMUX* 2-22
 line mode: *CMUX* B-1
 operation of DBUGR: *DBGS* D-1
 page mode: *CMUX* B-1
 read: *CMUX* 4-3; *DMUX* 2-5
 terminal: *DMUX* 2-7
 terminal device driver (DDV05): *CMUX* 4-3
 move: *EDIT* 4-9
 remaining: *GEN* 2-19
 BlockToDisk subroutine: *REL* 7-4
 BLR: *MAC* 3-5, B-4
 BLS: *MAC* 3-5, B-4
 BM command: *EDIT* 4-9
 body of the macro definition: *MAC* 5-2
 boot
 extension: *GEN* 2-25
 execution: *SMM* 6-4
 file NAMR: *GEN* 2-25
 loaders and boot extension: *SMM* 6-3
 bootstrap loader: *SMM* 6-4
 disk loader ROM: *SMM* 6-3
 primary system disk: *INST* 2-4
 bootstrap loader: *SMM* 6-4
 scheduling configurator: *SMM* 10-2
 bootup halts: *SMM* 10-19
 BR command: *CUSR* 4-8, 5-15; *GEN* 2-8;
 TUSR 4-29
 break character: *CMUX* 4-10
 Break command: *DEBUG* 2-13, 5-4; *MAC* 4-18,
 B-17, M-8
 break condition: *DMUX* 2-5
 generate: *DMUX* 2-24
 save data on break: *DMUX* 2-24
 break flag: *TUSR* 4-29
 BREAK key: *CMUX* 3-1, 3-3, 3-5
 BREAK macro: *MAC* N-12
 Break Uplevel command: *DEBUG* 5-7
 breaking a line
 line mode: *EDIT* 3-32
 screen mode: *EDIT* 3-37, 4-62
 through regular expressions: *EDIT* 5-18
 breakmode
 commands
 See system commands: *TUSR* 4-2
 FL: *TUSR* 4-36
 HE: *TUSR* 4-40
 processing: *TUSR* 4-15
 structure: *TUSR* 4-20
 summary: *TUSR* 2-8, 4-2
 errors: *TUSR* A-1
 processors: *SMM* 3-4
 prompt: *TUSR* 2-18, 4-15, 4-17
 Breakpoint command: *DEBUG* 3-4
 breakpoints: *LODR* 2-20
 activating: *DEBUG* 5-3
 and program control: *DBGS* C-7
 clearing: *DEBUG* 3-6, 5-7, 5-8
 deactivating: *DEBUG* 5-10
 displaying: *DEBUG* 3-6, 5-5

MLLDR, setting: *DBGS* 6-3
 numbers: *DEBUG* 3-4
 setting: *DEBUG* 3-4
 setting at returns: *DEBUG* 5-7
 setting conditional: *DEBUG* 3-5
 setting temporary at returns: *DEBUG* 5-30
 through path switches: *DBGS* 6-4
 BRG Range: *DMUX* 2-14
 ID800/ID801 default: *DMUX* 2-21
 bringing up a device: *CUSR* 2-13
 brother node: *LODR* 3-2
 BRS: *MAC* 3-5, B-4
 BSS: *MAC* 4-34, B-15
 BSTAT subroutine: *HPIB* 5-2, 5-5
 buffer
 conversion subroutine: *PROG* 5-84
 DCB: *CUSR* 6-2
 flag
 clear: *BSP* 3-19
 set: *BSP* 3-18
 passage father/son: *PROG* 2-70
 zero, ClearBuffer: *REL* 7-6
 buffer limits: *GEN* 2-66, 3-14; *TUSR* 4-27
 examine: *TUSR* 4-27
 modify: *TUSR* 4-27
 buffered
 and unbuffered input/output: *TUSR* 4-8
 output: *GEN* 2-76
 read: *DMUX* 2-25
 user request: *CMUX* 4-4
 buffering
 an I/O controller: *TUSR* 4-35
 automatic: *PROG* 1-18
 I/O: *PROG* 1-18
 buffers
 channel: *CMUX* 1-3
 input: *CMUX* 2-3
 flushing: *CMUX* 2-18
 on-board: *CMUX* 2-3
 packing (DCB): *PROG* 3-17
 phone number: *CMUX* 2-24
 reception: *CMUX* 1-3
 transmission: *CMUX* 1-3
 type-ahead: *CMUX* 3-1
 user: *PROG* 3-17, 3-23
 BUFR and BUFLN parameters
 read request: *DMUX* 2-1
 write request: *DMUX* 2-9
 BUMPEXIT macro: *MAC* N-6
 bus
 assembly: *HPIB* 2-7
 command messages: *HPIB* 4-5
 functional description: *HPIB* 1-3
 interface card
 HP 12009A: *HPIB* 2-3
 HP 59310B: *HPIB* 2-1
 LU numbers: *HPIB* 3-1
 operation example: *HPIB* 1-2
 programming languages: *HPIB* 1-3
 RTE-6/VM LU assignment: *HPIB* 3-4
 RTE-A LU assignment: *HPIB* 3-6

service program: *HPIB* 5-11, D-1
 specifications: *HPIB* 1-4
 structure: *HPIB* 1-5
 BYT: *MAC* 4-35, 4-36, B-15
 byte manipulation, GetByte: *REL* 12-8
 byte processing: *MAC* 3-3, 4-44

C

C command: *EDIT* 3-31, 4-11
 C option: *MAC* E-2
 CA command: *LINK* 3-5; *TUSR* 3-39
 cable
 connector hardware: *HPIB* 2-8
 installation: *HPIB* 2-7
 length restrictions: *HPIB* 2-3
 cabling: *CMUX* 1-3
 CABS: *REL* 3-11
 cache, disk: *GEN* 2-20
 Calc Dest Name: *CUSR* 6-15
 calculate globals: *TUSR* 3-39
 calculate sign
 real or integer times integer: *REL* 3-49
 real or integer times real: *REL* 3-53
 call LOGOF, CLGOF: *REL* 6-4
 call LOGON, CLGON: *REL* 6-5
 CALL macro: *MAC* L-2, L-5, N-7
 CALL subroutine operations: *MAC* L-4
 CALL summary
 CALL: *MAC* N-7
 DCALL: *MAC* N-7
 DLCALL: *MAC* N-7
 DUCALL: *MAC* N-7
 LCALL: *MAC* N-7
 PCALL: *MAC* N-7
 UCALL: *MAC* N-7
 calling
 conventions: *REL* 2-1
 library subroutines: *PROG* 5-1
 macros: *MAC* 5-1, 5-3
 sequence: *LODR* 3-1
 sample: *LODR* 3-6
 CALLM utility: *PROG* 1-34; *UTIL* 12-13
 .include directive: *UTIL* 12-19
 invoking: *UTIL* 12-18
 CALLS utility: *PROG* 1-34; *UTIL* 12-13
 catalog file: *UTIL* 12-14
 directives: *UTIL* 12-14
 index file: *UTIL* 12-17
 invoking: *UTIL* 12-13
 online help facility: *UTIL* 12-13
 relating topics to other topics: *UTIL* 12-15
 cancel current timer, KillTimer: *REL* 7-27
 canceling
 EDIT: *EDIT* 2-8
 last change: *EDIT* 2-29
 capability: *BSP* 2-32
 capability level: *TUSR* 2-2
 for privileged GASP commands: *BSP* 5-1
 restrictions: *CUSR* 1-4

capitalizing first letters: *EDIT* 5-21
 caret (^) character. *See* anchor (^) character
 carriage control capabilities: *DMUX* 2-27
 carriage control when printing: *UTIL* 8-1, 8-4
 carriage return: *DMUX* 2-4
 carriage return control character: *EDIT* 3-26
 cartridge: *TUSR* 3-12
 access: *TUSR* 3-18
 allocate: *TUSR* 3-18
 auxiliary system: *PROG* 3-12
 backup utilities: *UTIL* 5-1
 READT: *UTIL* 5-6
 WRITT: *UTIL* 5-1
 directory: *PROG* 3-12; *TUSR* 3-15
 directory format: *PROG* G-5; *SMM* D-4;
 TUSR C-12
 disk: *PROG* 1-25
 dismount: *TUSR* 3-62
 dismounting considerations (FMGR): *SMM*
 3-10
 global: *PROG* 3-12
 group: *PROG* 1-25, 3-12; *TUSR* 2-9, 3-16, 3-17
 in the session environment: *PROG* 3-12
 initialization: *PROG* 3-9; *TUSR* 3-80
 list: *TUSR* 3-42, 3-43
 mount: *TUSR* 3-90
 mounting considerations: *SMM* 3-10
 non-session: *PROG* 3-12; *TUSR* 2-9, 3-16, 3-17
 organization: *PROG* 3-8; *TUSR* 3-14
 ownership: *TUSR* 2-9
 pack: *TUSR* 3-98
 pool: *PROG* 1-25; *TUSR* 3-18
 private: *PROG* 1-25, 3-12; *TUSR* 2-9, 3-16, 3-17
 removable: *TUSR* 3-13
 requirements worksheet: *SMM* 3-16
 system: *PROG* 1-25, 3-12; *TUSR* 2-9, 3-16
 tapes: *RDSV* B-10
 types: *TUSR* 3-16
 Cartridge Reference Number (CRN): *PROG* 3-7;
 TUSR 3-12
 cartridge tape units (CTUs): *CMUX* 5-4
 control request: *CMUX* 5-5
 device control sequence: *CMUX* 5-5
 device status sequence: *CMUX* 5-5
 dynamic status: *CMUX* 5-5
 lock keyboard: *CMUX* 5-5
 read/write request: *CMUX* 5-4
 binary/ASCII: *CMUX* 5-4
 rewind: *CMUX* 5-5
 unlock keyboard: *CMUX* 5-5
 Case Folding (CF) option: *EDIT* 2-32, 2-34, 3-19,
 3-25, 3-50, 4-4, B-1
 CaseFold, convert lowercase to uppercase: *REL*
 7-5
 CATALOGS directory: *SMM* 3-12
 CAX: *MAC* 3-9, B-7
 CAY: *MAC* 3-9, B-7
 CBS: *MAC* 3-4, B-3
 CBT: *MAC* 3-3, B-3
 CBX: *MAC* 3-9, B-7
 CBY: *MAC* 3-9, B-7
 CCA: *MAC* 3-8, B-6
 CCB: *MAC* 3-8, B-6
 CCE: *MAC* 3-8, B-6
 CD command: *CUSR* 5-16
 CDS: *MAC* 4-8, B-17
 assembly language
 constructs: *MAC* M-3
 programming: *MAC* M-1
 command: *MAC* M-4
 control: *MAC* B-17
 data and strings: *MAC* N-2
 definition: *MAC* M-1
 environment: *MAC* 4-11
 features: *MAC* M-1
 opcodes: *MAC* 3-17
 program examples: *MAC* M-11
 programs: *REL* 2-4
 programming: *MAC* M-1
 strings and data: *MAC* N-9
 CDS/non-CDS subroutine calls: *MAC* N-1
 CDSONOFF macro library: *MAC* N-1
 CDSONOFF strings and data
 BREAK macro: *MAC* N-12
 COMPARE macro: *MAC* N-10
 COMPAREBYTES macro: *MAC* N-11
 COMPAREWORDS macro: *MAC* N-11
 EMPTYSTRING macro: *MAC* N-9
 END macro: *MAC* N-13
 LOCAL macro: *MAC* N-11
 MOVE macro: *MAC* N-10
 MOVEBYTES macro: *MAC* N-10
 MOVECODETODATA macro: *MAC* N-10
 MOVEWORDS macro: *MAC* N-10
 RELOC macro: *MAC* N-12
 STRING macro: *MAC* N-9
 CEXP: *REL* 3-12
 CEXP entry, #EXP: *REL* 3-137
 CF option: *EDIT* 2-32, 3-25
 CGLOBAL: *MAC* 4-48, 4-50, B-16
 CHAN: base page word: *DRVW* 3-3
 change
 associated group: *CUSR* 3-30
 auxiliary cartridges: *SMM* 6-18
 background (BG) COMMON: *GEN* 2-62, 3-13
 case of text: *EDIT* 5-20
 directory owner: *CUSR* 3-30
 directory protection: *CUSR* 3-32
 driver partition: *GEN* 2-60, 3-13
 ENTS: *GEN* 2-45
 file protection: *CUSR* 3-27
 I/O device attributes: *CUSR* 2-13
 list device: *TUSR* 3-87
 log device: *TUSR* 3-88
 partition definitions: *SMM* 10-11
 program
 memory requirements: *CUSR* 4-11
 program partition assignments: *SMM* 10-14
 program priorities: *CUSR* 4-10
 size: *LINK* 3-22
 purge to save: *BSP* 3-13
 radix of numeric printout: *DBGS* 2-4

real-time (RT) COMMON: *GEN* 2-61, 3-13
 record position: *BSP* 3-21
 save to purge: *BSP* 3-14
 subdirectory protection: *CUSR* 3-32
 value of a variable: *DEBUG* 3-7, 5-25
 Virtual Memory Area: *CUSR* 4-13
 working directory: *CUSR* 5-16
 Change List File command: *DEBUG* 5-7
 Change Name Phase: *GEN* 3-10
 ChangeBits: *REL* 7-2
 channel buffers: *CMUX* 1-3
 character
 classes
 definition: *EDIT* B-1
 metacharacters: *EDIT* 5-10
 negated: *EDIT* 5-11
 range of characters (–): *EDIT* 5-11
 framing bits: *DMUX* 2-20
 mode, read: *DMUX* 2-3
 patterns, identifying: *UTIL* 11-1
 set, HP: *DMUX* E-1
 strings: *CUSR* 6-5; *REL* 2-5
 character-by-character scheduling: *DMUX* 2-24
 characteristics of program types, *LODR* 2-15
 characteristics of spool file: *BSP* 2-11
 characters in arrays, compare, CharsMatch: *REL* 7-6
 CharFill: *REL* 7-5
 CharsMatch: *REL* 7-6
 Chebyshev series, evaluate: *REL* 3-69
 check
 system session table address,
 FromSySession: *REL* 6-7
 consistency on CI file system LU: *UTIL* 6-23
 file size: *EDIT* 4-74
 CheckBits: *REL* 7-2
 CI: *EDIT* 1-1, 1-3, 1-4, 1-6, 2-2, 2-7, 2-19, 2-27;
 SMM 3-5
 command descriptions: *CUSR* 5-1
 commands: *CUSR* 1-3, 2-1, 2-23
 deleting files: *EDIT* 3-11
 directory, newly built: *UTIL* 6-4
 features: *CUSR* 1-3
 file access considerations: *SMM* 3-15
 file system: *SMM* 3-5
 introduction: *CUSR* 1-1
 file volume mounting considerations: *SMM* 3-13
 files: *CUSR* 1-5
 accessing: *CUSR* 6-4
 manipulating: *CUSR* 3-1
 hierarchical file volumes: *SMM* 3-11
 initialization: *SMM* 6-10
 not available: *CUSR* 1-6
 temporary files: *CUSR* 7-2, 7-3
 use of back quotes: *EDIT* 3-5
 CIC: Central Interrupt Control module: *DRVW* 2-2
 circular call chain: *LODR* 3-19, 3-20. *See also*
 recursion
 circular scheduling: *TUSR* 1-3
 CJ command: *BSP* 4-3, 4-5, 4-13
 CL command: *CUSR* 5-17; *TUSR* 3-42
 CLA: *MAC* 3-8, B-6
 class: *PROG* 2-30
 Class Control, EXEC 19: *PROG* 2-41
 Class Get EXEC 21: *PROG* 2-43
 Class I/O: *CMUX* 2-1, 4-4; *GEN* 2-65, 2-77;
 PROG 1-18
 applications: *PROG* 5-13
 mailbox I/O: *PROG* 5-20
 multiple terminals: *PROG* 5-17
 EXEC calls: *PROG* 2-29
 operation: *PROG* 2-32
 requests: *PROG* 2-30
 flush - CLRQ: *PROG* 5-15
 terms
 class: *PROG* 2-30
 class number: *PROG* 2-30
 class request: *PROG* 2-30
 completed class queue: *PROG* 2-30
 pending class requests: *PROG* 2-30
 class number: *PROG* 2-30, 2-31
 allocation - CLRQ: *PROG* 5-13
 allocation CLRQ subroutine: *PROG* 2-31
 class ownership: *PROG* 5-14, 5-15
 CLRQ: *PROG* 5-13
 Class Read EXEC 17: *PROG* 2-35
 Class Write EXEC 18: *PROG* 2-35
 Class Write/Read EXEC 20: *PROG* 2-35
 CLB: *MAC* 3-8, B-6
 CLC: *MAC* 3-13, B-10
 CLCC: *MAC* B-10
 CLCUC, convert lowercase to uppercase: *REL* 7-7
 CLE: *MAC* 3-5, 3-8, B-4, B-6
 Clear Breakpoint command: *DEBUG* 5-8
 clear buffer flag: *BSP* 3-19
 Clear command: *DEBUG* 5-7
 clear flag indicator: *MAC* J-1
 clear or set memory: *DBGS* 5-4
 CLEAR statement: *HPIB* 4-15
 CLEAR subroutine: *HPIB* 4-15
 CLEARBIT (system macro): *MAC* L-2, L-12
 ClearBitMap: *REL* 12-2
 ClearBuffer, zero a passed buffer: *REL* 7-6
 clearing breakpoints: *DEBUG* 3-6, 5-7, 5-8
 clearing tracepoints: *DEBUG* 5-8
 CLF: *MAC* 3-13, B-10
 CLGOF, call LOGOF: *REL* 6-4
 CLGON, call LOGON: *REL* 6-5
 CLO: *MAC* 3-13, B-10
 CLOAD utility: *PROG* 1-31; *TUSR* 1-9;
 UTIL 2-1, 2-36
 calling: *UTIL* 2-36
 examples: *UTIL* 2-38
 CLOCAL: *MAC* 4-48, 4-50, B-16
 CLOG: *REL* 3-13
 CLOG entry, #LOG: *REL* 3-138
 cloning programs: *LINK* 3-6
 close
 and queue for outspooling: *BSP* 3-16
 file: *EDIT* 3-10
 list file: *EDIT* 4-20. *See also* FCL command

source file: *EDIT* 3-10, 4-21
 CLOSE FMP call: *CUSR* B-6; *PROG* 3-44
 CLOSE utility: *CUSR* 3-42
 closure character (*). *See* metacharacter match
 zero or more (*)
 CLRQ subroutine - Class I/O Management:
 PROG 5-13
 CLSVM subroutine: *PROG* 4-38
 CM, copy of CI: *CUSR* 1-6
 CMA: *MAC* 3-8, B-6
 CMB: *MAC* 3-8, B-6
 CMD utility: *PROG* 1-34; *SMM* 6-17; *UTIL* 12-1,
 12-5
 calling: *UTIL* 12-5
 error messages: *UTIL* 12-8
 examples: *UTIL* 12-7
 CMDFILES Directory: *SMM* 3-13
 CMDW/CMDR subroutines: *HPIB* 4-20
 CME: *MAC* 3-8, B-6
 CmndStackInit, initialize command stack: *REL* 7-7
 CmndStackMarks, check for marked lines: *REL*
 7-8
 CmndStackPush, add line to command stack: *REL*
 7-8
 CmndStackRestore, restore command stack: *REL*
 7-9
 CmndStackSaveP, CmndStackRstrP, save and reset
 command stack: *REL* 7-10
 CmndStackScreen: *REL* 7-11
 CmndStackStore, store command stack contents in
 a file: *REL* 7-12
 CmndStackUmark, remove marks from command
 stack lines: *REL* 7-12
 CMPLX: *REL* 3-14
 CMW: *MAC* 3-3, B-3
 CN command: *CUSR* 2-12, 5-18; *TUSR* 3-44
 CNFG subroutine: *HPIB* 7-6
 CO command: *CUSR* 3-20, 3-24, 3-38, 5-19;
 EDIT 2-2, 2-23, 2-25, 2-28, 2-38, 3-36, 4-12;
 RDSV 2-6, 3-6; *TUSR* 3-46
 Code and Data Separation. *See* CDS
 code input, *LODR* 9-5
 COL: *MAC* 4-25, B-15
 colon character: *EDIT* 2-23
 colon prompt: *BSP* 2-25
 COM: *MAC* B-18, J-6
 combinations of vector instructions: *REL* 9-7
 command
 addressed: *HPIB* 4-6
 and command file: *LODR* 4-2
 MLS programs: *LODR* 4-5
 non-segmented programs: *LODR* 4-5
 ATN—The Command Mode: *HPIB* 4-11
 capability levels: *TUSR* 2-2, 2-7, 2-8
 DCL—Device Clear: *HPIB* 4-8, 4-15
 EOI and ATN—Parallel Poll: *HPIB* 4-9
 file: *EDIT* 3-49
 file manipulating: *CUSR* 3-3
 GET—Group Execute Trigger: *HPIB* 4-7, 4-17
 GTL—Go To Local: *HPIB* 4-6, 4-16
 IFC—Interface Clear: *HPIB* 4-11

INDXR: *LODR* 6-41
 AB: *LODR* 6-42
 CR: *LODR* 6-42
 EX: *LODR* 6-42
 IN: *LODR* 6-42
 LI: *LODR* 6-42
 TR: *LODR* 6-43
 line mode: *EDIT* 1-10
 LLO—Local Lockout: *HPIB* 4-8, 4-16
 mode: *HPIB* 1-7, 4-1, 4-5
 number in command string: *EDIT* 3-4
 options: *EDIT* 3-24, B-2
 parameters: *EDIT* 3-13
 parsing: *EDIT* 3-21
 pattern defaults: *EDIT* 2-44
 PPC—Parallel Poll Configure: *HPIB* 4-6
 PPU—Parallel Poll Unconfigure: *HPIB* 4-9
 REN—Remote Enable: *HPIB* 4-10, 4-15
 repeat: *EDIT* 4-98
 review: *EDIT* 2-35
 SDC—Selected Device Clear: *HPIB* 4-6, 4-15
 separator: *EDIT* 3-4, 3-22, 3-32, 3-50
 CS option: *EDIT* 3-25
 SPD—Serial Poll Disable: *HPIB* 4-9
 SPE—Serial Poll Enable: *HPIB* 4-9
 SRQ—Service Request: *HPIB* 4-10
 stack: *DEBUG* 5-8; *EDIT* 3-50
 command: *CUSR* 5-2; *DEBUG* 5-8; *EDIT* 1-2,
 2-35, 4-92, 4-96, B-1
 example program: *REL* 7-13
 posting contents: *CUSR* 3-29
 using the: *CUSR* 2-5
 Xdb: *DEBUG* 7-3
 stacking: *TUSR* 3-150
 string: *EDIT* 3-50, B-1
 string passage: *PROG* J-2
 structure: *TUSR* 3-27
 summary: *DEBUG* 5-1; *LODR* 4-3
 syntax: *EDIT* 3-4, 3-13, 3-15; *UTIL* 6
 command files: *LODR* 3-8, 4-2, 4-5, 6-1; *RDSV*
 2-3, 2-6, 3-3, 3-6, 3-10, B-2, B-3, B-11
 examples: *LINK* 2-6
 executing: *CUSR* 2-15
 nesting: *CUSR* 2-21
 listing (SXREF): *LODR* 6-27
 sample: *LODR* 3-11, 6-15, D-5
 shortening: *LODR* 6-18
 syntax checking (SXREF): *LODR* 6-23, 6-25
 writing: *LODR* 3-8
 Command Interpreter. *See* CI
 Command Set 80. *See* CS/80
 commands
 MLLDR and LOADR: *LODR* 5-1, 9-3
 * (comment): *LODR* 5-11
 AB (abort): *LODR* 5-2
 AS (assign): *LODR* 5-2
 D (disk node specification): *LODR* 5-2
 DI (display undefined externals): *LODR* 5-2
 EC (echo commands to list output): *LODR*
 5-3

EN, EX, /E (end of command input): *LODR* 5-3

FM (format): *LODR* 5-3

FO (force load): *LODR* 5-4

LI (user library file): *LODR* 5-4

LL (list output): *LODR* 5-4

LO (set relocation base): *LODR* 5-5

M (memory node): *LODR* 5-5

MS (multiple search): *LODR* 5-6

NA (user library name): *LODR* 5-6

OP (opcode): *LODR* 5-7

PF (profile): *LODR* 5-7

RE (relocate): *LODR* 5-7

SA (save): *LODR* 5-8

SE (search): *LODR* 5-8

SH (shareable EMA): *LODR* 5-9

SL (search user libraries): *LODR* 5-9

SY (system library name): *LODR* 5-10

SZ (size): *LODR* 5-10

TR (transfer): *LODR* 5-10

VS (VMA size): *LODR* 5-11

WS (working set size): *LODR* 5-11

multiple, per line: *CUSR* 2-23

commas, PutInCommas: *REL* 7-31

comment: *GEN* 2-6, 3-3; *LODR* 5-11

command: *TUSR* 3-34

delimiter

- semicolon: *MAC* 2-12
- space: *MAC* 2-13

field: *MAC* 1-6, 2-1, 2-2, 2-12

in macro definition: *MAC* 5-6

line: *LINK* 3-24

Comment (*) command: *DEBUG* 5-9; *EDIT* 4-100; *LINK* 3-24

commenting an Include file: *DEBUG* 5-9

common

- allocation: *LINK* 4-1
- definition of: *LINK* 4-1
- system: *LINK* 4-1

common logarithm

- double real: *REL* 3-97
- extended real: *REL* 3-28
- real: *REL* 3-5

COMMON: *LODR* 2-16, 4-19, 4-30, 6-17, 7-2, 8-11; *PROG* 1-10

areas: *PROG* 1-12

background: *PROG* 1-12

blank: *LODR* 2-16

block types and sizes (SGMTR): *LODR* 6-10

EMA: *LODR* F-1

improper use of: *LODR* 8-12

initialization: *LODR* 3-22

labeled: *LODR* 6-7, 6-9, 6-10; *PROG* 4-13

local: *LODR* 2-16; *PROG* 1-12

named: *LODR* 4-19

named SAVE: *LODR* 4-19

ordinary: *LODR* 6-8

parameters: *PROG* 3-21

real-time: *PROG* 1-12

requirements for SGMTR: *LODR* 6-7

reverse: *LODR* 2-16

SAVE: *LODR* F-1

summary of types: *LODR* F-1

system: *LODR* 2-16

type and size mismatches: *LODR* 6-10

unlabeled: *LODR* 2-16

COMMON relocatable space: *MAC* 1-11, 4-3, 4-9, 4-22

communication with user programs: *DRVW* 4-9

compacting files: *UTIL* 6-11

compare, double integer: *REL* 4-3

compare characters in arrays, CharsMatch: *REL* 7-6

COMPARE macro: *MAC* N-10

CompareBufs: *REL* 12-3

COMPAREBYTES macro: *MAC* N-11

CompareWords: *REL* 12-3

COMPAREWORDS macro: *MAC* N-11

comparing files: *UTIL* 2-43

comparison of HP loaders: *LINK* 1-4

comparison operators: *MAC* 4-51, 4-61, 4-63

comparison to previous drivers: *DMUX* 3-1

- DV800 and DVM00: *DMUX* 3-1
- DVC00 and DVR00: *DMUX* 3-2

compatibility (RTE-A vs. RTE-6/VM): *DMUX* 1-2

FIFO vs. type-ahead mode: *DMUX* 1-3

LU numbers: *DMUX* 1-2

pass program name: *DMUX* 2-16

program scheduling: *DMUX* 1-2

protocols: *DMUX* 1-4

screen mode: *DMUX* 1-4

timeout bits: *DMUX* 1-2

compilation considerations, *LODR* 8-1

compile and load

- programs: *INST* 4-11
- utilities

 - CLOAD: *UTIL* 2-1, 2-36
 - COMPL: *UTIL* 2-1, 2-33

compiler options: *DEBUG* 2-4

COMPL utility: *PROG* 1-31; *TUSR* 1-8; *UTIL* 2-1, 2-33

calling: *UTIL* 2-33

examples: *UTIL* 2-35

complement

- complex: *REL* 3-131
- double real unpacked mantissa: *REL* 3-124
- real: *REL* 3-134

completed class queue: *PROG* 2-30, 2-31

completion

- of GASP initialization: *BSP* 5-7
- message: *LODR* 4-29, 9-6
- section: *DRVW* 4-11
- privileged driver: *DRVW* 4-8

complex: *REL* 3-14

conjugate: *REL* 3-15

exponential: *REL* 3-12

extract real: *REL* 3-52

- return extended precision: *REL* 3-66
- natural logarithm: *REL* 3-13

CompressAsciiRLE: *REL* 12-4

computer cards: *INST* A-1

computer interrupt mechanism: *DRVW* 2-12

computer power: *INST* A-2
 Concat, concatenate strings: *REL* 7-15
 concatenate files (MERGE): *UTIL* 2-1, 2-40
 concatenation: *MAC* 4-51
 ConcatSpace, concatenate strings with embedded blanks: *REL* 7-15
 conditional assembly: *MAC* 1-12, 4-1, 4-63, B-17
 conditional breakpoint: *DBGS* 6-5
 conditional execution of LINK command: *LINK* 3-10
 conditional skip: *TUSR* 3-78
 configuration: *DEBUG* 2-1; *HPIB* 7-1
 CNFG subroutine: *HPIB* 7-6
 configuration straps, modem card: *CMUX* 2-23
 configuration table: *PROG* H-3; *SMM* 8-3; *TUSR* C-17; *UTIL* 2-18
 active: *SMM* C-7
 definition: *SMM* 7-1
 configuration word: *HPIB* 7-1
 D bit: *HPIB* 7-3
 E bit: *HPIB* 7-5
 I bit: *HPIB* 7-4
 J bit: *HPIB* 7-4
 O bit: *HPIB* 7-4
 P bit: *HPIB* 7-4
 R bit: *HPIB* 7-2
 S bit: *HPIB* 7-2
 configuration, system: *UTIL* 2-18
 configurator error messages: *SMM* 10-19
 configurator halts & error messages: *SMM* 10-4
 configurator program: *SMM* 10-4
 configure
 driver response: *CMUX* 2-30
 port: *CMUX* 2-31
 CONJG: *REL* 3-15
 conjugate, of complex: *REL* 3-15
 connect, modem line: *CMUX* 2-23
 no wait bit: *CMUX* 2-23
 Console Reconfiguration: *INST* D-6
 constant definition, instructions: *MAC* 4-1, 4-35, B-15
 constants: *DEBUG* 4-15
 contents of memory: *DBGS* 3-2
 continuation/completion section: *DRVW* 3-10
 control
 character: *EDIT* B-1
 characters/codes
 acknowledge: *EDIT* 3-26
 carriage return: *EDIT* 3-26
 delete: *EDIT* 3-26
 inquire: *EDIT* 3-26
 line feed: *EDIT* 3-26
 null: *EDIT* 3-26
 commands
 line mode: *EDIT* 3-31
 screen mode: *EDIT* 1-10, 1-11, 1-12, 3-36
 key combinations: *EDIT* 4-61
 keys: *EDIT* 2-36, 4-61
 canceling: *EDIT* 3-37
 double execution: *EDIT* 3-37
 line mode: *EDIT* 3-31
 screen mode: *EDIT* 2-15, 2-20, 3-36
 single execution: *EDIT* 3-37
 control request: *CMUX* 2-11; *DMUX* 2-11
 configure driver response: *CMUX* 2-30
 connect modem line: *CMUX* 2-23
 no wait bit: *CMUX* 2-23
 control word (CNTWD): *DMUX* 2-11
 define baud rate group: *DMUX* 2-14
 define termination character: *DMUX* 2-15
 device LU: *DMUX* 2-11
 disable program scheduling: *DMUX* 2-17
 disable scheduling: *CMUX* 2-17
 disconnect modem line: *CMUX* 2-25
 no wait bit: *CMUX* 2-25
 dynamic status: *CMUX* 2-13; *DMUX* 2-12
 control word: *DMUX* 2-12
 special forms: *DMUX* 2-13
 enable program scheduling: *DMUX* 2-15
 enable scheduling: *CMUX* 2-17
 FIFO buffer mode control: *DMUX* 2-24
 flush input buffer: *CMUX* 2-18
 flush input buffers: *DMUX* 2-18
 flush output: *DMUX* 2-18
 function codes: *DMUX* 2-11
 generate break: *DMUX* 2-24
 get terminal configuration: *CMUX* 2-22
 line spacing/page eject: *DMUX* 2-13
 loop test: *CMUX* 2-14
 LU number: *DMUX* 2-11
 read HP terminal straps: *DMUX* 2-18
 reset baud rate group: *DMUX* 2-29
 restore output processing: *DMUX* 2-18
 set binary length: *CMUX* 2-32
 set device timeout: *DMUX* 2-17
 set ID segment address of modem alarm program: *CMUX* 2-21
 set port configuration: *CMUX* 2-31
 set port ID: *CMUX* 2-19; *DMUX* 2-19
 set port protocol: *DMUX* 2-26
 set program address: *CMUX* 2-19
 set read type: *CMUX* 2-33
 set timeout: *CMUX* 2-18
 summary: *CMUX* 2-12
 terminate receive buffer: *CMUX* 2-15
 type-ahead schedule retry count: *CMUX* 2-21
 control statement: *MAC* 1-2, 1-3, 5-15, E-1, J-1
 control structures
 execution: *CUSR* 2-24
 IF-THEN-ELSE-FI: *CUSR* 2-24, 5-42
 WHILE-DO-DONE: *CUSR* 2-24, 5-96
 control terminal: *TUSR* 3-60
 control transfer, computed GOTO, .GOTO: *REL* 5-34
 control word: *CMUX* 2-2
 control word (CNTWD)
 read request: *DMUX* 2-2
 write request: *DMUX* 2-9
 controller: *DRVW* 2-1; *HPIB* 1-3
 address: *HPIB* 2-1
 as talker/listener: *HPIB* 4-5
 configuration: *HPIB* 7-1

EOR requirements: *HPIB 7-4*
 controller select code: *GEN 2-16, 2-17, 3-6*
 controlling
 devices: *CUSR 2-12*
 programs: *CUSR 4-1*
 controls: *DBGS 1-3, 6-8*
 change the contents of memory: *DBGS 3-2*
 examine memory and set the location counter:
 DBGS 3-2
 memory change: *DBGS 3-3*
 memory/location changes: *DBGS 3-5*
 temporarily change to the print mode: *DBGS 3-10*
 conventions, calling: *REL 2-1*
 conversion
 ASCII digit to internal numeric, .FMUI: *REL 5-31*
 ASCII to double integer, OctalToDint: *REL 7-29*
 ASCII to double integer conversion,
 DecimalToDint: *REL 7-16*
 ASCII to single integer, OctalToInt: *REL 7-29*
 ASCII to single integer conversion: *REL 7-17*
 block and sector to track and sector: *REL 7-4*
 complex real to double real: *REL 3-76*
 double integer to ASCII
 DintToDecimal: *REL 7-17*
 IntToDecimal: *REL 7-24*
 double integer to double real: *REL 4-13*
 double integer to extended real: *REL 4-15*
 double integer to octal
 DintToOctal: *REL 7-18*
 IntToOctal: *REL 7-26*
 double integer to real: *REL 4-12*
 double length record number to real: *REL 4-1*
 double precision to integer, /TINT: *REL 3-175*
 double real to complex real: *REL 3-115*
 double real to double integer: *REL 4-14*
 double real to extended real without rounding:
 REL 3-116
 double real to integer: *REL 3-80, 3-118*
 double real to real: *REL 3-102*
 extended real to complex: *REL 3-78*
 extended real to double integer: *REL 4-16*
 extended real to double real: *REL 3-81*
 extended real to real: *REL 3-55*
 without rounding: *REL 3-56*
 HP 1000 single precision floating point to IEEE,
 FCHI: *REL 11-2*
 IEEE standard format double precision to HP
 1000, DFCIH: *REL 11-2*
 IEEE standard format single precision to HP
 1000, FCIH: *REL 11-3*
 integer to complex: *REL 3-91*
 integer to double real: *REL 3-94*
 integer to extended real: *REL 3-92*
 integer to real: *REL 3-41*
 internal to normal format, .FMUP: *REL 5-31*
 lowercase to uppercase
 CaseFold: *REL 7-5*
 CLCUC: *REL 7-7*
 numeric to ASCII, .FMUO: *REL 5-31*
 real part of complex to integer: *REL 3-70*
 real to double integer: *REL 4-11*
 real to double real: *REL 3-64*
 real to extended: *REL 3-22*
 real to integer: *REL 3-46*
 routines: *PROG 5-80*
 segment address to program name and LU
 number, IdAddToName: *REL 7-22*
 segment address to segment number,
 IdAddToNumber: *REL 7-22*
 segment number to segment address,
 IdNumberToAdd: *REL 7-23*
 signed mantissa into normalized real format:
 REL 3-103
 track, sector, to double integer block number:
 REL 7-19
 converting FMGR files: *CUSR B-1*
 accessing FMGR files: *CUSR B-11*
 APOSN, LOCF, and POSNT calls: *CUSR B-8*
 CLOSE calls: *CUSR B-6*
 CREAT and CRETS calls: *CUSR B-7*
 extended calls: *CUSR B-10*
 file and directory names: *CUSR B-1*
 file positioning: *CUSR B-5, B-8*
 general considerations: *CUSR B-1*
 namr calls and strings: *CUSR B-2*
 OPEN and OPENF calls: *CUSR B-4*
 other calls: *CUSR B-10*
 PURGE and NAMF calls: *CUSR B-10*
 READF and WRITF calls: *CUSR B-5*
 standard file type extensions: *CUSR B-12*
 converting FORTRAN DO loops, with VIS: *REL 9-1*
 converting the directory structure of an FMGR
 cartridge: *UTIL 6-2*
 CONWD parameter: *BSP 2-15*
 copy command: *EDIT 2-28*
 copy one string to another, StringCopy: *REL 7-39*
 COPY operation
 speeding up: *TUSR 3-52*
 terminating: *TUSR 3-51*
 copy routine
 DVSWP (double precision): *REL 8-24*
 DWSWP (EMA double precision): *REL 8-24*
 VSWP (single precision): *REL 8-24*
 WSWP (EMA single precision): *REL 8-24*
 copying
 disk files between cartridges: *TUSR 3-46*
 files: *CUSR 3-24*
 screen memory: *EDIT 4-68*
 screen mode text: *EDIT 4-6*
 text: *EDIT 2-28, 2-30, 4-12*
 COR.A subroutine: *PROG 5-74*
 COR.B subroutine: *PROG 5-74*
 COS: *REL 3-16*
 COS entry (call-by-name), %OS: *REL 3-159*
 cosine
 #COS: *REL 3-136*
 complex: *REL 3-17*
 double precision: *REL 3-73*

extended real: *REL* 3-23
 real: *REL* 3-16
 count down counter: *CMUX* 4-11
 CPA: *MAC* 3-2, B-2
 CPB: *MAC* 3-2, B-2
 CPU-to-CPU protocol
 definition: *DMUX* 2-29
 setting: *DMUX* 2-27
 CR command: *CUSR* 3-26, 5-22; *LINK* 3-5; *TUSR*
 3-53, 3-55
 CRDIR (create directory/subdirectory) command:
 CUSR 3-28, 5-26
 CREAT
 call: *CUSR* B-7; *PROG* 3-29
 error: *RDSV* 3-12
 create file failure: *EDIT* 3-7
 Create Variable command: *DEBUG* 5-9
 creating
 a directory: *CUSR* 3-28
 a disk file: *TUSR* 3-53
 a dummy driver: *UTIL* 10-2
 a file: *EDIT* 2-7, 2-9, 3-5, 3-6, 4-15, 4-86
 a non-disk file: *TUSR* 3-55
 a subdirectory: *CUSR* 3-29
 empty files: *CUSR* 3-26
 regular expressions patterns: *EDIT* 5-20
 relocatable files: *INST* 4-10
 macro libraries
 control statement: *MAC* E-1
 description: *MAC* 5-1, 5-15
 M option: *MAC* 5-15
 macro: *MAC* 5-15
 T Option: *MAC* 5-15
 MLS tree, *LODR* 3-5
 text: *EDIT* 2-12
 CRETS call: *CUSR* B-7; *PROG* 3-34
 CREVM subroutine: *PROG* 4-35
 cross-reference table: *MAC* 1-9
 generator: *MAC* F-1
 listing: *MAC* E-2
 cross referencer, see *SXREF*
 CS command: *BSP* 2-18, 4-3, 4-5, 4-19; *TUSR* 3-58
 CS option: *EDIT* 3-25
 CS/80 disks: *GEN* 2-16; *UTIL* 1-1, 3-1, 3-2, 3-6,
 3-9, 3-11, 3-24, 3-26, 3-38, 3-46, 3-48, 9-29, 9-30,
 9-34
 configuration: *SMM* 4-8
 restoration: *INST* D-7
 CS/80 Exerciser utility. See *EXER* utility
 CS/80 tape cartridge (CTD): *UTIL* 3-1, 3-3, 3-6,
 3-11, 3-16, 3-33, 3-39, 3-46, 3-48, 3-52, 3-54, 3-56,
 9-1, 9-29
 CSET: *MAC* 4-50, B-16
 CSNCS: *REL* 3-17
 CSQRT: *REL* 3-18
 CT command: *TUSR* 3-60
 CTD tape
 characteristics: *INST* D-9
 installing primary system from: *INST* D-9
 primary system supplied on: *INST* D-2
 CTRL: *EDIT* 2-15

CTRL-A: *EDIT* 3-37, 4-62
 CTRL-B: *EDIT* 3-32
 CTRL-C: *EDIT* 2-20, 3-31, 3-38, 4-62
 CTRL-D: *BSP* 2-41; *EDIT* 2-37
 CTRL-F: *EDIT* 2-15, 2-21, 3-35, 3-38, 4-62
 CTRL-I: *EDIT* 3-31
 CTRL-J: *EDIT* 3-38, 4-62
 CTRL-K: *EDIT* 2-28, 3-38, 4-63
 CTRL-O: *EDIT* 3-38, 4-63
 CTRL-P: *EDIT* 3-35, 3-38, 4-62, 4-63
 CTRL-Q: *EDIT* 2-17, 3-38, 4-63
 CTRL-R: *EDIT* 2-37, 3-31
 CTRL-S: *EDIT* 2-16, 3-31, 3-38, 4-63
 CTRL-T: *EDIT* 2-15, 3-32, 3-38, 4-63
 CTRL-U: *EDIT* 2-17, 2-21, 3-38, 3-39, 4-63
 CTRL-X: *EDIT* 2-16, 3-32, 3-35, 3-38, 4-63
 CTRL-Z: *EDIT* 3-37, 4-62
 CTRL-D: *EDIT* 4-63
 CU command: *CUSR* 5-28; *TUSR* 4-30
 current node, *LODR* 3-8, 4-21
 current page links, *LODR* 2-3, 3-2, 4-10, 4-18, E-3
 current prompt: *EDIT* B-1
 current time subroutine FTIME: *PROG* 5-83
 cursor location: *EDIT* 2-22, 2-24, 3-36
 cursor position: *CMUX* 4-13
 cursor tracking: *CMUX* 4-13
 CXA: *MAC* 3-9, B-7
 CXB: *MAC* 3-9, B-7
 CYA: *MAC* 3-9, B-7
 CYB: *MAC* 3-9, B-7
 Cyclic Redundancy Check (CRC): *REL* 12-18
 cyclic redundancy check (CRC): *UTIL* 3-7, A-1
 cylinder: *TUSR* 3-2

D

D (disk node specification), *LODR* 3-9, 5-2
 D command: *EDIT* 4-13
 D option: *MAC* E-2
 D.RTR: *BSP* 3-18; *CUSR* 7-1; *PROG* 3-10
 D1 decimal substring carries, *SDCAR*: *REL* 10-34
 D1 format: *REL* 10-6
 D1 to D2 decimal format conversion, *SD1D2*:
 REL 10-37
 D2 decimal substring carries, *SCARY*: *REL* 10-33
 D2 format: *REL* 10-4
 D2 to A2 substring conversion, *SDEA2*: *REL*
 10-36
 D2 to D1 decimal substring conversion, *SD2D1*:
 REL 10-38
 DA - deallocate spooling: *BSP* 4-3, 4-5, 4-32
 DABS: *REL* 3-19
 dangerous command confirmation: *EDIT* 1-13,
 1-15, 2-8, 2-41, 3-5, 3-8, 3-47, 4-2, 4-3, 4-22, 4-35,
 4-79
 data
 and strings: *MAC* N-2
 area: *UTIL* 9-29, A-1
 considerations, *LODR* 3-22
 lines: *HPIB* 1-5

messages: *HPIB* 4-11
 mode: *HPIB* 1-7, 4-1, 4-11
 overrun: *CMUX* 3-8
 reference, *LODR* 6-19, 8-9, 9-9
 settling time: *HPIB* 2-3
 structures: *UTIL* 3-52
 transfer: *PROG* 3-17
 to and from devices: *CUSR* 3-38
 to and from files: *CUSR* 6-9
 Data Control Block (DCB): *CUSR* 6-2; *PROG* 3-3, 3-15, 3-21, 3-80; *TUSR* 3-3; *UTIL* A-4
 format: *PROG* G-2; *SMM* D-2
 legend: *PROG* G-3
 DATAN: *REL* 3-20
 dating files: *EDIT* 3-8
 DATN2: *REL* 3-21
 DAV handshake line: *HPIB* 1-6
 DayTime, seconds since January 1, 1970: *REL* 7-16
 DB (DEBUG) command: *LINK* 3-6
 DBL: *MAC* 3-4, 4-40, 4-44, B-16, H-10
 DBLE: *REL* 3-22
 DBR: *MAC* 3-4, 4-40, 4-44, B-16
 DEBUGR: *PROG* 1-32; *TUSR* 1-11
 at a glance: *DBGS* C-1
 loading and using: *DBGS* 1-2
 size: *DBGS* 1-1
 DC command: *TUSR* 3-62
 DC (dismount disk volume) command: *CUSR* 3-36, 5-29
 DC (do not clone) command: *LINK* 3-6
 DC1/DC2 handshaking: *CMUX* 5-1
 DCALL: *MAC* N-8
 DCB (Data Control Block): *CUSR* 6-2
 DCB Format: *SMM* D-1
 DcbOpen: *CUSR* 6-15
 DCL bus command: *HPIB* 4-8
 DCOS: *REL* 3-23
 DCPC (Dual Channel Port Controller): *CMUX* 1-3; *DRVW* 3-17; *PROG* 1-8
 assignment by RTE: *DRVW* 3-18
 control of assignment: *DRVW* 3-17
 intermixed DCPC/non-DCPC operation: *DRVW* 3-24
 interrupt handling: *DRVW* 3-22
 processing: *DRVW* 3-17
 returning channels to RTE: *DRVW* 3-22
 DDEF: *MAC* 4-40, 4-41, B-16
 DDINT: *REL* 3-24
 DDT05: *CMUX* 1-3
 DDV05: *CMUX* 1-3, 2-31, 4-3, 5-2
 Control Function 11B (line spacing): *CMUX* B-2
 Control Function 25B (terminal config.): *CMUX* B-2
 control request definition: *CMUX* B-2
 handshake control: *CMUX* 5-1
 I/O requests: *CMUX* B-2
 subchannel assignment: *CMUX* B-1
 subchannel support: *CMUX* 5-4
 user interface: *CMUX* B-1
 DDV12: *CMUX* 1-3, 2-31, 4-3, 5-2
 control request: *CMUX* B-4
 user interface: *CMUX* B-3
 write request: *CMUX* B-3
 DE (Debug) command: *LINK* 3-6
 Deactivate Breakpoint command: *DEBUG* 5-10
 deadlock situations: *UTIL* 2-5
 deadly embrace: *PROG* 5-36
 deallocate ID segment, IDCLR: *REL* 7-22
 debug
 command summary: *DEBUG* 5-1
 command stack: *DEBUG* 5-8
 compiling programs: *DEBUG* 2-4
 configuration: *DEBUG* 2-1
 error messages: *DEBUG* A-1
 exiting: *DEBUG* 2-14
 limitations: *DEBUG* 2-3
 LINK options: *DEBUG* 2-4
 loading: *DEBUG* 2-2
 program profiler: *DEBUG* 6-1
 prompt: *DEBUG* 2-11
 runstring: *DEBUG* 2-5
 runstring options: *DEBUG* 2-6
 -B: *DEBUG* 2-6
 -D: *DEBUG* 2-7
 -I: *DEBUG* 2-7
 -L: *DEBUG* 2-8
 -M: *DEBUG* 2-8
 -P: *DEBUG* 2-9
 -RB: *DEBUG* 2-10
 -V: *DEBUG* 2-10
 -W: *DEBUG* 2-10
 suspending: *DEBUG* 5-26
 debug commands
 activate breakpoint: *DEBUG* 5-3
 arguments (Xdb): *DEBUG* 7-3
 break: *DEBUG* 2-13, 5-4
 break uplevel: *DEBUG* 5-7
 breakpoint: *DEBUG* 3-4
 change list file: *DEBUG* 5-7
 clear: *DEBUG* 5-7
 clear breakpoint: *DEBUG* 5-8
 command stack (/): *DEBUG* 5-8
 comment (*): *DEBUG* 5-9
 create variable: *DEBUG* 5-9
 deactivate breakpoint: *DEBUG* 5-10
 display: *DEBUG* 2-13, 3-6, 5-10
 automatically: *DEBUG* 5-11
 entry points: *DEBUG* 5-11
 location: *DEBUG* 5-12
 symbols: *DEBUG* 5-12
 type: *DEBUG* 5-13
 variables: *DEBUG* 5-13
 do while: *DEBUG* 5-14
 echo: *DEBUG* 5-15
 else: *DEBUG* 5-15
 enddo: *DEBUG* 5-16
 endif: *DEBUG* 5-16
 execute: *DEBUG* 5-17
 exit: *DEBUG* 2-14, 3-7, 5-17
 find: *DEBUG* 5-18

goto: *DEBUG* 5-19
 help: *DEBUG* 2-14, 5-19
 histogram: *DEBUG* 5-20
 if: *DEBUG* 5-20
 include: *DEBUG* 5-21
 kill variable: *DEBUG* 5-22
 list: *DEBUG* 5-23
 modify: *DEBUG* 2-14, 3-7, 5-25
 operator suspend: *DEBUG* 5-26
 overview: *DEBUG* 5-26
 path: *DEBUG* 5-27
 proceed: *DEBUG* 2-13, 5-28
 proceed across terminations: *DEBUG* 5-29
 proceed uplevel: *DEBUG* 5-30
 return: *DEBUG* 5-30
 run: *DEBUG* 5-30
 set: *DEBUG* 5-31
 status: *DEBUG* 5-32
 step: *DEBUG* 3-8, 5-32
 step into: *DEBUG* 3-10
 trace: *DEBUG* 5-34
 view: *DEBUG* 5-35
 where: *DEBUG* 3-11, 5-35
 debugger: *LODR* 1-3, 3-4
 force load: *LODR* 4-30
 interface with MLLDR: *LODR* 2-20
 DEC: *MAC* 4-35, 4-37, B-15
 decimal addition and subtraction: *DBGS* A-3
 decimal constants: *MAC* 4-37, 4-38
 decimal integer: *MAC* 4-37
 decimal string arithmetic subroutines: *REL* 10-1
 decimal to octal conversion: *DBGS* A-3
 DecimalToDint, ASCII to double integer
 conversion: *REL* 7-16
 DecimalToInt, ASCII to single integer conversion:
 REL 7-17
 declaring
 assembly-time variables: *MAC* 4-1, 4-47
 extended memory area (EMA): *PROG* 4-13
 shareable EMA: *PROG* 4-8, 4-9
 VMA array: *PROG* 4-3
 decrement double integer: *REL* 4-4
 (and skip if zero): *REL* 4-6
 DEF: *MAC* 4-40, B-16
 default: *EDIT* B-2
 library file search sequence: *LINK* 4-5
 LINK command file search sequence: *LINK* 4-5
 macro parameters: *MAC* 5-10
 output file formats: *MAC* E-6
 parameters: *REL* 2-2
 program file search sequence: *LINK* 4-5
 relocatable file search sequence: *LINK* 4-5
 search sequence: *CUSR* 3-33
 snapshot file search sequence: *LINK* 4-5
 defaulting a parameter: *EDIT* 3-36
 defining constants: *DEBUG* 4-15
 Defining CS/80 Track Map Table: *SMM* A-3
 defining symbolic addresses in *DEBUGR*: *DBGS*
 2-8
 Defining the ICD Track Table: *SMM* A-13
 defining UDSPs: *CUSR* 3-33
 DELETE: *MAC* 5-16, B-14
 Delete (D) command: *EDIT* 4-13
 delete (special character): *DMUX* 2-4
 delete control character: *EDIT* 3-26
 deleting
 a file: *EDIT* 3-11
 characters: *EDIT* 2-12
 lines: *EDIT* 2-12, 4-13, 4-35
 permanent programs, *LODR* 2-10
 symbols from the symbol table: *DBGS* 2-12
 tabs: *EDIT* 4-78
 text: *EDIT* 2-29, 2-42, 3-33
 trailing blanks: *EDIT* 4-8
 deletion, commands, *LODR* 2-7
 delimiter: *EDIT* 2-31, B-2
 demand-paged virtual memory: *TUSR* 1-4
 DENTRY macro: *MAC* N-6
 depth, *LODR* 3-3
 descriptions of system macros: *MAC* L-4
 destination
 file masks: *CUSR* 3-20
 LU: *BSP* 5-5
 detach from session, DETACH: *REL* 6-6
 Determine User Requirements: *SMM* 2-1
 determining
 line number: *EDIT* 2-21
 location: *EDIT* 2-21
 device: *DRVW* 2-1; *GEN* 2-18, 2-19
 initialization: *CMUX* 2-12
 maximum supported: *CMUX* 1-3
 status: *CMUX* 2-11
 status words (EQT 4 and 5): *CMUX* 3-6
 timeout: *PROG* 1-18; *TUSR* 4-71
 setting: *DMUX* 2-17
 type: *CMUX* 4-8; *DMUX* 2-27
 device address: *HPIB* 2-5
 address assignment table: *HPIB* 2-6
 addressable mode devices: *HPIB* 2-6
 and LU numbers: *HPIB* 3-1
 and subchannels: *HPIB* 3-1
 dual-address devices: *HPIB* 2-5
 switches: *HPIB* 2-3
 device clear on program abort: *DRVW* 3-14
 device communications
 CMDW/CMDR subroutines: *HPIB* 4-20
 data messages: *HPIB* 4-11
 IOCNT subroutines: *HPIB* 4-23
 PACK USING statement: *HPIB* 4-21
 READ/ENTER/INPUT/WRITE/PRINT
 statements: *HPIB* 4-22
 SECW/SECR/SECWR/SECRR subroutines:
 HPIB 4-22
 device configuration: *UTIL* 2-18
 Device Configuration Inputs: *SMM* 4-47
 Device Control, TO Command: *SMM* 9-1
 device control
 CLEAR statement: *HPIB* 4-15
 CLEAR subroutine: *HPIB* 4-15
 GTL subroutine: *HPIB* 4-16
 LLO subroutine: *HPIB* 4-16
 LOCAL LOCKOUT statement: *HPIB* 4-17

LOCAL statement: *HPIB* 4-16
 LOCL subroutine: *HPIB* 4-17
 REMOTE statement: *HPIB* 4-16
 RMOTE subroutine: *HPIB* 4-15
 TRIGGER statement: *HPIB* 4-17
 TRIGR subroutine: *HPIB* 4-17, 4-18
 device driver: *DRVW* 2-2; *UTIL* 2-18
 address table: *CMUX* 4-11
 example: *CMUX* 4-21
 address table (\$DVTB): *CMUX* 2-31
 assigned to port: *CMUX* 2-31
 DDT05 (without CTU support): *CMUX* 1-3
 DDV05 (with CTU support): *CMUX* 1-3, 2-31, 4-3, 5-2
 Control Function 11B (line spacing): *CMUX* B-2
 Control Function 25B (terminal config.): *CMUX* B-2
 control request definition: *CMUX* B-2
 handshake control: *CMUX* 5-1
 I/O requests: *CMUX* B-2
 subchannel assignment: *CMUX* B-1
 subchannel support: *CMUX* 5-4
 user interface: *CMUX* B-1
 DDV12: *CMUX* 1-3, 2-31, 4-3, 5-2
 control request: *CMUX* B-4
 user interface: *CMUX* B-3
 write request: *CMUX* B-3
 description: *CMUX* 1-3, 4-1
 DVA05: *CMUX* 5-4
 EQT extent: *CMUX* 4-4
 equipment type: *CMUX* 4-8
 HP implementation: *CMUX* 4-3
 interface: *CMUX* 4-4
 location and size: *CMUX* 4-12
 partition: *CMUX* 4-12
 restrictions and requirements: *CMUX* 4-4
 return to the interface driver: *CMUX* 4-5
 A-Register: *CMUX* 4-6
 B-Register: *CMUX* 4-8
 EQT entries: *CMUX* 4-8
 EQT extent: *CMUX* 4-6
 Exit command: *CMUX* 4-6
 function modifier: *CMUX* 4-7
 sample listing: *CMUX* 4-22
 system abort requests: *CMUX* 4-4
 usage: *CMUX* 4-1
 with CTU support: *CMUX* 1-3
 writing: *CMUX* 4-1
 example: *CMUX* 4-13
 device LU, control request: *DMUX* 2-11
 Device Reference Table: *BSP* 2-6; *DRVW* 2-9; *GEN* 2-57, 3-12; *PROG* 2-76, E-6
 device table (DVT): *HPIB* 3-1
 device-specific considerations: *CMUX* 5-1
 devices
 and interface cards: *SMM* 4-37
 bringing up: *CUSR* 2-13
 controlling: *CUSR* 2-12
 I/O, referenced as files: *CUSR* 3-2
 referencing offline: *UTIL* 3-26
 transferring data to/from: *CUSR* 3-38
 DEX: *MAC* 4-35, 4-37, B-15
 DEXP entry: *REL* 3-25
 \$EXP: *REL* 3-140
 DEY: *MAC* 4-35, 4-38, B-15
 DF option: *EDIT* 3-26
 DFCHI, HP 1000 double precision floating point to IEEE conversion: *REL* 11-1
 DFCIH, IEEE standard format double precision to HP 1000 conversion: *REL* 11-2
 DI (display undefined externals), *LODR* 5-2
 DI (display) command: *LINK* 3-7
 dial-back program example: *CMUX* 2-27
 dialing
 pulse: *CMUX* 2-24
 tone: *CMUX* 2-24
 difference, positive real: *REL* 3-26
 DIM: *REL* 3-26
 DintToDecimal, double integer to ASCII conversion: *REL* 7-17
 DintToDecimalr, double integer to ASCII conversion: *REL* 7-18
 DintToOctal, double integer to octal conversion: *REL* 7-18
 DintToOctalr, double integer to octal conversion: *REL* 7-19
 DIO lines and parallel polling: *HPIB* 4-7
 direct address, AddressOf: *REL* 7-1
 direct addressing: *HPIB* 4-20
 direct calls: *REL* 2-3
 directory/directories: *CUSR* 3-6; *RDSV* 1-1, 3-6; *TUSR* 3-15
 CATALOGS.DIR: *SMM* 3-12
 CMDFILES.DIR: *SMM* 3-13
 creating: *CUSR* 3-28
 default (WD): *CUSR* 3-6
 entry type 0 files: *PROG* G-8
 format: *SMM* D-1
 HELP.DIR: *SMM* 3-12
 LIBRARIES.DIR: *SMM* 3-12
 list: *TUSR* 3-66
 listing: *CUSR* 3-22
 manipulating: *CUSR* 3-28
 moving: *CUSR* 3-30
 names: *CUSR* B-1
 organization: *SMM* 3-11
 ownership: *CUSR* 3-30
 PROGRAMS.DIR: *SMM* 3-13
 protection: *CUSR* 3-32
 purging: *CUSR* 3-32
 SCRATCH.DIR: *SMM* 3-13
 specifiers: *CUSR* 3-9, 3-10
 SYSTEM.DIR: *SMM* 3-12
 user of: *CUSR* 5-98
 working (WD): *CUSR* 3-6
 disable, program scheduling: *CMUX* 2-17; *DMUX* 2-17
 disconnect, modem line: *CMUX* 2-21, 2-25
 no wait bit: *CMUX* 2-25
 disk
 management: *SMM* 3-9

allocation error messages: *PROG* A-8
allocation pool: *SMM* C-8
blocks: *UTIL* A-1
cache: *GEN* 2-20
caching: *UTIL* 3-3, 3-48, 9-34
cartridge: *RDSV* 4-1; *PROG* 1-25
cartridge exchange: *SMM* 5-12
cartridge organization: *TUSR* 3-14
errors: *PROG* 3-9; *TUSR* 3-13
file directory: *PROG* G-7; *SMM* D-6
file location: *TUSR* 3-12
file record formats: *PROG* I-25
initialization and sparing: *UTIL* A-3
loader ROM: *SMM* 6-3
LU/select code specification: *SMM* 5-10
nodes, *LODR* 3-22, 6-6, 6-8, 6-19, 7-2, 8-11
parity error (track error): *PROG* A-5
parity errors: *SMM* A-1
read/write subroutine BINRY: *PROG* 5-49
subchannel: *GEN* 2-20
 restrictions: *GEN* 2-20
supported: *UTIL* 1-1
disk backup procedure: *INST* 2-3
 backup on magnetic tape: *INST* 2-3
 drive: *INST* A-1
 initialization: *INST* 2-9
disk backup utilities: *TUSR* 1-10
disk configuration: *SMM* 4-5
 CS/80 disk configuration: *SMM* 4-8
 HP 7906(H): *SMM* 4-19
 HP 7920(H): *SMM* 4-24
 HP 7925(H): *SMM* 4-27
 HP 9895: *SMM* 4-37
 ICD/MAC disk surface organization: *SMM* 4-5
 ICD/MAC spare tracks: *SMM* 4-6
disk driver
 DVA32: *SMM* 4-68
 DVM33: *SMM* 4-70
 DVR32: *SMM* 4-67
 DVR33: *SMM* 4-72
disk formatting utilities: *TUSR* 3-54; *UTIL* 9-1
 FORMC: *UTIL* 9-1, 9-25
 FORMAT: *UTIL* 9-2
disk packing process: *UTIL* 6-6
disk planning: *SMM* 3-16, 3-17, 4-3
 cartridge requirements worksheet: *SMM* 3-16
 multiple CPU: *SMM* 4-5
 multiple disk controllers: *SMM* 4-4
 peripheral subchannels: *SMM* 4-4
 system/auxiliary subchannels: *SMM* 4-3
disk space: *EDIT* 4-16
disk-resident nodes, and memory-resident nodes,
 mixed, *LODR* 3-17
disk-resident programs: *GEN* B-18; *TUSR* 1-3
 background (BG): *GEN* 2-70
 real-time (RT): *GEN* 2-70
 type 4 BG programs: *GEN* 2-70, B-18
DiskSize, tracks and sector per track: *REL* 7-20
DiskToBlock: *REL* 7-19
dismount
 cartridge: *TUSR* 3-62
 volumes: *CUSR* 3-35
DISP6: *GEN* B-2
dispatching: *PROG* 1-3
dispatching errors: *PROG* A-3
display
 account information: *SMM* 8-21
 LIST,ACCT: *SMM* 8-22
 LIST,USER: *SMM* 8-21, 8-22
 breakpoints: *DEBUG* 3-6, 5-5
 directory owner: *CUSR* 3-30
 directory protection: *CUSR* 3-32
 entered Debug commands: *DEBUG* 5-8
 file: *EDIT* 2-22
 information: *EDIT* 2-20, 2-39
 I/O configuration: *CUSR* 2-10
 large screen: *EDIT* 2-16
 line number: *EDIT* 2-21, 4-53
 memory usage: *CUSR* 2-9
 messages: *TUSR* 3-93
 online reference: *EDIT* 4-94
 options: *EDIT* 3-29
 See also viewing options
 parameters: *TUSR* 3-68
 portion of a file: *EDIT* 2-22
 See also L command, W command
 program status: *CUSR* 2-7, 4-9
 session LU information: *TUSR* 3-114, 4-58
 source file status: *EDIT* 4-95
 status information: *DEBUG* 5-32
 system time: *CUSR* 2-14
 text: *EDIT* 4-40
 virtual memory size: *TUSR* 4-76
 working directory: *CUSR* 3-29, 5-68
 working set size: *TUSR* 4-81
Display Automatically command: *DEBUG* 5-11
Display command: *DEBUG* 2-13, 3-6, 5-10; *GEN*
 2-36
Display Entry Points command: *DEBUG* 5-11
Display Functions (DF) option: *EDIT* 3-26
Display Location command: *DEBUG* 5-12
Display Symbols command: *DEBUG* 5-12
Display Type command: *DEBUG* 5-13
Display Variables command: *DEBUG* 5-13
disposition flags: *BSP* 3-6, 3-8
Distributed System (DS) Network: *CUSR* 3-40
distributed system test: *INST* 4-9
DIV: *MAC* 3-11, B-11
DIVD: *MAC* 3-11, B-11
divide
 complex by complex: *REL* 3-67
 double integer: *REL* 4-5
 DVID (double precision): *REL* 8-9
 DWID (EMA double precision): *REL* 8-9
 extended real by extended real: *REL* 3-125
 real: *REL* 3-87
 substrings, SDIV: *REL* 10-19
 VDIV (single precision): *REL* 8-9
 WDIV (EMA single precision): *REL* 8-9
DJ - display job status: *BSP* 4-5, 4-10
DJP: *MAC* 3-16, B-12
DJS: *MAC* 3-16, B-12

DL command: *CUSR* 3-22, 5-30; *TUSR* 3-66
DLCALL: *MAC* N-8
DLD: *MAC* 3-11, B-11
DLENTY macro: *MAC* N-5
DLOG entry: *REL* 3-27
 \$LOG: *REL* 3-141
DLOGT entry: *REL* 3-28
 \$LOGT: *REL* 3-142
DM (debug monitor) command: *LINK* 3-7
DM error: *PROG* A-4
DMA (direct memory access): *CMUX* 1-3
DMAX1, DMIN1: *REL* 3-29
DMOD: *REL* 3-30
DMS: Dynamic Mapping System: *DRVW* 3-31
 privileged driver: *DRVW* 4-10
DMT: Driver Mapping Table: *DRVW* 2-15
DN command: *CUSR* 5-35; *TUSR* 4-31
DO loops, converting, with VIS: *REL* 9-1
Do While command: *DEBUG* 5-14
dollar sign (\$). See end-of-file, metacharacter
dot (.) metacharacter: *EDIT* 5-7
dot product routine: *REL* 8-17
 DVDOT (double precision): *REL* 8-17
 DWDOT (EMA double precision): *REL* 8-17
 VDOT (single precision): *REL* 8-17
 WDOT (EMA single precision): *REL* 8-17
double integer to ASCII conversion
 DintToDecimal: *REL* 7-17
 DintToDecimalr: *REL* 7-18
double integer to octal conversion
 DintToOctal: *REL* 7-18
 DintToOctalr: *REL* 7-19
double precision floating point conversion
 DFCHI: *REL* 11-1
 DFCIH: *REL* 11-2
double precision to integer conversion, /TINT:
 REL 3-175
double real
 arithmetic: *REL* 3-112
 remainder: *REL* 3-100
down an I/O controller or device: *TUSR* 4-31
DP command: *TUSR* 3-68
DP (do not purge) command: *LINK* 3-8
DPOLY: *REL* 3-31
driver
 automatic "up": *DRVW* 3-24
 communication word: *DMUX* 2-7
 device: *DRVW* 2-2
 device types: *DMUX* 2-27
 Mapping Table (DMT): *DRVW* 2-15; *PROG*
 E-9
 naming requirements: *DRVW* 3-2
 partition: *PROG* 1-10
 Driver Partition #1: *GEN* B-1
 Driver Partitions #2 - #N: *GEN* B-4
 overflow: *GEN* 3-5
 privileged: *DRVW* 4-2
 structure and operation: *DRVW* 4-3
 processing of timeout: *DRVW* 3-15
 relocation utility (DRREL): *UTIL* 10-1, 10-5
 replacement utility (DRRPL): *UTIL* 10-1, 10-11
 sample: *DRVW* 3-35
 standard: *DRVW* 2-15
 structure and operation: *DRVW* 3-1
drivers
 dummy: *UTIL* 10-2
 finding space for: *UTIL* 10-1
 installation: *UTIL* 10-1
 overlying existing: *UTIL* 10-1
 relocating: *UTIL* 10-1
 replacement: *UTIL* 10-4, 10-11, 10-20
 using available pages: *UTIL* 10-2
drivers, identifying: *UTIL* 2-18
DRREL utility: *PROG* 1-34; *UTIL* 10-1, 10-5
 calling: *UTIL* 10-5
 commands: *UTIL* 10-7
 error messages: *UTIL* 10-9
 example: *UTIL* 10-8
DRRPL utility: *PROG* 1-34; *UTIL* 10-1, 10-11
 calling: *UTIL* 10-11
 commands summary: *UTIL* 10-12
 DI/MI command listing format: *UTIL* 10-13
 driver replacement: *UTIL* 10-20
 driver replacement example: *UTIL* 10-20
 DRRPL entry type/action: *UTIL* 10-19
 error messages: *UTIL* 10-23
 MD/DD command listing format: *UTIL* 10-15
 ME/DE command listing format: *UTIL* 10-14
 replacement driver specification: *UTIL* 10-16
DRT table entry, DVC00: *DMUX* B-3
DRT: Device Reference Table: *DRVW* 2-9
DS: *CUSR* 6-3
 and FMP calls: *CUSR* 6-82
 and FMP routines: *CUSR* 6-82
 file access: *CUSR* 3-40
 file access considerations: *CUSR* 3-42
 node: *CUSR* 6-4
 programmatic logon: *REL* 6-3
 user: *CUSR* 6-4
DS command: *BSP* 4-5, 4-16
DS Transparency Software installation: *SMM* 6-20
DS/1000: *CUSR* 1-5
 errors: *CUSR* A-13, A-14
DS/1000-IV
 configuration: *INST* 2-18
 initialization: *INST* 2-19
DS[AL:] command: *BSP* 4-3
DsCloseCon: *CUSR* 6-83
DsDcbWord: *CUSR* 6-83
DsDiscInfo: *CUSR* 6-84
DsDiscRead: *CUSR* 6-84
DsFstat: *CUSR* 6-85
DSIGN: *REL* 3-33
DSIN: *REL* 3-34
DsNodeNumber: *CUSR* 6-85
DsOpenCon: *CUSR* 6-86
DSQRT entry: *REL* 3-35
 \$SQRT: *REL* 3-143
DsSetDcbWord: *CUSR* 6-86
DST: *MAC* B-11
DSX: *MAC* 3-9, B-8
DSY: *MAC* 3-9, B-8

DTACH, detach from session: *REL* 6-6
 DTAN: *REL* 3-36
 no error, \$TAN: *REL* 3-144
 DTANH: *REL* 3-37
 DTMF tone dialing: *CMUX* 2-24
 DU command: *TUSR* 3-70
 Dual Channel Port Controller. *See* DCPC
 DUCALL: *MAC* N-9
 dumb devices: *CMUX* 5-3
 dumping: *DBGS* C-6
 tables and patches: *DBGS* 4-1
 duplicate names, *LODR* 6-21
 duplicate pending line and edit. *See* O command
 duplicate program name, *LODR* 4-17
 duplication of modules, *LODR* 3-17, 3-22, 6-3,
 6-18, 6-19, 6-20, 8-9, 8-11
 DV800, EQT extension word usage: *DMUX* B-5
 DVA05: *CMUX* 5-4
 DVABS, absolute value routine (double precision):
 REL 8-13
 DVADD, vector add (double precision): *REL* 8-9
 DVC00
 generation considerations: *DMUX* B-3
 DRT table entry: *DMUX* B-3
 EOT/timeout options: *DMUX* B-3
 subchannel assignment: *DMUX* B-3
 typical device configurations: *DMUX* B-4
 DVC01 and DVC02: *DMUX* B-3
 DVDIV, vector divide (double precision): *REL* 8-9
 DVDOT, vector dot product routine (double
 precision): *REL* 8-17
 DVM00: *CMUX* 1-3, 4-1, 5-3
 DVMAB, vector largest value (absolute) (double
 precision): *REL* 8-20
 DVMAX, vector largest value (double precision):
 REL 8-20
 DVMIN, vector smallest value (double precision):
 REL 8-20
 DVMINV, vector smallest value (absolute) (double
 precision): *REL* 8-20
 DVMOV, vector move routine (double precision):
 REL 8-24
 DVMPY, vector multiply (double precision): *REL*
 8-9
 DVNRM, vector sum routine (absolute) (double
 precision): *REL* 8-14
 DVPIV, vector pivot routine (double precision):
 REL 8-18
 DVR05: *CMUX* B-1, B-3
 DVR12 (12B): *BSP* 3-17
 DVR32 Lock/Unlock Function Call: *SMM* A-17
 DVS43: *BSP* 1-2
 DV SAD, vector-scalar add (double precision):
 REL 8-11
 DVSDV, vector-scalar divide (double precision):
 REL 8-11
 DVSMY, vector-scalar multiply (double precision):
 REL 8-11
 DVSSB, vector-scalar subtract (double precision):
 REL 8-11
 DV SUB, vector subtract (double precision): *REL*
 8-9
 DV SUM, vector sum routine (double precision):
 REL 8-14
 DV SWP, vector copy routine (double precision):
 REL 8-24
 DVT00: *CMUX* 1-3
 DVWMOV, vector EMA/non-EMA move routine
 (double precision): *REL* 8-26
 DVW MV, vector EMA copy routine (double
 precision): *REL* 8-26
 DWABS, absolute value routine (EMA double
 precision): *REL* 8-13
 DWADD, vector add (EMA double precision):
 REL 8-9
 DW DIV, vector divide (EMA double precision):
 REL 8-9
 DW DOT, vector dot product routine (EMA double
 precision): *REL* 8-17
 DW MAB, vector largest value (absolute) (EMA
 double precision): *REL* 8-20
 DW MAX, vector largest value (EMA double
 precision): *REL* 8-20
 DW MIN, vector smallest value (EMA double
 precision): *REL* 8-20
 DW MINV, vector smallest value (absolute) (EMA
 double precision): *REL* 8-20
 DW MOV, vector move routine (EMA double
 precision): *REL* 8-24
 DW MPY, vector multiply (EMA double precision):
 REL 8-9
 DW NRM, vector sum routine (absolute) (EMA
 double precision): *REL* 8-14
 DW PIV, vector pivot routine (EMA double
 precision): *REL* 8-18
 DW SAD, vector-scalar add (EMA double
 precision): *REL* 8-11
 DW SDV, vector-scalar divide (EMA double
 precision): *REL* 8-11
 DW SMY, vector-scalar multiply (EMA double
 precision): *REL* 8-11
 DW SSB, vector-scalar subtract (EMA double
 precision): *REL* 8-11
 DW SUB, vector subtract (EMA double precision):
 REL 8-9
 DW SUM, vector sum routine (EMA double
 precision): *REL* 8-14
 DW SWP, vector copy routine (EMA double
 precision): *REL* 8-24
 DW W MV, vector non-EMA copy routine (double
 precision): *REL* 8-26
 dynamic buffer area - *see* also SZ command
 dynamic buffer area, *LODR* 2-15, 7-8, 8-2
 dynamic mapping system: *MAC* B-12; *PROG* 1-6
 instructions: *MAC* 3-15
 dynamic mapping violations: *PROG* A-2
 dynamic memory partitions: *CUSR* 4-12
 dynamic status: *CMUX* 2-13, 3-6; *DMUX* 2-12
 bit definitions: *CMUX* 2-13
 control word: *DMUX* 2-12

CTUs: *CMUX* 5-5
device status: *DMUX* 2-12
special forms: *DMUX* 2-13

E

EAPOS FMP call: *PROG* 3-64
EB - see Extended Background
EB command: *LINK* 3-8
EC (echo) command: *LINK* 3-8; *LODR* 4-21, 5-3
EC command: *EDIT* 1-7, 2-9, 2-17, 3-6, 3-46, 4-15;
 RDSV 2-6, 3-6
EC option: *EDIT* 3-26
echo command: *RDSV* 3-6
ECHO (display parameters at terminal) command:
 CUSR 2-19, 5-36
echo bit: *CMUX* 2-3
 read request: *DMUX* 2-2
 write request: *DMUX* 2-10
Echo command: *DEBUG* 5-15
ECHO option: *GEN* 3-3
echoing: *CMUX* 2-2
ECLOS FMP call: *PROG* 3-44
ECPREA call: *PROG* 3-29
edit pending line and advance. See C command
EDIT/1000: *PROG* 1-32
 accessing the program: *EDIT* 1-6
 basics: *EDIT* 1-1
 command
 listing: *EDIT* 2-20
 options: *EDIT* B-2
 syntax: *EDIT* 3-13
 description: *EDIT* 1-1
 error/information messages: *EDIT* A-1
 exiting the program: *EDIT* 1-7, 4-2, 4-3, 4-15,
 4-16
 features: *EDIT* 1-2
 file size: *EDIT* 1-13, 3-14
 file size limit: *EDIT* 2-17
 information sources: *EDIT* 1-4
 loading: *EDIT* C-1
 memory requirements: *EDIT* C-2
 multipoint environment: *EDIT* D-1
 operations: *EDIT* 1-8
 prompt: *EDIT* 1-6, 1-10, 1-13, 1-14, 2-7, 2-21,
 3-6, 3-31, B-1
 record limit: *EDIT* 2-17
 regular expressions: *EDIT* 3-22
 runstring: *EDIT* 1-2, 1-6, 1-8, 1-11, 2-7, 2-10,
 3-3, 3-34, 3-47, B-3
 screen error message: *EDIT* 2-12
 screen mode: *EDIT* 4-61
 security: *EDIT* 3-48
 session options: *EDIT* 2-20, 3-25, 4-72, B-2
 tutorial: *EDIT* 2-1
 work area: *EDIT* 1-8, 3-48
editing: *CMUX* 2-2
 a new file: *EDIT* 2-9
 an existing file: *EDIT* 2-9
 line mode: *EDIT* 1-2, 1-10, 3-31, 3-33
 modes: *EDIT* 1-10, 3-8
 screen mode: *EDIT* 1-2, 1-11, 2-4, 2-10, 3-34,
 B-3
 text: *EDIT* 3-36
Eight Channel Multiplexer Drivers: *SMM* 4-78
EIOSZ subroutine: *PROG* 4-22
ELA: *MAC* 3-5, B-4
ElapsedTime: *REL* 7-20
ELB: *MAC* 3-5, B-4
ELOCFF FMP call: *PROG* 3-61
ELSE (system macro): *MAC* L-7
Else command: *DEBUG* 5-15
ELSEIF (system macro): *MAC* L-8
EM (extended memory access) command: *LINK*
 3-9
EMA. See Extended Memory Area
EMA/non-EMA
 copy routine, WSWP (single precision): *REL*
 8-26
 move routine: *REL* 8-26
 DVWMOV (double precision): *REL* 8-26
 VWMOV (single precision): *REL* 8-26
EMAST subroutine: *PROG* 4-16
empty file, creating: *CUSR* 3-26
empty module, *LODR* 4-18
EMPTYSTRING macro: *MAC* N-9
EN command: *LINK* 3-9; *RDSV* 2-12; *TUSR* 2-11
EN, EX, or /E (end of command input), *LODR* 5-3
enable
 program scheduling: *CMUX* 2-17; *DMUX* 2-15
 system console to be session terminal: *TUSR*
 2-11
 terminals: *TUSR* 3-61
ENABLE INTR statement: *HPIB* 5-3, 5-19
END: *MAC* 1-4, 4-3, 4-32, B-14
END command: *MAC* 4-12, 4-13
end EDIT: *EDIT* 2-8, 2-17
END macro: *MAC* N-13
END record, *LODR* 3-2, 6-28
END statement, *LODR* 3-2, 6-5
end of
 command: *RDSV* 3-11
 data: *BSP* 2-42
 partition, *LODR* 7-8
 program, *LODR* 7-8
end-of-file
 characters: *EDIT* 1-13, 2-21
 display: *EDIT* 2-11
 mark: *TUSR* 3-132, 3-133
 perform on tape, .TAPE: *REL* 5-39
 processing: *BSP* 2-41
Enddo command: *DEBUG* 5-16
ENDIF (system macro): *MAC* L-9
Endif command: *DEBUG* 5-16
ENDMAC: *MAC* 5-2, 5-7, B-17
ENDREP: *MAC* 4-63, 4-66, B-17
enlarge free space areas on disks: *UTIL* 6-11
ENQ/ACK handshaking: *CMUX* 5-1
 enable/disable: *CMUX* 2-20
 flowchart of algorithm: *DMUX* D-1

ENT: *MAC* 4-19, B-14
 ENT record, *LODR* 6-41
 entering
 line commands from screen mode: *EDIT* 2-20
 outspool destination LU: *BSP* 5-5
 screen mode: *EDIT* 2-10
 text: *EDIT* 1-10, 2-7
 ENTIE: *REL* 3-38
 ENTIER
 extended real: *REL* 3-39
 real: *REL* 3-38
 ENTIX: *REL* 3-39
 ENTRY macro: *MAC* L-2, L-4, M-9, N-4
 entry macros
 BUMPEXIT: *MAC* N-6
 DENTRY: *MAC* N-6
 DLENTY: *MAC* N-5
 ENTRY: *MAC* N-4
 EXIT, EXIT1, EXIT2: *MAC* N-6
 OENTRY: *MAC* N-4
 entry point, *LODR* 3-9
 FORTRAN, *LODR* 6-4
 Macro, *LODR* 6-5
 main, *LODR* 6-4
 non-main, *LODR* 6-5
 Pascal, *LODR* 6-4
 ENTRY subroutine operations: *MAC* L-4
 EOF. *See* end-of-file
 EOI and ATN bus command: *HPIB* 4-9
 EOI bus management line: *HPIB* 1-7
 EOR
 requirements for controller: *HPIB* 7-5
 requirements for devices: *HPIB* 7-4
 EOT (ctrl-D): *DMUX* 2-4
 EOT (end-of-tape): *CMUX* 4-10
 EOT/timeout options, DVC00 generation: *DMUX* B-3
 EPOSN FMP call: *PROG* 3-67
 EQ command: *CUSR* 5-37; *TUSR* 4-33, 4-35
 EQ (displays I/O controller/status) command: *CUSR* 5-37
 EQLU library function: *CMUX* 3-3
 EQLU subroutine: *PROG* 5-51
 EQT (Equipment Table): *BSP* 2-5; *CMUX* 1-3; *DRVW* 2-5; *HPIB* 3-1; *PROG* 1-20, 2-76, E-1; *TUSR* 4-6, 4-44
 assignment: *TUSR* 4-44
 buffering: *TUSR* 4-35
 down: *TUSR* 4-32
 driver initiation: *DRVW* 3-3
 entry: *BSP* 2-6; *DMUX* B-1; *GEN* 3-11
 assignments: *SMM* 4-41
 summary: *CMUX* A-1
 extension words, serial drivers: *DMUX* B-2
 usage: *DMUX* B-5
 extent: *CMUX* 4-6
 device driver: *CMUX* 4-4
 word 1: *CMUX* 4-6, 4-7
 word 2: *CMUX* 4-5, 4-6, 4-7
 word 3: *CMUX* 4-6
 word 4: *CMUX* 4-6
 word 5: *CMUX* 2-11, 3-6, 4-6, 4-8
 word 6: *CMUX* 4-4, 4-5, 4-7
 word 8: *CMUX* 4-8, 4-20
 word definitions and uses: *CMUX* 4-9
 words 6-8: *CMUX* 4-5
 word 14: *CMUX* 4-8
 EQU: *MAC* 4-40, 4-43, B-16
 equality search: *DBGS* 5-2
 Equipment Table (EQT). *See* EQT
 equipment type: *CMUX* 4-8
 ER command: *EDIT* 1-7, 2-7, 2-9, 2-17, 2-35, 3-6, 3-46, 4-16; *RDSV* 2-6
 ER0.E: *REL* 5-2
 ERA: *MAC* 3-5, B-4
 erasing errors: *EDIT* 3-31, 3-46
 ERB: *MAC* 3-5, B-4
 EREAD FMP call: *PROG* 3-50
 ERRLU: *REL* 5-3
 ERRO: *REL* 5-4
 error
 aborted data transfer: *HPIB* 6-4
 codes: *HPIB* 6-1
 EQT overflow: *HPIB* 6-4
 IBERR subroutine: *HPIB* 6-1
 IFT space too small: *HPIB* 6-4
 illegal interrupt: *HPIB* 6-3
 message descriptions: *EDIT* 1-15
 message display format: *EDIT* 1-10, 3-12, 3-45
 messages: *EDIT* 3-42, 3-48, A-1
 processing
 by program: *HPIB* 6-1
 by system: *HPIB* 6-2
 example: *HPIB* 6-5
 recovery: *EDIT* 3-45, 3-46-3-48
 line mode errors: *EDIT* 1-11, 3-31
 screen mode error: *EDIT* 2-12
 screen mode message: *EDIT* 1-12, 2-12
 specified program does not exist: *HPIB* 6-4
 timeout or transmission: *HPIB* 6-2
 error codes: *GEN* A-1; *CUSR* 6-9
 DM: *PROG* A-4
 EX: *PROG* A-3
 for ERO.E: *REL* 5-4
 for ERRLU: *REL* 5-3
 IO22: *BSP* 3-5
 LU lock: *PROG* A-13
 MP: *PROG* A-4
 RE: *PROG* A-5
 RQ: *PROG* A-5
 TI: *PROG* A-5
 TR: *PROG* A-5
 VMA/EMA: *PROG* A-32
 error conditions, SWTCH: *SMM* 5-26

error handling: *GEN* 3-4
 error messages: *DBGS* B-1; *DEBUG* A-1; *LINK* A-1; *TUSR* A-1
 ACCTS: *SMM* 8-33
 assembly: *MAC* E-9
 configurator: *SMM* 10-19
 during reconfiguration: *SMM* 10-4
 form: *LINK* A-1
 LGON: *SMM* 8-33
 runstring/control statement: *MAC* E-9
 SAVER: *RDSV* A-1
 VIS: *REL* 9-62
 error recovery
 dynamic status checking: *CMUX* 3-6
 EQT words 4 and 5: *CMUX* 3-6
 I/O status
 checking: *CMUX* 3-6
 request returns: *CMUX* 3-7
 LU status word: *CMUX* 3-6
 port status: *CMUX* 3-6
 error reporting: *GEN* 2-3; *MAC* 1-8, B-17
 on default names: *LINK* 4-7
 errors: *PROG* A-1
 base page link overflow, *LODR* 6-6
 data overrun: *CMUX* 3-8
 disk allocation: *PROG* A-8
 dispatching: *PROG* A-3
 DS/1000 software: *CUSR* A-14
 DS/1000 transparency software: *CUSR* A-13
 duplicate program name, *LODR* 4-17
 EXEC other: *PROG* A-8
 executive: *PROG* A-1
 executive halt: *PROG* A-14
 expected order of commands, *LODR* 5-1, 6-26
 FMP codes: *CUSR* A-2
 formats: *CUSR* A-1
 INDXR, *LODR* A-21
 I/O call: *PROG* A-10
 I/O format: *PROG* A-12
 IO07: *CMUX* 4-6
 LOADR, *LODR* A-1
 memory overflow, *LODR* 6-3, 6-6, 7-1
 messages and codes: *CUSR* A-1
 MLLDR, *LODR* A-1
 multilevel segmentation, *LODR* 4-14
 native language support utilities errors: *CUSR* A-14
 offpath reference, *LODR* 6-20, 6-25, 8-12
 other, *LODR* 4-16
 overflow: *CMUX* 3-6
 parity: *CMUX* 3-6, 3-8; *PROG* A-6
 partition size: *DEBUG* 2-3
 path overflow, *LODR* 6-3, 6-20
 program abort: *DEBUG* 2-3
 program management: *PROG* A-13
 read: *CMUX* 3-8
 reporting, *LODR* 4-13
 returns on FMP calls: *CUSR* 6-9
 routing: *PROG* A-16
 runtime, *LODR* 8-11
 SGMTR, *LODR* A-12
 summary of SGMTR, *LODR* 6-21
 summary of SXREF, *LODR* 6-39
 SXREF, *LODR* A-17
 syntax checking mode (SXREF), *LODR* 6-25
 timeout: *CMUX* 3-6
 VMA/EMA: *PROG* 4-12, A-32
 waiting for resources, *LODR* 4-17
 warnings, *LODR* 4-16, 7-8
 ESC-4 CTRL-B: *EDIT* 3-37, 4-62
 escape (\) character: *EDIT* 3-19, 3-32, 5-4, B-2
 Escape Character (EC) option: *EDIT* 3-26
 escaping screen mode: *EDIT* 1-11, 2-21
 ETime: *REL* 7-20
 Euclidean norm: *REL* 8-17
 Evaluate User Base: *SMM* 1-1
 evaluation of expressions: *MAC* 4-64
 EWRIT FMP call: *PROG* 3-56
 EX (exit) command: *BSP* 4-3, 4-5, 4-8; *CUSR* 5-38; *TUSR* 3-74
 EX errors: *PROG* A-3
 examine memory: *DBGS* 3-2
 examine or modify buffer limit: *TUSR* 4-27
 examining a location: *DEBUG* 3-6, 5-10
 example
 answer file: *GEN* E-1
 generation listing: *GEN* F-1
 page mode application: *DMUX* C-1
 protocol charts: *DMUX* A-1
 system generation: *GEN* 3-5
 example of a macro: *MAC* 5-2
 example VIS programs: *REL* 9-24
 examples of the Macro/1000 runstring: *MAC* E-7
 exception condition handling: *CUSR* 7-1
 Exchange (G) command: *EDIT* 2-34
 Exchange (X) command: *EDIT* 2-34
 Exchange and Search (Y) command. *See* Y command
 exchanging patterns: *EDIT* 2-34, 2-42
 exchanging text: *EDIT* 3-19
 EXEC 8: *LODR* 2-6, 9-1
 EXEC 14: *PROG* 5-46
 EXEC call: *BSP* 3-2; *CMUX* 1-3, 2-1; *DRVW* 2-2
 control request: *CMUX* 2-11
 control word: *CMUX* 2-2
 description conventions: *PROG* 2-17
 error messages: *PROG* A-1
 error returns: *PROG* 2-10
 errors other: *PROG* A-8
 formats: *PROG* 2-3, 2-4, 2-5, 2-6, 2-7, 2-8
 function code: *CMUX* 2-2
 I/O request: *CMUX* 2-2
 LU number: *CMUX* 2-2
 parameters: *CMUX* 2-11
 request code: *CMUX* 2-1
 standard: *PROG* 2-26
 summary: *PROG* 2-1
 EXEC calls
 EXEC 1 - standard I/O read: *PROG* 2-20
 EXEC 2 - standard I/O write: *PROG* 2-20
 EXEC 3 - I/O control call: *PROG* 2-26

EXEC 4 - local disk track allocation: *PROG* 2-87
 EXEC 5 - local disk track release: *PROG* 2-89
 EXEC 6 - program completion: *PROG* 2-52
 EXEC 7 - program suspend: *PROG* 2-55
 EXEC 8 - program segment load: *PROG* 2-57
 EXEC 9 - immediate schedule with wait: *PROG* 2-59
 EXEC 10 - immediate schedule without wait: *PROG* 2-59
 EXEC 11 - time request: *PROG* 2-74
 EXEC 12 - program time scheduling: *PROG* 2-65
 EXEC 13 - I/O status: *PROG* 2-76
 EXEC 14 - sample program: *PROG* 5-46
 EXEC 14 - string passage: *PROG* 2-69
 EXEC 15 - global disk track allocation: *PROG* 2-87
 EXEC 16 - global disk track release: *PROG* 2-89
 EXEC 17 - class read: *PROG* 2-35
 EXEC 18 - class write: *PROG* 2-35
 EXEC 19 - class I/O control: *PROG* 2-41
 EXEC 20 - class write/read: *PROG* 2-35
 EXEC 21 - class get: *PROG* 2-43
 EXEC 22 - program swapping control: *PROG* 2-72
 EXEC 23 - queue schedule with wait: *PROG* 2-59
 EXEC 24 - queue schedule without wait: *PROG* 2-59
 EXEC 25 - partition status: *PROG* 2-81
 EXEC 26 - memory size: *PROG* 2-83
 EXEC processor: *PROG* 2-1
 EXEC6 system module: *GEN* B-3
 Execute command: *DEBUG* 5-17
 execute RTE system command: *TUSR* 3-137
 executing a command file: *CUSR* 2-15
 executing a program: *CUSR* 4-4
 resuming execution: *CUSR* 4-9
 running programs with wait: *CUSR* 4-4
 running programs without wait: *CUSR* 4-5
 time scheduling programs: *CUSR* 4-6
 execution confirmation. *See* dangerous command confirmation
 execution control structures: *CUSR* 2-24
 executive communication: *PROG* 1-27, 2-1
 executive halt errors: *PROG* A-14
 EXER utility: *UTIL* B-1
 error handling: *UTIL* B-7
 EXER and CS80 tape drives: *UTIL* B-7
 loading the program: *UTIL* B-1
 selected command descriptions: *UTIL* B-4
 CHANGE LU: *UTIL* B-4
 DESCRIBE: *UTIL* B-4
 ERT LOG: *UTIL* B-4
 FAULT LOG: *UTIL* B-5
 INPUT: *UTIL* B-6
 OUTPUT: *UTIL* B-7
 REV: *UTIL* B-6
 RO ERT: *UTIL* B-6
 RUN LOG: *UTIL* B-5
 TABLES: *UTIL* B-5
 using the Exerciser: *UTIL* B-2
 Exit and Create (EC) command: *EDIT* 2-9
 Exit and Replace (ER) command: *EDIT* 2-7, 2-9
 Exit command: *CMUX* 4-6; *DEBUG* 2-14, 3-7, 5-17
 EXIT macro: *MAC* L-2, L-5, M-10, N-6
 EXIT subroutine operations: *MAC* L-4
 EXIT1 macro: *MAC* N-6
 EXIT2 macro: *MAC* N-6
 exiting
 EDIT: *EDIT* 1-7, 4-2, 4-3, 4-15, 4-16
 saving: *EDIT* 2-9, 2-17
 without saving: *EDIT* 2-8
 screen mode: *EDIT* 1-11, 2-17, 3-42
 EXP: *REL* 3-40
 EXP entry (call-by-name), %XP: *REL* 3-164
 ExpandAsciiRLE: *REL* 12-5
 exponential, extended real: *REL* 3-25
 exponentiate
 double real to double real power: *REL* 3-122
 double real to integer power: *REL* 3-120
 double real to unsigned integer power: *REL* 3-119
 integer to integer power: *REL* 3-95
 real to double real power: *REL* 3-108
 real to integer power: *REL* 3-106
 real to real power: *REL* 3-107
 real to unsigned integer power: *REL* 3-90
 exponentiate e
 double real power: *REL* 3-85
 real power: *REL* 3-40
 export/import mode: *UTIL* 7-1
 expressions: *DBUG* 1-3
 address operators: *DEBUG* 4-10
 alternate variable display: *DEBUG* 4-12
 arithmetic operators: *DEBUG* 4-9
 attribute operators: *DEBUG* 4-9
 definition: *MAC* 2-10
 legal use of: *MAC* 2-11
 operator precedence: *DEBUG* 4-11
 operators: *MAC* 2-5, 4-51
 override operators: *DEBUG* 4-11
 substrings: *DEBUG* 4-15
 using: *DEBUG* 4-8
 using assembly-time variables: *MAC* 4-52
 EXT: *MAC* 4-19, B-14, H-6
 EXT utility: *UTIL* 11-1, 11-6
 -C option: *UTIL* 11-8
 -N option: *UTIL* 11-9
 -T option: *UTIL* 11-8
 -V option: *UTIL* 11-10
 calling: *UTIL* 11-6
 error handling: *UTIL* 11-11
 loading: *UTIL* 11-11
 no options: *UTIL* 11-7
 options: *UTIL* 11-6
 options summary: *UTIL* 11-7
 output formats: *UTIL* 11-7
 extend complement, real: *REL* 3-132
 extended

arithmetic group: *MAC* 3-11
 arithmetic unit: *MAC* B-11
 instruction group: *MAC* B-7
 precision constants: *MAC* 4-37
 relocatable records: *MAC* 1-2, 1-3
 extended background: *LINK* 3-8
 map: *GEN* B-5
 program: *LODR* 2-15, 3-4
 type 6: *GEN* B-18
 extended calls, FMGR files conversion: *CUSR*
 B-10
 extended code space, *LODR* 0-3
 Extended Memory Area (EMA): *LODR* 7-8, 70-1;
 MAC 4-9, B-18, H-9, J-7; *PROG* 4-6; *TUSR* 1-5
 allocation of: *LINK* 4-2
 and memory structure: *PROG* 4-6
 and shareable EMA, *LODR* 2-17
 area page align: *LINK* 3-16
 call by value and call by reference (VIS): *REL*
 9-17
 considerations (VIS): *REL* 9-16
 copy routine, DVWMV (double precision):
 REL 8-26
 declaring: *PROG* 4-13
 I/O transfers: *PROG* 4-20
 labeled COMMON, *LODR* 6-10
 local: *TUSR* 1-5
 programming: *MAC* 4-35; *PROG* 4-13
 relocatable space: *MAC* 1-11, 4-3, 4-22, 4-34,
 4-41
 shareable EMA: *PROG* 4-7; *TUSR* 1-5
 size: *LODR* 2-15; *PROG* 4-18; *TUSR* 4-65
 variables: *REL* 2-5
 extended real
 to integer, truncate: *REL* 3-24, 3-45
 to real, conversion: *REL* 3-55
 without rounding: *REL* 3-56
 extended records: *UTIL* 2-61
 extents
 copied into main during file packing: *UTIL* 6-6
 file: *CUSR* 3-12; *TUSR* 3-3, 3-11; *UTIL* 4-24,
 4-42
 external references identification: *UTIL* 11-1, 11-6
 EXTN: *BSP* 1-2
 EXTRACT: *MAC* 5-16, B-14
 extract real from complex: *REL* 3-52
 return extended precision: *REL* 3-66

F

F command: *EDIT* 2-23, 2-31, 3-18, 3-46, 4-18
 F option: *MAC* E-2
 FAD: *MAC* 3-14, B-11
 failure analysis: *CMUX* 3-8
 FakeSpStatus: *REL* 12-6
 Fast FORTRAN Processor (FFP): *PROG* 5-11;
 REL 2-6
 father program: *PROG* 2-59
 father/son buffer passage: *PROG* 2-70

FattenMask: *CUSR* 6-16
 fault, *LODR* 3-3, 4-31
 node, *LODR* 2-20
 overhead, *LODR* 2-20
 FC tape format media supplied: *INST* D-12
 FCHI, HP 1000 single precision floating point to
 IEEE conversion: *REL* 11-2
 FCIH, IEEE standard format single precision to
 HP 1000 conversion: *REL* 11-3
 FCL command: *EDIT* 3-7, 3-9, 3-10, 4-20
 FCONT FMP call: *PROG* 3-73
 FCS command: *EDIT* 3-10, 4-21
 FDV: *MAC* 3-14, B-11
 features: *BSP* 1-1
 FI command: *EDIT* 2-9, 2-24, 3-8, 3-46, 4-22
 FIELD (system macro): *MAC* L-2, L-14
 FIFO mode: *DMUX* 1-3
 control: *DMUX* 2-24
 enable: *DMUX* 2-24
 file: *PROG* 1-28, 3-1
 access
 random: *PROG* 3-49
 rights: *RDSV* B-11
 sequential: *PROG* 3-49
 definition FMP calls: *PROG* 3-28
 descriptor: *EDIT* 1-13, 2-24, 3-34
 extent: *EDIT* 4-16; *PROG* 3-5
 line limit: *EDIT* 3-14
 merging: *EDIT* 2-30
 names: *PROG* 3-23
 naming conventions: *EDIT* 3-11
 naming defaults: *LINK* 4-4
 namr: *EDIT* 1-13, B-2
 See also filename specification
 non-update mode: *PROG* 3-6
 renaming during conversion of FMGR cartridge
 directory structure: *UTIL* 6-3
 passage: *PROG* J-2
 positioning: *PROG* 3-60
 posting: *EDIT* 3-7
 protection: *PROG* 3-24
 purge phase: *RDSV* 2-13
 save phase: *RDSV* 2-2, 2-12
 scratch: *PROG* 3-28
 security: *PROG* 3-11; *TUSR* 3-15
 code: *PROG* 3-11, 3-24
 search phase: *RDSV* 2-1
 sequential: *PROG* 3-64
 size: *EDIT* 4-74
 size limit: *EDIT* 2-17, 3-14
 space: *RDSV* B-4
 truncation: *EDIT* 1-13; *PROG* 3-45
 type extension: *EDIT* 3-11
 types: *PROG* 1-28, 3-2; *TUSR* 3-7
 0 - non-disk devices: *PROG* 3-2
 1 - fixed-length (128-word records): *PROG*
 3-3
 2 - fixed-length (user-defined record length):
 PROG 3-3
 3 - variable-length records: *PROG* 3-3
 4 - ASCII data: *PROG* 3-4

5 - relocatable binary code: *PROG* 3-4
 6 - memory image code: *PROG* 3-4
 7 - absolute binary code: *PROG* 3-4
 greater than 7: *PROG* 3-32
 greater than 7 - user-defined data format:
 PROG 3-4
 update mode: *PROG* 3-6
 updates: *PROG* 3-6
 file analysis utilities
 EXT: *UTIL* 11-1, 11-6
 FLAG: *UTIL* 11-1, 11-2
 file attribute specification: *MAC* E-6
 file backup utilities available: *INST* D-16
 file calls, FMGR, converting: *CUSR* B-1
 File Compacting and Disk Pack (MPACK): *UTIL*
 6-11
 calling MPACK: *UTIL* 6-11
 compacting options: *UTIL* 6-12
 logging option: *UTIL* 6-16
 MPACK examples: *UTIL* 6-17
 MPACK options: *UTIL* 6-11
 packing options: *UTIL* 6-15
 file comparison: *UTIL* 2-43
 File Copy (FC): *UTIL* 4-2, 4-113
 ABort command: *UTIL* 4-116
 Brief, Full status display format: *UTIL* 4-121
 calling FC: *UTIL* 4-113
 cartridge lock, open: *UTIL* 4-123, 4-136
 CF Comment File name command: *UTIL* 4-116
 CL Cartridge List command: *UTIL* 4-117
 Clear destination disk: *UTIL* 4-121
 CO command examples: *UTIL* 4-124
 CO command options: *UTIL* 4-120
 CO command source and destination
 parameters: *UTIL* 4-119
 command summary function: *UTIL* 4-116
 COpy command: *UTIL* 4-118
 copy single volume of multi-volume tape set:
 UTIL 4-123
 DEfault command: *UTIL* 4-126
 destination disk handling: *UTIL* 4-135
 display required tape length: *UTIL* 4-123
 DL Directory List command: *UTIL* 4-127
 ECho command: *UTIL* 4-129
 Eliminate extents: *UTIL* 4-122
 error handling in transfer files: *UTIL* 4-139
 EXit command: *UTIL* 4-129
 extents, file: *UTIL* 4-122, 4-135
 FC commands: *UTIL* 4-114
 FC error messages: *UTIL* 4-141
 globals used in transfer files: *UTIL* 4-136
 GRoup CO commands: *UTIL* 4-129
 Ignore data errors: *UTIL* 4-122
 Keep tape online (K): *UTIL* 4-122, 4-131, 4-134
 LC List Comment files command: *UTIL* 4-131
 LH List Header files command: *UTIL* 4-131
 LL List Device command: *UTIL* 4-131
 loading FC: *UTIL* 4-136
 master security code (msc): *UTIL* 4-119
 performance considerations, file copy
 operations: *UTIL* 4-135
 purge source file: *UTIL* 4-123
 recover unused space: *UTIL* 4-123
 replace duplicate files: *UTIL* 4-122
 SCKip area definition command: *UTIL* 4-132
 SKip volume option in multi-volume read:
 UTIL 4-133
 tape directory list format: *UTIL* 4-128
 tape handling: *UTIL* 4-133
 TItle command: *UTIL* 4-132
 TRansfer command (to/from command file):
 UTIL 4-132
 verify transferred data integrity: *UTIL* 4-124
 file copy and file interchange utilities: *UTIL* 4-1
 file descriptor: *CUSR* 6-3; *TUSR* 3-29
 in Macro: *CUSR* 6-7
 in Pascal: *CUSR* 6-5
 file directory: *PROG* 3-10, G-6; *SMM* D-5;
 TUSR C-13
 accessing with FMP calls: *CUSR* 6-2
 entry, type 0: *SMM* D-7
 file external references utility (EXT): *UTIL* 11-6
 File Input (FI) command: *EDIT* 2-9
 file interchange utilities: *UTIL* 4-2
 FC: *UTIL* 4-2, 4-113
 FST: *UTIL* 4-2, 4-3
 LIF: *UTIL* 4-2, 4-156
 TF: *UTIL* 4-2, 4-55
 file management: *PROG* 3-1
 package (FMP): *CUSR* 6-1; *PROG* 1-28, 3-1;
 TUSR 1-6, 3-1
 error messages: *TUSR* A-1
 system: *BSP* 1-2; *PROG* 1-28; *SMM* 4-91
 terms
 block: *TUSR* 3-3
 cartridge: *TUSR* 3-2
 cylinder: *TUSR* 3-2
 data control block: *TUSR* 3-3
 disk: *TUSR* 3-2
 extent: *TUSR* 3-3
 files: *TUSR* 3-2
 ID segment: *TUSR* 3-3
 logical unit: *TUSR* 3-3
 non-disk device: *TUSR* 3-3
 record: *TUSR* 3-3
 sector: *TUSR* 3-2
 track: *TUSR* 3-2
 user buffer: *TUSR* 3-3
 File Manager (FMGR): *EDIT* 2-7, 3-11, 3-12;
 PROG 1-28, 3-1; *TUSR* 3-1
 command structure: *TUSR* 3-27
 commands: *TUSR* 2-8, 3-26
 error codes: *TUSR* 3-32
 parameters syntax rules: *TUSR* 3-28
 privileged commands: *TUSR* 3-29
 prompt: *TUSR* 2-17, 4-17
 scheduling interactively: *TUSR* D-1
 scheduling programmatically: *PROG* J-1
 file manipulation utilities
 MERGE: *UTIL* 2-1, 2-40
 SCOM: *UTIL* 2-1, 2-43
 file-name table, *RDSV* 1-1, 2-1, 2-8, 2-12, 5-2

File Ownership reporting (FOWN): *UTIL* 6-21
File Storage to Tape utility (FST): *PROG* 1-33;
UTIL 4-3
Append option: *UTIL* 4-22
appending data: *UTIL* 4-35
backing up using file masking: *UTIL* 4-27
backup bits: *UTIL* 4-22
BACkup command: *UTIL* 4-7
Brief option: *UTIL* 4-22
building a new directory file: *UTIL* 4-38
calling FST: *UTIL* 4-4
Clear option: *UTIL* 4-22
command stack: *UTIL* 4-7
commands: *UTIL* 4-6
consecutive backups: *UTIL* 4-35
D, K, N, and S qualifiers: *UTIL* 4-26
delta backups: *UTIL* 4-31
DF Directory File command: *UTIL* 4-8
disk directory file: *UTIL* 4-40
DL List Directory command: *UTIL* 4-8
Duplicate option: *UTIL* 4-22
end-of-file position ignored with Whole option:
UTIL 4-25
error handling: *UTIL* 4-45
error messages and warnings: *UTIL* 4-46
EXit command: *UTIL* 4-9
extents, file: *UTIL* 4-24, 4-42, 4-58
Faulty option: *UTIL* 4-22
file masking and renaming: *UTIL* 4-26
FST.RC start-up file: *UTIL* 4-4, 4-5
full backups: *UTIL* 4-31
GO begin backup/restore command: *UTIL* 4-9
HElP command: *UTIL* 4-9
incremental backup: *UTIL* 4-31
Inhibit option (I): *UTIL* 4-22
installing FST: *UTIL* 4-45
Keep option: *UTIL* 4-23, 4-36
LC List Comment file command: *UTIL* 4-10
LH List Header command: *UTIL* 4-10
LI List selected files command: *UTIL* 4-10
LL select Log device/file command: *UTIL* 4-11
LN List Non-selected files command: *UTIL* 4-11
Lock option: *UTIL* 4-23
MinDir option (M): *UTIL* 4-23
MT specify tape LU command: *UTIL* 4-12
multiple reels: *UTIL* 4-35
NEXt command: *UTIL* 4-12
Normal option (N): *UTIL* 4-23
options: *UTIL* 4-20
Original option (O): *UTIL* 4-24
POsition command: *UTIL* 4-13
PREvious command: *UTIL* 4-13
Purge option (P): *UTIL* 4-24
Quiet option (Q): *UTIL* 4-24
recommended system usage: *UTIL* 4-41
replacing reserved characters in FMGR file
names: *UTIL* 4-41
REstore command: *UTIL* 4-14
restoring files from overwritten tape: *UTIL*
4-22, 4-38
restoring from incremental backups: *UTIL* 4-33
restoring using file masking: *UTIL* 4-29
RUn command: *UTIL* 4-15
RwndOff option (R): *UTIL* 4-24
SC Select Comment file command: *UTIL* 4-15
SD Set Tape Density command: *UTIL* 4-16
SEcure command: *UTIL* 4-16
Shareable EMA (SHEMA): *UTIL* 4-40, 4-45
SHow user selected states command: *UTIL* 4-16
sparse files: *UTIL* 4-58
SrchApp option (S): *UTIL* 4-24
streaming during verify pass: *UTIL* 4-25
streaming may not occur using RE command:
UTIL 4-14
streaming mode: *UTIL* 4-14, 4-25, 4-42
tape format: *UTIL* 4-40, 4-43
tape loading: *UTIL* 4-36
tape positioning on overwritten tapes: *UTIL*
4-38
TAr command: *UTIL* 4-17
TF compatibility: *UTIL* 4-36
TItle command: *UTIL* 4-18
TRansfer to command file command: *UTIL*
4-18
UNIX TAR format: *UTIL* 4-17
UNselect command: *UTIL* 4-19
Update option (U): *UTIL* 4-25, 4-34
using GRoup commands for large restores:
UTIL 4-14
Verify option (V): *UTIL* 4-25
Whole option (W): *UTIL* 4-25
Yes option: *UTIL* 4-26
Z option: *UTIL* 4-26
file system
Command Interpreter (CI): *SMM* 3-5
conventions: *SMM* 6-8
utilities: *UTIL* 6-1
File System Verification (FVERI): *UTIL* 6-23
FOWN: *UTIL* 6-21
FPACK: *UTIL* 6-6
FSCON: *UTIL* 6-2
MPACK: *UTIL* 6-11
report disk Free Space (FREES): *UTIL* 6-18
File System Conversion (FSCON): *UTIL* 6-2
calling FSCON: *UTIL* 6-2
conversion process: *UTIL* 6-3
FSCON error messages: *UTIL* 6-5
requirements for conversion: *UTIL* 6-2
File System Pack (FPACK): *UTIL* 6-6
calling FPACK: *UTIL* 6-6
moving directories: *UTIL* 6-8
moving files: *UTIL* 6-10
moving subdirectories: *UTIL* 6-9
packing process: *UTIL* 6-6
File System Verification utility (FVERI): *UTIL*
6-23
error messages: *UTIL* 6-27
error recovery: *UTIL* 6-26
Help command: *UTIL* 6-25
operating instructions: *UTIL* 6-25
file system, CI: *CUSR* 1-1
file transport utility (FPORT): *UTIL* 7-1

file type extensions: *LINK* 2-3
 standard: *CUSR* B-12

file(s)
 access: *TUSR* 3-11
 accessing FMGR: *CUSR* B-11
 accessing with FMP calls: *CUSR* 6-2
 CI normal: *CUSR* 7-2
 CI temporary: *CUSR* 7-3
 cleaning up: *CUSR* 7-1
 command, nesting: *CUSR* 2-21
 converting FMGR files: *CUSR* B-1
 copying: *CUSR* 3-24; *TUSR* 3-46
 create: *TUSR* 3-52
 creating empty: *CUSR* 3-26
 descriptors: *CUSR* 3-5
 destination masks: *CUSR* 3-20
 differences between CI and FMGR: *CUSR* 3-39
 directory: *CUSR* 3-1, 3-6; *TUSR* 3-15
 directory list: *TUSR* 3-66
 directory specifiers: *CUSR* 3-9, 3-10
 executing a: *CUSR* 2-15
 extents: *CUSR* 3-12; *TUSR* 3-11
 fixed-length: *TUSR* 3-8
 FMGR: *CUSR* 3-20, 3-39, 7-3, B-1
 I/O devices referenced as: *CUSR* 3-2
 identification: *CUSR* 3-1
 introduction to CI: *CUSR* 1-5
 length: *CUSR* 3-1
 list file contents: *TUSR* 3-84
 listing: *CUSR* 3-23
 manipulating: *CUSR* 3-1
 manipulating commands: *CUSR* 3-3
 mask characters: *CUSR* 3-16
 masks: *CUSR* 3-15, 3-20
 moving: *CUSR* 3-25
 names: *CUSR* 3-1, 3-4, B-1; *TUSR* 3-30
 non-disk files: *TUSR* 3-57
 operations: *CUSR* 3-22
 ownership and associated group: *CUSR* 3-13
 positioning: *CUSR* B-5, B-8
 printing: *UTIL* 8-1
 properties: *CUSR* 3-1
 protection: *CUSR* 3-1, 3-13, 3-27
 purging: *CUSR* 3-25
 record format: *TUSR* 3-72, 3-131
 record length: *CUSR* 3-1, 3-12
 remote: *CUSR* 3-41, 3-43
 renaming: *CUSR* 3-24
 searching for: *CUSR* 3-33, 3-34
 security code: *TUSR* 3-15, 3-30
 size: *CUSR* 3-1, 3-12; *TUSR* 3-31
 standard type extensions: *CUSR* B-12
 subdirectories: *CUSR* 3-8
 temporary: *CUSR* 3-2, 7-1, 7-4
 time stamps: *CUSR* 3-1, 3-14
 transfer data and create files: *TUSR* 3-129
 transfer data to existing file: *TUSR* 3-70
 type extensions: *CUSR* 3-4
 types: *CUSR* 3-1, 3-11
 unpurging: *CUSR* 3-26
 variable length: *TUSR* 3-8

filename: *EDIT* 3-4
 default: *EDIT* 3-11
 display: *EDIT* 2-11
 in EDIT runstring: *EDIT* 2-7
 parameters: *EDIT* 1-13
 specification: *EDIT* 1-13
 Filesave Specification: *SMM* 5-13
 fill number: *UTIL* 9-5, A-4
 fill number (interleaving): *UTIL* 9-6, 9-32
 FillBuffer: *REL* 12-7
 Find (B) command: *EDIT* 2-31
 Find (F) command: *EDIT* 2-31
 Find command: *DEBUG* 5-18
 FindBits: *REL* 7-3
 finding a pattern: *EDIT* 2-31, 3-18, 4-4, 4-18
 finding space for drivers: *UTIL* 10-1
 firmware: *CMUX* 5-1
 Firmware Configuration: *SMM* 4-80
 Firmware Considerations: *INST* 5-2
 FirstCharacter: *REL* 12-7
 FIX: *MAC* 3-14, B-11
 fixed-length strings: *CUSR* 6-5
 FL command: *CUSR* 5-39; *TUSR* 4-36
 FLAG utility: *UTIL* 11-1, 11-2
 calling: *UTIL* 11-2
 examples: *UTIL* 11-3
 loading: *UTIL* 11-5
 options: *UTIL* 11-2
 options summary: *UTIL* 11-3
 FLOAT: *REL* 3-41
 FLOAT entry (call-by-name), %LOAT: *REL* 3-154
 floating point
 instructions: *MAC* 3-14, B-11
 library: *PROG* 5-11
 number: *MAC* 4-37
 FLT: *MAC* 3-14, B-11
 FLTDR: *REL* 4-1
 flush
 class request: *PROG* 5-15
 class requests on LU: *PROG* 5-15
 input buffer: *CMUX* 2-18; *DMUX* 2-18
 output: *DMUX* 2-18
 terminal buffer: *TUSR* 4-36
 FM (format), *LODR* 5-3
 default, *LODR* 5-3
 FM option: *EDIT* 4-72
 FMGR
 File Access Considerations: *SMM* 3-14
 file manager program: *CUSR* 6-1
 file system: *CUSR* 1-1
 files: *CUSR* 3-20, 3-39, 7-3
 accessing: *CUSR* B-11
 converting: *CUSR* B-1
 temporary: *CUSR* 7-4
 Group and User Cartridge Requirements: *SMM* 3-20
 handling: *CUSR* 3-39
 Initialization: *SMM* 6-6
 masking: *CUSR* 3-20
 Non-Session Cartridge Requirements: *SMM* 3-20

program: *CUSR* 3-39
 System Global Cartridge Requirements: *SMM* 3-20
 FMGR cartridge: *UTIL* 6-2
 conversion process: *UTIL* 6-3
 converting directory structure: *UTIL* 6-2
 converting the directory: *UTIL* 6-2
 file renaming: *UTIL* 6-3
 free space table: *UTIL* 6-2
 total size: *UTIL* 6-2
 FMGR cartridge types: *SMM* 3-9
 FMGR commands: *BSP* 1-2
 ** comments: *TUSR* 3-34
 AC-allocate cartridge: *TUSR* 3-35
 AN-send message: *TUSR* 3-38
 CA-calculate globals: *TUSR* 3-39
 CL-cartridge list: *TUSR* 3-42
 CN-control non-disk device: *TUSR* 3-44
 CO-copy disk files: *TUSR* 3-46
 CR-create a disk file: *TUSR* 3-53
 CR-create a non-disk file: *TUSR* 3-55
 CS-modify spool options: *BSP* 1-3, 2-3, 2-32, 3-3; *TUSR* 3-58
 CS,LU,RW: *BSP* 2-19
 CT-control terminal: *TUSR* 3-60
 DC-dismount cartridge: *TUSR* 3-62
 DL-directory list: *TUSR* 3-66
 DP-display parameters: *BSP* 2-13; *TUSR* 3-68
 DU-transfer data: *TUSR* 3-70
 EO: *BSP* 2-25, 2-31, 2-41
 EX-terminate session: *TUSR* 3-74
 HE-HELP function: *TUSR* 3-76
 IF-conditional skip: *TUSR* 3-78
 IN-initialize cartridge: *TUSR* 3-80
 JO: *BSP* 2-25, 2-28, 2-32, 2-41
 LI-list file: *TUSR* 3-84
 LL-change list device: *TUSR* 3-87
 LO-change log device: *TUSR* 3-88
 MC-mount cartridge: *TUSR* 3-90
 ME-display messages: *TUSR* 3-93
 OF-terminate program: *TUSR* 3-94
 PA-pause and send message: *TUSR* 3-96
 PK-pack cartridge: *TUSR* 3-98
 PU-purge file: *TUSR* 3-100
 RN-rename file: *TUSR* 3-102
 RP-restore program: *TUSR* 3-104
 RT-release tracks: *TUSR* 3-107
 RU-run program: *TUSR* 3-108
 SE-set globals: *TUSR* 3-113
 SL: *BSP* 1-3, 2-3, 2-4, 2-5, 2-14, 2-17, 2-32, 3-3
 SL-display session LU: *TUSR* 3-114
 SL-modify SST: *TUSR* 3-122
 SL-set up spool file: *TUSR* 3-116
 SM-send message: *TUSR* 3-124
 SP-save program: *TUSR* 3-126
 ST-transfer data: *TUSR* 3-129
 SV: *BSP* 2-28
 SV-change severity code: *TUSR* 3-135
 SY-execute RTE system command: *TUSR* 3-137
 TE-send message to system console: *TUSR* 3-138
 TR-transfer control: *TUSR* 3-139
 WH-run WHZAT program: *TUSR* 3-143
 XE: *BSP* 2-32
 FMGR error codes: *BSP* A-1
 batch and pooling: *BSP* A-3
 FMGR error messages: *TUSR* A-1
 FMGR ST tape format media supplied: *INST* D-12
 FMP: *MAC* 3-14, B-11
 calling sequence and parameters: *CUSR* 6-2
 calls and DS: *CUSR* 6-82
 error codes: *CUSR* A-2
 error returns: *CUSR* 6-9
 example programs: *CUSR* 6-87
 advanced FMP: *CUSR* 6-89
 mask: *CUSR* 6-88
 read/write: *CUSR* 6-87
 routines: *CUSR* 6-1
 descriptions of: *CUSR* 6-11
 FS bit: *CUSR* 7-2
 use with DS: *CUSR* 6-82
 tracks: *PROG* 3-12
 FMP call parameters: *PROG* 3-15
 IBUF: *PROG* 3-23
 ICR: *PROG* 3-25
 IDCB: *PROG* 3-21
 IDCBS: *PROG* 3-80
 IDCBZ: *PROG* 3-26
 IERR: *PROG* 3-23
 INAM: *PROG* 3-23
 ISC: *PROG* 3-24
 FMP disk files: *GEN* 1-2
 FMP errors: *GEN* 3-4, A-1; *PROG* 3-23
 FMP example
 advanced: *CUSR* 6-89
 mask: *CUSR* 6-88
 programs: *CUSR* 6-87
 read/write: *CUSR* 6-87
 FMP FMGR calls: *PROG* 3-15
 APOSN: *PROG* 3-64
 CLOSE: *PROG* 3-44
 CREAT: *PROG* 3-29
 CRETS: *PROG* 3-34
 description conventions: *PROG* 3-27
 EAPOS: *PROG* 3-64
 ECLOS: *PROG* 3-44
 ECREA: *PROG* 3-29
 ELOCF: *PROG* 3-61
 EPOSN: *PROG* 3-67
 EREAD: *PROG* 3-50
 EWRT: *PROG* 3-56
 examples using: *PROG* 3-84
 FCONT: *PROG* 3-73
 formats: *PROG* 3-19
 FSTAT: *PROG* 3-76
 IDCBS: *PROG* 3-80
 LOCF: *PROG* 3-61
 NAMF: *PROG* 3-81
 OPEN and OPENF: *PROG* 3-37
 POSNT: *PROG* 3-67
 POST: *PROG* 3-82

PURGE: *PROG* 3-47
 READF: *PROG* 3-50
 RWNDF: *PROG* 3-71
 special purpose: *PROG* 3-72
 summary: *PROG* 3-16
 WRITE: *PROG* 3-56
 FmpAccessTime: *CUSR* 6-16
 FmpAppend: *CUSR* 6-17
 FmpBitBucket: *CUSR* 6-17
 FmpBuildHierarch: *CUSR* 6-18
 FmpBuildName: *CUSR* 6-19
 FmpBuildPath: *CUSR* 6-20
 FmpCloneName: *CUSR* 6-21
 FmpClose: *CUSR* 6-22
 FmpControl: *CUSR* 6-22
 FmpCopy: *CUSR* 6-23
 A option: *CUSR* 6-23
 B option: *CUSR* 6-23
 C option: *CUSR* 6-23
 D option: *CUSR* 6-23
 N option: *CUSR* 6-23
 P option: *CUSR* 6-23
 Q option: *CUSR* 6-23
 T option: *CUSR* 6-23
 U option: *CUSR* 6-23
 FmpCreateDir: *CUSR* 6-25
 FmpCreateTime: *CUSR* 6-25
 FmpDcbPurge: *CUSR* 6-26
 FmpDevice: *CUSR* 6-26
 FmpDismount: *CUSR* 6-26
 FmpEndMask: *CUSR* 6-27
 FmpEof: *CUSR* 6-27
 FmpError: *CUSR* 6-28
 FmpExpandSize: *CUSR* 6-28
 FmpFileName: *CUSR* 6-29
 FmpHierarchName: *CUSR* 6-29
 FmpInfo: *CUSR* 6-30
 FmpInitMask: *CUSR* 6-30
 FmpInteractive: *CUSR* 6-31
 FmpIoOptions: *CUSR* 6-31
 FmpIoStatus: *CUSR* 6-32
 FmpLastFileName: *CUSR* 6-32
 FmpList: *CUSR* 6-33
 FmpListX: *CUSR* 6-34
 FmpLu: *CUSR* 6-35
 FmpMaskName: *CUSR* 6-35
 FmpMount: *CUSR* 6-36
 FmpNextMask: *CUSR* 6-37
 FmpOpen: *CUSR* 6-38
 C option: *CUSR* 6-40
 D option: *CUSR* 6-40
 E option: *CUSR* 6-40
 F option: *CUSR* 6-41
 I option: *CUSR* 6-41
 N option: *CUSR* 6-41
 n option: *CUSR* 6-42
 Q option: *CUSR* 6-41
 S option: *CUSR* 6-41
 T option: *CUSR* 6-41
 U option: *CUSR* 6-42
 X option: *CUSR* 6-42
 FmpOpenFiles: *CUSR* 6-43
 FmpOpenScratch: *CUSR* 6-43
 FmpOpenTemp: *CUSR* 6-45
 FmpOwner: *CUSR* 6-46
 FmpPackSize: *CUSR* 6-47
 FmpPagedDevWrite: *CUSR* 6-47
 FmpPagedWrite: *CUSR* 6-48
 FmpPaginator: *CUSR* 6-49
 FmpParseName: *CUSR* 6-50
 FmpParsePath: *CUSR* 6-51
 FmpPosition: *CUSR* 6-53
 FmpPost: *CUSR* 6-54
 FmpProtection: *CUSR* 6-54
 FmpPurge: *CUSR* 6-55
 FmpRawMove: *CUSR* 6-55
 FmpRead: *CUSR* 6-56
 FmpReadString: *CUSR* 6-57
 FmpRecordCount: *CUSR* 6-58
 FmpRecordLen: *CUSR* 6-58
 FmpRename: *CUSR* 6-59
 FmpReportError: *CUSR* 6-60
 FmpRewind: *CUSR* 6-60
 FmpRpProgram: *CUSR* 6-61
 FmpRunProgram: *CUSR* 6-63
 FmpRwBits: *CUSR* 6-64
 FmpSetDcbInfo: *CUSR* 6-64
 FmpSetDirInfo: *CUSR* 6-65
 FmpSetEof: *CUSR* 6-66
 FmpSetIoOptions: *CUSR* 6-66
 FmpSetOwner: *CUSR* 6-67
 FmpSetPosition: *CUSR* 6-67
 FmpSetProtection: *CUSR* 6-68
 FmpSetWord: *CUSR* 6-69
 FmpSetWorkingDir: *CUSR* 6-70
 FmpShortName: *CUSR* 6-70
 FmpSize: *CUSR* 6-71
 FmpStandardName: *CUSR* 6-71
 FmpTruncate: *CUSR* 6-72
 FmpUdspEntry: *CUSR* 6-73
 FmpUdspInfo: *CUSR* 6-73
 FmpUniqueName: *CUSR* 6-74
 FmpUnPurge: *CUSR* 6-74
 FmpUpdateTime: *CUSR* 6-75
 FmpWorkingDir: *CUSR* 6-76
 FmpWrite: *CUSR* 6-76
 FmpWriteString: *CUSR* 6-77
 FO (force load), *LODR* 5-4
 FO (force) command: *LINK* 3-10
 force command, *LODR* 4-14
 force handshake bit, write request: *DMUX* 2-10
 force load, *LODR* 3-15, 4-30
 forced Xon condition: *CMUX* 2-31
 formal macro parameters: *MAC* 5-3, 5-4, 5-7
 format of routines: *PROG* 5-7; *REL* 1-1
 FORMAT utility, RE format command: *UTIL* 9-17
 formats: *BSP* 2-4
 formatting a flexible disk: *UTIL* 9-2, A-4
 FORMC utility: *UTIL* 9-25
 ABORT, ENd, and EXit commands: *UTIL* 9-27
 break detection: *UTIL* 9-26

calling: *UTIL* 9-25
 command execution: *UTIL* 9-26
 commands: *UTIL* 9-27
 commands summary: *UTIL* 9-27
 device driver status: *UTIL* 9-26
 disk formatting: *UTIL* 9-32
 entering the LU: *UTIL* 9-30
 error messages: *UTIL* 9-39
 FOrmat command: *UTIL* 9-28
 formatting operation: *UTIL* 9-29
 HElP command: *UTIL* 9-28
 SPare command: *UTIL* 9-33
 sparing operation: *UTIL* 9-34
 tape formatting: *UTIL* 9-30
 VErify command: *UTIL* 9-36
 verify operation: *UTIL* 9-36
 FORMT utility: *TUSR* 3-54; *UTIL* 9-1, 9-2
 calling: *UTIL* 9-3
 commands: *UTIL* 9-4
 commands summary: *UTIL* 9-4
 confirming formatting: *UTIL* 9-6
 confirming initializing: *UTIL* 9-10
 EN command: *UTIL* 9-4
 entering the LU: *UTIL* 9-6, 9-10, 9-22
 entering the track number: *UTIL* 9-15
 error messages: *UTIL* 9-23
 FO command: *UTIL* 9-5
 formatting example: *UTIL* 9-8
 formatting operation: *UTIL* 9-6
 formatting process: *UTIL* 9-7
 HELP command: *UTIL* 9-4
 IN command: *UTIL* 9-9
 IN examples: *UTIL* 9-12
 initializing operation: *UTIL* 9-10
 initializing process: *UTIL* 9-11
 loading: *UTIL* 9-2
 locking other LUs: *UTIL* 9-6
 reformatting operation: *UTIL* 9-18
 sector interleaving: *UTIL* 9-6
 SP examples: *UTIL* 9-16
 SPare command: *UTIL* 9-14
 sparing operation: *UTIL* 9-15
 sparing process: *UTIL* 9-15
 VErify command: *UTIL* 9-21
 verify operation: *UTIL* 9-22
 verify process: *UTIL* 9-22
 FORTRAN: *LODR* 3-23, 6-4, 6-8, 6-9, 6-10, 6-19, 6-20, 8-2, 8-11, 9-9, 70-1; *PROG* 1-26, 2-4, 2-5 and BASIC/1000D strings: *HPIB* 4-20
 automatic addressing: *HPIB* 4-20
 device control: *HPIB* 4-12
 DO loops, converting, with VIS: *REL* 9-1
 routines callable from: *REL* 2-6
 secondary addressing: *HPIB* 4-3, 4-22
 syntax: *HPIB* 4-12
 FPORT utility
 calling: *UTIL* 7-3
 export/import mode: *UTIL* 7-1
 loading: *UTIL* 7-4
 transport map: *UTIL* 7-1
 free space table on an FMGR cartridge: *UTIL* 6-2
 free space table/bit map: *UTIL* 6-23
 FREES utility: *UTIL* 6-18
 FromSySession: *REL* 6-7
 FS bit: *CUSR* 7-2
 FSB: *MAC* 3-14, B-11
 FST. *See* File Storage to Tape utility (FST)
 FSTAT FMP call: *PROG* 3-76
 FTIME subroutine: *PROG* 5-83
 FTRAP: *REL* 5-5
 full type-ahead mode: *CMUX* 3-4
 function
 GETINTR: *HPIB* 5-6, 5-20
 PPOLL: *HPIB* 5-6
 SPOLL: *HPIB* 5-5
 function code: *CMUX* 2-2; *PROG* 2-27, 3-74
 binary mode bit: *CMUX* 2-3
 control request, summary: *CMUX* 2-12
 echo bit: *CMUX* 2-3
 honesty bit: *CMUX* 2-3
 read request: *CMUX* 2-4
 special buffer control bit: *CMUX* 2-3
 transparent mode bit: *CMUX* 2-3
 write request: *CMUX* 2-5
 Function Code 11B: *DMUX* 2-13
 Function Code 16B: *DMUX* 2-14
 Function Code 17B: *DMUX* 2-15
 Function Code 20B: *DMUX* 2-15
 Function Code 21B: *DMUX* 2-17
 Function Code 22B: *DMUX* 2-17
 Function Code 23B: *DMUX* 2-18
 Function Code 24B: *DMUX* 2-18
 Function Code 25B: *DMUX* 2-18
 Function Code 26B: *DMUX* 2-18
 Function Code 30B: *DMUX* 2-19
 Function Code 32B: *DMUX* 2-24
 Function Code 33B: *DMUX* 2-24
 Function Code 34B: *DMUX* 2-26
 Function Code 35B: *DMUX* 2-29
 Function Code 6B: *DMUX* 2-12
 function codes, control request: *DMUX* 2-11
 function key manipulation utilities
 KEYS: *UTIL* 2-1, 2-57
 KYDMP: *UTIL* 2-1, 2-60
 function modifier: *CMUX* 4-7
 function of the initiation section: *DRVW* 3-7

G

G command: *EDIT* 2-34, 3-18, 4-26
 G globals: *TUSR* 3-22
 GASP: *BSP* 1-2, 2-30, 4-1, 5-4
 CS command: *BSP* 2-22
 DJ command: *BSP* 2-48
 DS command: *BSP* 2-22, 2-23
 error codes: *BSP* A-9
 error explanation: *BSP* 4-7
 initialization: *BSP* 5-1, 5-7
 operator commands: *BSP* 1-6
 running: *BSP* 4-6
 GEN command: *MAC* 4-18, B-14

general driver structure and operation: *DRVW* 3-1
 general operation of RTE I/O: *DRVW* 2-15
 general system utilities: *UTIL* 2-1
 generate break: *DMUX* 2-24
 generate microcode instructions: *MAC* E-2
 Generating Your Own System: *INST* 5-2
 generation
 DVC00: *DMUX* B-3
 DRT table entry: *DMUX* B-3
 EOT/timeout options: *DMUX* B-3
 subchannel assignment: *DMUX* B-3
 example: *GEN* 3-5
 serial drivers: *DMUX* B-1
 generation listing, example: *GEN* F-1
 Generation map file, naming convention: *INST* D-11
 generation planning: *GEN* 2-1
 Generation vs. On-Line Loading: *SMM* 4-109
 generator control: *MAC* B-14
 instructions: *MAC* 4-1, 4-17
 generator relocation guidelines, modules: *GEN* B-17
 generator requirements: *GEN* 1-3
 generator routine: *MAC* F-1
 GENIX utility: *PROG* 1-34; *UTIL* 12-1, 12-9
 calling: *UTIL* 12-9
 error messages: *UTIL* 12-12
 examples: *UTIL* 12-11
 input file format: *UTIL* 12-9
 transfer function: *UTIL* 12-9
 get a character, SGET: *REL* 10-10
 GET bus command: *HPIB* 4-7
 get SCB error mnemonic: *PROG* 5-58
 get session capability: *PROG* 5-61
 get session number, GETSN: *REL* 6-10
 GetAcctInfo, access user and group accounting: *REL* 6-7
 GetBitMap: *REL* 12-8
 GetByte: *REL* 12-8
 GetDibit: *REL* 12-9
 GetFatherIdNum: *REL* 7-21
 GETINTR function: *HPIB* 5-6
 GetNibble: *REL* 12-9
 GetOwnerNum: *REL* 6-9
 GetResetInfo, access/reset user accounting: *REL* 6-9
 GetRunString: *REL* 12-10
 GETSN, get session number: *REL* 6-10
 GETST: *PROG* 5-45; *REL* 5-8
 GetString: *REL* 12-11
 getting
 help: *LINK* 2-5, 3-24
 terminal configuration: *CMUX* 2-22
 global assembly-time variable: *MAC* 4-48
 global cartridges: *PROG* 3-12
 global changes: *EDIT* 2-24
 See also G command, X command, U command
 global parameters: *LINK* B-5; *TUSR* 3-22, 3-110
 assign values: *TUSR* 3-113
 calculate values: *TUSR* 3-39
 equivalence: *TUSR* 3-24

format: *TUSR* 3-25
 G globals: *TUSR* 3-22
 P globals: *TUSR* 3-22
 S globals: *TUSR* 3-23
 usage in procedure files: *TUSR* 3-145
 global tracks: *PROG* 2-86
 GO command: *CUSR* 4-9, 5-40; *TUSR* 4-37
 go to a specific line: *EDIT* 4-54
 Goto command: *DEBUG* 5-19
 GPNAM: *REL* 6-10
 graphics coordinate transformation (VIS): *REL* 9-15
 greatest integer
 (ENTIER), real: *REL* 3-38
 double real: *REL* 3-117
 real: *REL* 3-93
 group
 account definitions: *SMM* 7-10
 account entry: *SMM* C-11
 accounts: *SMM* 3-8
 and user account entries: *SMM* 8-4
 and user FMGR cartridge requirements: *SMM* 3-20
 cartridges: *PROG* 1-25, 3-12; *TUSR* 2-9, 3-16
 ID
 GroupToId routine: *REL* 6-11
 OwnerToId routine: *REL* 6-14
 GTERR subroutine: *PROG* 5-58
 GTL bus command: *HPIB* 4-6
 GTL subroutine: *HPIB* 4-14
 GTSCB subroutine: *PROG* 5-60
 guard tone on/off: *CMUX* 2-23

H

H command: *EDIT* 1-6, 2-20, 4-28
 half HP protocol
 definition: *DMUX* 2-29
 setting: *DMUX* 2-27
 half HP Xon protocol
 definition: *DMUX* 2-29
 setting: *DMUX* 2-27
 halt errors executive: *PROG* A-14
 halt instruction: *MAC* 3-12, B-9
 halts, bootup and reconfiguration: *SMM* 10-19
 handshake lines: *HPIB* 1-6
 handshaking: *CMUX* 5-1
 DC1/DC2: *CMUX* 5-1
 ENQ/ACK: *CMUX* 2-20, 5-1
 hardware: *CMUX* 5-1
 Xon/Xoff: *CMUX* 2-31, 5-1
 hard parity errors: *PROG* A-6
 hardcopy/spacing mode: *DMUX* 2-26
 hardware
 considerations: *PROG* 1-19
 requirements: *DEBUG* 2-1
 HE (help) command: *CUSR* 5-41; *TUSR* 3-76, 4-40
 header lines: *EDIT* 4-31
 heading: *MAC* 4-26

HED: *MAC* 4-25, 4-26, B-15
 HELLO file: *TUSR* 2-2, 2-5
 help: *EDIT* 1-6, 2-20, 4-28, 4-94
 Help (?) command: *EDIT* 4-94; *LINK* 3-24
 Help command: *DEBUG* 2-14, 5-19
 help commands: *CUSR* 2-4, 5-1, 5-41
 HELP directory: *SMM* 3-12
 HELP file: *TUSR* 3-76, 4-40, 4-41
 help file entries
 ACCTS: *SMM* 8-35
 LGON: *SMM* 8-43
 help function: *TUSR* 3-76, 4-40
 help lookup utilities
 CALLM: *UTIL* 12-13
 CALLS: *UTIL* 12-13
 CMD: *UTIL* 12-1
 GENIX: *UTIL* 12-1
 HELP: *UTIL* 12-1
 help utilities: *TUSR* 1-12
 HELP utility: *PROG* 1-34; *UTIL* 12-1
 calling: *UTIL* 12-2
 error messages: *UTIL* 12-4
 examples: *UTIL* 12-3
 Help Utility: *SMM* 6-16
 HELP Operation in the Session Environments:
 SMM 6-16
 HexToInt: *REL* 7-21
 HI File (MTM Only): *SMM* 6-15
 High Main Address +1 (23): *SMM* B-7
 high order bit set in file name: *CUSR* 3-2
 high-speed
 linking: *LINK* 4-3
 operation: *HPIB* 2-3
 histogram: *DEBUG* 6-1, 6-3
 displaying: *DEBUG* 6-3
 plotting: *DEBUG* 5-20
 Histogram command: *DEBUG* 5-20
 HL command: *EDIT* 4-31
 HLT: *MAC* 3-13, B-10
 HLTC: *MAC* B-10
 honesty bit: *CMUX* 2-3
 honesty mode bit: *DMUX* 2-10
 horizontal search window: *EDIT* 3-18
 HP 1000, single precision floating point to IEEE
 conversion, FCHI: *REL* 11-2
 HP 1000 Software: *INST* 1-1
 HP 37213A Modem Card, configuration straps:
 CMUX 2-23
 HP 37214A Systems Modem Card Cage. *See*
 systems modem
 HP 7906(H) Disk Configuration: *SMM* 4-19
 HP 7920(H), Disk Configuration: *SMM* 4-24
 HP 7925(H), Disk Configuration: *SMM* 4-27
 HP 7970B BCD-ASCII conversion: *DMUX* E-6
 HP 9895 Disk Configuration: *SMM* 4-37
 HP character set: *DMUX* E-1
 HP Computer Systems File Copy (LIF): *UTIL*
 4-156
 calling LIF: *UTIL* 4-158
 CO command: *UTIL* 4-160
 DL Directory List command: *UTIL* 4-161
 EXit command: *UTIL* 4-162
 HElp command: *UTIL* 4-162
 INitialize command: *UTIL* 4-162
 LIF commands: *UTIL* 4-158
 LIF error handling: *UTIL* 4-168
 LlSt command: *UTIL* 4-163
 LL set Logical List device: *UTIL* 4-163
 MC Mount Cartridge: *UTIL* 4-164
 naming conventions: *UTIL* 4-157
 PK Pack Cartridge: *UTIL* 4-164
 PUrge command: *UTIL* 4-165
 RN Rename command: *UTIL* 4-165
 STore command: *UTIL* 4-166
 SV Severity command: *UTIL* 4-167
 TTransfer control command: *UTIL* 4-167
 HP disk configuration: *SMM* 4-15
 HP Loaders, comparison of: *LINK* 1-4
 HP model 7900 disk: *UTIL* 1-1, 3-1, 3-16, 3-26,
 3-32, 3-38, 3-42, 3-49, 9-2
 HP model 9895 flexible disk: *UTIL* 3-37, 3-42,
 3-49, 9-2, 9-5
 HP protocol
 definition: *DMUX* 2-28
 setting: *DMUX* 2-27
 HP Xon/Xoff protocol
 definition: *DMUX* 2-28
 setting: *DMUX* 2-27
 HP-IB Interface Driver DVA37: *SMM* 4-73
 Hp150_DefField: *REL* 12-12
 Hp150_DelField: *REL* 12-13
 Hp150_GetField: *REL* 12-14
 Hp150_SoftKey: *REL* 12-14
 Hp150_TouchMode: *REL* 12-15
 Hp150_TouchOff: *REL* 12-15
 Hp150_TouchReset: *REL* 12-16
 HPCRT library routines: *REL* 12-1
 HpCrtCharMode: *REL* 12-16
 HpCrtCheckStraps: *REL* 7-7, 12-17
 HpCrtCRC16_F: *REL* 12-18
 HpCrtCRC16_S: *REL* 12-18
 HpCrtGetCursor: *REL* 12-19
 HpCrtGetCursorXY: *REL* 12-20
 HpCrtGetfield_I: *REL* 12-21
 HpCrtGetfield_S: *REL* 12-22
 HpCrtGetLine_Pos: *REL* 12-23
 HpCrtGetMenuItem: *REL* 12-24
 HpCrtHardReset: *REL* 12-24
 HpCrtLineMode: *REL* 12-25
 HpCrtMenu: *REL* 12-25
 HpCrtNlsMenu: *REL* 12-26
 HpCrtNlsXMenu: *REL* 12-26
 HpCrtPageMode: *REL* 12-27
 HpCrtParity_Chk: *DMUX* 2-20
 HpCrtParity_Gen: *DMUX* 2-20
 HpCrtParityChk: *REL* 12-27
 HpCrtParityGen: *REL* 12-28
 HpCrtQTDPort7: *REL* 12-28
 HpCrtReadChar: *DMUX* 2-1; *REL* 12-29
 HpCrtReadPage: *REL* 12-30
 HpCrtRestorePort: *REL* 12-31
 HpCrtSavePort: *REL* 12-31

HpCrtSchedProg: *DMUX* 1-2; *REL* 12-32
 HpCrtSchedProg_S: *DMUX* 1-2; *REL* 12-32
 HpCrtScreenSize: *REL* 12-32
 HpCrtSendChar: *REL* 12-33
 HpCrtSSRCDriver: *REL* 12-34
 HpCrtSSRCDriver?: *REL* 12-34
 HpCrtStatus: *REL* 12-35
 HpCrtStripChar: *DMUX* 1-4; *REL* 12-36
 HpCrtStripCntrls: *REL* 12-36
 HpCrtXMenu: *REL* 12-37
 HpCrtXReadChar: *REL* 12-37
 HpCrtXSendChar: *REL* 12-38
 HpLowerCaseName: *REL* 12-38
 HpMdm: *DMUX* 2-7
 HpRte6: *REL* 12-39
 HpRteA: *REL* 12-39
 HpZ, mini-formatter: *REL* 12-40
 HpZAscii64: *REL* 12-43
 HpZAscii95: *REL* 12-43
 HpZAsciiHpEnh: *REL* 12-44
 HpZAsciiMne3: *REL* 12-45
 HpZAsciiMne4: *REL* 12-46
 HpZBackSpaceIbuf: *REL* 12-46
 HpZBinc: *REL* 12-47
 HpZBino: *REL* 12-47
 HpZDecc: *REL* 12-48
 HpZDeco: *REL* 12-47
 HpZDecv: *REL* 12-47
 HpZDefIBuf: *REL* 12-48
 HpZDefIString: *REL* 12-49
 HpZDefOBuf: *REL* 12-49
 HpZDicv: *REL* 12-49
 HpZDParse: *REL* 12-50
 HpZDumpBitMap: *REL* 12-53
 HpZDumpBuffer: *REL* 12-54
 HpZFieldDefine: *REL* 12-55
 HpZFmpWrite: *REL* 12-56
 HpZGetNextChar: *REL* 12-56
 HpZGetNextStrDsc: *REL* 12-57
 HpZGetNextToken: *REL* 12-57
 HpZGetNumB2: *REL* 12-58
 HpZGetNumB4: *REL* 12-58
 HpZGetNumD2: *REL* 12-58
 HpZGetNumD4: *REL* 12-58
 HpZGetNumO2: *REL* 12-58
 HpZGetNumO4: *REL* 12-58
 HpZGetNumStrDsc: *REL* 12-59
 HpZGetNumToX: *REL* 12-60
 HpZGetRemStrDsc: *REL* 12-61
 HpZHexc: *REL* 12-61
 HpZHexi: *REL* 12-62
 HpZHexo: *REL* 12-63
 HpZIBufRemain: *REL* 12-63
 HpZIBufReset: *REL* 12-63
 HpZIBufUsed: *REL* 12-63
 HpZIBufUseStrDsc: *REL* 12-64
 HpZInsertAtFront: *REL* 12-65
 HpZmbt: *REL* 12-65
 HpZMesss: *REL* 12-66
 HpZMoveString: *REL* 12-67
 HpZmvc: *REL* 12-67

HpZmvs: *REL* 12-68
 HpZmvs_Control: *REL* 12-69
 HpZmvs_Escape: *REL* 12-70
 HpZmvs_Large: *REL* 12-70
 HpZNlsMvs: *REL* 12-71
 HpZNlsSubset: *REL* 12-71
 HpZOBufReset: *REL* 12-71
 HpZOBufUsed: *REL* 12-72
 HpZOBufUseStrDsc: *REL* 12-72
 HpZOctc: *REL* 12-73
 HpZOctd: *REL* 12-73
 HpZOcto: *REL* 12-74
 HpZOctv: *REL* 12-74
 HpZPadToCount: *REL* 12-75
 HpZPadToPosition: *REL* 12-75
 HpZParse: *REL* 12-76
 HpZPeekNextChar: *REL* 12-56
 HpZPlural: *REL* 12-78
 HpZPrintPort: *REL* 12-79
 HpZQandA: *REL* 12-80
 HpZReScan: *REL* 12-80
 HpZRomanNumeral: *REL* 12-81
 HpZsbt: *REL* 12-82
 HpZStripBlanks: *REL* 12-82
 HpZUdeco: *REL* 12-82
 HpZUdecv: *REL* 12-83
 HpZWriteCN17: *REL* 12-83
 HpZWriteCN22: *REL* 12-83
 HpZWriteCN30: *REL* 12-83
 HpZWriteCN33: *REL* 12-83
 HpZWriteCN34: *REL* 12-84
 HpZWriteDV20: *REL* 12-84
 HpZWriteDV6: *REL* 12-84
 HpZWriteLU: *REL* 12-84
 HpZWriteToString: *REL* 12-85
 HpZWriteXLU: *REL* 12-85
 HpZYesOrNo: *REL* 12-86
 hyperbolic tangent
 double real: *REL* 3-114
 extended real: *REL* 3-37
 real: *REL* 3-60

I

I command: *EDIT* 4-33
 I option: *MAC* E-2
 IABS: *REL* 3-42
 IABS entry (call-by-name), %ABS: *REL* 3-145
 IAND: *REL* 3-43
 IBERR subroutine: *HPIB* 6-1
 IBUF call: *PROG* 3-23
 IBUFR: *BSP* 3-2, 3-11, 3-15, 3-17
 format: *BSP* 3-7
 IC option: *EDIT* 3-26
 ICAPS subroutine: *PROG* 5-61
 ICD (Integrated Controller Disk): *UTIL* 1-1, 3-1,
 3-26, 3-30, 3-32, 3-37, 3-42, 3-49, 9-1, 9-2, 9-9,
 A-1
 address & unit numbers: *SMM* A-13
 configuration: *INST* D-6

defining track map table: *SMM* A-13
 sectors: *SMM* A-12
 subchannels: *SMM* A-12
 surface organization: *SMM* A-13
 tracks: *SMM* A-12
ICD and MAC
 disk surface organization: *SMM* 4-5
 spare tracks: *SMM* 4-6
 subchannel initialization: *SMM* 5-17
ICR call: *PROG* 3-25
ID extensions: *GEN* 2-68, 3-14; *PROG* 4-18
ID segment: *CUSR* 4-2, 4-4, 4-7, 6-61, 7-2, 7-3;
LODR 2-8, 2-9, 2-10, 9-2; *PROG* 1-6, 2-59, 2-82,
 4-18; *TUSR* 3-94, 3-104, 3-111, 3-128, 3-143, 4-6,
 4-39, 4-47, 4-49, 4-57, 4-79, C-1
 blank: *GEN* 3-14
 deallocate, IDCLR: *REL* 7-22
 extensions: *PROG* C-10; *TUSR* C-6
 long: *GEN* 2-67
 requirements for program loading, *LODR* 2-11
 short: *GEN* 2-68, 3-14; *PROG* C-11
IdAddToName, convert segment address to
 program name and LU number: *REL* 7-22
IdAddToNumber, convert segment address to
 segment number: *REL* 7-22
IDCB call: *PROG* 3-21
IDCBS call: *PROG* 3-80
IDCBZ call: *PROG* 3-26
IDCLR: *REL* 7-22
 identification of programs: *CUSR* 4-2
IDGET subroutine: *CMUX* 2-19, 2-21; *PROG*
 5-76
IDIM: *REL* 3-44
IDINT: *REL* 3-45
IdNumberToAdd, convert segment number to
 segment address: *REL* 7-23
IdToGroup: *REL* 6-11
IdToOwner: *REL* 6-12
IEC 625-1 (equivalent): *HPIB* 2-8
IEEE standard format
 double precision to HP 1000 conversion,
 DFCIH: *REL* 11-2
 single precision to HP 1000 conversion, FCIH:
REL 11-3
IEEE-488-1978: *HPIB* 1-4
IERR call: *PROG* 3-23
IF (system macro): *MAC* L-6
If command: *DEBUG* 5-20
IF command: *TUSR* 3-78
IF (conditional execution of LINK) command:
LINK 3-10
IF-THEN-ELSE-FI (control structure) command:
CUSR 2-24, 5-42
IFBRK system subroutine: *PROG* 5-77; *TUSR*
 4-29
IFC bus command: *HPIB* 4-10
IFC bus management line: *HPIB* 1-7
IFIX: *REL* 3-46
IFIX entry (call-by-name), %FIX: *REL* 3-150
IFN: *MAC* B-18, J-3
IFT space too small: *HPIB* 6-4
IFTTY subroutine: *PROG* 5-52
IFX: *MAC* J-3
IFZ: *MAC* B-18
IGET: *REL* 5-9
IGLOBAL: *MAC* 4-48, 4-50, B-16
 illegal interrupt: *HPIB* 6-3
ILOCAL: *MAC* 4-48, 4-50, B-16
 imaginary part, extraction of: *REL* 3-2
 immediate schedule with or without wait: *PROG*
 2-59, 2-60
 implementation notes: *MAC* I-1
 import/export mode: *UTIL* 7-1
IN command: *CUSR* 3-37, 5-44; *TUSR* 3-54, 3-80
INA: *MAC* 3-8, B-6
INAM call: *PROG* 3-23
INAMR: *REL* 5-10
INB: *MAC* 3-8, B-6
INCLUDE: *MAC* B-14
 Include command: *DEBUG* 5-21
INCLUDE statement: *MAC* 1-13, 4-15, 5-1
inclusive OR: *DBGS* A-1
inclusive OR entry
 (call-by-name), %OR: *REL* 3-158
 integer: *REL* 3-50
 logical: *REL* 3-48
 increase disk free space: *UTIL* 6-6
 increment double integer: *REL* 4-7
 (and skip if zero): *REL* 4-8
 increment parameters other than one (VIS): *REL*
 9-8
IND.E: *REL* 5-13
 indefinite (@) character: *EDIT* 2-33, 3-18, 5-2,
 5-15
 indefinite character option: *EDIT* 3-26
 index register instructions: *MAC* 3-9, B-7
 index to GASP operator commands: *BSP* 4-3
 indexing libraries: *LINK* 1-2, 4-3
 indirect address subroutine: *PROG* 5-82
 indirection addressing indicator: *MAC* 2-13, 3-1,
 J-1
INDXR: *LODR* 6-41; *PROG* 1-32; *TUSR* 1-10
 commands: *LODR* 6-41
 error messages: *LODR* A-21
 examples: *LODR* 6-43
 operation: *LODR* 6-41
 inequality search: *DBGS* 5-3
information
 display. *See* displaying information
 messages: *EDIT* 3-45, A-1
 information messages: *EDIT* 1-15
See also error messages
 inhibit automatic program renaming: *TUSR* 3-112
 initial offset mode: *PROG* 2-65
 initialization: *GEN* 2-2
 dialogue: *SMM* 7-4
 file *179XX: *INST* D-11
 of cartridges: *PROG* 3-9
 macro call sequences: *MAC* N-2
Initialization Phase: *GEN* 2-9, 3-6
initialize
 a square matrix (VIS): *REL* 9-11

an array in a certain order (VIS): *REL* 9-12
 cartridge: *TUSR* 3-80
 initialized virtual memory: *PROG* 4-25
 initializing and sparing a hard disk: *UTIL* 9-2, A-3
 initializing volumes: *CUSR* 3-37
 initializing, formatting, and sparing ICD/MAC
 disks: *UTIL* A-1, 9-2
 initiation section: *DRVW* 3-3, 4-4
 function: *DRVW* 3-7
 standard driver: *DRVW* 3-3
 INP (input device): *PROG* J-2
 INPRS subroutine: *PROG* 5-84
 input buffer: *CMUX* 2-3
 flushing: *CMUX* 2-18
 read: *REL* 5-17
 input editing: *DMUX* 2-2
 input/output
 instructions: *MAC* 3-12, B-9
 overflow and halt: *MAC* B-9
 inputting a file: *EDIT* 2-9
 inquire control character: *EDIT* 3-26
 inserting
 a comment: *EDIT* 4-100
 characters: *EDIT* 2-12
 characters at a specific column: *EDIT* 5-22
 lines: *EDIT* 2-12
 text: *EDIT* 2-12, 2-28, 3-33, 4-33
 text in line character edit mode: *EDIT* 3-27
 inserting MACLIB in source code: *MAC* E-12
 inspool
 files: *BSP* 1-5
 program (JOB): *BSP* 1-5
 inspooling: *BSP* 2-30
 installation: *HPIB* 2-9
 guide: *LINK* 5-1
 material supplied: *INST* D-1
 summary: *INST* 1-2
 installing
 Macro/1000: *MAC* E-11
 FC format tapes: *INST* D-13
 LINDX: *LINK* 5-1
 LINK: *LINK* 5-1
 Primary System
 from CTD tape: *INST* D-9
 from Magnetic Tape: *INST* D-4
 READR/SAVER format tapes: *INST* D-14
 ST format tapes: *INST* D-12
 INT: *REL* 3-47
 INT entry (call-by-name), %NT: *REL* 3-157
 integer
 comparison: *MAC* 4-61
 numbers: *MAC* 4-37
 integer inclusive OR: *REL* 3-50
 integer to ASCII conversion
 IntToDecimal: *REL* 7-24
 IntToDecimalr: *REL* 7-24
 integer to octal conversion
 IntToOctal: *REL* 7-26
 IntToOctalr: *REL* 7-26
 interactive
 editor: *TUSR* 1-7
 commands: *TUSR* 2-19
 link commands: *LINK* 3-1
 LU query: *PROG* 5-52
 operation: *EDIT* 1-10, 3-50
 operator commands: *TUSR* 2-17
 scheduling of FMGR: *TUSR* D-1
 spooling: *BSP* 2-3
 interface card
 HP 12009A: *HPIB* 2-3
 address: *HPIB* 2-3
 select code: *HPIB* 2-3
 HP 59310B: *HPIB* 2-1
 address: *HPIB* 2-1
 interface driver
 control requests: *CMUX* 2-13
 description: *CMUX* 1-3, 4-1
 DVM00 (with modem support): *CMUX* 1-3, 4-1,
 5-3
 DVT00 (without modem support): *CMUX* 1-3
 operating system interface: *CMUX* 4-2
 usage: *CMUX* 4-1
 interface table (IFT): *HPIB* 3-1
 interfacing to operating system
 CI programs: *CUSR* 1-1
 FMGR programs: *CUSR* 1-1
 interleaving: *UTIL* 9-5, A-4
 intermixed DCPC and non-DCPC operations:
 DRVW 3-24
 internal routines: *REL* 10-31
 internal to normal format conversion, .FMUP:
 REL 5-31
 interrupt
 handling with microcode: *PROG* E-13
 handling without microcode: *PROG* E-11
 mechanism: *DRVW* 2-12
 privileged: *PROG* 1-17
 processing: *PROG* 1-17
 table: *DRVW* 2-13; *GEN* 2-58, 3-12; *PROG*
 E-11
 serial drivers: *DMUX* B-2
 interrupt and device status
 BSTAT subroutine: *HPIB* 5-5
 ENABLE INTR statement: *HPIB* 5-3
 GETINTR function: *HPIB* 5-6
 ON INTR statement: *HPIB* 5-3
 PPOLL CONFIGURE statement: *HPIB* 5-6
 PPOLL subroutine: *HPIB* 5-4
 PPOLL UNCONFIGURE statement: *HPIB* 5-6
 PPSCH subroutine: *HPIB* 5-4
 PPSN subroutine: *HPIB* 5-4
 PSTAT subroutine: *HPIB* 5-8
 SPOLL statement: *HPIB* 5-5
 SRQ subroutine: *HPIB* 5-2
 SRQSN subroutine: *HPIB* 5-3
 STATS subroutine: *HPIB* 5-5
 interrupting LU query: *PROG* 5-51
 interval timer: *TUSR* 4-42
 introduction: *BSP* 1-1, 3-2
 to CI files: *CUSR* 1-5
 IntString: *REL* 7-23

IntToDecimal, integer to ASCII conversion: *REL* 7-24
 IntToDecimalr, integer to ASCII conversion: *REL* 7-24
 IntToHex: *REL* 7-25
 IntToHexR: *REL* 7-25
 IntToOctal, integer to octal conversion: *REL* 7-26
 IntToOctalr, integer to octal conversion: *REL* 7-26
 inverse tangent, double real: *REL* 3-62
 invoking OLDRE: *MAC* E-2
 I/O
 between disk files: *BSP* 2-2
 buffered: *TUSR* 4-8
 buffering: *PROG* 1-18
 call error codes: *PROG* A-10
 completion: *DRVW* 2-20
 configuration: *INST* 2-4
 display: *CUSR* 2-10
 continuation: *DRVW* 2-19
 control call - EXEC 3: *PROG* 2-26
 controller: *DRVW* 2-1; *PROG* 1-19; *TUSR* 4-31, 4-34, 4-74
 timeout: *DRVW* 3-14; *PROG* 1-21
 device: *PROG* 1-19
 attributes, changing: *CUSR* 2-13
 drivers: *DRVW* 2-2
 referenced as files: *CUSR* 3-2
 status: *TUSR* 4-44
 error message format: *PROG* A-12
 error messages: *TUSR* A-20
 EXEC calls: *BSP* 3-2; *PROG* 1-20
 class I/O: *PROG* 2-29
 standard I/O: *PROG* 2-19
 function code: *BSP* 2-15
 initiation: *DRVW* 2-19
 processing: *PROG* 1-17
 processor: *DRVW* 2-2
 reconfiguration: *INST* D-6
 steps: *SMM* 10-6
 re-entrant: *TUSR* 4-8
 request linkage: *TUSR* 4-12
 requests and related routines: *PROG* 5-48
 select code: *PROG* 1-19; *TUSR* 4-33
 status: *CMUX* 3-6
 EXEC 13: *PROG* 2-76
 request returns: *CMUX* 3-7
 swapping: *PROG* 2-24
 tables and processing: *PROG* E-1
 to disk files: *BSP* 2-3
 transfers to/from the VMA/EMA: *PROG* 4-20
 unbuffered: *TUSR* 4-8
 without wait: *PROG* 2-29
 I/O extender: *CMUX* 1-3
 I/O request: *CMUX* 2-2
 DDV05: *CMUX* B-2
 input functions: *CMUX* 2-2
 echoing: *CMUX* 2-2
 editing: *CMUX* 2-2
 terminators: *CMUX* 2-2
 I/O specifiers: *HPIB* 4-2, 4-13

I/O Structure Planning: *SMM* 4-37
 Devices and Interface Cards: *SMM* 4-37
 Equipment Table Entry Assignments: *SMM* 4-41
 Logical Unit Assignments: *SMM* 4-39
 Select Code Assignments: *SMM* 4-38
 IO07: *CMUX* 4-6
 IOC: I/O Control module: *DRVW* 2-2
 IOCNT subroutine: *HPIB* 4-23
 IOR: *MAC* 3-2, B-2; *REL* 3-48
 IS (compare strings or numbers) command: *CUSR* 5-45
 ISC call: *PROG* 3-24
 ISET: *MAC* 4-50, B-16
 ISIGN: *REL* 3-49
 ISIGN entry (call-by-name), %SIGN: *REL* 3-162
 ISLU: *BSP* 3-2, 3-11
 ISMP: *BSP* 3-2, 3-11
 ISSR: *REL* 5-14
 ISSW: *REL* 5-15
 ISSW entry (call-by-name), %SSW: *REL* 5-42
 ISX: *MAC* 3-9, B-8
 ISY: *MAC* 3-9, B-8
 ISZ: *MAC* 3-2, B-2
 IT command: *CUSR* 4-6, 5-47; *TUSR* 4-42
 IXGET: *REL* 5-9
 IXOR: *REL* 3-50

J

J command: *EDIT* 4-34
 JLA: *MAC* 3-10, B-8
 JLB: *MAC* 3-10, B-8
 JLY: *MAC* 3-10, B-8
 JMP: *MAC* 3-2, B-2
 JO, initiate job for spooling: *BSP* 2-33
 JOB program: *BSP* 1-2, 2-26, 2-28, 2-30
 entered from a file: *BSP* 2-42
 entered from batch device: *BSP* 2-40
 entered interactively: *BSP* 2-41
 error conditions: *BSP* 2-49
 error messages: *BSP* 2-50
 manipulation: *BSP* 4-9
 processing: *BSP* 2-30
 status: *BSP* 2-48
 JOBFIL file: *BSP* 2-30, 2-40
 jobs
 batch: *TUSR* 1-7
 maximum number of active and pending: *BSP* 5-2
 joining files: *EDIT* 2-30, 4-49
 joining lines
 line mode: *EDIT* 4-34
 screen mode: *EDIT* 3-38, 4-62
 JPY: *MAC* 3-10, B-8
 JRS: *MAC* 3-15, B-12
 JSB: *MAC* 3-2, B-2
 JSCOM, substring compare: *REL* 10-7
 jump sparing: *UTIL* 9-29

K

K command: *EDIT* 2-23, 2-29, 3-6, 4-35
KEYS utility: *PROG* 1-33; *TUSR* 1-11; *UTIL* 2-1, 2-57
 calling: *UTIL* 2-57
 commands summary: *UTIL* 2-59
 error messages: *UTIL* 2-59
keyword: *UTIL* 12-2, 12-5, 12-10
keyword indexed help utilities. *See* CALLS and CALLM utilities
Kill (K) command: *EDIT* 2-29
kill lines: *EDIT* 4-35
kill trailing blanks: *EDIT* 4-8
Kill Variable command: *DEBUG* 5-22
KillTimer, cancel current timer: *REL* 7-27
KS - kill outspool: *BSP* 4-4, 4-5, 4-24
Kx command: *EDIT* 2-23, 4-38
KYDMP utility: *PROG* 1-33; *TUSR* 1-11; *UTIL* 2-1, 2-60
 calling: *UTIL* 2-60

L

L command: *EDIT* 2-22, 3-6, 3-46, 4-40
 append (+) option: *EDIT* 4-41
 LN version: *EDIT* 4-40
 LU version: *EDIT* 4-40
L option: *MAC* E-1
L2 norm: *REL* 8-17
LABEL: *MAC* B-17
LABEL command: *MAC* M-8
label field: *MAC* 2-1, 2-4, 5-4, 5-7, 5-9
LABEL statement: *MAC* M-13
labeled COMMON - *see* COMMON
labeled common block: *PROG* 4-13
labeled common relocatable space: *MAC* 1-11
LAE: *MAC* 3-5, B-4
language
 Basic/1000C: *PROG* 1-26
 Basic/1000D: *PROG* 1-26
 considerations, *LODR* 3-22, 8-1
 FORTRAN: *PROG* 1-26
 instruction set: *REL* 2-6
 Macro/1000: *PROG* 1-26
 Micro-Assembler: *PROG* 1-26
 Pascal/1000: *PROG* 1-26
 support: *PROG* 1-26
large background program: *LODR* 2-15
 map: *GEN* B-5
largest value
 DVMAX (double precision): *REL* 8-20
 DWMAX (EMA double precision): *REL* 8-20
 VMAX (single precision): *REL* 8-20
 WMAX (EMA single precision): *REL* 8-20
largest value (absolute)
 DVMAB (double precision): *REL* 8-20
 DWMAB (EMA double precision): *REL* 8-20
 VMAB (single precision): *REL* 8-20

WMAB (EMA single precision): *REL* 8-20
LastMatch: *REL* 7-27
LAX: *MAC* 3-10, B-7
LAY: *MAC* 3-10, B-7
LB. *See* large background program
LB (large background) command: *LINK* 3-11
LBD: *MAC* 3-2
LBE: *MAC* 3-5, B-4
LBF: *MAC* B-12
LBT: *MAC* 3-4, B-3
LBX: *MAC* 3-10, B-7
LBY: *MAC* 3-10, B-7
LCALL: *MAC* N-7
LDA: *MAC* 3-2, B-2
LDB: *MAC* B-2
LDX: *MAC* 3-9, B-7
LDY: *MAC* 3-9, B-7
LE command: *EDIT* 4-43
LE option: *LODR* 4-24; *EDIT* 3-26
leaf node: *LODR* 3-2
learning exercises: *EDIT* 5-25
length attribute: *MAC* 4-55
LFA: *MAC* 3-15, B-12
LFB: *MAC* 3-15
LG command: *TUSR* B-7
LGON, Help File Entries: *SMM* 8-43
LGON Error Messages: *SMM* 8-33
LGTAT utility: *PROG* 1-33, 2-86; *TUSR* 1-12; *UTIL* 2-1, 2-15
 abbreviated output: *UTIL* 2-15
 calling: *UTIL* 2-15
 complete output: *UTIL* 2-16
 output example: *UTIL* 2-17
 track assignment table: *UTIL* 2-16
LI (library) command: *LINK* 3-11; *LODR* 3-9, 5-4
LI (list files) command: *CUSR* 3-23, 5-48; *EDIT* 4-44; *RDSV* 2-6, 3-4, 3-6; *TUSR* 3-84
LIA: *MAC* 3-13, B-9
LIAC: *MAC* B-9
LIB: *MAC* 3-13
LIB/NOLIB command: *GEN* 2-35
LIBC: *MAC* B-9
libraries: *SMM* 4-99
 creation: *MAC* E-1
 description: *LINK* 1-2
 file search sequence: *LINK* 4-5
 introduction: *REL* 1-1
LIBRARIES directory: *SMM* 3-12
LIMEM subroutine: *PROG* 5-78
LINDX: *PROG* 1-32
 runstring: *LINK* 4-4
line
 break: *EDIT* 3-37, 4-62
 character edits: *EDIT* 3-31
 feed control character: *EDIT* 3-26
 header: *EDIT* 4-31
 join: *EDIT* 3-38, 4-34, 4-62
 length: *EDIT* 3-3, 3-13, 3-42, 4-43
 length option: *EDIT* 3-26
 marks: *EDIT* 2-23, 2-28, 3-15
 number: *EDIT* 2-21, 2-24, 2-28

number in file: *EDIT* 4-44
 range: *EDIT* 2-28, B-3
 range specification: *EDIT* 2-28, 2-31, 3-12
 specification: *EDIT* 2-22, 3-13, 3-15, B-2
 specification offset: *EDIT* 3-15

line connect
 modem panel: *CMUX* 2-23
 no wait bit: *CMUX* 2-23

line disconnect
 modem panel: *CMUX* 2-21, 2-25
 no wait bit: *CMUX* 2-25

line feed: *DMUX* 2-4

line mode: *EDIT* 1-10
 breaking lines: *EDIT* 3-33
 character editing: *EDIT* 3-31, 4-11, 4-55, 4-56
 commands: *EDIT* 2-38
 commands from screen mode: *EDIT* 2-18, 2-20, 3-36
 control commands: *EDIT* 3-31
 deleting text: *EDIT* 3-33
 editing: *EDIT* 1-2, 1-10, 3-31
 examples: *EDIT* 3-33
 extending lines: *EDIT* 3-33
 inserting text: *EDIT* 3-33
 replacing text: *EDIT* 3-33
 single line screen edit: *EDIT* 4-57
 tabs: *EDIT* 3-32
 truncating lines: *EDIT* 3-33

Line Number (N) command: *EDIT* 2-21

line printer device driver (DDV12): *CMUX* 1-3, 2-31, 4-3, 5-2
 control request: *CMUX* B-4
 user interface: *CMUX* B-3
 write request: *CMUX* B-3

Line Printer Driver
 DVA12: *SMM* 4-60
 DVB12: *SMM* 4-61
 DVC12: *SMM* 4-62
 DVR12: *SMM* 4-59

line spacing, DDV05 (CN 11B): *CMUX* B-2

line spacing/page eject: *DMUX* 2-13

line speed: *CMUX* 2-24

linear scheduling: *TUSR* 1-3

link, base page: *DRVW* 2-12

LINK: *PROG* 1-32
 command files
 examples: *LINK* 2-6
 search sequence: *LINK* 4-5
 use of: *LINK* 1-2, 2-6, B-3
 commands: *LINK* 3-1
 description: *LINK* 1-1
 examples: *LINK* 1-3
 file type extensions: *LINK* 2-3
 interactive: *LINK* 1-2
 LINK/LOADR command file: *UTIL* 2-36
 runstring: *LINK* 1-2, 2-1, B-1
 commands: *LINK* B-2
 scheduling: *LINK* B-1
 specifying commands: *LINK* 1-2
 termination, ABORT: *LINK* 3-4
 termination, END: *LINK* 3-9

linkage type: *LODR* 5-3

linkage word: *TUSR* 4-6

linked list technique: *TUSR* 4-6

linking. *See also* base page linking.

linking. *See also* current page linking.

linking: *LODR* 2-3
 base page: *LODR* 2-3, 2-4
 current page: *LODR* 2-3
 mixed: *LODR* 2-3, 2-4
 overview: *LODR* E-1
 programs: *DEBUG* 2-4
 reported in completion message: *LODR* 4-29, 9-6

links, reducing base page: *LINK* 4-1

linespec: *EDIT* 3-15

LINKS IN command: *GEN* 2-32

LINKS IN CURRENT command: *GEN* B-13

LIST: *MAC* 4-25, 4-29, B-15

List (L) command: *EDIT* 2-22

list command: *DEBUG* 5-23; *RDSV* 3-6

list device: *TUSR* 3-87

list file
 closing: *EDIT* 3-7, 4-20
 contents: *TUSR* 3-84
 defaults: *LINK* 4-6
 definition: *EDIT* B-2
 description: *EDIT* 4-41
 posting: *EDIT* 3-7

list header: *TUSR* 4-6

list output: *LODR* 5-4; *MAC* 1-6, E-1

list program attributes: *LINK* 3-13

listener: *HPIB* 1-3, 4-2

listing
 data from I/O LU: *CUSR* 3-38
 directory: *CUSR* 3-22
 EDIT commands: *EDIT* 2-20
 files: *CUSR* 3-23
 text: *EDIT* 2-22
 to a printer: *EDIT* 2-22, 3-9
 volumes: *CUSR* 3-37
 window of text: *EDIT* 2-22

listing control, instructions: *MAC* 1-13, 4-1, 4-25, B-15

LIT: *MAC* 2-8, 4-35, 4-38, B-15

literal pattern matching: *EDIT* 2-33, 5-2, 5-4

literal values: *MAC* 2-8, 4-38

literals
 =A: *MAC* 2-8
 =B: *MAC* 2-8
 =D: *MAC* 2-8
 =F: *MAC* 2-8
 =J: *MAC* 2-8
 =L: *MAC* 2-8
 =R: *MAC* 2-8
 =S: *MAC* 2-8

LITF: *MAC* 2-8, 4-35, 4-39, B-15

LK (relink) command: *LINK* 3-12

LKEMA - lock shareable EMA partition: *PROG* 4-7, 4-23

LL command: *LINK* 3-13; *TUSR* 3-87

LLO bus command: *HPIB* 4-8

LLO subroutine: *HPIB* 4-14
 LN command: *EDIT* 4-45
 LO (set relocation base): *LODR* 5-5
 LO command: *LINK* 3-13; *TUSR* 3-88
 load and complement, real: *REL* 3-133
 load-and-go area: *TUSR* B-1
 load map
 command: *LINK* 3-13
 default: *LODR* 4-18
 discussion: *LINK* 4-14
 EC option: *LODR* 4-21, 8-10
 LE option: *LODR* 4-24
 sample: *LODR* 4-18
 load-on-call: *LODR* 1-2, 2-5, 2-20, 3-1, 3-16
 load point: *LODR* 4-18
 loader
 and generator control: *MAC* B-14
 control instructions: *MAC* 4-1, 4-17
 LOADR: *TUSR* 1-9
 MLLDR: *TUSR* 1-9
 loading
 and using *DBGU*: *DBGS* 1-2
 EDIT
 help file: *EDIT* C-2
 RTE-6/VM: *EDIT* C-5
 errors: *DBGU* 2-3
 from a logical unit: *LODR* 4-2, 9-5
 large programs. *See also* reducing load time.
 large programs. *See also* SGMTR.
 large programs: *LODR* 6-1, 8-1, 8-4, 8-5
 base page link overflow: *LODR* 8-7
 evaluate the program: *LODR* 8-3
 load time errors: *LODR* 8-6
 reducing links: *LODR* 8-10
 reducing load time: *LODR* 6-18, 8-12
 reducing path size: *LODR* 8-8
 runtime errors: *LODR* 8-11
 segmenting using SGMTR: *LODR* 8-4
 offline utilities: *UTIL* 3-27
 offline utility, !BCKOF: *INST* F-1
 overlay programs: *LINK* 4-10
 programs: *INST* 4-8
 READR/SAVER: *RDSV* 5-1
 reconfigurator: *INST* D-5
 loadmap. *See* load map.
 LOADPARMADD macro: *MAC* N-5
 LOADR: *PROG* 1-32
 code input: *LODR* 9-5
 command input: *LODR* 9-3
 commands: *LODR* 9-3; *RDSV* 5-1
 completion message: *LODR* 9-6
 considerations: *LINK* 1-5
 converting to multilevel segmentation: *LODR* 9-9
 errors: *LODR* A-1
 functions: *LODR* 1-1, 2-1
 memory layout: *LODR* 9-7
 operation: *LODR* 9-3
 runstring: *LODR* 9-3
 single-level segmentation: *LODR* 9-1
 summary of commands: *LODR* 9-4
 LOADREC: *MAC* 4-46, B-18
 LOC. *See* load-on-call.
 local
 assembly time variable: *MAC* 4-49
 COMMON. *See* COMMON
 data: *LODR* 6-19, 8-11
 SAVE area: *LODR* 4-19
 tracks: *PROG* 2-86
 LOCAL LOCKOUT statement: *HPIB* 4-17
 LOCAL macro: *MAC* M-10, N-11
 LOCAL statement: *HPIB* 4-16, 4-17
 location
 counter changes: *DBGS* 3-5
 examination: *DBGS* C-5
 of spool files: *BSP* 5-4
 locations
 specifying: *DBGU* 4-1
 subscripts (arrays): *DBGU* 4-6
 variables: *DBGU* 4-4
 LOCF call: *CUSR* B-8; *PROG* 3-61
 lock cartridge: *UTIL* 3-9
 lock keyboard: *CMUX* 5-5
 locked LU: *REL* 7-27
 WhoLockedLu: *REL* 7-42
 locked resource number, WhoLockedRn: *REL* 7-42
 LOCL subroutine: *HPIB* 4-17
 LOD: *MAC* B-14
 LOD command: *MAC* 4-17
 log device: *TUSR* 3-88, 3-89
 Log Track Assignment Table: *UTIL* 2-16
 logical
 negation: *MAC* 4-56
 operators: *MAC* 4-51, 4-61, 4-63
 address space: *LODR* 1-3
 See also longest path
 See also memory maps
 AND entry (call-by-name), %AND: *REL* 3-147
 inclusive OR: *REL* 3-48
 memory: *PROG* 1-6; *PROG* 4-2
 and base page: *PROG* F-3
 organization: *GEN* B-5
 product, integer: *REL* 3-43
 product reviewed: *DBGS* 5-1
 read: *CUSR* 6-9
 source area: *TUSR* 3-16, B-1, B-6
 transfer: *CUSR* 6-9
 unit. *See* LU.
 LOGLU subroutine: *PROG* 5-53
 logoff procedures: *TUSR* 2-6, 2-7
 EX command: *TUSR* 3-74
 logon
 procedure: *TUSR* 2-3
 programmatic: *REL* 6-3
 LOGON program: *BSP* 2-32
 long ID segments: *GEN* 2-67
 longest path: *LODR* 2-15, 3-3, 3-16, 4-29
 loop test: *CMUX* 2-14
 lowercase to uppercase, CaseFold: *REL* 7-5
 LS. *See* logical source area.
 LS command: *TUSR* B-6, B-13

LSHIFT (system macro): *MAC* L-16
 LSL: *MAC* 3-12, B-11
 LSR: *MAC* 3-12, B-11
 LST: *MAC* B-18, J-10
 LU: *BSP* 5-5; *TUSR* 3-20, 4-58
 allocation
 disk cartridge: *SMM* 7-2
 group and user peripheral: *SMM* 7-2
 standard LU: *SMM* 7-2
 station: *SMM* 7-2
 subsystems: *SMM* 7-2
 worksheet: *SMM* 7-2
 assignment: *BSP* 2-13; *SMM* 4-39
 command: *CUSR* 5-53; *EDIT* 4-47; *TUSR* 4-44
 display information: *TUSR* 3-114
 down: *TUSR* 4-32
 loading from: *LODR* 4-2
 lock: *PROG* 1-18, 5-30
 applications and resource numbers: *PROG*
 5-24
 error codes: *PROG* A-13
 subroutine LURQ: *PROG* 5-30
 locked, WhoLockedLu: *REL* 7-42
 mappings: *GEN* 2-65, 3-14; *TUSR* 3-122
 number: *CMUX* 2-2; *DRVW* 2-8; *EDIT* B-2;
INST 4-4; *HPIB* 3-1; *PROG* 1-20
 and device addresses: *HPIB* 3-1
 and EQTs, DVTs, and IFTs: *HPIB* 3-1
 and hardware: *HPIB* 3-2
 CN command: *HPIB* 3-9
 control request: *DMUX* 2-11
 EQ command: *HPIB* 3-5
 IO command: *HPIB* 3-6
 LU command: *HPIB* 3-4
 LUPRN utility: *HPIB* 3-4
 of the bus: *HPIB* 3-1
 restrictions: *DMUX* 1-2
 RTE-A assignment: *HPIB* 3-6
 RTE-6/VM assignment: *HPIB* 3-4
 SL command: *HPIB* 3-5
 query
 interactive: *PROG* 5-52
 interrupting: *PROG* 5-51
 terminal: *PROG* 5-57
 reassignment: *INST* 2-14
 session: *PROG* 1-20; *TUSR* 2-2, 3-20
 status word: *CMUX* 3-6
 system: *PROG* 1-20; *TUSR* 2-2, 3-20
 table, serial drivers: *DMUX* B-2
 LuLocked subroutine: *REL* 7-27
 LUPRN utility: *CUSR* 2-10; *TUSR* 1-12; *UTIL*
 2-1
 “LUPRN file: *UTIL* 2-18
 calling: *UTIL* 2-18
 customizing driver names: *UTIL* 2-28
 errors: *UTIL* 2-29
 examples: *UTIL* 2-21
 notes: *UTIL* 2-27
 output table format: *UTIL* 2-20
 LURQ subroutine: *PROG* 5-30
 LUSES subroutine: *PROG* 5-62; *REL* 6-12

LUTRU subroutine: *PROG* 5-54

M

M (memory node): *LODR* 3-8, 5-5
 M command: *EDIT* 2-30, 3-16, 4-49
 M option: *MAC* 5-15, E-1
 MA (send load map to terminal) command: *LINK*
 3-13
 MA option: *EDIT* 4-72
 MAC (Multiple Access Controller Disk): *UTIL*
 1-1, 3-1, 3-26, 3-32, 3-36, 3-41, 3-48, 9-1, 9-2, 9-9,
 A-1
 MAC disk subchannels: *SMM* A-8
 defining Track Map Table: *SMM* A-9
 disk sectors: *SMM* A-8
 disk surface organization: *SMM* A-8
 disk tracks: *SMM* A-8
 disk unit number: *SMM* A-9
 multiple 13037B/C controller operation: *SMM*
 A-11
 machine instructions: *MAC* 1-10, 2-5, 3-1, B-2
 MACLIB statement: *MAC* 4-13, 5-3, 5-15, B-17
 MACLIB.MLB: *MAC* E-12
 MACLIBFILE file: *MAC* E-11
 Macro: *CUSR* 6-7; *LODR* 6-5, 6-8, 6-10;
PROG 1-26, 2-8
 macro
 body: *MAC* 5-5
 call sequences
 initialization: *MAC* N-2
 NEWSUB: *MAC* N-3
 TRACKBACK: *MAC* N-4
 call statement: *MAC* 1-1, 1-10, 5-1, 5-2, 5-3
 calling: *MAC* 5-1, 5-3
 definition: *MAC* 1-1, 1-10, 2-5, 5-1, 5-2, B-17,
 M-9
 ENDMAC statement: *MAC* 5-7
 example: *MAC* 5-2
 libraries
 creating: *MAC* 5-1
 delete: *MAC* 5-16
 description: *MAC* 5-1, 5-3
 extract: *MAC* 5-16
 extract and delete: *MAC* 5-16
 filedescriptor: *MAC* E-11
 old: *MAC* E-11
 name statement: *MAC* 5-2, 5-4
 names list (T option): *MAC* 5-15
 nesting: *MAC* 5-1
 parameters: *MAC* 4-47, 5-1, 5-4, 5-7
 MACRO statement: *MAC* 5-2, 5-4, B-17
 magic symbols: *DBGS* 6-13
 magnetic tape
 driver, DVR23: *SMM* 4-65, 4-66
 loader !MTLDR: *INST* D-4
 position, PTAPE: *REL* 5-23
 utility functions, MAGTP: *REL* 5-16
 MAGTP: *REL* 5-16
 mailbox I/O: *PROG* 2-29

main entry point: *LODR* 6-2
 main programs: *LODR* 2-14
 maintaining
 account system: *SMM* 8-1
 system: *SMM* 1-7
 manipulating
 directories: *CUSR* 3-28
 files: *CUSR* 3-1
 volumes: *CUSR* 3-35
 mantissa
 complement, double real unpacked: *REL* 3-124
 normalized, rounded, packed (double real):
 REL 3-128
 real, extract: *REL* 3-98
 manual conventions: *DEBUG* 1-2; *EDIT* 1-3
 manual system startup: *INST* B-1
 reconfiguration: *INST* B-2
 MAP command: *GEN* 2-26
 map examination special mode: *DBGS* 3-8
 MAP LINKS command: *GEN* B-13
 map registers: *DBGS* C-9
 mapping
 RTE-III and RTE-M/III: *DRVW* 3-32, 4-13
 RTE-IV and RTE-6/VM: *DRVW* 3-33, 4-15
 table: *DRVW* 2-15
 Mapping Segment. *See* MSEG
 margin setup: *CMUX* 4-13
 mark: *DBGS* 1-4; *EDIT* B-2
 mark \Q: *DBGS* A-2
 Mark Line (Kx) command: *EDIT* 2-23
 marking lines: *EDIT* 2-23, 2-28, 4-38
 MaskDiscLu: *CUSR* 6-78
 masking
 and FMGR files: *CUSR* 3-20
 characters: *CUSR* 3-16
 destination file: *CUSR* 3-20
 file masks: *CUSR* 3-15
 qualifiers: *CUSR* 3-16, 3-21
 MaskIsDS: *CUSR* 6-78
 MaskMatchLevel: *CUSR* 6-79
 MaskOldFile: *CUSR* 6-79
 MaskOpenId: *CUSR* 6-80
 MaskOwnerIds: *CUSR* 6-80
 MaskSecurity: *CUSR* 6-81
 Master EQT, serial drivers: *DMUX* B-5
 master mode, momentarily in: *DBGS* 2-13
 match pattern: *EDIT* 2-34, B-2
 master security code: *PROG* 3-11; *TUSR* 2-11,
 2-12, 3-16, 3-80
 material supplied, installation: *INST* D-1
 matrix
 inversion (VIS): *REL* 9-30
 multiiplication EMA example: *REL* 9-22
 transposition (VIS): *REL* 9-13
 MAX (system macro): *MAC* L-11
 MAX/MIN routines: *REL* 8-20
 MAX0: *REL* 3-6
 MAX1: *REL* 3-7
 maximum
 double real value: *REL* 3-99
 extended real: *REL* 3-29
 integer value: *REL* 3-6
 number active and pending spool files: *BSP* 5-4
 number of jobs, job file disk: *BSP* 5-2
 pathlength and tree size: *LODR* 3-16
 real value: *REL* 3-7
 maximum number of partitions: *GEN* 2-68
 MBF: *MAC* B-12
 MBI: *MAC* 3-15, B-12
 MBT: *MAC* 3-4, B-3
 MBW: *MAC* 3-15, B-12
 MC command: *CUSR* 3-37, 5-54; *TUSR* 3-18, 3-90
 ME command: *TUSR* 3-93
 media formats: *INST* D-12
 meeting changing cartridge requirements: *SMM*
 3-22
 MEM status special mode: *DBGS* 3-8
 Member subroutine: *REL* 6-13
 memory
 allocation table entry: *PROG* F-7
 areas, VMA and WS: *CUSR* 4-13
 change controls: *DBGS* 3-3
 configuration: *INST* 2-6
 contents: *DBGS* 3-2
 counter changes: *DBGS* 3-5
 lock: *PROG* 2-72
 background (BG): *GEN* 2-22
 real-time (RT): *GEN* 2-22
 management: *PROG* 1-6
 and related tables: *PROG* F-1
 maps: *LODR* 7-1, 9-7, C-1; *PROG* 1-6, 1-7
 organization
 logical: *GEN* B-5
 physical: *GEN* B-1
 partitions
 status of: *UTIL* 2-2
 system: *CUSR* 4-12
 protect fence: *PROG* 1-13, 1-14
 protect violations: *PROG* A-2
 protection: *GEN* B-13; *PROG* 1-13
 reconfiguration: *INST* D-6
 procedures: *SMM* 10-9
 reference instructions: *MAC* 3-2, B-2
 relocatability: *MAC* 4-56
 requirements, program: *CUSR* 4-11
 search: *DBGS* 5-1
 search and clear: *DBGS* C-7
 size: *GEN* 2-24
 EXEC 26: *PROG* 2-83
 spaces: *MAC* 4-2
 usage, displaying: *CUSR* 2-9
 Memory and I/O Reconfiguration: *SMM* 10-1
 memory allocation: *LODR* 1-3, 2-13, 7-1
 base page to root: *LODR* 7-2
 LOADR: *LODR* 9-7
 NAM record: *LODR* 2-13
 program nodes: *LODR* 7-2
 disk-resident only: *LODR* 7-2
 memory and disk nodes: *LODR* 7-3
 memory-resident only: *LODR* 7-3
 root node only: *LODR* 7-2
 program types: *LODR* 2-13

VMA/EMA area: *LODR* 7-8
VMA/EMA page table: *LODR* 7-8
memory nodes: *LODR* 6-6
memory overflow: *LODR* 6-3, 6-6, 7-1, 8-3, 8-5, 8-7
memory overhead - see overhead
memory usage criteria: *LODR* 3-5
memory-image format: *LODR* 2-2; *PROG* 3-1
memory-resident
 access table area II: *GEN* 2-22
 base page: *GEN* B-4
 library: *GEN* 2-2, 2-69, B-4; *PROG* 1-11, 5-6
 library modules: *GEN* B-18
 map: *GEN* B-5
 program area: *GEN* B-4
 programs: *GEN* 2-69, B-18; *PROG* 1-7, 1-11
memory-resident and disk-resident nodes, mixed:
 LODR 3-17
Merge (M) command: *EDIT* 2-30, 4-49
MERGE utility: *LODR* 6-41; *PROG* 1-32;
 TUSR 1-10; *UTIL* 2-1, 2-40
 break detection: *UTIL* 2-42
 calling: *UTIL* 2-40
 examples: *UTIL* 2-42
 loading: *UTIL* 2-42
 operation: *UTIL* 2-41
 options: *UTIL* 2-41
merged and indexed files: *LODR* 6-11
merging
 files: *EDIT* 2-30, 4-49
 libraries: *LINK* 4-3
message: *HPIB* 4-1
 command: *HPIB* 4-5
 data: *HPIB* 4-11
 file: *PROG* 3-14; *TUSR* 3-93
 processor interface: *PROG* 5-85
 service request: *HPIB* 5-2
 to system console: *TUSR* 3-138, 4-68
MESSAGE (system macro): *MAC* L-17
MESSS subroutine: *PROG* 5-85
metacharacter
 See also Regular Expressions (RE)
 alphanumeric transition (:): *EDIT* 5-3, 5-16
 beginning anchor (^): *EDIT* 5-3, 5-7, 5-9
 break line character (<\$>): *EDIT* 5-18
 character class [xyz]: *EDIT* 5-3, 5-10
 definition: *EDIT* 2-33, 3-18, 3-22, 5-2, B-2
 descriptions: *EDIT* 5-7
 ending anchor (\$): *EDIT* 5-3, 5-9
 exchange: *EDIT* 5-5
 indefinite (@) character: *EDIT* 5-3, 5-9, 5-15
 line break character (<\$>): *EDIT* 5-3
 lowercase tagged string recall (<n): *EDIT* 5-3,
 5-18
 match one or more (+): *EDIT* 5-3, 5-13
 match pattern n times (<n>): *EDIT* 5-3, 5-14
 match zero or more (*): *EDIT* 5-3, 5-12
 negated character class [^xyz]: *EDIT* 5-3, 5-11
 single-character wildcard (.): *EDIT* 5-3, 5-7
 tagged string {xyz}: *EDIT* 5-3, 5-17
 tagged string recall (&n): *EDIT* 5-3, 5-17
 uppercase tagged string recall (>n): *EDIT* 5-3,
 5-18
MFB: *MAC* 3-15
MIA: *MAC* 3-13, B-9
MIAC: *MAC* B-9
MIB: *MAC* 3-13, B-9
MIBC: *MAC* B-9
MIC: *MAC* B-18, J-10
micro-assembler: *PROG* 1-26
microcode replacement values: *GEN* 2-45
microcode replacements: *MAC* 1-3, 4-24
microcoded routines (RPLs): *REL* 2-6
microcoded subroutines: *PROG* 5-11
microcoding capabilities: *MAC* 1-3
MIN (system macro): *MAC* L-11
MIN0: *REL* 3-6
MIN1: *REL* 3-7
minimum
 double real value: *REL* 3-99
 extended real: *REL* 3-29
 integer value: *REL* 3-6
 real value: *REL* 3-7
MinStrDsc: *REL* 12-87
minus sign: *DBGS* A-1
mixed linking: *LODR* 2-3, 2-4, 4-10, 6-6
MLLDR: *TUSR* 1-9
 breakpoint, setting: *DBGS* 6-3
 considerations: *LINK* 1-5, 4-2
 errors: *LODR* A-1
 interface with debugger: *LODR* 2-20
 modes of operation: *LODR* 4-1
 operation overview: *LODR* 1-1
 processing sample trace: *LODR* 3-13
 runstring operation: *LODR* 4-6
 runstring operation examples: *LODR* 4-11
 runstring parameters: *LODR* 4-6
 command: *LODR* 4-6
 format: *LODR* 4-9
 input: *LODR* 4-7
 list: *LODR* 4-7
 opcode: *LODR* 4-8
 partition: *LODR* 4-10
 profile: *LODR* 4-10
 size: *LODR* 4-10
MLS. *See also* multilevel segmentation.
MLS commands: *LODR* 3-8
 D (disk node): *LODR* 3-9
 LI (user library file): *LODR* 3-9
 M (memory node): *LODR* 3-8
 MS (multiple search): *LODR* 3-10
 NA (user library name): *LODR* 3-9
 RE (relocate): *LODR* 3-9
 SE (search): *LODR* 3-10
 SL (search user libraries): *LODR* 3-10
 SY (system library name): *LODR* 3-9
MLS programs: *LODR* 4-5
MLS tree: *LODR* 3-2
 creating: *LODR* 3-5
 restrictions: *LODR* 3-16

MLS-LOC, see multilevel segmentation,
 load-on-call
 MLS-LOC loader (MLLDR): *PROG* 1-16, 1-31;
 TUSR 1-9
 MLSDB (interactive debugger): *TUSR* 1-11. *See*
 also debugger.
 MMAP subroutine: *PROG* 4-47, B-9
 mnemonic: *EDIT* 3-13
 MNOTE: *MAC* 4-63, 4-67, B-17
 MO (move files) command: *CUSR* 3-20, 3-25, 5-55
 MO command: *EDIT* 2-23, 2-29, 4-51–4-52
 MOD: *MAC* 4-60; *REL* 3-51
 mode control: *DBGS* 2-1, 3-10, C-2
 modem
 212 versus V.22 mode: *CMUX* 2-23
 alarm program, setting ID segment address of:
 CMUX 2-21
 auto-dial: *CMUX* 2-24
 card cage. *See* systems modem
 dial-back program example: *CMUX* 2-27
 line speed: *CMUX* 2-24
 no wait bit: *CMUX* 2-23, 2-25
 panel
 line connect: *CMUX* 2-23
 line disconnect: *CMUX* 2-21, 2-25
 port initialization, example: *CMUX* 2-26
 support of: *CMUX* 5-3
 modem control bit: *DMUX* 2-20
 MODEM program: *CMUX* 2-21, 2-23
 modem-related port status: *CMUX* 2-13
 modify
 a file. *See* editing
 command: *DEBUG* 2-14, 3-7, 5-25
 partition priority aging: *TUSR* 4-22
 program page requirements: *GEN* 2-80, 3-17
 Session Switch Table (SST): *TUSR* 3-122
 spool options: *TUSR* 3-58
 value of a variable: *DEBUG* 3-7, 5-25
 virtual memory size: *TUSR* 4-76
 working set size: *TUSR* 4-81
 module: *LODR* 3-2
 modules
 system: *GEN* B-18
 table area II: *GEN* B-17
 modulus, of complex (real): *REL* 3-11
 mother partitions: *PROG* 1-15, 2-81, 4-10;
 TUSR 1-4
 swapping: *PROG* 4-10
 mounting
 cartridges: *TUSR* 3-90
 disk volumes: *CUSR* 3-35
 move
 complex to complex: *REL* 3-68
 extended real to extended real: *REL* 3-126
 name of program from ID segment, PNAME:
 REL 5-22
 Move (MO) command: *EDIT* 2-29
 MOVE macro: *MAC* N-10
 move routines: *REL* 8-24
 DVMOV (double precision): *REL* 8-24
 DWMOV (EMA double precision): *REL* 8-24
 VMOV (single precision): *REL* 8-24
 WMOV (EMA single precision): *REL* 8-24
 MOVEBYTES macro: *MAC* N-10
 MOVECODETODATA macro: *MAC* N-10
 MoveWords: *REL* 7-28
 MOVEWORDS macro: *MAC* N-10
 moving
 around the screen: *EDIT* 2-36
 columns of data: *EDIT* 5-23
 directories: *CUSR* 3-30
 files: *CUSR* 3-25
 screen mode text: *EDIT* 4-9
 text: *EDIT* 2-29, 4-51
 through the file: *EDIT* 2-21
 MP error: *PROG* A-4
 MPY: *MAC* 3-11, B-11
 MPYD: *MAC* 3-11, B-11
 MR command: *TUSR* B-8
 MS (multiple search): *LINK* 3-14; *LODR* 3-10, 5-6
 MS command: *TUSR* B-3
 MSEG: *MAC* 4-34, B-15; *PROG* 4-2
 allocation of: *LINK* 4-2
 size: *LODR* 4-29, 7-9; *TUSR* 4-65
 MT command: *RDSV* 2-6, 3-4, 3-7
 multilevel segmentation. *See also* MLLDR.
 multilevel segmentation: *LODR* 3-1, 7-9; *PROG*
 1-16
 benefits of: *LODR* 2-6
 command file: *LODR* 3-11
 converting to: *LODR* 9-9
 data reference: *LODR* 3-16
 duplication of modules: *LODR* 3-17
 errors: *LODR* 4-14
 load-on-call: *LODR* 2-5
 maximum pathlength: *LODR* 3-16
 maximum tree size: *LODR* 3-16
 overview: *LODR* 3-1
 reducing path size: *LODR* 8-8
 restrictions: *LODR* 3-16, 6-19, 6-20
 restrictions on duplicating modules: *LODR* 3-19
 structure: *LODR* 3-1
 terminology: *LODR* 3-2
 tree structure: *LODR* 3-7
 writing the command file: *LODR* 3-8
 multi-point configuration: *INST* 2-22
 multi-point environment
 Q and O commands: *EDIT* D-1
 tab control: *EDIT* D-3
 use of EDIT in: *EDIT* D-1
 multi-point terminal: *TUSR* 2-3
 multi-programming with timeslicing: *PROG* 1-3;
 TUSR 1-3
 multi-terminal environment: *GEN* 2-67
 Multi-Terminal Monitor (MTM): *GEN* 2-67;
 SMM 1-1, 1-5; 4-113; *TUSR* 2-1, 2-15; *UTIL* 1-1
 breakmode prompt: *TUSR* 4-17
 services: *TUSR* 2-16
 multi-user interface selecting: *SMM* 1-1
 multi-user remote file access: *CUSR* 3-41
 multi-dimensional arrays, efficiency (VIS): *REL*
 9-19

multiple
 12821A Interface Card operation: *SMM A-15*
 13037B/C Controller operation: *SMM A-11*
 commands per line: *CUSR 2-23*
 CPU, 7905/06/20/25 systems: *SMM 4-5*
 CPU operation: *SMM A-16*
 disk controllers: *SMM 4-4*
 modules: *MAC 1-13, 4-13*

multiplexer
 control request: *CMUX 2-11*
 firmware: *CMUX 5-1*
 panel: *CMUX 1-3*
 cabling: *CMUX 1-3*

multiply
 by 2 to integer power: *REL 3-104*
 complex by complex: *REL 3-71*
 double integer: *REL 4-9*
 extended real by extended real: *REL 3-127*
 hardware: *REL 3-101*
 real: *REL 3-89*
 substrings, *SMPY*: *REL 10-22*

multiply routines
 DVMPY (double precision): *REL 8-9*
 DWMPY (EMA double precision): *REL 8-9*
 VMPY (single precision): *REL 8-9*
 WMPY (EMA single precision): *REL 8-9*

MUX errors
 overflow: *CMUX 3-6*
 parity: *CMUX 3-6*
 read: *CMUX 3-8*
 timeout: *CMUX 3-6*

MUX pre-driver: *DMUX B-2*

MVW: *MAC 3-4, B-3*
 MWF: *MAC 3-15, B-12*
 MWI: *MAC 3-15, B-12*
 MWW: *MAC 3-15, B-13*

MyIdAdd, return segment address: *REL 7-28*

N

N command: *EDIT 2-2, 2-21, 2-28, 2-39, 4-53*
 n command: *EDIT 2-21, 4-54*
 N option: *MAC E-2*
 NA (user library name) command: *LODR 3-9, 5-6*
 NA (program name) command: *LINK 3-14*
 NAM record: *LODR 2-13, 6-17, 6-41*
 NAM statement: *LODR 3-2; MAC 1-4, 4-3, 4-4, 4-13, B-14*
 NAM type 5: *LODR 9-2*
 named COMMON. *See* COMMON.
 NAMF FMP call: *CUSR B-10; PROG 3-81*
 NAMR: *REL 5-17*
 namr: *EDIT B-2*
 calls and strings: *CUSR B-2*
 parameter: *TUSR 3-29*
 subparameters: *TUSR 3-30*
 native language support utilities errors: *CUSR A-14*
 natural logarithm
 complex: *REL 3-13*
 double real: *REL 3-96*
 extended real: *REL 3-27*
 real: *REL 3-4*
 NDAC handshake line: *HPIB 1-6*
 negate
 double integer: *REL 4-10*
 double real: *REL 3-135*
 negate operand: *MAC 4-55*
 negative increment (VIS): *REL 9-10*
 nested DO loops example (VIS): *REL 9-6*
 nesting command files: *CUSR 2-21*
 nesting of macro definitions: *MAC 5-1, 5-11*
 new user: *SMM 4-1*
 NEWSUB: *MAC N-3*
 nice bit: *DMUX 2-26*
 NO parameter: *BSP 2-34*
 no-abort option: *PROG 2-11*
 no-operation instruction: *MAC 3-10, B-3*
 no-suspend I/O option: *PROG 2-15*
 no type-ahead mode: *CMUX 3-4*
 no wait bit
 line connect: *CMUX 2-23*
 line disconnect: *CMUX 2-25*
 No Window (N) option: *EDIT 3-24*
 noallocate option. *See also* ALLOCATE.
 noallocate option: *LODR 6-8, 6-9*
 node: *LODR 3-2*
 node fault: *LODR 2-20, 3-3, 4-31*
 node numbers: *LODR 3-3*
 node ordinal - *see* preorder
 node tree: *LODR 3-2*
 sample: *LODR 3-6*
 non-alphanumeric commands: *EDIT 4-92*
 non-CDS environment: *MAC 4-9*
 non-disk devices: *PROG 3-2; TUSR 3-132*
 control: *TUSR 3-44*
 non-disk (type 0) files: *CUSR 6-10; TUSR 3-57*
 non-EMA copy routine, DWVMV (double precision): *REL 8-26*
 non-EMA labeled COMMON - *see* COMMON
 non-extended relocatable records: *MAC 1-2*
 non-main modules: *LODR 6-5*
 non-segmented programs: *LODR 4-5*
 non-sequentially extended type 1 and 2 files: *TUSR 3-52*
 non-session
 and non-MTM systems: *SMM 4-114*
 cartridge: *PROG 3-12; TUSR 2-9, 3-16*
 allocation and access: *TUSR 3-19*
 file access considerations: *SMM 3-14*
 FMGR cartridge requirements: *SMM 3-20*
 mode: *TUSR 2-11*
 operations: *INST 4-11*
 terminals in session environment: *TUSR 2-14*
 non-update mode: *PROG 3-6*
 NOP: *MAC 3-10, B-3*
 normal
 CI files: *CUSR 7-2*
 completion: *PROG 2-52*
 mode (non-type-ahead): *CMUX 3-1*

termination messages: *SMM* 5-20
 NOT function (call-by-name), %OT: *REL* 3-160
 NRFD handshake line: *HPIB* 1-6
 NS parameter: *BSP* 2-34
 null control character: *EDIT* 3-26
 null type extension: *MAC* E-6
 number of
 blank ID extensions: *GEN* 2-68, 3-14
 blank ID segments: *GEN* 3-14
 blank long ID segments: *GEN* 2-67
 blank short ID segments: *GEN* 2-68
 blocks on device: *GEN* 2-18
 I/O classes: *GEN* 2-65
 lines in file: *EDIT* 4-44
 LU mappings: *GEN* 2-65
 partitions: *GEN* 3-14
 partitions, maximum: *GEN* 2-68
 resource numbers: *GEN* 2-66, 3-14
 short ID segments: *GEN* 3-14
 spool files: *BSP* 5-2, 5-4
 number systems: *GEN* 3-5
 numeric
 mode: *DBGS* 2-3
 terms: *MAC* 2-6
 to ASCII conversion, .FMUO: *REL* 5-31
 NumericTime subroutine: *REL* 7-28

O

O command: *EDIT* 3-31, 4-55
 O option: *MAC* E-2
 obtaining efficiency with multidimensional arrays
 (VIS): *REL* 9-19
 OC command: *RDSV* 3-5
 OC,n command: *RDSV* 3-8
 OCT: *MAC* 4-35, 4-39, B-15
 octal addition and subtraction: *DBGS* A-2
 octal constants: *MAC* 4-36, 4-39
 octal to decimal conversion: *DBGS* A-3
 OctalToDint, ASCII to double integer conversion:
 REL 7-29
 OctalToInt, ASCII to single integer conversion:
 REL 7-29
 OENTRY macro: *MAC* N-4
 OF command: *CUSR* 5-56; *TUSR* 3-94, 4-46
 offline, backup !BCKOF: *INST* D-3
 offline physical backup: *UTIL* 3-26
 data structures: *UTIL* 3-52
 disk-to-disk copy (CO): *UTIL* 3-35
 display I/O configuration (I/O): *UTIL* 3-39
 error messages: *UTIL* 3-57
 HELP function (HE): *UTIL* 3-34
 loading and using the PBU I/O reconfiguration:
 UTIL 3-30
 loading the offline utilities: *UTIL* 3-27
 loading the offline utility from cartridge tape
 into memory: *UTIL* 3-28
 loading the offline utility from magnetic tape
 into memory: *UTIL* 3-28

loading utilities supplied on cartridge tape:
 UTIL 3-33
 loading utilities supplied on magnetic tape:
 UTIL 3-33
 offline commands: *UTIL* 3-34
 offline system console operations: *UTIL* 3-34
 PSAVE format on CS/80 cartridge tape: *UTIL*
 3-54
 PSAVE format on magnetic tape (reel-to-reel):
 UTIL 3-52
 pushbutton image format on CS/80 CTD: *UTIL*
 3-56
 RE command options: *UTIL* 3-43
 RE example: *UTIL* 3-44
 referencing devices offline: *UTIL* 3-26
 restore tape file (RE): *UTIL* 3-39
 SA example: *UTIL* 3-49
 save disk to tape (SA): *UTIL* 3-46
 tape movement functions: *UTIL* 3-51
 transfer to input LU (TR): *UTIL* 3-51
 offline system console operations: *UTIL* 3-34
 offpath reference: *LODR* 3-19, 3-20, 6-17, 6-20,
 6-22, 6-25, 8-3, 8-12
 OK? prompt: *EDIT* 1-13
 See also dangerous command confirmation
 old literal constructs: *MAC* J-2
 old pseudo opcodes: *MAC* J-2
 OLDRE: *MAC* 1-3
 OLDRE option: *MAC* E-2
 OLDRE utility: *UTIL* 2-1, 2-61
 calling: *UTIL* 2-62
 error messages: *UTIL* 2-65
 extended records: *UTIL* 2-61
 FORTRAN restrictions: *UTIL* 2-65
 MACRO/1000 restrictions: *UTIL* 2-64
 operation: *UTIL* 2-62
 Pascal restrictions: *UTIL* 2-65
 program restrictions: *UTIL* 2-64
 translation results: *UTIL* 2-63
 ON command: *CUSR* 5-57; *TUSR* 4-48
 ON INTR statement: *HPIB* 5-3
 on-board buffer: *CMUX* 2-3
 one dimensional array examples (VIS): *REL* 9-2
 online driver replacement utilities
 DRREL: *TUSR* 1-12; *UTIL* 10-1
 DRRPL: *TUSR* 1-12; *UTIL* 10-11
 loading: *UTIL* 10-4
 online generator (RT6GN): *GEN* 1-2; *TUSR* 1-11
 commands: *GEN* 2-3
 comments: *GEN* 3-3
 dialogue: *GEN* 2-2
 error codes: *GEN* A-1
 error handling: *GEN* 3-4
 executing: *GEN* 3-1
 features: *GEN* 1-2
 online help summary: *CUSR* 2-4
 online loading of Macro/1000: *MAC* E-11
 online physical backup utilities: *UTIL* 3-1, 3-9
 loading the on-line utilities: *UTIL* 3-10
 PCOPY: *UTIL* 3-9, 3-24
 PRSTR: *UTIL* 3-9, 3-16

PSAVE: *UTIL* 3-9, 3-11
 restoring the disks: *UTIL* 3-9
 online reference: *EDIT* 1-4, 1-6, 2-20, 4-28, 4-94
See also Help command
 online replacement utilities: *UTIL* 10-1
 online/offline physical backup utilities: *UTIL* 3-1
 compatibility among disk drives: *UTIL* 3-2
 data verification: *UTIL* 3-5
 multiple-volume tape sets: *UTIL* 3-4
 pushbutton (PB) operations: *UTIL* 3-6
 pushbutton save/restore data verification: *UTIL* 3-6
 tape handling: *UTIL* 3-3
 tape positioning: *UTIL* 3-3
 unit save tape files: *UTIL* 3-4
 using the BReak command: *UTIL* 3-8
 using the utilities: *UTIL* 3-1
 verification of saves: *UTIL* 3-5
 verification of restores: *UTIL* 3-5
 OP (opcode): *LODR* 5-7
 default: *LODR* 5-7
 OP command: *TUSR* 2-12
 opcode field: *MAC* 2-1, 2-2, 2-5
 open files
 cleaning up: *CUSR* 7-1
 flags: *CUSR* 7-2
 FS bit: *CUSR* 7-2
 open flag word: *TUSR* C-5
 open flags: *CUSR* 7-2
 OPEN FMP call: *CUSR* B-4; *PROG* 3-37
 exclusive: *PROG* 3-40
 file options: *PROG* 3-39
 flags: *PROG* 3-41
 non-exclusive: *PROG* 3-40
 update: *PROG* 3-41
 OPENF FMP call: *CUSR* B-4; *PROG* 3-37
 defaults: *PROG* 3-40
 operand field: *MAC* 2-1, 2-2, 2-5, 2-6
 operating environment: *TUSR* 2-1
 operating system: *PROG* 3-12
 area: *GEN* B-2
 code partitions: *PROG* 1-11
 description: *GEN* 1-4
 determination, .OPSY: *REL* 5-36
 features: *TUSR* 1-2
 operating with session monitor: *TUSR* 2-1
 operating without session monitor: *TUSR* 2-15
 operations: *RDSV* 4-1
 operator precedence: *DEBUG* 4-11; *MAC* 2-10
 Operator Suspend command: *DEBUG* 5-26; *TUSR* 4-60
 operators: *DBGS* 1-4
 OPNVM subroutine: *PROG* 4-36
 OPSYS subroutine: *PROG* 5-65
 optional subsystem installation: *INST* D-12
 options: *EDIT* B-2
 options sort: *RDSV* 2-2
 OR
 integer inclusive: *REL* 3-50
 logical inclusive: *REL* 3-48
 OR (order EMA area) command: *LINK* 3-15
 OR entry, inclusive (call-by-name), %OR: *REL* 3-158
 ORB: *MAC* B-18, J-2
 in replacement drivers: *UTIL* 10-3
 order of commands, expected: *LODR* 6-26
 ORG: *MAC* 4-3, 4-7, B-14
 ORR: *MAC* 4-3, B-14, B-18, J-3
 ORR command: *MAC* 4-12
 OS command: *RDSV* 3-5
 OS (operator suspend) command: *LINK* 3-15
 OS,n command: *RDSV* 3-8
 OTA: *MAC* 3-13, B-10
 OTAC: *MAC* B-10
 OTB: *MAC* 3-13, B-10
 OTBC: *MAC* B-10
 OU (output) command: *LINK* 3-16
 outlu parameter: *BSP* 2-13, 2-15
 output
 editing routine, SEDIT: *REL* 10-28
 file
 construction defaults: *MAC* E-6
 size defaults: *MAC* E-6
 type defaults: *MAC* E-6
 lines per page, default: *MAC* E-5
 modes: *DBGS* 2-1
 pause message, PAU.E: *REL* 5-21
 spooling: *BSP* 1-5
 outspool
 error messages: *BSP* A-8
 errors: *BSP* 2-23
 files: *BSP* 1-5
 logical unit assignment: *BSP* 2-15
 priority: *BSP* 2-32
 session logical unit: *BSP* 3-9
 status: *BSP* 2-22
 outspooled: *BSP* 2-3
 outspooling: *BSP* 2-1, 2-21, 2-30
 close and queue: *BSP* 3-16
 queue: *BSP* 3-15
 overflow bit: *MAC* 3-12, 3-13, B-9
 OVF: *REL* 5-20
 overflow error: *CMUX* 3-6
 overhead,
 debugger: *LODR* 6-6
 EMA: *LODR* 6-6
 fault: *LODR* 2-20
 links: *LODR* 8-10
 memory: *LODR* 7-9
 multilevel segmentation: *LODR* 7-9
 profile option: *LODR* 6-6, 7-9
 virtual memory: *LODR* 8-8
 VMA: *LODR* 6-6
 overlaid FMP files: *SMM* 5-14
 overlaying an existing driver: *UTIL* 10-1
 override
 command: *RDSV* 3-8
 operators: *DEBUG* 4-11
 option: *MAC* E-5
 overriding
 display format: *DEBUG* 4-12
 variable type: *DEBUG* 5-25

Overview command: *DEBUG* 5-26
OVF: *REL* 5-20
OWNER (display/change owner) command:
 CUSR 3-36, 5-58
ownership
 changing: *CUSR* 3-30
 directory, displaying: *CUSR* 3-30
 file: *CUSR* 3-1, 3-13
 volume: *CUSR* 3-36
OwnerTold, return user ID and group ID: *REL*
 6-14

P

P command: *EDIT* 3-31, 4-56
P globals: *TUSR* 3-22
P option: *MAC* E-2, E-5
PA command: *TUSR* 3-96
PA (page align EMA area) command: *LINK* 3-16
PAA: *MAC* 3-15, B-12
PAB: *MAC* 3-15, B-12
PACK USING statement: *HPIB* 4-21
packing
 a cartridge: *TUSR* 3-98
 a disk: *UTIL* 6-11
 files on a volume: *UTIL* 6-6
page alignment: *LODR* 3-8, 3-17, 5-5, 6-3, 6-6, 7-3,
 7-8, 8-10
page eject/line spacing: *DMUX* 2-13
page ejects, unconditional: *DMUX* 2-26
page fault: *PROG* 4-2
page mode: *CMUX* 2-22; *DMUX* 2-7
 example application: *DMUX* C-1
page requirements: *RDSV* 5-1
Page Table (PTE): *PROG* 4-2, 4-3
pages remaining: *GEN* 2-76
Paper Tape Punch Driver DVR02: *SMM* 4-56
Paper Tape Reader Driver DVR01: *SMM* 4-55
parallel polling: *HPIB* 5-10, 5-16
 automatic response: *HPIB* 5-11
 BASIC/1000D subroutines: *HPIB* 5-16
 disabling: *HPIB* 5-18
 PPC bus command: *HPIB* 4-6
 PPOLL function: *HPIB* 5-6
 PSTAT subroutine: *HPIB* 5-8
 service programs: *HPIB* 5-9
parameter input: *GEN* 2-2
Parameter Input Phase: *GEN* 2-37, 3-10
parameters: *GEN* 2-37
 common: *PROG* 3-21
 default: *REL* 2-2
 EXEC call: *CMUX* 2-11
 from ID segment, RMPAR: *REL* 5-24
 global area: *LINK* B-5
 passage applications: *PROG* 5-40
 runstring: *MAC* E-4
 string recovery: *PROG* 5-45
 syntax rules: *TUSR* 3-28
parity: *CMUX* 2-20

error: *CMUX* 3-6, 3-8
 hard: *PROG* A-6
 soft: *PROG* A-7
parity checking bits: *DMUX* 2-20
Parity Error/Overflow bit: *CMUX* 4-10
parse string
 SplitCommand: *REL* 7-36
 SplitString: *REL* 7-37
PARSE subroutine: *PROG* 5-87
parsing: *EDIT* 3-21, 5-20
partition: *LODR* 5-2; *TUSR* 1-3
 assignment: *TUSR* 4-25
 background: *PROG* 1-15; *TUSR* 1-3
 considerations: *PROG* 4-10
 defining as RT or BG: *GEN* 2-78
 definition: *GEN* 2-2
 drivers: *CMUX* 4-12; *GEN* 2-69
 management: *SMM* 9-6
 memory, assigning: *CUSR* 4-12
 mother: *PROG* 1-15, 4-10; *TUSR* 1-4
 priority: *TUSR* 4-22
 real-time: *PROG* 1-15; *TUSR* 1-3
 reserved: *TUSR* 4-75
 shareable EMA: *PROG* 1-15, 4-7, 4-10, 4-12;
 TUSR 1-4
 specifying maximum number of: *GEN* 3-14
 status - EXEC 25: *PROG* 2-81
 subpartitions: *PROG* 4-11
Partition Definition Phase: *GEN* 2-70, 3-15
PARTITION REQUIRED: *LODR* 4-29, 6-3, 7-1
partition-resident drivers: *GEN* B-17
Pascal: *LODR* 3-22, 6-4, 8-2, 9-1, 9-9; *PROG* 1-26,
 2-6, 2-7
 packed arrays: *DEBUG* 4-7
 routines callable from: *REL* 2-7
passing
 command string: *PROG* J-2; *TUSR* 3-110, 4-48
 file: *PROG* J-2
 procedures as parameters: *LODR* 6-20
 string - EXEC 14: *PROG* 2-69
password: *TUSR* 2-4
path: *LODR* 3-2
Path command: *CUSR* 5-59; *DEBUG* 5-27
path numbers: *LODR* 2-20, 3-4
path overflow: *LODR* 6-3, 6-20, 8-3, 8-6
path size: *LODR* 6-2, 6-3
path switches: *DBGS* 6-4
pathlength and tree size, maximum: *LODR* 3-16
pattern
 definition: *EDIT* B-2
 delimiter: *EDIT* 2-31, 3-19, 3-22
 exchange: *EDIT* 2-34, 3-19, 4-26, 4-88, 5-17
 exchange substitute: *EDIT* 2-34
 match: *EDIT* 3-18
matching
 anchoring to beginning of line: *EDIT* 5-7
 anchoring to end of line: *EDIT* 5-9
 literal: *EDIT* 2-33, 3-18, 5-2, 5-4
 longest possible sequence: *EDIT* 5-5
 regular expressions: *EDIT* 5-2
 shortest possible sequence: *EDIT* 5-5

specifying a string: *EDIT* 5-16
 parsing: *EDIT* 5-20
 search: *EDIT* 4-90
 All (A) option: *EDIT* 2-32, 3-19
 backward: *EDIT* 3-15
 definition: *EDIT* 2-31, 3-18
 forward: *EDIT* 3-15
 shortcuts: *EDIT* 3-23
 sets: *EDIT* 5-10, 5-11
 specification: *EDIT* 3-18
 strings: *EDIT* 5-2
 substitute: *EDIT* B-3
 pattern matching utility (FLAG): *UTIL* 11-2
 patterns files: *UTIL* 11-1
 PAU.E: *REL* 5-21
 pause and send message: *TUSR* 3-96
 pause message
 PAU.E: *REL* 5-21
 print: *REL* 5-37
 PBA: *MAC* B-12
 PBB: *MAC* 3-15, B-12
 PBS: *MAC* 3-15
 PC option: *EDIT* 3-26
 PCAL: *MAC* B-13
 PCAL call sequence (CDS): *REL* 2-4
 PCAL opcode: *MAC* M-4
 PCALL macro: *MAC* M-9, N-8
 PCOPY utility: *PROG* 1-33; *UTIL* 3-1, 3-24
 calling PCOPY: *UTIL* 3-24
 calling PCOPY interactively: *UTIL* 3-24
 example: *UTIL* 3-25
 pending class request: *PROG* 2-31
 pending line
 character exchange: *EDIT* 4-26
 deleting current: *EDIT* 2-29
 description: *EDIT* 1-12, 3-31
 displaying character edit information: *EDIT* 2-39
 displaying line number: *EDIT* 2-21
 edits: *EDIT* 2-38, 3-31, 4-11, 4-34, 4-55, 4-56, 4-59
 line mode display: *EDIT* 1-10
 line number: *EDIT* 2-21
 pointer: *EDIT* 2-22
 return: *EDIT* 2-20
 screen mode display: *EDIT* 1-12
 setting location: *EDIT* 2-28
 starting screen mode: *EDIT* 3-34
 pending line edits: *EDIT* 2-38, 3-31
 pending spool files: *BSP* 5-4
 peripheral resource usage: *SMM* 2-3
 peripheral subchannels: *SMM* 4-4
 permanent loads: *LODR* 4-8
 permanent program: *LODR* 1-2, 4-30; *TUSR* 3-95, 3-112
 usage: *GEN* 2-67
 PERR6: *GEN* B-3
 PF (profile): *LODR* 5-7
 PHI chip: *HPIB* 2-3, 4-5
 phone number buffer: *CMUX* 2-24
 physical
 backup utilities: *INST* D-16
 disk image backup utilities: *UTIL* 3-1
 memory: *PROG* 1-6, 1-8, 4-2
 organization: *GEN* B-1
 pages: *UTIL* 10-2
 read: *CUSR* 6-9; *PROG* 3-18
 record length: *CMUX* 4-6
 write: *PROG* 3-18
 pivot routine: *REL* 8-18
 DVPIV (double precision): *REL* 8-18
 DWPIV (EMA double precision): *REL* 8-18
 VPIV (single precision): *REL* 8-18
 WPIV (EMA single precision): *REL* 8-18
 PK command: *TUSR* 3-98
 planning
 generator responses: *GEN* 2-1
 account structure: *SMM* 3-7
 playback file: *DEBUG* 7-1, 7-10
 plotting a histogram: *DEBUG* 5-20
 plus sign: *DBGS* A-1
 PNAME: *REL* 5-22
 pointers, list of, \$SETP: *REL* 5-41
 POLL (polling function) command: *CUSR* 5-62
 polling
 parallel: *HPIB* 5-7, 5-10, 5-12, 5-16, 5-17, 5-20, 5-22
 serial: *HPIB* 5-1, 5-8, 5-9, 5-10, 5-12, 5-15, 5-18
 types: *HPIB* 5-8
 polynomial
 extended real: *REL* 3-129
 quotient double precision: *REL* 3-31
 pool cartridge: *PROG* 1-25; *TUSR* 3-18
 port configuration, setting: *CMUX* 2-31
 port ID, setting: *CMUX* 2-19; *DMUX* 2-19
 port maps: *PROG* 1-7, 1-8
 port number: *CMUX* 2-21
 port number bits: *DMUX* 2-21
 port status: *CMUX* 3-6
 position magnetic tape, PTATE: *REL* 5-23
 positional variables: *CUSR* 2-16; *LINK* 4-8
 positioning
 type 0 files: *PROG* 3-68
 type 1 and 2 files: *PROG* 3-68
 type 3 and above files: *PROG* 3-69
 positive difference, integer: *REL* 3-44
 POSNT FMP call: *CUSR* B-8; *PROG* 3-67
 POST FMP call: *PROG* 3-82
 postamble: *UTIL* 9-5, A-1
 posting a file: *EDIT* 3-7
 potential offpath references. *See* offpath reference.
 powerfail: *PROG* 1-21
 battery: *INST* A-3
 processing: *DRVW* 3-7, 3-25
 power down sequence: *DRVW* 3-25
 power up sequence: *DRVW* 3-25
 restart I/O sequence: *DRVW* 3-26
 test: *INST* 2-23
 powerfail/auto-restart: *PROG* E-13; *SMM* 4-90
 PPC bus command
 PPD secondary command: *HPIB* 4-7

PPE secondary command: *HPIB* 4-7
 PPOLL CONFIGURE statement: *HPIB* 5-6
 PPOLL function: *HPIB* 5-7
 PPOLL subroutine: *HPIB* 5-4
 PPOLL UNCONFIGURE statement: *HPIB* 5-7, 5-8
 PPSCH subroutine: *HPIB* 5-4
 PPSN subroutine: *HPIB* 5-4
 PPU bus commands: *HPIB* 4-8
 PR command: *CUSR* 5-63; *TUSR* 4-51
 PR (priority) command: *LINK* 3-17
 preamble: *UTIL* 9-5, 9-11, 9-29, A-1
 status bits S, P, and D: *UTIL* 9-11, A-1
 predefined variables: *CUSR* 2-19
 preliminary command file: *LODR* 3-5, 6-1, 8-4
 preorder: *LODR* 3-3, 4-18, 6-17, 6-28
 primary disk
 clean up: *INST* 2-23
 identification: *INST* 1-1
 Primary System
 answer file: *INST* C-1
 auto boot-up check: *INST* 2-14
 configuration: *INST* C-1
 description: *INST* 1-2
 files
 contents: *INST* D-2
 size: *INST* D-3
 on magnetic tape: *INST* D-1
 operations overview: *INST* 4-1
 supplied on CTD tape: *INST* D-2
 PRIN0 clone: *UTIL* 8-7
 print
 mode, temporarily change: *DBGS* 3-10
 momentarily in master mode: *DBGS* 2-13
 pause message, .PAUS: *REL* 5-37
 time: *TUSR* 4-69
 PRINT utility: *UTIL* 8-1
 &FFL module: *UTIL* 8-12
 &FFL variables: *UTIL* 8-11
 calling PRINT: *UTIL* 8-1
 loading PRINT: *UTIL* 8-11
 PRINT examples: *UTIL* 8-9
 PRINT messages: *UTIL* 8-8
 PRINT operation: *UTIL* 8-7
 PRINT options: *UTIL* 8-2
 using the PRINT utility: *UTIL* 8-1
 printer, honesty mode bit: *DMUX* 2-10
 printer/paper position bit: *DMUX* 2-26
 printing: *EDIT* 3-9
 files: *UTIL* 8-1
 library error messages, ER0.E: *REL* 5-2
 printout
 as numeric constants: *DBGS* 2-3
 as symbolic instructions: *DBGS* 2-2
 priority
 assignment: *BSP* 2-32
 program: *CUSR* 4-2, 4-10; *PROG* 1-3
 ProgramPriority subroutine: *REL* 7-30
 private cartridges: *PROG* 1-25, 3-12; *TUSR* 2-9, 3-16
 privileged: *PROG* 5-6
 commands: *TUSR* 3-29
 *: *TUSR* 3-34
 AN: *TUSR* 3-38
 CT: *TUSR* 3-60
 DP: *TUSR* 3-68
 HE: *TUSR* 3-76
 in procedure files: *TUSR* 3-146
 PA: *TUSR* 3-96
 SM: *TUSR* 3-124
 SY: *TUSR* 3-137
 TE: *TUSR* 3-138, 4-68
 driver: *DRVW* 4-1
 completion section: *DRVW* 4-8
 design considerations: *DRVW* 4-9
 DMS: *DRVW* 4-10
 initiation section: *DRVW* 4-4
 interrupt card: *DRVW* 4-1
 privileged section: *DRVW* 4-5
 sample: *DRVW* 4-17
 structure and operation: *DRVW* 4-3
 timeout values: *DRVW* 4-11
 fence: *PROG* 1-22
 GASP commands: *BSP* 5-1
 interrupt: *PROG* 1-17
 fence: *CMUX* 1-3; *DRVW* 4-1; *UTIL* 2-20
 processing: *PROG* 1-22
 select code: *GEN* 2-21
 subroutine structure: *PROG* 5-4
 PRMPT program: *CMUX* 3-3; *TUSR* 4-15
 procedure files: *PROG* 3-14; *TUSR* 3-19, 3-145
 comments: *TUSR* 3-34
 using global parameters: *TUSR* 3-147
 using in a job: *BSP* 2-27
 Proceed Across Terminations command: *DEBUG* 5-29
 Proceed command: *DEBUG* 2-13, 5-28
 Proceed Uplevel command: *DEBUG* 5-30
 processing of system and breakmode commands: *TUSR* 4-15
 processor, Fast FORTRAN (FFP): *REL* 2-6
 profile option: *LODR* 1-3, 2-20, 4-30, 7-9
 profile output: *LODR* 4-31
 profiling a program: *DEBUG* 6-1
 ProgIsSuper, check for super program: *REL* 6-15
 program
 address, setting: *CMUX* 2-19
 background: *TUSR* 1-3
 breaking execution: *CUSR* 4-8
 changing memory requirements: *CUSR* 4-11
 changing priorities: *CUSR* 4-10
 completion - EXEC 6: *PROG* 2-52
 control commands summary: *CUSR* 4-1
 controlling: *CUSR* 4-1
 development cycle: *LINK* 1-1
 disk-resident: *GEN* B-18; *TUSR* 1-3
 displaying status: *CUSR* 2-7, 4-9
 execution: *CUSR* 4-4; *TUSR* 3-108, 4-56
 father and son: *PROG* 2-59
 file search sequence: *LINK* 4-5
 ID segment: *CUSR* 4-2, 4-4, 4-7, 6-61; *PROG* C-5; *SMM* B-4; *TUSR* C-1

identification: *CUSR* 4-2
 input: *GEN* 2-2
 load and verify: *DBGS* C-6
 loading: *DBGS* 4-1; *GEN* 2-2
 adding permanent: *LODR* 2-9
 deleting permanent: *LODR* 2-10
 permanent: *LODR* 2-8
 replacing permanent: *LODR* 2-9
 requirements and restrictions: *LODR* 2-10
 temporary: *LODR* 2-8
 location counter: *MAC* 1-11, 4-2
 management
 error codes: *PROG* A-13
 EXEC calls: *PROG* 2-51
 memory requirements: *CUSR* 4-11
 memory-resident: *GEN* B-18
 operator suspend: *TUSR* 4-60
 page requirements, modifying: *GEN* 2-80
 partitions: *GEN* B-4; *PROG* 1-15; *TUSR* 1-3, 4-25
 assigning: *GEN* 2-82, 3-17; *SMM* 10-15
 permanent: *TUSR* 3-95
 priorities: *CUSR* 4-2, 4-10; *PROG* 1-3; *TUSR* 4-51
 prompt: *INST* 4-4
 real-time: *TUSR* 1-3
 relocation and linking: *LODR* 1-1, 2-1
 reschedule: *TUSR* 4-37
 schedule at interval time: *TUSR* 4-43
 scheduling: *CMUX* 3-3; *DMUX* 1-2; *TUSR* 1-3, 4-48
 BREAK key: *CMUX* 3-3
 by drivers: *DRVW* 3-27
 disable: *DMUX* 2-17
 enable: *DMUX* 2-15
 EXEC 9,10,23, and 24: *PROG* 2-59
 segment load - EXEC 8: *PROG* 2-57
 segmentation: *PROG* 1-16; *TUSR* 1-5
 shareable EMA: *GEN* 2-81
 size: *LODR* 2-15
 command: *TUSR* 4-64
 state lists: *TUSR* 4-6
 states: *PROG* D-4; *TUSR* 4-4
 disk suspended (state 5): *PROG* D-5; *TUSR* 4-5
 dormant (state 0): *PROG* D-4; *TUSR* 4-4
 general wait (state 3): *PROG* D-4; *TUSR* 4-4
 I/O suspended: *PROG* D-4
 memory suspended (state 4): *PROG* D-4; *TUSR* 4-4
 operator suspended (state 6): *PROG* D-5; *TUSR* 4-5
 scheduled (state 1): *PROG* D-4; *TUSR* 4-4
 suspended (state 2): *TUSR* 4-4
 user diagram: *PROG* D-6
 status: *TUSR* 4-62; *UTIL* 2-2
 status routines: *PROG* 5-74
 suspend - EXEC 7: *PROG* 2-55
 swapping: *PROG* 2-24
 control - EXEC 22: *PROG* 2-72
 temporary: *TUSR* 3-128

 terminate with OF command: *TUSR* 3-94, 4-46
 termination: *LODR* 2-20
 time scheduling: *PROG* 2-65
 type 4 background disk-resident: *GEN* 2-70, B-18
 type 6 extended background: *GEN* B-18
 types: *LODR* 2-13, 4-30; *PROG* 1-6; *UTIL* 2-12
 background: *LODR* 2-15
 extended background: *LODR* 2-15, 3-4
 large background: *LODR* 2-15
 real-time: *LODR* 2-15
 RTE-6/VM: *MAC* O-1
 RTE-A: *MAC* O-1
 summary: *PROG* D-2
 program addition, commands: *LODR* 2-7
 Program Input Phase: *GEN* 2-26, 3-9
 program link instructions: *MAC* 4-1, 4-19, B-14
 program profiler
 displaying a histogram: *DEBUG* 6-3
 features: *DEBUG* 6-1
 sample session: *DEBUG* 6-2
 starting profile mode: *DEBUG* 5-26, 6-2
 program-related tables: *PROG* D-1
 program relocatable
 counter: *MAC* 2-7
 space: *MAC* 1-11, 4-3, 4-9, 4-34
 program relocation: *MAC* 1-10
 program scheduling
 program-to-program communication: *PROG* 5-20
 program types:
 program(s)
 removing: *CUSR* 4-8
 restoring: *CUSR* 4-7, 4-9
 resuming execution: *CUSR* 4-9
 running: *CUSR* 4-3
 running with wait: *CUSR* 4-4
 running without wait: *CUSR* 4-5
 suspending: *CUSR* 4-9
 time scheduling: *CUSR* 4-6
 programmatic logon: *REL* 6-3
 programmatic scheduling: *DEBUG* 2-9
 return parameters for: *LODR* 4-31
 programming aids: *MAC* 1-10
 ProgramPriority: *REL* 7-30
 PROGRAMS Directory: *SMM* 3-13
 ProgramTerminal: *REL* 7-30
 Prompt Character (PC) option: *EDIT* 3-26
 properties, file: *CUSR* 3-1
 PROT (display/change protection) command: *CUSR* 3-27, 3-32, 5-64
 protection
 directory: *CUSR* 3-32
 file: *CUSR* 3-27
 volume: *CUSR* 3-36
 protocol
 defining with CN 34B: *DMUX* 2-27
 descriptions: *DMUX* 2-28
 protocol chart examples: *DMUX* A-1
 prototype ID segment: *CUSR* 6-61
 PRSTR utility: *PROG* 1-33; *UTIL* 3-1, 3-16
 calling PRSTR: *UTIL* 3-16

calling PRSTR interactively: *UTIL* 3-18
 examples: *UTIL* 3-21
 PRTM subroutine: *PROG* 5-43
 PRTN subroutine: *PROG* 5-43
 PS (page align overlays) command: *LINK* 3-17
 PSAVE utility: *PROG* 1-33; *UTIL* 3-11
 calling: *UTIL* 3-11
 calling PSAVE interactively: *UTIL* 3-12
 disc backup example: *INST* 2-10
 examples: *UTIL* 3-14
 PSAVE format
 CS/80 cartridge tape: *UTIL* 3-54
 magnetic tape (reel-to-reel): *UTIL* 3-52
 pseudo operations: *MAC* 2-5, 4-1, B-14
 PSTAT subroutine: *HPIB* 5-8
 PSTVM subroutine: *PROG* 4-38
 PTAPE: *REL* 5-23
 PTERR subroutine: *PROG* 5-63
 PU command: *CUSR* 3-25, 3-32, 5-66; *RDSV* 2-7;
 TUSR 3-100
 pulse dialing: *CMUX* 2-24
 punctuation characters: *EDIT* 2-23, 2-31, 2-34
 PURGE FMP call: *CUSR* B-10; *PROG* 3-47
 purge saver: *RDSV* 2-2
 purging
 a file: *EDIT* 3-11
 account
 PURGE,GROUP: *SMM* 8-23
 PURGE,USER: *SMM* 8-23
 directories: *CUSR* 3-32
 files: *CUSR* 3-25; *INST* 5-4; *TUSR* 3-100
 text: *EDIT* 2-12
 PURVM subroutine: *PROG* 4-37
 pushbutton image format on CS/80 CTD: *UTIL*
 3-56
 pushbutton operations: *UTIL* 3-6
 put a character, SPUT: *REL* 10-13
 PutBitMap: *REL* 12-88
 PutByte: *REL* 12-88
 PutDibit: *REL* 12-89
 PutInCommas: *REL* 7-31
 PutNibble: *REL* 12-89
 PWD command: *CUSR* 5-68

Q

Q command: *EDIT* 4-57
 Q option: *MAC* E-2
 QU command: *CUSR* 5-69; *TUSR* 4-52
 QU option: *EDIT* 3-26
 QueryTimer, return number of ticks remaining:
 REL 7-31
 queue
 depth: *BSP* 5-5
 for outpooling: *BSP* 3-15
 schedule with or without wait: *PROG* 2-59, 2-60
 quick reference task charts: *EDIT* 2-36
 Quiet (Q) option: *EDIT* 3-24
 quiet mode: *EDIT* 3-4, 3-26

quitting
 EDIT: *EDIT* 3-10
 saving changes: *EDIT* 2-17
 without saving changes: *EDIT* 2-8
 screen mode: *EDIT* 1-11, 3-42
 quitting Debug: *DEBUG* 3-7
 quotient, polynomial, double precision: *REL* 3-31
 quoting: *CUSR* 2-23

R

R command: *EDIT* 3-32, 4-59
 R option: *MAC* E-1
 R\$PN\$ program: *CMUX* 3-3; *TUSR* 4-15
 raise
 complex to integer power: *REL* 3-77
 double real to double real power: *REL* 3-82
 double real to real power: *REL* 3-84
 extended real to integer power: *REL* 3-83
 real to double real power: *REL* 3-105
 real to real power: *REL* 3-121
 RAL: *MAC* 3-5, B-4
 RAM: *MAC* B-18, J-11
 RAM (random access memory): *CMUX* 1-3
 random file access: *PROG* 3-49
 range reduction for SIN, .COS, .TAN, .EXP,
 .TANH; /CMRT: *REL* 3-167
 RAR: *MAC* 3-5, B-4
 RBL: *MAC* 3-5, B-4
 RBR: *MAC* 3-5, B-4
 RC command: *LINK* 3-17
 RD bit: *DMUX* 2-26
 RE (relocate) command: *LINK* 3-18; *LODR* 3-9,
 5-7
 RE error: *PROG* A-5
 RE option: *EDIT* 3-26, 4-88, 4-90
 read
 block mode: *CMUX* 4-3
 call - EXEC 1: *PROG* 2-20
 error: *CMUX* 3-8
 HP terminal straps: *DMUX* 2-18
 input buffer: *REL* 5-17
 memory address
 IGET: *REL* 5-9
 IXGET: *REL* 5-9
 request function codes: *CMUX* 2-4
 setting read type: *CMUX* 2-33
 read request: *DMUX* 2-1
 ASCII mode: *DMUX* 2-1
 ASCII vs binary mode: *DMUX* 2-5
 auto-home bit: *DMUX* 2-3
 binary bit: *DMUX* 2-3
 block mode: *DMUX* 2-5
 buffered: *DMUX* 2-25
 BUFR and BUFLN parameters: *DMUX* 2-1
 character mode types: *DMUX* 2-3
 control word (CNTWD): *DMUX* 2-2
 echo bit: *DMUX* 2-2
 special status read: *DMUX* 2-7
 transparency bit: *DMUX* 2-2

Z-bit: *DMUX* 2-2
read tape utility (READT): *UTIL* 5-1
READ/ENTER/INPUT/WRITE/PRINT
statements: *HPIB* 4-22
READF FMP call: *CUSR* B-5; *PROG* 3-50
reading in a file: *EDIT* 2-9
reading the screen: *EDIT* 2-11, 2-24
READR
READR commands
/A: *RDSV* 3-11
/E: *RDSV* 3-11
AL: *RDSV* 3-6
and file selection phase: *RDSV* 3-1, 3-6
CO: *RDSV* 3-6
EC: *RDSV* 3-6
LI: *RDSV* 3-6
MT: *RDSV* 3-7
OC,n: *RDSV* 3-8
OS,n: *RDSV* 3-8
SE,namr: *RDSV* 3-8
TR,namr: *RDSV* 3-10
TT: *RDSV* 3-10
UP: *RDSV* 3-10
VE: *RDSV* 3-11
file restoration phase: *RDSV* 3-1
file selection phase: *RDSV* 3-1
tape format media supplied: *INST* D-12
READT utility: *PROG* 1-33; *UTIL* 5-1, 5-6;
TUSR 1-10
calling: *UTIL* 5-6
error messages: *UTIL* 5-9
examples: *UTIL* 5-8
real
to double real, conversion: *REL* 3-64
to integer, conversion: *REL* 3-46
real remainder: *REL* 3-8
REAL routine: *REL* 3-52
real to integer, truncate: *REL* 3-47
real-time
clock: *TUSR* 4-69
command: *LINK* 3-19
partition: *TUSR* 1-3
program: *TUSR* 1-3
programming: *TUSR* 1-2
real-time (RT) COMMON: *GEN* B-2; *PROG*
1-12
area: *PROG* 1-10
changing: *GEN* 2-61
real-time (RT) disk residents: *GEN* 2-70
Real-Time Disk Usage: *SMM* A-1
real-time map: *GEN* B-5
real-time program: *LODR* 2-15
rearranging files on a volume: *UTIL* 6-6
reassign file protection status: *CUSR* 3-27
reception, bits per character: *CMUX* 2-19
reception buffers: *CMUX* 1-3
reconfiguration
example: *SMM* 10-16
exceptions: *INST* D-6
halts: *SMM* 10-19
I/O: *INST* D-6
memory: *INST* D-6
procedures: *SMM* 10-5
Memory: *SMM* 10-9
steps, I/O: *SMM* 10-6
reconfigurator loading: *INST* D-5
reconfiguring your system: *INST* 5-1
record: *PROG* 3-1; *TUSR* 3-3
file: *DEBUG* 7-1, 7-10
format: *PROG* I-1; *TUSR* 3-72, 3-131
length: *CUSR* 3-12; *PROG* 3-5
position
change: *BSP* 3-21
retrieve: *BSP* 3-20
reconfiguration utility (OLDRE): *UTIL* 2-1,
2-61
record-all file: *DEBUG* 7-10
recover parameter string: *PROG* 5-45
recovery mode: *EDIT* 3-4, 3-47, B-3
See also recovery operation
error messages: *EDIT* 3-48
recovery operation: *EDIT* 1-2, 1-8, 3-4, 3-46
recursion: *MAC* 5-13
and offpath references: *LODR* 3-19, 3-20, 6-20
redefinition of opcodes: *MAC* 5-11
reduce argument, for SIN, COS, TAN, EXP: *REL*
3-72
reducing
links: *LODR* 8-10
load time: *LODR* 6-18, 8-12
path size: *LODR* 8-8
re-entrant: *PROG* 5-6
I/O: *GEN* 2-77; *PROG* 1-18; *TUSR* 4-8
I/O subroutine REIO: *PROG* 5-55
subroutine: *GEN* 2-77
subroutine structure: *PROG* 5-2
re-executing a command: *EDIT* 2-35
reformat current time: *PROG* 5-90
refresh: *DEBUG* 5-35
register halts: *INST* A-3
register reference
alter-skip group: *MAC* 3-5, 3-8, B-6
shift-rotate group: *MAC* 3-5, B-4
registers
map: *DBGS* C-9
special: *DBGS* C-9
regular expressions
See also metacharacter
and RTE user interface: *EDIT* 5-27
building CI command file: *EDIT* 5-27
creating patterns: *EDIT* 5-20
definition: *EDIT* 3-22, 5-2, B-3
exercises: *EDIT* 5-25
gathering data from files: *EDIT* 5-29
line length limitations: *EDIT* 5-5, 5-6
match one or more occurrences (+): *EDIT* 5-13
match zero or more occurrences (*): *EDIT* 5-12
Regular Expressions (RE) option: *EDIT* 3-26, 4-4,
4-13
REIO (re-entrant I/O): *BSP* 3-18; *CMUX* 4-4;
PROG 5-55
release

disk tracks: *TUSR* 4-55
 reserved partition: *TUSR* 4-75
 tracks: *TUSR* 3-107
 relinking: *LINK* 4-7
 LK command: *LINK* 3-12
 RELOC: *MAC* 1-11, 4-3, 4-13, 4-23, 4-34, 4-41, B-14
 RELOC command: *MAC* 4-9, M-8
 RELOC macro: *MAC* N-12
 relocatable
 assembly: *MAC* E-1
 code: *LODR* 1-1; *MAC* 1-4
 expressions: *MAC* 2-10
 extended records: *MAC* 1-2, 1-3
 file search sequence: *LINK* 4-5
 indexer. *See* *INDXR*.
 non-extended records: *MAC* 1-2, 1-3
 program: *MAC* 4-4
 record formats: *MAC* H-1; *PROG* I-3
 records: *UTIL* 2-61
 space
 base page: *MAC* 1-11
 common: *MAC* 1-11
 EMA: *MAC* 1-11
 labeled common: *MAC* 1-11
 program: *MAC* 1-11
 SAVE: *MAC* 1-11
 relocate command: *GEN* 2-35; *LODR* 5-1
 relocating and installing device drives online: *UTIL* 10-1
 relocating drivers: *UTIL* 10-5
 relocating loader (LOADR): *LODR* 9-1; *TUSR* 1-9
 relocation base: *LODR* 2-2, 3-4
 relocation base. *See also* load point.
 relocation commands: *LODR* 2-1
 LI (user library file): *LODR* 2-1
 LO (set relocation base): *LODR* 2-1
 MS (multiple search): *LODR* 2-1
 RE (relocate): *LODR* 2-1
 SA (save area): *LODR* 2-1
 SE (search): *LODR* 2-1
 SL (search user library): *LODR* 2-1
 relocation sequence: *LINK* 4-9
 remainder
 double real: *REL* 3-100
 extended real: *REL* 3-30
 integer: *REL* 3-51
 real: *REL* 3-8
 remote file
 access limitations: *CUSR* 3-43
 defaults: *LINK* 4-6
 closing: *CUSR* 3-42
 considerations: *CUSR* 3-42
 multiuser: *CUSR* 3-41
 specifying: *CUSR* 3-40
 remote mode: *HPIB* 4-16
 REMOTE statement: *HPIB* 4-16
 removable cartridges: *TUSR* 3-13
 Remove (R) option: *EDIT* 3-24
 removing
 programs: *CUSR* 4-8
 trailing blanks, TrimLen: *REL* 7-41
 working directory: *LINK* B-1
 REN bus command: *HPIB* 4-16
 REN bus management line: *HPIB* 1-7
 renaming files: *CUSR* 3-24; *TUSR* 3-102
 reordering modules: *LINK* 4-1
 REP: *MAC* B-18, J-5
 REPEAT: *MAC* 4-63, 4-66, B-17
 repeat (_) command: *EDIT* 4-92, 4-98
 repeating command string: *EDIT* 4-98
 replace pending line with text. *See* R command
 replacement drivers: *UTIL* 10-1, 10-11, 10-16, 10-20
 replacement formats: *MAC* 3-18
 replacement values: *GEN* 2-45
 replacing
 a file: *EDIT* 4-16
 a file without exiting EDIT: *EDIT* 4-87
 permanent programs: *LODR* 2-7, 2-9
 text: *EDIT* 3-33
 See also pattern exchange
 report disk Free Space (FREES): *UTIL* 6-18
 report File Space by Owner (FOWN): *UTIL* 6-21
 calling FOWN: *UTIL* 6-21
 FOWN examples: *UTIL* 6-21
 request code: *CMUX* 2-1
 request error explanation: *TUSR* 3-32
 required partition size: *LODR* 2-15
 requirements for program loading: *LODR* 2-11
 reschedule program: *TUSR* 4-37
 reserved memory partitions: *CUSR* 4-12
 ResetAcctTotals, reset user and group accounting totals: *REL* 6-15
 ResetTimer: *REL* 7-31
 RESOLVE (system macro): *MAC* L-17
 resource management: *PROG* 1-23; *TUSR* 1-5
 subroutine RNRQ: *PROG* 5-26
 resource numbers (RN): *GEN* 2-66; *PROG* 1-23, 5-26
 and logical unit lock applications: *PROG* 5-24
 locked, WhoLockedRn: *REL* 7-42
 response preparation: *GEN* 2-8
 restart I/O sequence: *DRVW* 3-26
 restart session FMGR: *TUSR* 4-54
 restore output processing: *DMUX* 2-18
 restoring
 cartridge to disk: *UTIL* 5-6
 CS/80 disk: *INST* D-7
 HP 7906/7920 disks: *INST* D-7
 HP 7906H/7920H disks: *INST* D-7
 primary system: *INST* D-7
 programs: *CUSR* 4-7, 4-9; *TUSR* 3-104, 3-110
 restrictions: *DBGS* 6-7
 resuming program execution: *CUSR* 4-9
 retrieve record position: *BSP* 3-20
 retry count: *CMUX* 2-21
 return
 data on timeout (RD bit): *DMUX* 2-26
 direct address, AddressOf: *REL* 7-1
 group ID

GroupToId: *REL* 6-11
 OwnerToId: *REL* 6-14
 group name
 GPNAM: *REL* 6-10
 IdToGroup: *REL* 6-11
 number of ticks remaining, QueryTimer: *REL* 7-31
 owner ID, GetOwnerNum: *REL* 6-9
 segment address, MyIdAdd: *REL* 7-28
 session number
 RTNSN: *REL* 6-16
 USNUM: *REL* 6-21
 status: *CUSR* 2-24
 user ID, OwnerToId: *REL* 6-14
 user name
 IdToOwner: *REL* 6-12
 SessnToOwnerName: *REL* 6-17
 USNAM: *REL* 6-21
 user table address, LUSES: *REL* 6-12
 return address adjust
 .ENTC: *REL* 5-27
 .ENTN: *REL* 5-27
 .ENTP: *REL* 5-28
 .ENTR: *REL* 5-28
 Return command: *CUSR* 5-70; *DEBUG* 5-30
 Return (RT) option: *EDIT* 3-26, 4-4
 return parameter subroutines: *PROG* 5-43
 return parameters for programmatic scheduling:
 LODR 4-31
 reverse COMMON. *See* COMMON.
 reverse common command: *LINK* 3-17
 Reverse (V) option: *EDIT* 3-24
 reverse match: *EDIT* B-3
 reversing commands: *EDIT* 2-29
 reviewing commands entered: *EDIT* 2-35
 rewind tape, .TAPE: *REL* 5-39
 Rex routines: *REL* 7-32
 RexBuildPattern: *REL* 7-33
 RexBuildSubst: *REL* 7-32
 RexExchange: *REL* 7-32
 RexMatch: *REL* 7-32
 RM (relocate module) command: *LINK* 3-18
 RMOTE subroutine: *HPIB* 4-15
 RMPAR subroutine: *BSP* 3-2, 3-11, 3-21; *CMUX* 3-3; *HPIB* 5-9, 5-13, 5-14; *LODR* 4-31; *PROG* 5-41; *REL* 5-24
 RN command: *CUSR* 3-20, 3-24, 5-71; *TUSR* 3-102
 RNRQ subroutine: *PROG* 5-26
 allocate options: *PROG* 5-29
 set options: *PROG* 5-29
 RO (reorder) command: *LINK* 3-19
 ROM
 Configurator Scheduling: *SMM* 10-1
 Disk Loader: *SMM* 6-3
 root node: *LODR* 3-2
 root node only: *LODR* 7-2
 ROTATE (system macro): *MAC* L-15
 rotating base page: *LODR* 4-24
 round, real: *REL* 3-38
 rounding of digit string produced by .FMUO,
 .FMUR: *REL* 5-33
 routine: *LODR* 3-2
 routines
 callable from FORTRAN: *PROG* 5-9; *REL* 2-6
 callable from Pascal: *PROG* 5-9; *REL* 2-7
 format of: *PROG* 5-7; *REL* 1-1
 RP command: *CUSR* 5-72; *TUSR* 3-104
 RPL: *LODR* 6-11; *MAC* 4-19, 4-24, B-14, H-13, H-15; *REL* 2-6
 RQ error: *PROG* A-5
 RRL: *MAC* 3-12, B-11
 RRR: *MAC* 3-12, B-11
 RS command: *BSP* 4-4, 4-5, 4-21; *TUSR* 4-54
 RS (restart a program) command: *CUSR* 4-9
 RS (restart session progenitor) command: *CUSR* 5-73
 RS-232-C: *CMUX* 1-3, 5-2
 RS-423-A EIA: *CMUX* 1-3, 5-2
 RSA: *MAC* 3-16, B-13
 RSB: *MAC* 3-16, B-13
 RSS: *MAC* 3-8, B-6
 RT. *See* real-time.
 RT command: *LINK* 3-19; *TUSR* 3-107, 4-55
 RT (real-time) memory lock: *GEN* 2-22
 RT option: *EDIT* 3-26
 RT_ER: *REL* 5-25
 RT6GN - online generator: *PROG* 1-32
 RTCOM: *GEN* B-3
 RTE input/output structure: *DRVW* 2-1
 RTE operating system: *EDIT* 2-2, 3-12
 and *EDIT* regular expressions: *EDIT* 5-27
 error/information messages: *EDIT* A-14
 file system errors: *EDIT* 3-45
 general description: *TUSR* 1-1
 RTE-6/VM: *EDIT* 1-1
 RTE-A: *EDIT* 1-1
 user interface: *EDIT* 2-7, 2-17, 2-19, 2-27, 3-11
 RTE-A
 Hello program: *EDIT* 1-4
 program types: *MAC* O-1
 RTE-6/VM: *SMM* 4-90
 file system: *CUSR* 1-1
 installation: *INST* 1-3; *LINK* 5-1
 memory organization: *GEN* B-1
 program types: *MAC* O-1
 snapshot file: *LINK* 4-1
 system disk layout: *TUSR* C-7
 RTEMA: *GEN* B-3
 RTERR: *GEN* B-3
 RTIME: *GEN* B-3
 RTIOQ: *GEN* B-3
 RTNSN, return session number: *REL* 6-16
 RTRAP: *REL* 5-5
 RU command: *CUSR* 3-33, 4-3, 5-74; *EDIT* 3-11, 3-50, 4-60; *TUSR* 3-108, 4-56
 Run command: *DEBUG* 5-30
 run length encoding: *REL* 12-4, 12-5
 running a program: *CUSR* 4-3; *EDIT* 4-60; *TUSR* 3-108, 4-56

time scheduling programs: *CUSR* 4-6
 with wait: *CUSR* 4-4
 without wait: *CUSR* 4-5
 running
 ACCTS: *SMM* 7-4
 Group Account Definitions: *SMM* 7-10
 Initialization Dialogue: *SMM* 7-4
 User Account Definitions: *SMM* 7-11
 debug: *DBUG* 2-11
 Macro/1000: *MAC* E-4
 LINK: *LINK* 2-1
 interactively: *LINK* 2-4, B-1
 READR: *RDSV* 3-3
 runstring
 commands: *LINK* 2-2, B-2
 defaults: *LINK* 4-6
 definition: *EDIT* 1-2, 1-6, B-3
 description: *EDIT* 3-3
 examples: *LINK* 2-5; *MAC* E-7
 file recovery: *EDIT* 3-47
 including editing commands in: *EDIT* 3-49
 including S command: *EDIT* 1-11, 2-10
 options: *EDIT* 3-3
 parameters: *MAC* E-4
 SGMTR: *LODR* 6-1
 screen command in: *EDIT* 3-34
 variations: *EDIT* 2-7
 RVA: *MAC* 3-16, B-13
 RVB: *MAC* 3-16, B-13
 RWNDF FMP call: *PROG* 3-71

S

S command: *EDIT* 1-11, 2-10, 2-19, 2-27, 3-34, 4-61
 S Globals: *TUSR* 3-23
 S-Register set, ISSR: *REL* 5-14
 SA (save): *LODR* 5-8
 SA command: *TUSR* B-10
 SA2DE, A2 to decimal conversion: *REL* 10-31
 SADD, substring add: *REL* 10-17
 SAE: *MAC* 3-5, B-4
 SAM Extension Reconfiguration: *SMM* 10-10
 SamInfo (RTE-A only): *REL* 7-35
 sample
 answer file: *GEN* E-1
 calling sequence and node tree: *LODR* 3-6
 command file: *LODR* 3-11
 generation: *GEN* 3-5
 generation listing: *GEN* F-1
 program
 loadmap: *LINK* 4-11; *LODR* 4-18, 4-21, 4-25
 SGMTR output: *LODR* D-5
 source code: *LODR* D-1
 SXREF output: *LODR* D-8
 trace of MLLDR processing: *LODR* 3-13
 worksheet conventions: *SMM* 4-46
 SAVE: *LODR* 70-1
 area: *LODR* 4-19, 7-2

allocation: *LINK* 4-2
 labeled COMMON: *LODR* 6-10
 loader command: *LODR* 5-8
 variable: *LODR* 6-19
 SAVE button caution, CS/80 disk: *INST* D-9
 save data on break: *DMUX* 2-24
 save program: *TUSR* 3-126
 save to purge, change: *BSP* 3-14
 SAVE relocatable space: *MAC* 1-11, 4-3, 4-9, 4-22
 SAVER
 command and file search phase: *RDSV* 2-1, 2-6
 error messages: *RDSV* A-1
 file purge phase: *RDSV* 2-2, 2-13
 file save phase: *RDSV* 2-1, 2-12
 scheduling: *RDSV* 2-2
 SAVER commands
 /A: *RDSV* 2-11
 /E: *RDSV* 2-12
 CO: *RDSV* 2-6
 EC: *RDSV* 2-6
 ER: *RDSV* 2-6
 LI: *RDSV* 2-6
 MT: *RDSV* 2-6
 PU: *RDSV* 2-7
 SE,namr: *RDSV* 2-7
 SO: *RDSV* 2-9
 SS: *RDSV* 2-10
 SZ: *RDSV* 2-10
 T6: *RDSV* 2-11
 TR,NAMR: *RDSV* 2-10
 TT: *RDSV* 2-11
 UN: *RDSV* 2-11
 VE: *RDSV* 2-11
 saving
 a file: *EDIT* 2-17, 2-24, 3-5
 and exiting EDIT: *EDIT* 2-17
 file after abnormal abort: *EDIT* 3-46, 3-47
 line marks: *EDIT* 2-24
 screen edits: *EDIT* 2-15, 3-37, 3-42
 without exiting EDIT: *EDIT* 2-24
 saving-resources
 completion: *PROG* 2-53
 termination: *LODR* 2-20
 SAX: *MAC* 3-10, B-7
 SAY: *MAC* 3-10, B-7
 SBE: *MAC* 3-5, B-4
 SBS: *MAC* 3-4, B-3
 SBT: *MAC* 3-4, B-3
 SBX: *MAC* 3-10, B-7
 SBY: *MAC* 3-10, B-7
 SC command: *EDIT* 4-68
 SC (system common) command: *LINK* 3-19
 scalar-vector arithmetic routines: *REL* 8-11
 SCARY, D2 decimal substring carries: *REL* 10-33
 SCHD6: *GEN* B-3
 schedule call error codes: *PROG* A-8
 schedule configuration from ROM: *SMM* 10-1
 schedule configurator from bootstrap loader:
SMM 10-2
 scheduled list: *PROG* 1-3
 scheduling: *PROG* 1-3

circular: *TUSR* 1-3
 FMGR interactively: *TUSR* D-1
 FMGR programmatically: *PROG* J-1
 linear: *TUSR* 1-3
 LINK: *LINK* 2-1, B-1
 program: *TUSR* 4-48
 program without wait: *DEBUG* 5-17
 READR: *RDSV* 3-2
 SAVER: *RDSV* 2-2
 string passage: *GEN* 2-77
 SCOM utility: *PROG* 1-33; *TUSR* 1-12; *UTIL* 2-1, 2-40, 2-43
 calling: *UTIL* 2-43
 compare operation: *UTIL* 2-47
 error messages: *UTIL* 2-56
 examples: *UTIL* 2-49
 options: *UTIL* 2-44
 returned values: *UTIL* 2-48
 status interrogation: *UTIL* 2-48
 scoping rules: *DEBUG* 4-4
 scratch cartridge command: *LINK* 3-5
 SCRATCH directory: *SMM* 3-13
 scratch directory file: *EDIT* 3-47
 scratch file: *PROG* 3-28, 3-34
 command: *LINK* 3-5
 definition: *EDIT* 1-8, B-3, C-2
 system: *EDIT* 3-47
 screen
 accessing next: *EDIT* 2-15, 3-38, 4-62
 accessing previous: *EDIT* 2-15, 3-38, 4-62, 4-63
 advance: *EDIT* 2-15
 brackets: *EDIT* 2-11, 2-21, 3-34, 4-66
 copy: *EDIT* 4-68
 display: *EDIT* 2-11, 2-16, 3-35
 error message: *EDIT* 2-12
 extended: *EDIT* 3-35
 line limit, show: *EDIT* 3-35
 line overlap: *EDIT* 2-14, 3-35
 overflow protection: *EDIT* 3-35
 read and write: *EDIT* 2-11
 size, show: *EDIT* 3-35
 wrap-around: *EDIT* 2-12
 Screen (S) command: *EDIT* 2-10
 Screen Default (SD) option: *EDIT* 2-11, 3-27, 3-35
 Screen line Limit (SL) option: *EDIT* 3-27
 screen mode: *DMUX* 1-4
 command: *EDIT* 1-11
 commands: *EDIT* 4-61
 control key combinations: *EDIT* 2-14, 3-36, 4-61
 copy block of text: *EDIT* 4-6
 defaults: *EDIT* 4-67
 definition: *EDIT* B-3
 description: *EDIT* 1-10, 1-11, 2-10, 3-34
 double execution of control keys: *EDIT* 2-15
 editing: *EDIT* 1-2, 1-11, 2-4, 2-10, 3-34, 4-61
 editing commands: *EDIT* 2-37
 entering: *EDIT* 4-61
 error message: *EDIT* 2-12, 3-42, 4-66
 exiting: *EDIT* 2-11, 2-17, 2-21, 3-34, 3-42
 line commands: *EDIT* 2-20, 3-36
 line marks: *EDIT* 2-23, 2-24
 maximum lines: *EDIT* 2-11
 move block of text: *EDIT* 4-9
 quit: *EDIT* 3-38, 4-63
 single execution of control keys: *EDIT* 2-15
 SD - shut down spooling: *BSP* 4-4, 4-5, 4-29
 SD option: *EDIT* 2-11, 3-27
 SD1D2, D1 to D2 decimal format conversion: *REL* 10-37
 SD2D1, D2 to D1 decimal substring conversion: *REL* 10-38
 SDA: System Driver Area: *DRVW* 2-15
 SDC bus command: *HPIB* 4-6
 SDCAR, D1 decimal substring carries: *REL* 10-34
 SDEA2, D2 to A2 substring conversion: *REL* 10-36
 SDIV, divide substrings: *REL* 10-19
 SE (search): *LODR* 3-10, 5-1, 5-8
 SE command: *EDIT* 2-7, 2-11, 3-25, 3-29, 3-36, 4-69, 5-8; *LINK* 3-20; *RDSV* 3-4, 3-8; *TUSR* 3-113
 SE,namr command: *RDSV* 2-7
 search
 and exchange commands: *EDIT* 3-24
 and replace. *See* pattern exchange, Y command
 commands: *LODR* 4-14, 9-5
 MS (multiple search): *LODR* 5-6
 SL (search user libraries): *LODR* 5-9
 limit: *EDIT* 2-32
 mask: *DBGS* 5-1
 processing: *LODR* 3-13, 4-14, 5-4, 5-6, 6-6, 6-8, 9-2
 range: *EDIT* 2-31
 sequence: *LINK* 4-10
 sequences, specifying a directory: *CUSR* 3-33
 window: *EDIT* 3-18, 5-8, 5-9
 searching
 for a pattern: *EDIT* 2-31, 2-41
 for files: *CUSR* 3-33
 for source file: *MAC* E-9
 libraries
 LI command: *LINK* 3-11
 MS command: *LINK* 3-14
 SE command: *LINK* 3-20
 secondary addressing: *HPIB* 4-22
 secondary command
 PPD—Parallel Poll Disable: *HPIB* 4-7
 PPE—Parallel Poll Enable: *HPIB* 4-7
 Seconds routine: *REL* 7-35
 seconds since 12 AM January 1, 1970: *REL* 7-35
 DayTime: *REL* 7-16
 sector: *TUSR* 3-2
 sector interleaving: *UTIL* 9-5, 9-6, 9-32, A-4
 security: *EDIT* 3-48
 security code: *EDIT* 1-13, A-5; *TUSR* 3-15
 file: *PROG* 3-24
 files: *PROG* 3-11
 master: *PROG* 3-11
 SECW/SECR/SECWR/SECRR subroutines: *HPIB* 4-22
 SEDIT, output editing routine: *REL* 10-28
 SEGLD subroutine: *LODR* 2-6, 9-1; *PROG* 5-66

- with link: *PROG* 5-66
- with loader: *PROG* 5-67
- segment address
 - MyIdAdd: *REL* 7-28
 - to program name an LU number conversion, IdAddToName: *REL* 7-22
 - to segment number, IdAddToNumber: *REL* 7-22
- segment number to segment address, IdNumberToAdd: *REL* 7-23
- segmentation. *See also* multi-level segmentation
- segmentation
 - and loading tools: *LODR* 2-7, 6-1
 - in previous operating systems: *LODR* 2-6
 - multi-level: *PROG* 1-16
 - options: *LODR* 6-6
 - programmatically: *PROG* 1-16, 2-57
 - restrictions: *LODR* 3-16, 6-19
 - techniques: *PROG* 1-16
 - utility SGMTR: *LODR* 6-1
- segmented programs: *TUSR* 3-128
- segmenter utility - *see* SGMTR
- SEGRT subroutine: *PROG* 5-69
- select code: *DRVW* 2-12; *HPIB* 2-3
 - assignments: *SMM* 4-38
 - I/O: *PROG* 1-19
- selecting the operation environment: *INST* 4-5
- selective assembly options N,Z: *MAC* E-2
- self time scheduling: *PROG* 2-67
- semicolon (;): *BSP* 2-41; *DEBUG* 2-12
- send message
 - to list device: *TUSR* 3-38
 - to session user: *TUSR* 3-124
 - to system console: *PROG* 5-89; *TUSR* 3-138
- SEP.6 patterns file: *UTIL* 11-1
- sequence counter: *CUSR* 7-3
- sequence numbers (#) command: *EDIT* 4-92
- sequential files: *PROG* 3-64
 - access: *PROG* 3-49
- serial drivers
 - comparison to previous drivers: *DMUX* 3-1
 - DV800 and DVM00: *DMUX* 3-1
 - DVC00 and DVR00: *DMUX* 3-2
 - control request: *DMUX* 2-11
 - device type: *DMUX* 2-27
 - EQT entries: *DMUX* B-1
 - EQT extension words: *DMUX* B-2
 - usage: *DMUX* B-5
 - generation considerations: *DMUX* B-1
 - interrupt table: *DMUX* B-2
 - list of
 - RTE-6/VM: *DMUX* 1-1
 - RTE-A: *DMUX* 1-1
 - LU table: *DMUX* B-2
 - Master EQT: *DMUX* B-5
 - MUX pre-driver: *DMUX* B-2
 - read request: *DMUX* 2-1
 - special characters: *DMUX* 2-4
 - user-level interface: *DMUX* 2-1
 - write request: *DMUX* 2-9
- serial polling: *HPIB* 5-9, 5-18
- automatic: *HPIB* 5-8
- BASIC subroutines: *HPIB* 5-10, 5-18, 5-19
- disabling: *HPIB* 5-15
- GETINTR function: *HPIB* 5-6
- service programs: *HPIB* 5-9, 5-12
- SPOLL function: *HPIB* 5-5
- STATS subroutine: *HPIB* 5-5
- serial ports, status of: *UTIL* 2-30
- serially-reusable
 - completion: *PROG* 2-52
 - termination: *LODR* 2-20
- service programs: *HPIB* 5-12
 - bus: *HPIB* 5-12
- service request
 - from BASIC: *HPIB* 5-9, 5-12
 - from FORTRAN: *HPIB* 5-21
- session
 - account file: *SMM* 3-1, 3-4
 - account maintenance: *INST* 4-8
 - cartridge allocation and access: *TUSR* 3-18
 - concept: *SMM* 3-1
 - environment: *SMM* 3-1
 - HELP operation: *SMM* 6-16
 - features: *TUSR* 2-1
 - identification number: *TUSR* 2-4
 - logon/logoff processors: *SMM* 3-5
 - mode: *TUSR* 2-11
 - number
 - RTNSN: *REL* 6-16
 - USNUM: *REL* 6-21
 - or batch environment: *BSP* 2-1
 - table
 - active: *SMM* C-7
 - relationship: *PROG* H-4
 - termination: *INST* 4-9
 - user access: *TUSR* 1-6
 - word: *TUSR* C-5
- Session Control Block (SCB): *BSP* 2-32; *PROG* 1-24, H-1; *SMM* 3-2, C-1; *TUSR* 2-10, 3-37, 3-92, C-15
- session LU: *BSP* 3-7; *PROG* 1-20, 1-24
 - allocation worksheet: *SMM* 7-2
 - definition: *SMM* 7-1
 - account SST definition: *SMM* 7-1
 - configuration table definition: *SMM* 7-1
- Session Monitor: *PROG* 1-20, 1-24, 3-13; *SMM* 1-4, 4-110; *TUSR* 1-6, 2-1; *UTIL* 1-1
 - account file: *SMM* 3-2, 8-1
 - breakmode processors: *SMM* 3-4
 - cartridge structure: *TUSR* 1-6
 - Command Interpreter (CI): *SMM* 3-5
 - components: *SMM* 3-3
 - File Management System: *SMM* 3-5
 - initialization: *SMM* 7-1
 - operating system: *SMM* 3-5
 - system control: *SMM* 8-24
 - SD: *SMM* 8-25
 - SD,0: *SMM* 8-24
 - SD,SESSION: *SMM* 8-24
 - tables: *SMM* C-1
- session-related data structure: *TUSR* 2-10

Session Switch Table (SST): *BSP* 2-6, 3-4, 4-25;
PROG 1-24, H-3; *SMM* 3-2, C-3; *TUSR* 1-6, 2-2,
 2-10, 3-21, 3-92, 3-114, 3-122, 4-58, C-17
 SESSN subroutine: *PROG* 5-64
 SessnToOwnerName, return user name: *REL* 6-17
 SET (display/define variables) command: *CUSR*
 2-17, 2-19, 5-76
 Set command: *DEBUG* 5-31
 set or clear memory: *DBGS* 5-4
 set up a working directory: *CUSR* 3-29
 set up spool file for I/O device: *TUSR* 3-116
 SetAcctLimits, set user and group accounting
 limits: *REL* 6-17
 SETBIT (system macro): *MAC* L-2, L-12
 SetBitMap: *REL* 12-90
 SetPriority: *REL* 12-90
 SetTimer: *REL* 7-36
 setting
 baud rate: *CMUX* 2-20
 baud rate generator: *CMUX* 2-19
 binary length: *CMUX* 2-32
 break flag: *TUSR* 4-29
 breakpoint, MLLDR: *DBGS* 6-3
 breakpoints: *DEBUG* 3-4, 5-4
 global parameters: *TUSR* 3-113
 ID segment address of modem alarm program:
 CMUX 2-21
 line length: *EDIT* 3-3
 lines to minimum length: *EDIT* 5-24
 location counter: *DBGS* 3-2
 options: *EDIT* 2-7, 2-40, 3-29, 4-69
 port configuration: *CMUX* 2-31
 port ID: *CMUX* 2-19; *DMUX* 2-19
 port number: *CMUX* 2-21
 port protocol: *DMUX* 2-26
 program address: *CMUX* 2-19
 read type: *CMUX* 2-33
 real-time clock: *TUSR* 4-70
 search path: *DEBUG* 5-27
 tabs: *EDIT* 4-75
 time and date: *EDIT* 4-77
 timeout: *CMUX* 2-18
 user and group accounting limits, SetAcctLimits:
 REL 6-17
 virtual memory size: *LINK* 3-23
 SETTM subroutine: *PROG* 5-71
 setup buffer: *BSP* 3-4
 setup with SPOPN: *BSP* 3-4
 severity: *BSP* 2-28
 code: *TUSR* 3-135
 setting: *BSP* 2-28
 SEXT: *MAC* 4-19
 SEZ: *MAC* 3-8, B-6
 SFB: *MAC* 3-4, B-3
 SFC: *MAC* 3-13, B-10
 SFILL, substring fill: *REL* 10-9
 SFS: *MAC* 3-13, B-10
 SGET, get a character: *REL* 10-10
 SGMTR - see also loading large programs
 SGMTR: *LODR* 3-5, 6-1, 8-1, 8-4; *PROG* 1-31
 aborting: *LODR* 6-7
 error messages: *LODR* A-12
 errors, summary: *LODR* 6-21
 first run of SGMTR: *LODR* 8-4
 function: *LODR* 6-1
 indexed and merged files: *LODR* 6-11
 merged and indexed files: *LODR* 6-11
 offpath reference message: *LODR* 6-22
 operation: *LODR* 6-1
 output: *LODR* 6-12
 passing procedures as parameters: *LODR* 6-20
 preparing the input file: *LODR* 6-7
 reducing path size: *LODR* 8-8
 requirements for COMMON: *LODR* 6-7
 RPLs: *LODR* 6-11
 runstring parameters: *LODR* 6-1
 input: *LODR* 6-1, 6-2
 load options: *LODR* 6-2, 6-6
 main entry point: *LODR* 6-2, 6-4
 output: *LODR* 6-1, 6-2
 path size: *LODR* 6-2, 6-3
 sample output: *LODR* D-5
 scratch file: *LODR* 6-7
 segmentation restrictions: *LODR* 6-19
 segmenting a subtree: *LODR* 6-5
 shortening the command file: *LODR* 6-18
 symbol table overflow: *LODR* 8-3
 segmentation options: *LODR* 6-2, 6-6
 SH ALL command. See SH command
 SH command: *EDIT* 2-11, 2-20, 2-21, 2-23, 3-29,
 4-72
 SH (shareable EMA) command: *LINK* 3-20;
LODR 5-9
 SH loader command: *PROG* 4-8, 4-9
 shareable EMA: *LODR* 1-3, 2-17, 4-30
 declaration: *PROG* 4-8, 4-9
 label: *PROG* 4-7
 label file: *LODR* 2-17; *PROG* 4-8, 4-9
 partitions: *LODR* 2-17; *GEN* 2-81, 3-17; *PROG*
 1-15, 2-82, 4-7, 4-10, 4-12; *TUSR* 1-4, 4-26
 lock - LKEMA subroutine: *PROG* 4-23;
 TUSR 4-73
 unlock - ULEMA subroutine: *PROG* 4-23;
 TUSR 4-73
 program considerations: *PROG* 4-8, 4-9
 programs: *GEN* 2-81
 using: *PROG* 4-7
 shared base page: *LODR* 4-24
 shared logical address space: *LODR* 3-4
 SHEMA
 allocation: *LINK* 4-2
 shift-rotate group: *MAC* 3-5, B-4
 short ID handler: *SMM* 6-19
 short ID segments: *GEN* 2-68, 3-14; *PROG* C-11;
 TUSR C-7
 shortening the command file: *LODR* 6-18
 Show (SH) command: *EDIT* 2-11
 SIGN: *REL* 3-53
 entry (call-by-name), %IGN: *REL* 3-151
 sign
 bit, S-Register, ISSW: *REL* 5-15
 change, SSIGN: *REL* 10-40

real or integer times integer, calculate: *REL* 3-49
 real or integer times real, calculate: *REL* 3-53
 transfer, extended real: *REL* 3-33
 signal lines
 bus management: *HPIB* 1-7
 data: *HPIB* 1-5
 handshake: *HPIB* 1-6
 SIN: *REL* 3-54
 entry (call-by-name), %IN: *REL* 3-152
 range reduction, /CMRT: *REL* 3-167
 sine
 #SIN call: *REL* 3-139
 complex: *REL* 3-17
 double precision: *REL* 3-110
 double real (no error return), /SIN: *REL* 3-172
 extended real: *REL* 3-34
 real: *REL* 3-16, 3-54
 Single Exchange (S) option: *EDIT* 3-24
 single-level segmentation: *LODR* 1-2, 9-1
 single precision floating point conversion
 FCHI: *REL* 11-2
 FCIH: *REL* 11-3
 SIO Record Format: *PROG* I-26
 size of spool files: *BSP* 5-3
 SJP: *MAC* 3-16, B-12
 SJS: *MAC* 3-16, B-12
 skip sparing: *UTIL* 9-29
 skip sparing a flexible disk: *UTIL* 9-5, A-2
 SKP: *MAC* 4-25, 4-31, B-15
 SL (search user libraries): *LODR* 3-10, 5-9
 SL - spool setup and outspool control: *BSP* 2-10
 hold attribute: *BSP* 2-14
 SL command: *CUSR* 5-77; *TUSR* 3-114, 3-116, 3-122, 4-58
 SL option: *EDIT* 2-11, 3-27
 SLA: *MAC* 3-5, 3-8, B-4, B-6
 SLB: *MAC* 3-5, 3-8, B-4, B-6
 SM command: *TUSR* 3-124
 smallest value
 DVMIN (double precision): *REL* 8-20
 DWMIN (EMA double precision): *REL* 8-20
 VMIN (single precision): *REL* 8-20
 WMIN (EMA single precision): *REL* 8-20
 smallest value (absolute)
 DVMIV (double precision): *REL* 8-20
 DWMIV (EMA double precision): *REL* 8-20
 VMIV (single precision): *REL* 8-20
 WMIV (EMA single precision): *REL* 8-20
 SMOVE, substring move: *REL* 10-11
 SMP: *BSP* 1-2, 2-21
 calls: *BSP* 3-1, 3-3, 3-11, 3-23
 change purge to save: *BSP* 3-13
 change record position: *BSP* 3-21
 change save to purge: *BSP* 3-14
 IBUFR: *BSP* 3-2, 3-11, 3-15, 3-17
 IBUFR format: *BSP* 3-7
 ISLU: *BSP* 3-2
 ISMP: *BSP* 3-2
 retrieve record position: *BSP* 3-20
 error messages: *BSP* A-7
 program calls: *BSP* 1-6
 SMPY, multiply substrings: *REL* 10-22
 SN (snapshot) command: *LINK* 3-21
 snapshot file
 definition of: *LINK* 4-1
 search sequence: *LINK* 4-5
 use of: *LINK* 1-3
 SNGL: *REL* 3-55
 SNGM: *REL* 3-56
 SOC: *MAC* 3-13, B-10
 SOCC: *MAC* B-10
 soft parity errors: *PROG* A-7
 softkeys: *CMUX* B-1
 defining: *UTIL* 2-57, 2-60
 software
 components and resource requirements: *SMM* 4-80
 firmware configuration: *SMM* 4-80
 operating system: *SMM* 4-90
 I/O structure: *DRVW* 2-2
 requirements: *DEBUG* 2-1
 solution of linear systems (VIS): *REL* 9-27
 son
 node: *LODR* 3-2
 program: *PROG* 2-59
 sophisticated pattern matching: *EDIT* 3-22
 sophisticated search and exchange: *EDIT* 3-22
 sort options: *RDSV* 2-2, 2-9
 sorting files: *RDSV* B-1
 SOS: *MAC* 3-13, B-10
 SOSC: *MAC* B-10
 source
 file: *EDIT* 1-2, 1-8, 2-25, 3-6, 3-10, 3-11, 3-50, 4-21, B-3, C-2; *MAC* 1-4
 file descriptor requirements: *MAC* E-4
 record formats: *PROG* I-1
 statements: *MAC* 2-1
 SP command: *TUSR* 3-126
 space () command: *EDIT* 3-32, 4-92, 4-97
 spare cartridge pool: *SMM* 3-9, 3-21, 8-3; *TUSR* 3-18
 sparing a hard disk: *UTIL* A-3
 sparing defective tracks: *UTIL* 9-14, 9-33
 sparing hard disk tracks online: *UTIL* A-2
 sparse files: *UTIL* 4-101
 SPC: *MAC* 4-25, 4-32, B-15
 SPD command: *HPIB* 4-9
 SPE commands: *HPIB* 4-9
 special buffer control bit: *CMUX* 2-3
 special characters: *DMUX* 2-4
 special mapping function subroutines: *DRVW* 3-31
 privileged drivers: *DRVW* 4-12
 special registers: *DBGS* C-9
 modification and examination: *DBGS* 3-6
 special status read: *DMUX* 2-7
 word definitions: *DMUX* 2-8
 Specific Line Number (n) command: *EDIT* 2-21
 specifications: *HPIB* 1-4
 specified program does not exist: *HPIB* 6-4
 specify null type extension: *MAC* E-6
 specify selected file attributes: *MAC* E-6

specifying

- directories: *CUSR* 3-6, 3-33
- remote files: *CUSR* 3-40
- subdirectories: *CUSR* 3-8
- UDSPs in file descriptors: *CUSR* 3-34

specifying locations: *DEBUG* 4-1

speed sensing: *CMUX* 2-21; *DMUX* 2-22

speeding up the COPY operation: *TUSR* 3-52

SPLCON: *BSP* 2-5, 2-21, 3-4, 3-11, 5-5

- size of: *BSP* 5-4

SplitCommand, parse string: *REL* 7-36

SplitString, parse string: *REL* 7-37

SPOL01: *BSP* 2-4

SPOL01-SPOL80: *BSP* 2-13, 3-3

SPOLnn: *BSP* 2-4

SPOLL function: *HPIB* 5-5

SPOLY: *REL* 3-57

spool

- batch job: *BSP* 2-1
- call example: *BSP* 3-23
- control file: *BSP* 2-5
- control: *BSP* 3-3, 3-11
 - calls: *BSP* 3-12
 - through SMP calls: *BSP* 3-1
- CS-command: *TUSR* 3-58
- driver (DVS43): *BSP* 2-5, 2-7
- EQTs: *BSP* 3-11, 5-4
- files: *BSP* 1-3, 2-4, 2-10; *TUSR* 3-99, 3-116
 - maximum number of active and pending: *BSP* 5-4
 - assignment: *BSP* 2-13
 - BO: *BSP* 2-14
 - buffering: *BSP* 3-18
 - characteristics of: *BSP* 2-11
 - extents: *BSP* 3-18
 - format: *BSP* 2-4
 - headers: *BSP* 2-4, 2-14
 - location of: *BSP* 5-4
 - manipulation: *BSP* 4-15
 - number of: *BSP* 5-2, 5-4
 - size of: *BSP* 5-3
 - state diagram: *BSP* 4-23
 - status upon re-boot: *BSP* 2-24
 - WR: *BSP* 2-14
- header format: *BSP* 2-15
- I/O abort errors: *BSP* A-6
- LU: *BSP* 2-5, 2-7, 2-31; *TUSR* 3-119
- monitor program (SMP): *BSP* 2-5; *TUSR* 1-7
- options, change: *BSP* 3-17
- pool files: *BSP* 2-4, 2-5, 5-4
- positioning: *BSP* 3-3, 3-19
- S globals: *TUSR* 3-23
- setup: *BSP* 2-5, 3-3
- SL command: *TUSR* 3-114
- system: *BSP* 1-2; *PROG* 1-30; *SMM* 4-94
 - initialization: *INST* 2-24; *SMM* 6-17
 - manipulation: *BSP* 4-28

spooling: *BSP* 1-2; *CUSR* 1-3

- interactively: *BSP* 2-1
- program: *BSP* 2-1

SPOPn: *BSP* 2-4, 3-3

- call: *BSP* 3-4

SPOUT utility: *UTIL* 2-1, 2-30

- calling: *UTIL* 2-30
- examples: *UTIL* 2-31
- including in a user program: *UTIL* 2-32
- operation: *UTIL* 2-30

SPOUT: *BSP* 1-2, 2-14, 2-21, 3-2

SPUT, put a character: *REL* 10-13

SQRT: *REL* 3-58

- entry (call-by-name), %QRT: *REL* 3-161

square matrix, initialize (VIS): *REL* 9-11

square root

- complex: *REL* 3-18
- double real: *REL* 3-111
- extended real: *REL* 3-35
- real: *REL* 3-58

SRQ bus command: *HPIB* 4-10, 5-2

SRQ bus management line: *HPIB* 1-7

SRQ subroutine: *HPIB* 5-2

SRQSN subroutine: *HPIB* 5-3

SS command: *CUSR* 4-9, 5-78; *LINK* 3-21; *RDSV* 2-10; *TUSR* 4-60

SSA: *MAC* 3-8, B-6

SSB: *MAC* 3-8, B-6

SSGA (Subsystem Global Area): *GEN* B-2, B-17

SSIGN, sign change: *REL* 10-40

SSM: *MAC* 3-16, B-12

SST (Session Switch Table): *CUSR* 5-77

SSUB, subtract substrings: *REL* 10-26

ST command: *CUSR* 4-9, 5-79; *TUSR* 3-129, 4-62

STA: *MAC* 3-2, B-2

stack: *EDIT* 2-35; *REL* 2-5

stacking, command: *TUSR* 3-150

standard: *BSP* 2-14

- boot procedures: *SMM* 6-2
- driver: *DRVW* 2-15, 3-1
 - sample: *DRVW* 3-35
- format: *BSP* 2-5, 2-15
- I/O EXEC calls: *PROG* 2-19
- I/O request flow: *PROG* E-16
- pattern matching: *EDIT* 3-18
- spool file: *BSP* 2-4, 2-5
- system LUs: *BSP* 2-31

starting

- EDIT: *EDIT* 2-7
- screen bracket: *EDIT* 2-12
- screen mode: *EDIT* 2-10

starting a Debug session: *DEBUG* 3-3

starting profile mode: *DEBUG* 5-26

Starting Up Your System: *INST* 3-1

statement

- ABORT: *HPIB* 4-18
- CLEAR: *HPIB* 4-15
- ENABLE INTR: *HPIB* 5-3, 5-19
- LOCAL: *HPIB* 4-17
- LOCAL LOCKOUT: *HPIB* 4-17
- ON INTR: *HPIB* 5-3, 5-19
- PACK USING: *HPIB* 4-21
- PPOLL CONFIGURE: *HPIB* 5-6
- PPOLL UNCONFIGURE: *HPIB* 5-7

READ/ENTER/INPUT/WRITE/PRINT: *HPIB* 4-22
 REMOTE: *HPIB* 4-15
 subroutine
 ABRT: *HPIB* 4-18
 BSTAT: *HPIB* 5-5
 call syntax: *HPIB* 4-12
 CLEAR: *HPIB* 4-15
 CMDW/CMDR: *HPIB* 4-20
 CNFG: *HPIB* 7-6
 GTL: *HPIB* 4-16
 IBERR: *HPIB* 6-1
 IOCNT: *HPIB* 4-23
 LLO: *HPIB* 4-16
 LOCL: *HPIB* 4-17
 PPOLL: *HPIB* 5-6
 PPSCH: *HPIB* 5-4
 PPSN: *HPIB* 5-4
 PSTAT: *HPIB* 5-8
 RMOTE: *HPIB* 4-15
 RMPAR: *HPIB* 5-9, 5-17
 SECW/SECR/SECWR/SECRR: *HPIB* 4-22
 SRQ: *HPIB* 5-2
 SRQSN: *HPIB* 5-3
 STATS: *HPIB* 5-5
 TRIGR: *HPIB* 4-17
 syntax: *HPIB* 4-12
 TRAP: *HPIB* 5-18, 5-19
 TRIGGER: *HPIB* 4-17
 statement continuation: *MAC* 2-14
 statement length: *MAC* 2-14
 Station Configuration Table (CT): *SMM* C-3
 statistical examples (VIS): *REL* 9-12
 status
 bit definitions from dynamic status: *CMUX* 2-13
 displaying program: *CUSR* 2-7, 4-9
 dynamic: *CMUX* 3-6
 EXEC calls: *PROG* 2-74
 I/O: *CMUX* 3-6
 LU: *CMUX* 3-6
 modem-related port: *CMUX* 2-13
 port: *CMUX* 3-6
 return: *CUSR* 2-24
 status bits: *UTIL* A-1, A-3
 Status command: *DEBUG* 5-32
 status utility (WHZAT): *UTIL* 2-2
 status word: *CMUX* 2-11, 3-6
 STB: *MAC* 3-2, B-2
 STC: *MAC* 3-13, B-10
 STCC: *MAC* B-10
 Step command: *DEBUG* 3-8, 5-32
 Step Into (S I) command: *DEBUG* 3-10
 stepping
 into subroutines: *DEBUG* 3-10
 over subroutines: *DEBUG* 3-9
 single lines: *DEBUG* 3-8
 STF: *MAC* 3-13, B-10
 STO: *MAC* 3-13, B-10
 STOP (system macro): *MAC* L-18
 stop bit selection bits: *DMUX* 2-20
 stop bits: *CMUX* 2-20
 storage allocation: *MAC* 4-1, 4-34, B-15
 StrDsc: *REL* 7-38
 streaming mode: *UTIL* 3-3
 string: *EDIT* B-3
 arithmetic routines: *REL* 10-17
 utilities routines: *REL* 10-7
 string comparison: *MAC* 4-61
 STRING macro: *MAC* N-9
 string manipulation
 BlankString: *REL* 7-4
 Concat: *REL* 7-15
 ConcatSpace: *REL* 7-15
 GetRunString: *REL* 12-10
 GetString: *REL* 12-11
 string passage: *GEN* 2-77
 EXEC 14: *PROG* 2-69
 StringCopy, copy one string to another: *REL* 7-39
 STX: *MAC* 3-10, B-7
 STY: *MAC* 3-10, B-7
 SU - start spooling: *BSP* 4-4, 4-5, 4-30
 subchannel: *GEN* 2-20; *PROG* 1-20; *TUSR* 4-33, 4-44
 assignment: *CMUX* B-1
 DRT entry: *DMUX* B-3
 CTU: *CMUX* 5-4
 determination: *CMUX* 4-18
 initialization: *SMM* 5-16
 HP 7900: *SMM* 5-16
 number: *DRVW* 3-35
 restrictions: *GEN* 2-20
 tracks: *UTIL* 2-15
 subchannel xx assigned: *GEN* 2-19
 subdirectories: *CUSR* 3-8
 creating: *CUSR* 3-29
 SUBHEAD: *MAC* 4-25, 4-27, B-15
 subheading: *MAC* 4-27
 subpartitions: *GEN* 2-78; *PROG* 4-11
 subroutine calls, CDS/non-CDS: *MAC* N-1
 subroutine operations
 CALL: *MAC* L-4
 ENTRY: *MAC* L-4
 EXIT: *MAC* L-4
 subroutines: *LODR* 2-15, 3-2
 ABREG: *PROG* 2-13
 double integer: *REL* 4-1
 LKEMA: *PROG* 4-7
 optional parameters: *PROG* 3-24
 return parameter: *PROG* 5-43
 special mapping functions: *DRVW* 3-31
 privileged drivers: *DRVW* 4-12
 ULEMA: *PROG* 4-7
 VMA/EMA: *PROG* 4-12
 VMA/EMA mapping management: *PROG* 4-41, B-1
 substitute pattern: *EDIT* 2-34, B-3
 substring
 add, \$ADD: *REL* 10-17
 compare, JSCOM: *REL* 10-7
 fill, \$FILL: *REL* 10-9
 move, SMOVE: *REL* 10-11
 substring operator: *MAC* 4-57

substrings: *DEBUG* 4-15
 Subsystem Global Area (SSGA): *GEN* 2-2; *LINK* 3-21; *PROG* 1-10, 1-12
 subsystem usage: *GEN* 2-78
 subtract
 complex from complex: *REL* 3-75
 double integer: *REL* 4-2
 DVSUB (double precision): *REL* 8-9
 DWSUB (EMA double precision): *REL* 8-9
 extended real: *REL* 3-123
 real: *REL* 3-86
 substrings, SSUB: *REL* 10-26
 VSUB (single precision): *REL* 8-9
 WSUB (EMA single precision): *REL* 8-9
 SUBTRACT (system macro): *MAC* L-10
 sum routine: *REL* 8-14
 DVSUM (double precision): *REL* 8-14
 DWSUM (EMA double precision): *REL* 8-14
 VSUM (single precision): *REL* 8-14
 WSUM (EMA single precision): *REL* 8-14
 sum routine (absolute)
 DVNRM (double precision): *REL* 8-14
 DWNRM (EMA double precision): *REL* 8-14
 VNRM (single precision): *REL* 8-14
 WNRM (EMA single precision): *REL* 8-14
 SUP: *MAC* 4-25, 4-32, 4-33, B-15
 super program, check for, ProgIsSuper: *REL* 6-15
 superuser, check for/if
 SuperUser: *REL* 6-18
 UserIsSuper: *REL* 6-20
 support of
 baud rates: *CMUX* 2-20
 CTUs: *CMUX* 1-3
 HP or non-HP devices: *CMUX* 5-1
 I/O extender: *CMUX* 1-3
 modem on multiplexer: *CMUX* 5-3
 modems: *CMUX* 1-3
 subchannels: *CMUX* B-1
 system console: *CMUX* 1-3
 supported baud rates: *DMUX* 2-14
 supported devices, maximum: *CMUX* 1-3
 suspending a program: *CUSR* 4-9
 EXEC 7: *PROG* 2-55
 suspending Debug: *DEBUG* 5-26
 SV command: *TUSR* 3-135
 swap delay: *GEN* 2-24
 swapping
 mother partition: *PROG* 4-10
 control - EXEC 22: *PROG* 2-72
 programs: *PROG* 2-24
 switches
 CSC: *DEBUG* 5-31
 EXIT: *DEBUG* 5-31
 LOG: *DEBUG* 5-31
 ML: *DEBUG* 5-31
 PASCAL: *DEBUG* 5-31
 RECORD: *DEBUG* 5-31
 STEPIN: *DEBUG* 5-31
 switching to profiling mode: *DEBUG* 6-1
 SWP: *MAC* B-11
 SWITCH: *GEN* 1-2

Address;unit:volume Specification: *SMM* 5-12
 Address/Unit/Platter Specification: *SMM* 5-11
 Destination I/O Configuration: *SMM* 5-8
 Disk Cartridge Exchange: *SMM* 5-12
 Error Conditions: *SMM* 5-26
 Example: *SMM* 5-23
 Filename Specification: *SMM* 5-7
 Filesave Specification: *SMM* 5-13
 Loading Instructions: *SMM* 5-4
 Operating Instructions: *SMM* 5-5
 Options: *SMM* 5-4
 Program: *SMM* 5-1
 Stop before Transfer: *SMM* 5-21
 System Subchannel Definition: *SMM* 5-9
 SWITCH Glossary
 Batch Mode: *SMM* 5-2
 CS/80 disk: *SMM* 5-1
 Destination Configuration: *SMM* 5-2
 Destination System: *SMM* 5-2
 Host Configuration: *SMM* 5-2
 Host System: *SMM* 5-2
 Target disk: *SMM* 5-2
 Target disk LU: *SMM* 5-2
 Target Select Code: *SMM* 5-2
 SWITCH Glossary: *SMM* 5-1
 ICD disks: *SMM* 5-1
 MAC disks: *SMM* 5-1
 SXREF: *LODR* 6-23; *PROG* 1-31
 aborting: *LODR* 6-24
 cross reference mode: *LODR* 6-27
 error messages: *LODR* A-17
 limitations: *LODR* 6-25
 listing: *LODR* 6-28
 operation: *LODR* 6-23
 output file: *LODR* 6-24
 runstring parameters: *LODR* 6-23
 sample output: *LODR* 6-30, D-8
 scratch files: *LODR* 6-24
 summary of errors: *LODR* 6-39
 syntax checking mode: *LODR* 6-23, 6-25
 SY (system library name): *LODR* 3-9, 5-10
 SY command: *TUSR* 3-137
 SYA: *MAC* 3-16, B-12
 SYB: *MAC* 3-16, B-12
 SYCON subroutine: *PROG* 5-89; *REL* 6-19
 symbol: *DBGS* 1-4
 definition instructions: *MAC* 4-1, 4-40, B-16
 ID: *MAC* 4-58
 listing table: *MAC* E-2
 manipulation: *DBGS* C-4
 table: *DBGS* 2-12; *MAC* 1-9
 symbolic
 addresses in *DEBUG*: *DBGS* 2-8
 addressing: *MAC* 1-10
 debugging: *LINK* 3-6
 mode: *DBGS* 2-2
 terms: *MAC* 2-6
 synchronous device: *DRIV* 2-1
 syntax checking mode (SXREF): *LODR* 6-23, 6-25
 syntax conventions: *PROG* 5-12
 system: *PROG* 1-11

abort requests: *CMUX* 4-4
 applications: *SMM* 2-3
 assembly time variables: *MAC* K-1
 base page: *PROG* 1-10
 boundaries: *GEN* 2-2
 calls and entry points: *PROG* 5-65
 cartridge directory: *PROG* 3-14
 cartridges: *PROG* 1-25, 3-12; *TUSR* 2-9, 3-16
 auxiliary: *TUSR* 3-16
 command errors: *TUSR* A-1
 commands: *CUSR* 2-1; *TUSR* 2-8, 2-17
 AG-modify partition priority: *TUSR* 4-22
 AS-assign partition: *TUSR* 4-25
 BL-examine or modify buffer limit: *TUSR* 4-27
 BR-set break flag: *TUSR* 4-29
 CU-CPU utilization: *TUSR* 4-30
 DN-down a device: *TUSR* 4-31
 EQ-buffering: *TUSR* 4-35
 EQ-status: *TUSR* 4-33
 GO-reschedule program: *TUSR* 4-37
 IT-interval timer: *TUSR* 4-42
 LU-assignment or reassignment: *TUSR* 4-44
 OF-terminate program: *TUSR* 4-46
 ON-schedule a program: *TUSR* 4-48
 PR-change program priority: *TUSR* 4-51
 processing: *TUSR* 4-15
 QU-timeslice quantum: *TUSR* 4-52
 RS-restart session copy of FMGR: *TUSR* 4-54
 RT-release disk tracks: *TUSR* 4-55
 RU-run a program: *TUSR* 4-56
 SL-display session LU: *TUSR* 4-58
 SS-operator suspend: *TUSR* 4-60
 ST-status: *TUSR* 4-62
 structure: *TUSR* 4-20
 summary: *TUSR* 4-2
 SZ-program size: *TUSR* 4-64
 TE-send message to system console: *TUSR* 4-68
 TI-print time: *TUSR* 4-69
 TM-set real-time clock: *TUSR* 4-70
 TO-device timeout: *TUSR* 4-71
 UL-unlock shareable EMA partition: *TUSR* 4-73
 UP-make EQT available: *TUSR* 4-74
 UR-release reserved partition: *TUSR* 4-75
 VS-virtual memory size: *TUSR* 4-76
 WH-run WHZAT program: *TUSR* 4-79
 WS-working set size: *TUSR* 4-81
 common: *LINK* 4-1
 configuration: *INST* 4-7
 console
 as a Session Terminal: *SMM* 9-4
 commands: *TUSR* 2-11, 4-17
 operation: *TUSR* 2-11
 write to, SYCON: *REL* 6-19
 support: *CMUX* 1-3
 crash: *EDIT* 1-8
 disk layout: *PROG* C-11
 driver area: *PROG* 1-11
 environment information: *UTIL* 2-2
 generation: *SMM* 1-6
 global FMGR cartridge requirements: *SMM* 3-20
 I/O processor: *DRVW* 2-2
 initialization: *SMM* 1-7, 6-1
 installation: *SMM* 1-6
 library: *PROG* 1-29, 3-12
 library subroutines
 CLRQ: *PROG* 5-13
 GETST: *PROG* 5-45
 LURQ: *PROG* 5-30
 PRTM: *PROG* 5-43
 PRTN: *PROG* 5-43
 RMPAR: *PROG* 5-41
 RNRO: *PROG* 5-26
 loading: *GEN* 2-2
 LU: *PROG* 1-20, 1-24
 manager: *CUSR* 1-4; *PROG* 3-12, 3-13
 commands: *CUSR* 2-3
 operations: *INST* 4-6
 map: *DRVW* 3-30; *GEN* B-5; *PROG* 1-7
 planning: *SMM* 1-6
 prompt: *TUSR* 4-17
 requirements, *RDSV* 1-2
 scratch
 and VMA Cartridge: *SMM* 9-7
 file: *EDIT* 3-47
 tracks: *PROG* 3-12; *TUSR* 3-16
 security: *TUSR* 3-16
 shut-down: *INST* 3-5
 snapshot, definition of: *LINK* 4-1
 start-up: *INST* 3-4
 status, obtaining: *CUSR* 2-7
 tables: *SMM* B-1
 time, displaying: *CUSR* 2-14
 utility programs: *TUSR* 1-8
 verification: *INST* 2-11
 system and auxiliary disk subchannel track
 information: *UTIL* 2-15
 system and breakmode commands: *TUSR* 4-1, 4-20
 conventions: *TUSR* 4-20
 structure: *TUSR* 4-20
 system and breakmode error messages: *TUSR* A-18
 System and Program Loading Phase: *GEN* 2-63, 3-13
 System Available Memory (\$CNFG): *GEN* B-4
 System Available Memory (SAM): *BSP* 2-14, 5-5; *CMUX* 4-12; *GEN* 2-76, B-1; *PROG* 1-11, 2-29; *TUSR* 4-8
 system available memory extension: *GEN* B-4
 System Boundaries Phase: *GEN* 2-60, 3-13
 system COMMON - see COMMON
 system communication area: *PROG* C-1; *SMM* B-1
 system configuration utility (LUPRN): *UTIL* 2-18
 SYSTEM Directory: *SMM* 3-12
 System Driver Area (SDA): *CMUX* 4-12; *GEN* B-2, B-17
 system generation: *SMM* 1-6

DVC00: *DMUX* B-3
 DRT table entry: *DMUX* B-3
 EOT/timeout options: *DMUX* B-3
 subchannel assignment: *DMUX* B-3
 response: *SMM* 4-1
 serial drivers: *DMUX* B-1
 system macros
 descriptions: *MAC* L-4
 library: *MAC* L-1
 system management overview: *SMM* 1-1
 system modules: *GEN* 2-69, B-18
 system protection: *SMM* 6-18
 system subchannel: *GEN* 2-20
 restrictions: *GEN* 2-20
 system tests: *SMM* 6-8
 system track allocation: *SMM* 6-5
 system user operations: *INST* 4-10
 system/auxiliary subchannels: *SMM* 4-3
 SystemProcess subroutine, check for/if system
 process: *REL* 6-20
 systems modem: *CMUX* 1-1, 2-19, 5-1, 5-3
 baud rate setting: *CMUX* 2-20
 loop test: *CMUX* 2-14
 panel, line connect: *CMUX* 2-23
 SZ command: *CUSR* 4-11, 5-80; *EDIT* 4-74;
RDSV 2-10; *TUSR* 4-64
 SZ (size) command: *LINK* 3-22; *LODR* 5-10
 SZA: *MAC* 3-8, B-6
 SZB: *MAC* 3-8, B-6
 SZONE, zone punch: *REL* 10-14

T

T option: *MAC* 5-15, E-2
 T5IDM: *LODR* 9-2
 T6 command: *RDSV* 2-11
 TA command: *EDIT* 4-75
 Tab Character (TC) option: *EDIT* 3-27
 Tab Kill (TK) command: *EDIT* 4-78
 Table Area I: *CMUX* 4-12; *GEN* B-1; *PROG* 1-10
 Table Area II: *GEN* B-2; *PROG* 1-11
 modules: *GEN* 2-69, B-17
 table generation: *GEN* 2-2
 Table Generation Phase: *GEN* 2-46, 3-11
 tables
 and directories: *TUSR* C-1
 and patches, dumping: *DBGS* 4-1
 program-related: *PROG* D-1
 tabs
 delete: *EDIT* 4-78
 description: *EDIT* 4-75
 in line mode: *EDIT* 3-32
 in line mode character edits: *EDIT* 3-32
 talker: *HPIB* 1-3, 4-1
 TAN: *REL* 3-59
 TAN entry (call-by-name), %AN: *REL* 3-146
 tangent
 double real: *REL* 3-113
 extended real: *REL* 3-36

real: *REL* 3-59
 TANH: *REL* 3-60
 TANH entry (call-by-name), %ANH: *REL* 3-148
 tape: *RDSV* 3-7
 format: *RDSV* B-4, B-5
 formats supplied: *INST* D-12
 media installation: *INST* D-1
 movement functions: *UTIL* 3-51
 operations, .TAPE: *REL* 5-39
 utilization: *RDSV* B-4
 verification: *DBGS* 4-2
 tape certification: *UTIL* 9-29
 Tape Filer (TF): *PROG* 1-33; *UTIL* 4-2, 4-55
 access time for tape files: *UTIL* 4-89
 alternatives to standard incremental backup:
UTIL 4-94
 Append to tape (A): *UTIL* 4-60
 B qualifier in incremental backup: *UTIL* 4-91
 backup bits: *UTIL* 4-91, 4-93, 4-94
 Brief logging mode (B): *UTIL* 4-61
 C option used in incremental backup: *UTIL*
 4-91
 calling TF: *UTIL* 4-56
 Clear backup bit (C): *UTIL* 4-61
 CO command: *UTIL* 4-58
 CO command options: *UTIL* 4-60
 CO command source and destination
 parameters: *UTIL* 4-58
 copy examples using DS: *UTIL* 4-77
 copy examples with subdirectories: *UTIL* 4-69
 copy examples without subdirectories: *UTIL*
 4-63
 copying files between FMP/UNIX: *UTIL* 4-104
 create time (tape): *UTIL* 4-89
 DEfault command: *UTIL* 4-80
 delta backups: *UTIL* 4-90
 directory creation on restore: *UTIL* 4-96
 directory file names (FMP/UNIX): *UTIL* 4-107
 disk full errors: *UTIL* 4-99
 DL Directory List command: *UTIL* 4-81
 duplicate files during restoring incremental
 backups: *UTIL* 4-93, 4-95
 EXit command: *UTIL* 4-84
 file access during backup/restore: *UTIL* 4-100
 file formats on FMP and UNIX: *UTIL* 4-103
 file properties, saving and restoring: *UTIL* 4-96
 file/tape compatibility, FMP/UNIX: *UTIL*
 4-103, 4-112
 full backup: *UTIL* 4-90
 GRoup copy commands: *UTIL* 4-84
 HElp command: *UTIL* 4-85
 Ignore errors and file marks (I): *UTIL* 4-61
 incremental backup: *UTIL* 4-90
 incremental backup procedure: *UTIL* 4-92
 inhibit UNIX to FMP text file conversion (N):
UTIL 4-61
 installing TF: *UTIL* 4-112
 Keep tape online (K): *UTIL* 4-61, 4-81, 4-84,
 4-85, 4-88
 LH List Header file: *UTIL* 4-85
 LL List Device: *UTIL* 4-86

maintaining the system time: *UTIL* 4-90
 missing time stamps: *UTIL* 4-89
 multi-tape backup/restore: *UTIL* 4-102
 multiple copies of the same backup: *UTIL* 4-92
 relation of DL command to CO command:
 UTIL 4-83
 replace Duplicate files (D): *UTIL* 4-61
 restoring incremental backups: *UTIL* 4-93
 restoring older versions from incremental
 backup: *UTIL* 4-94
 system backup and restore: *UTIL* 4-97
 tape protection and the K (Keep) option: *UTIL*
 4-88
 TF commands: *UTIL* 4-56
 time stamps: *UTIL* 4-89
 Title command: *UTIL* 4-87
 TRansfer command: *UTIL* 4-88
 UNIX compatibility: *UTIL* 4-62, 4-103
 Update option (U): *UTIL* 4-62
 update time (tape): *UTIL* 4-89
 using TF with FC tapes: *UTIL* 4-101
 using TF with FMGR files: *UTIL* 4-100
 Verify files copied (V): *UTIL* 4-62
 Yes option (Y): *UTIL* 4-62
 task charts: *EDIT* 2-36
 TATMP subroutine: *PROG* 5-73
 TBG select code: *GEN* 2-21
 TBS: *MAC* 3-4, B-3
 TC option: *EDIT* 3-27
 TE command: *TUSR* 3-138, 4-68
 temporarily change to the print mode: *DBGS* 3-10
 temporary
 data block (TDB): *TUSR* 4-8
 driver partition: *UTIL* 10-2
 files: *CUSR* 3-2, 7-1
 program: *LODR* 1-2, 4-30; *TUSR* 3-128
 storage: *TUSR* B-1
 usage: *GEN* 2-67
 terminal
 backspace key: *EDIT* 3-31, 3-46
 block mode: *DMUX* 2-7
 configuration
 block mode: *CMUX* 2-22
 DDV05 (CN 25B): *CMUX* B-2
 getting: *CMUX* 2-22
 page mode: *CMUX* 2-22
 control: *TUSR* 3-60
 device driver DDT05 (without CTU support):
 CMUX 1-3
 device driver DDV05 (with CTU support):
 CMUX 1-3, 2-31, 4-3, 5-2
 Control Function 11B (line spacing): *CMUX*
 B-2
 Control Function 25B (terminal config.):
 CMUX B-2
 control request definition: *CMUX* B-2
 handshake control: *CMUX* 5-1
 I/O requests: *CMUX* B-2
 subchannel assignment: *CMUX* B-1
 subchannel support: *CMUX* 5-4
 user interface: *CMUX* B-1
 display capacity: *EDIT* 2-16
 displaying maximum lines: *EDIT* 3-35
 line limit: *EDIT* 2-11
 local editing keys: *EDIT* 2-12, 3-34
 page mode: *DMUX* 2-7
 ProgramTerminal: *REL* 7-30
 read straps: *DMUX* 2-18
 terminal command: *RDSV* 3-10
 terminal driver
 DVR00: *SMM* 4-53
 DVR05/DVA05: *SMM* 4-57
 terminal power: *INST* A-3
 terminate
 COPY operation: *TUSR* 3-51
 program: *TUSR* 3-94, 4-46
 receive buffer: *CMUX* 2-15
 session: *TUSR* 3-74
 terminating
 normal: *PROG* 2-52
 saving-resources completion: *PROG* 2-53
 serially-reusable: *PROG* 2-52
 termination
 characters: *CMUX* 2-2, 2-4; *DMUX* 2-15
 command input: *LODR* 5-2, 5-3
 program: *LODR* 2-20
 terms: *DBGS* 1-4; *MAC* 2-5, 2-6
 test break flag subroutine IFBRK: *PROG* 5-77
 Test_PutByte: *REL* 12-91
 Test_SetBitMap: *REL* 12-92
 TESTBIT (system macro): *MAC* L-2, L-13
 TestBitMap: *REL* 12-91
 text
 copying: *EDIT* 4-12
 display formats: *EDIT* 3-12
 inserting: *EDIT* 4-33
 moving: *EDIT* 2-29
 wrap-around: *EDIT* 2-12, 3-42
 TEXT (system macro): *MAC* L-17
 text and message, text definition: *MAC* L-17
 Text/Program Preparation: *INST* 4-10
 TF. See Tape Filer (TF)
 TF command: *EDIT* 4-75
 TF tape format: *UTIL* 4-111
 throughput
 data overrun when exceeded: *CMUX* 3-8
 total aggregate: *CMUX* 1-3
 TI command: *CUSR* 5-81; *EDIT* 3-8, 4-77; *TUSR*
 4-69
 TI error: *PROG* A-5
 Time Base Generator Check: *INST* 2-23
 time list: *TUSR* 1-2, 4-13, 4-42
 time quantum: *PROG* 1-4
 time request - EXEC 11: *PROG* 2-74
 time scheduling: *TUSR* 1-2
 other programs: *PROG* 2-66
 programs: *CUSR* 4-6
 self: *PROG* 2-67
 Time Stamp (TS) option: *EDIT* 3-27
 time stamping files: *EDIT* 3-8
 time stamps: *CUSR* 3-14
 TIMEF: *REL* 7-40

TIMEI, TIMEO: *REL* 5-26
 TimeNow: *REL* 7-41
 timeout
 count down counter: *CMUX* 4-11
 device: *TUSR* 4-71
 error: *CMUX* 3-6
 return data on: *DMUX* 2-26
 setting: *CMUX* 2-18; *DMUX* 2-17
 value in B-Register: *CMUX* 4-8
 timeout bits: *DMUX* 1-2
 timeout for transmission error: *HPIB* 6-2
 timeout processing: *DRVW* 3-16
 timeout values, privileged drivers: *DRVW* 4-11
 timeout/EOT options, DVC00 generation: *DMUX* B-3
 timeout/logoff function: *CUSR* 2-25
 timer, reset, ResetTimer: *REL* 7-31
 timeslice quantum: *TUSR* 4-52
 timeslice word: *TUSR* C-4
 timeslicing: *CUSR* 4-10; *SMM* 9-3; *TUSR* 1-3, 4-53
 and multi-programming: *PROG* 1-3
 TK command: *EDIT* 4-78
 TL command: *BSP* 2-36; *EDIT* 4-75
 TM command: *CUSR* 2-14, 5-82; *EDIT* 4-75; *TUSR* 4-70
 TMVAL subroutine: *PROG* 5-90
 TO command: *CUSR* 2-14, 5-83; *SMM* 9-1; *TUSR* 4-71
 TP command: *EDIT* 4-75
 TR command: *CUSR* 2-15, 2-16, 2-21, 3-33, 5-84; *EDIT* 4-79; *GEN* 1-2, 2-3; *LINK* 3-22; *LODR* 5-10; *RDSV* 2-10; *TUSR* 3-139
 alternate versions of: *GEN* 2-4
 TR,namr command: *RDSV* 3-10
 TR error: *PROG* A-5
 Trace command: *DEBUG* 5-34
 TRACEBACK: *MAC* N-4
 Track Assignment Table (TAT): *PROG* 2-86
 track configuration: *SMM* A-2
 for disks: *SMM* A-2
 for ICD disk: *SMM* A-11
 disk address and unit numbers: *SMM* A-13
 sectors: *SMM* A-12
 subchannels: *SMM* A-12
 surface organization: *SMM* A-13
 tracks: *SMM* A-12
 HP 13037B/C MAC disk: *SMM* A-7
 track, sector, to double integer block number conversion: *REL* 7-19
 tracks: *TUSR* 3-2
 allocation - EXEC 4 or 15: *PROG* 2-87
 and sectors per track, DiskSize: *REL* 7-20
 assignment: *UTIL* 2-16
 bad: *TUSR* 3-13
 defective: *UTIL* 9-5, A-3
 flagged as bad: *UTIL* 9-9, 9-11, A-3
 global: *PROG* 2-86
 identifying defective: *UTIL* 9-2, 9-7
 local: *PROG* 2-86
 logical numbers of: *UTIL* 9-15
 management EXEC calls: *PROG* 2-86
 reading during initialization: *UTIL* 9-11, A-3
 release - EXEC code 5 or 16: *PROG* 2-89
 size: *UTIL* 3-2
 skipped: *UTIL* 9-5
 sparing: *UTIL* A-3
 sparing defective: *UTIL* 9-11, 9-14, 9-17, 9-21, 9-33
 subchannel: *UTIL* 2-15
 switching automatic: *PROG* 2-86
 verifying: *UTIL* 9-21, A-3
 trailing blanks: *EDIT* 4-8
 remove, TrimLen: *REL* 7-41
 transfer
 address: *LODR* 6-28
 control: *TUSR* 3-139
 subroutines: *LODR* 3-1
 computed GOTO, .GOTO: *REL* 5-34
 data and create file: *TUSR* 3-129
 data to existing file: *TUSR* 3-70
 extended real: *REL* 3-79
 sign
 double real to double real: *REL* 3-109
 extended real: *REL* 3-33
 Transfer (TR) command: *EDIT* 4-79
 transfer command: *RDSV* 3-10; *UTIL* 12-10
 transfer file #MACRO: *MAC* E-11
 transfer files: *LINK* B-5
 transfer function: *UTIL* 12-6, 12-9
 transferring data
 between disk and tape transports or tape cartridges: *UTIL* 3-1
 to and from devices: *CUSR* 3-38
 to and from files: *CUSR* 6-9
 transferring the new operating system: *SMM* 5-1
 transformation, graphics coordinate (VIS): *REL* 9-15
 transmission, bits per character: *CMUX* 2-19
 transmission buffers: *CMUX* 1-3
 transmission log: *CMUX* 2-15, 4-5, 4-8
 transmit pacing: *CMUX* 2-31
 transparency bit
 read request: *DMUX* 2-2
 write request: *DMUX* 2-9
 transparent mode bit: *CMUX* 2-3
 transport map: *UTIL* 7-1
 Transportable Type 6 Files: *SMM* 4-110
 trap cell: *DRVW* 2-12; *PROG* E-11
 trap cell instructions: *DRVW* 3-35
 TRAP statement: *HPIB* 5-18
 tree size and pathlength, maximum: *LODR* 3-16
 tree structure, sample: *LODR* 3-7
 TRIGGER statement: *HPIB* 4-17
 TRIGR subroutine: *HPIB* 4-17
 TrimLen, remove trailing blanks: *REL* 7-41
 TRMLU library function: *CMUX* 3-3; *PROG* 5-57
 troubleshooting serial ports: *UTIL* 2-30
 true address of parameter, .PCAD: *REL* 5-38
 true address transfer
 .ENTC: *REL* 5-27
 .ENTN: *REL* 5-27

.ENTP: *REL* 5-28
 .ENTR: *REL* 5-28
 truncate
 extended real to integer: *REL* 3-24, 3-45
 fractional part of double real: *REL* 3-130
 real: *REL* 3-3
 real to integer: *REL* 3-47
 truncation: *EDIT* 1-13, 3-3, 3-13, 3-14, 3-32, 3-33, 4-8
 TS command: *EDIT* 4-75
 TS option: *EDIT* 3-27
 TT command: *RDSV* 2-11, 3-10
 TTY protocol
 definition: *DMUX* 2-28
 setting: *DMUX* 2-27
 TU command: *EDIT* 4-75
 tutorial: *EDIT* 2-1
 TV Interface Driver, DVA13: *SMM* 4-63
 two dimensional array examples (VIS): *REL* 9-4
 TYPE (system macro): *MAC* L-18
 type 0 file
 directory entry: *PROG* G-8
 non-disk devices: *PROG* 3-2
 positioning: *PROG* 3-68
 type 1 file: *TUSR* 3-9
 access: *PROG* 3-41
 fixed-length (128-word record): *PROG* 3-3
 positioning: *PROG* 3-68
 read: *PROG* 3-52
 type 2
 file: *PROG* 3-3; *TUSR* 3-9
 positioning: *PROG* 3-68
 program: *LODR* 2-15
 type 3
 and above files positioning: *PROG* 3-69
 file: *PROG* 3-3; *TUSR* 3-9
 program: *LODR* 2-15
 type 4
 BG disk-resident programs: *GEN* 2-70
 with common: *GEN* B-18
 without common: *GEN* B-18
 file: *PROG* 3-4; *TUSR* 3-10
 program: *LODR* 2-15
 type 5
 file: *LODR* 1-1; *PROG* 3-4; *TUSR* 3-10
 module: *LODR* 9-2
 type 6
 extended BG programs, with common: *GEN* B-18
 file: *LODR* 2-8, 9-2; *PROG* 3-4; *TUSR* 3-10
 file usage: *GEN* 2-67
 program: *LODR* 2-15
 specification: *SMM* 5-15
 type 7 file: *PROG* 3-4; *TUSR* 3-10
 type 7 and greater, user-defined data format: *PROG* 3-4
 type 8 and greater files: *TUSR* 3-10
 TYPE and STOP, communication with RTE: *MAC* L-18
 type operator: *MAC* 4-58
 type-ahead

BREAK key: *CMUX* 3-1
 buffers: *CMUX* 3-1
 data: *CMUX* 2-11
 length: *CMUX* 2-11
 description: *CMUX* 3-1
 full type-ahead mode: *CMUX* 3-4
 no type-ahead mode: *CMUX* 3-4
 normal mode (non-type-ahead): *CMUX* 3-1
 retry count: *CMUX* 2-21
 with flush on break mode: *CMUX* 3-5
 with scheduling: *CMUX* 3-3, 3-5
 type-ahead mode: *DMUX* 1-3
 Types of Transfers: *SMM* 5-2
 typing in text: *EDIT* 2-12

U

U command: *EDIT* 3-18, 3-20, 4-81
 UART (Universal Asynchronous Receiver/Transmitter): *DMUX* 1-3
 UCALL: *MAC* N-8
 UDSP(s)
 default: *CUSR* 3-10
 defining: *CUSR* 3-33
 numbers: *CUSR* 3-10
 searching for files: *CUSR* 3-33
 specifying in file descriptors: *CUSR* 3-34
 UJP: *MAC* 3-16, B-12
 UJS: *MAC* 3-16, B-12
 UL command: *CUSR* 5-87; *TUSR* 4-73
 ULEMA - unlock a shareable EMA partition: *PROG* 4-7, 4-23
 UN command: *EDIT* 1-2, 1-11, 2-29, 3-31, 3-46, 4-83; *RDSV* 2-11
 UN option: *EDIT* 4-72
 unary operator
 :ICH:: *MAC* 2-10
 :MR:: *MAC* 2-10
 :SY:: *MAC* 2-10
 – negate: *MAC* 2-10
 description: *MAC* 4-51, 4-63
 unbuffered input/output: *TUSR* 4-8
 unconditional exchange: *EDIT* 4-81
 unconditional page ejects: *DMUX* 2-26
 undefined external reference: *LODR* 3-15, 4-13, 4-14, 5-2, 6-17, 6-29
 search sequence: *LINK* 4-9
 Undo (UN) command: *EDIT* 1-11, 1-15, 2-29
 undo list: *EDIT* 3-46, 4-83, 4-84
 undo list yank: *EDIT* 4-84
 undoing commands: *EDIT* 1-2, 4-83
 universal commands: *HPIB* 4-8
 UNL: *MAC* B-18, J-10
 unlabeled COMMON - see COMMON
 unlock keyboard: *CMUX* 5-5
 unlock EMA partition: *TUSR* 4-73
 unnumbered error messages: *BSP* A-4
 unpack, real: *REL* 3-88
 UNPU (unpurge files) command: *CUSR* 3-26, 5-88
 unpurging files: *CUSR* 3-26

UNS: *MAC* 4-25, 4-32, 4-33, B-15
 UNSET (delete user defined variable) command:
 CUSR 5-89
 UP command: *BSP* 4-4, 4-5, 4-26; *CUSR* 5-90;
 RDSV 3-5, 3-10, 4-1; *TUSR* 4-74
 update
 command: *RDSV* 3-10
 open: *PROG* 3-41
 mode: *PROG* 3-6, 3-29; *RDSV* B-3
 SCB error mnemonic: *PROG* 5-63
 updating
 files: *RDSV* B-3
 system disk: *RDSV* 4-1
 upper/lower case: *EDIT* 1-3, 5-20
 See also Case Folding (CF) option
 uppercase operator: *MAC* 4-58
 UR command: *CUSR* 5-91; *TUSR* 4-75
 USA: *MAC* 3-16, B-12
 USB: *MAC* 3-16, B-12
 use applications (VIS): *REL* 9-11
 user
 accounts: *SMM* 3-7
 definitions: *SMM* 7-11
 entry: *SMM* C-10
 buffer: *CUSR* 6-9; *PROG* 3-17, 3-23
 category: *SMM* 2-1
 ID, OwnerToId: *REL* 6-14
 interface: *RDSV* B-2
 device drivers: *CMUX* B-1
 map: *DRVW* 3-30; *PROG* 1-7
 message file: *TUSR* 2-2, 3-19
 name: *SMM* 1-4
 SessnToOwnerName: *REL* 6-17
 USNAM: *REL* 6-21
 verify, VFNAM: *REL* 6-22
 parameter: *BSP* 2-34
 partitions: *GEN* 1-4; *PROG* 1-11
 request
 buffered: *CMUX* 4-4
 unbuffered: *CMUX* 4-4
 table address, LUSES: *REL* 6-12
 user-defined variables: *CUSR* 2-17
 user-level interface: *DMUX* 2-1
 User/Group ID Map: *SMM* 8-4, C-8
 UserIsSuper, check for/if superuser: *REL* 6-20
 using
 AIF and AELSEIF: *MAC* 4-64
 breakpoints: *DEBUG* 3-4
 CI command files to run LINK: *LINK* 4-8
 DEBUGR to do simple arithmetic: *DBGS* A-2
 expressions: *DEBUG* 4-8
 LINK with FMGR: *LINK* B-1
 macro libraries: *MAC* 5-3
 spool system: *BSP* 2-1
 transfer files to run LINK: *LINK* B-5
 USNAM, return user name: *REL* 6-21
 USNUM, return the session number: *REL* 6-21
 utility functions, magnetic tape, MAGTP: *REL*
 5-16
 utility installation and CI initialization: *SMM* 6-10
 utility programs: *LODR* 6-1; *PROG* 1-31

CALLM: *PROG* 1-34
 CALLS: *PROG* 1-34
 CLOAD: *PROG* 1-31; *TUSR* 1-9
 CMD: *PROG* 1-34
 COMPL: *PROG* 1-31; *TUSR* 1-8
 DBUGR: *PROG* 1-32; *TUSR* 1-11
 disk backup: *TUSR* 1-10
 DRREL: *PROG* 1-34; *TUSR* 1-12
 DRPL: *PROG* 1-34; *TUSR* 1-12
 EDIT/1000: *PROG* 1-32
 FC: *TUSR* 1-10
 FST: *PROG* 1-33
 GENIX: *PROG* 1-34
 HELP: *PROG* 1-34
 help utilities: *TUSR* 1-12
 INDXR: *PROG* 1-32; *TUSR* 1-10
 KEYS: *PROG* 1-33; *TUSR* 1-11
 KYDMP: *PROG* 1-33; *TUSR* 1-11
 LGTAT: *PROG* 1-33; *TUSR* 1-12
 LINDX: *PROG* 1-32
 LINK: *PROG* 1-32
 LOADR: *PROG* 1-32; *TUSR* 1-9
 MERGE: *PROG* 1-32; *TUSR* 1-10
 MLLDR: *PROG* 1-31
 MLSDB: *TUSR* 1-11
 PCOPY: *PROG* 1-33
 PRSTR: *PROG* 1-33
 PSAVE: *PROG* 1-33
 READT: *PROG* 1-33; *TUSR* 1-10
 RT6GN: *PROG* 1-32; *TUSR* 1-11
 SCOM: *PROG* 1-33; *TUSR* 1-12
 SGMTR: *PROG* 1-31; *TUSR* 1-9
 SXREF: *PROG* 1-31; *TUSR* 1-9
 TF: *PROG* 1-33
 WHZAT: *PROG* 1-33; *TUSR* 1-11, 3-143, 4-79
 WRITT: *PROG* 1-33; *TUSR* 1-10
 utility subroutine structure: *PROG* 5-7
 UY command: *EDIT* 4-83, 4-84

V

VABS, absolute value routine (single precision):
 REL 8-13
 VADD, vector add (single precision): *REL* 8-9
 validity of disk volume directories and tables:
 UTIL 6-23
 variables
 positional: *CUSR* 2-16
 predefined: *CUSR* 2-19
 user-defined: *CUSR* 2-17
 VDIV, vector device (single precision): *REL* 8-9
 VDOT, vector dot product routine (single
 precision): *REL* 8-17
 VE command: *RDSV* 2-11, 3-11
 vector add
 DVADD (double precision): *REL* 8-9
 DWADD (EMA double precision): *REL* 8-9
 VADD (single precision): *REL* 8-9
 WADD (EMA single precision): *REL* 8-9
 vector arithmetic routines: *REL* 8-9

vector copy routine
 DVSWP (double precision): *REL* 8-24
 DWSWP (EMA double precision): *REL* 8-24
 VSWP (single precision): *REL* 8-24
 WSWP (EMA single precision): *REL* 8-24

vector divide
 DVDIV (double precision): *REL* 8-9
 DWDIV (EMA double precision): *REL* 8-9
 VDIV (single precision): *REL* 8-9
 WDIV (EMA single precision): *REL* 8-9

vector dot product routine
 DVDOT (double precision): *REL* 8-17
 DWDOT (EMA double precision): *REL* 8-17
 VDOT (single precision): *REL* 8-17
 WDOT (EMA single precision): *REL* 8-17

vector EMA copy routine, DVWMV (double precision): *REL* 8-26

vector EMA/non-EMA
 copy routine, WSWP (single precision): *REL* 8-26
 move routine
 DVWMOV (double precision): *REL* 8-26
 VWMOV (single precision): *REL* 8-26

vector instructions, combinations: *REL* 9-7

vector largest value
 DVMAX (double precision): *REL* 8-20
 DWMAX (EMA double precision): *REL* 8-20
 VMAX (single precision): *REL* 8-20
 WMAX (EMA single precision): *REL* 8-20

vector largest value (absolute)
 DVMAX (double precision): *REL* 8-20
 DWMAX (EMA double precision): *REL* 8-20
 VMAX (single precision): *REL* 8-20
 WMAX (EMA single precision): *REL* 8-20

vector move routine
 DVMOV (double precision): *REL* 8-24
 DWMOV (EMA double precision): *REL* 8-24
 VMOV (single precision): *REL* 8-24
 WMOV (EMA single precision): *REL* 8-24

vector multiply
 DVMPY (double precision): *REL* 8-9
 DWMPY (EMA double precision): *REL* 8-9
 VMPY (single precision): *REL* 8-9
 WMPY (EMA single precision): *REL* 8-9

vector non-EMA copy routine, DWVMV (double precision): *REL* 8-26

vector pivot routine
 DVPIV (double precision): *REL* 8-18
 DWPIV (EMA double precision): *REL* 8-18
 VPIV (single precision): *REL* 8-18
 WPIV (EMA single precision): *REL* 8-18

vector smallest value
 DVMIN (double precision): *REL* 8-20
 DWMIN (EMA double precision): *REL* 8-20
 VMIN (single precision): *REL* 8-20
 WMIN (EMA single precision): *REL* 8-20

vector smallest value (absolute)
 DVMIN (double precision): *REL* 8-20
 DWMIN (EMA double precision): *REL* 8-20
 VMIN (single precision): *REL* 8-20
 WMIN (EMA single precision): *REL* 8-20

vector subtract
 DVSUB (double precision): *REL* 8-9
 DWSUB (EMA double precision): *REL* 8-9
 VSUB (single precision): *REL* 8-9
 WSUB (EMA single precision): *REL* 8-9

vector sum routine
 DVSUM (double precision): *REL* 8-14
 DWSUM (EMA double precision): *REL* 8-14
 VSUM (single precision): *REL* 8-14
 WSUM (EMA single precision): *REL* 8-14

vector sum routine (absolute)
 DVNRM (double precision): *REL* 8-14
 DWNRM (EMA double precision): *REL* 8-14
 VNRM (single precision): *REL* 8-14
 WNRM (EMA single precision): *REL* 8-14

vector-scalar add
 DV SAD (double precision): *REL* 8-11
 DWSAD (EMA double precision): *REL* 8-11
 VSAD (single precision): *REL* 8-11
 WSAD (EMA single precision): *REL* 8-11

vector-scalar divide
 DVSDV (double precision): *REL* 8-11
 DWSDV (EMA double precision): *REL* 8-11
 VSDV (single precision): *REL* 8-11
 WSDV (EMA single precision): *REL* 8-11

vector-scalar multiply
 DVSMY (double precision): *REL* 8-11
 DWSMY (EMA double precision): *REL* 8-11
 VSMY (single precision): *REL* 8-11
 WSMY (EMA single precision): *REL* 8-11

vector-scalar subtract
 DVSSB (double precision): *REL* 8-11
 DWSSB (EMA double precision): *REL* 8-11
 VSSB (single precision): *REL* 8-11
 WSSB (EMA single precision): *REL* 8-11

verify
 data integrity: *UTIL* 9-2, 9-11, 9-21, 9-36
 disk operations: *INST* 2-1
 files: *RDSV* B-2
 peripherals: *INST* 2-13, 4-7
 processor: *INST* 2-12, 4-6
 tape: *DBG5* 4-2
 user name, VFNAM: *REL* 6-22

verify command: *RDSV* 3-11
 Verify option: *RDSV* B-2
 Vertical Window (VW) option: *EDIT* 3-27, 4-85, B-3
 VFNAM, verify user name: *REL* 6-22
 View command: *DEBUG* 5-35

viewing
 information: *EDIT* 2-20
 options: *EDIT* 3-29
See also SH command

virtual memory
 backing store file: *PROG* 4-2, 4-3
 declaring VMA array: *PROG* 4-3
 I/O transfers: *PROG* 4-20
 initialized: *PROG* 4-25
 mapping segments (MSEG,VSEG): *PROG* 4-2
 page fault: *PROG* 4-2
 page table: *PROG* 4-2, 4-3

programming: *PROG* 4-13
 size: *PROG* 4-18
 working set: *PROG* 4-2, 4-3
 Virtual Memory Area (VMA): *CUSR* 4-13; *LODR* 1-3, 2-18, 4-29, 5-11, 7-8, 8-8; *PROG* 4-1, 4-2, 4-3
 allocation of: *LINK* 4-2
 commands: *LODR* 2-18
 default environment: *LODR* 2-18
 description: *TUSR* 1-4
 program: *TUSR* 4-77
 size: *LODR* 2-15
 size information: *TUSR* 4-76
 working set: *TUSR* 4-77, 4-81
 Virtual Memory Mapping Segment (VSEG):
 PROG 4-2, 4-5
 VIS programs, examples: *REL* 9-24
 VL command: *TUSR* 3-142
 VM (virtual memory size) command: *LINK* 3-23
 VMA subroutines
 CLSV: *PROG* 4-38
 CREVM: *PROG* 4-35
 LKEMA: *PROG* 4-23
 OPNVM: *PROG* 4-36
 PSTVM: *PROG* 4-38
 PURVM: *PROG* 4-37
 ULEMA: *PROG* 4-23
 VREAD: *PROG* 4-39
 VWRIT: *PROG* 4-40
 VMAB, vector largest value (absolute)
 (single precision): *REL* 8-20
 VMA/EMA errors: *PROG* 4-12
 VMA/EMA mapping subroutines: *PROG* 4-41,
 B-1
 .EMIO: *PROG* 4-50, B-14
 .ESEG: *PROG* 4-49, B-11
 .IMAP: *PROG* 4-44, B-4
 .IRES: *PROG* 4-45, B-6
 .JMAP: *PROG* 4-46, B-7
 .JRES: *PROG* 4-47, B-8
 .LBP, .LBPR: *PROG* 4-49, B-12
 .LPX, .LPXR: *PROG* 4-50, B-13
 MMAP: *PROG* 4-47, B-9
 VMA/EMA programming: *PROG* 4-12
 VMA/EMA subroutines: *PROG* 4-12, 4-15
 EIOSZ: *PROG* 4-22
 EMAST: *PROG* 4-16
 VMAIO: *PROG* 4-20
 VMAST: *PROG* 4-18
 VMAIO subroutine: *PROG* 4-20
 VMAST subroutine: *PROG* 4-18
 VMAX, vector largest value (single precision):
 REL 8-20
 VMIN, vector smallest value (single precision):
 REL 8-20
 VMIV, vector smallest value (absolute) (single
 precision): *REL* 8-20
 VMOV, vector move routine (single precision):
 REL 8-24
 VMPY, vector multiply (single precision): *REL* 8-9

VNRM, vector sum routine (absolute) (single
 precision): *REL* 8-14
 volumes
 initializing: *CUSR* 3-37
 listing: *CUSR* 3-37
 manipulating: *CUSR* 3-35
 mounting and dismounting: *CUSR* 3-35
 ownership and protection: *CUSR* 3-36
 user of: *CUSR* 5-98
 VPIV, vector pivot routine (single precision): *REL*
 8-18
 VREAD subroutine: *PROG* 4-39
 VS (VMA size): *LODR* 5-11
 VS command: *CUSR* 4-13, 5-92; *TUSR* 4-76
 VSAD, vector-scalar add (single precision): *REL*
 8-11
 VSDV, vector-scalar divide (single precision): *REL*
 8-11
 VSMY, vector-scalar multiply (single precision):
 REL 8-11
 VSSB, vector-scalar subtract (single precision):
 REL 8-11
 VSUB, vector subtract (single precision): *REL* 8-9
 VSUM, vector sum routine (single precision):
 REL 8-14
 VSWP, vector copy routine (single precision): *REL*
 8-24
 VW option: *EDIT* 3-27
 VWMOV, vector EMA/non-EMA move routine
 (single precision): *REL* 8-26
 VWRIT subroutine: *PROG* 4-40

W

W command: *EDIT* 2-2, 2-22, 2-28, 2-39, 4-85
 WABS, absolute value routine (EMA single
 precision): *REL* 8-13
 WADD, vector subtract (EMA single precision):
 REL 8-9
 wait state messages: *UTIL* 2-4
 waiting for disk space: *LODR* 4-17
 waiting for list device: *LODR* 4-17
 waiting for resources: *LODR* 4-17
 warning and information reporting: *LODR* 4-16
 warning W-RQ PGS: *LODR* 7-8
 warnings (LOADR and MLLDR): *LODR* A-10
 duplicate program name: *LODR* 4-17
 reporting: *LODR* 4-16
 undefined externals: *LODR* 4-13
 WC command: *EDIT* 2-9, 2-24, 3-6, 4-86
 WC option: *EDIT* 3-27, 5-8
 WD (display or change working directory)
 command: *CUSR* 3-29, 5-93
 WDIV, vector divide (EMA single precision): *REL*
 8-9
 WDOT, vector dot product routine (EMA single
 precision): *REL* 8-17
 WELCOM File: *SMM* 6-11
 ALTER SYSTEM PARAMETERS: *SMM* 6-11

COMMAND ECHO: *SMM* 6-11
 OPERATOR MESSAGE: *SMM* 6-11
 WELCOM file: *HPIB* 3-6
 WEXT: *MAC* 4-19
 WH command: *CUSR* 5-95; *TUSR* 3-143, 4-79
 what the system macros do: *MAC* L-1
 Where command: *DEBUG* 3-11, 5-35
 WHILE-DO-DONE (control structure) command:
 CUSR 2-24, 5-96
 WhoLockedLu: *REL* 7-42
 WhoLockedRn: *REL* 7-42
 WHOSD (report user of directory or volume)
 command: *CUSR* 5-98
 WHZAT utility: *PROG* 1-33; *TUSR* 1-11, 3-143,
 4-79; *UTIL* 2-1, 2-2
 active program mode: *UTIL* 2-13, 2-14
 calling: *UTIL* 2-2
 false readings: *UTIL* 2-7
 general wait state messages: *UTIL* 2-4
 output, AL, SM options: *UTIL* 2-5
 output, PA option: *UTIL* 2-9
 output, PL option: *UTIL* 2-11
 partition status mode output: *UTIL* 2-10
 program scheduling example: *UTIL* 2-8
 program status: *UTIL* 2-2
 program status mode (AL) output: *UTIL* 2-6
 program status mode (SM) output: *UTIL* 2-7
 wildcard (@) character: *EDIT* 2-33
 See also indefinite (@) character
 WildCardMask: *CUSR* 6-81
 window
 definition: *EDIT* B-3
 horizontal search: *EDIT* 3-18
 Window (W) command: *EDIT* 2-22
 Window Columns (WC) option: *EDIT* 3-27
 WMAB, vector largest value (absolute) (EMA
 single precision): *REL* 8-20
 WMAX, vector largest value (EMA single
 precision): *REL* 8-20
 WMIN, vector smallest value (EMA single
 precision): *REL* 8-20
 WMIV, vector smallest value (absolute) (EMA
 single precision): *REL* 8-20
 WMOV, vector move routine (EMA single
 precision): *REL* 8-24
 WMPY, vector multiply (EMA single precision):
 REL 8-9
 WN command: *EDIT* 4-85
 WNRM, vector sum routine (absolute) (EMA
 single precision): *REL* 8-14
 word
 byte and bit processing: *MAC* B-3
 processing: *MAC* 3-3, B-3
 work area: *EDIT* 1-8
 work file: *EDIT* 1-2, 1-7, 1-12, 2-17, 3-4, 3-6, 3-46,
 3-50, B-3, C-2
 work file defaults: *MAC* E-6
 work file format
 RTE-6/VM: *EDIT* C-4
 RTE-A: *EDIT* C-3
 WORK=work file specification: *MAC* E-5

working directory (WD): *CUSR* 3-6, 3-29, 3-36
 working set: *LODR* 2-18, 4-29, 7-8; *PROG* 4-2,
 4-3, 4-5; *TUSR* 4-77, 4-81
 memory area: *CUSR* 4-13
 post: *PROG* 4-38
 WPIV, vector pivot routine (EMA single
 precision): *REL* 8-18
 WR command: *EDIT* 2-9, 2-24, 4-87
 wrap-around: *EDIT* 2-12
 Write and Create (WC) command: *EDIT* 2-9
 Write and Replace (WR) command: *EDIT* 2-9
 write call - EXEC 2: *PROG* 2-20
 write-protect switch: *LODR* 2-12
 write request: *DMUX* 2-9
 binary bit: *DMUX* 2-10
 BUFR and BUFLN parameters: *DMUX* 2-9
 control word (CNTWD): *DMUX* 2-9
 echo bit: *DMUX* 2-10
 force handshake bit: *DMUX* 2-10
 honesty mode bit: *DMUX* 2-10
 transparency bit: *DMUX* 2-9
 Z-bit: *DMUX* 2-9
 write request function codes: *CMUX* 2-5
 write tape utility (WRITT): *UTIL* 5-1
 write to system console, SYCON: *REL* 6-19
 WRITF FMP call: *CUSR* B-5; *PROG* 3-56
 writing device drivers: *CMUX* 4-1
 example: *CMUX* 4-13
 writing macro definitions: *MAC* 5-1, 5-4
 writing standard RTE drivers: *DRVW* 3-1
 writing to a file: *EDIT* 3-7, 4-86, 4-87
 WRITT utility: *PROG* 1-33; *TUSR* 1-10; *UTIL*
 5-1
 calling: *UTIL* 5-2
 error messages: *UTIL* 5-4
 examples: *UTIL* 5-3
 WS (working set size): *LODR* 5-11; *LINK* 3-23
 WS command: *CUSR* 4-13, 5-100; *TUSR* 4-81
 WSAD, vector-scalar add (EMA single precision):
 REL 8-11
 WSDV, vector-scalar divide (EMA single
 precision): *REL* 8-11
 WSMY, vector-scalar multiply (EMA single
 precision): *REL* 8-11
 WSSB, vector-scalar subtract (EMA single
 precision): *REL* 8-11
 WSUB, vector subtract (EMA single precision):
 REL 8-9
 WSUM, vector sum routine (EMA single
 precision): *REL* 8-14
 WSWP
 vector copy routine (EMA single precision):
 REL 8-24
 vector EMA/non-EMA copy routine (single
 precision): *REL* 8-26
 WU command: *EDIT* 4-85

X

X command: *EDIT* 2-34, 3-18, 4-88

X option: *MAC E-2*
 XAX: *MAC 3-9, B-8*
 XAY: *MAC 3-9, B-8*
 XBX: *MAC 3-9, B-8*
 XBY: *MAC 3-9, B-8*
 XCA: *MAC 3-16, B-13*
 XCB: *MAC 3-16, B-13*
 Xdb
 command stacking: *DEBUG 7-3*
 command summary: *DEBUG 7-5*
 commands: *DEBUG 7-3*
 breakpoint commands: *DEBUG 7-7*
 command arguments: *DEBUG 7-3*
 data display commands: *DEBUG 7-8*
 execution control commands: *DEBUG 7-8*
 file viewing commands: *DEBUG 7-9*
 miscellaneous commands: *DEBUG 7-11*
 record/playback commands: *DEBUG 7-10*
 stack tracing commands: *DEBUG 7-9*
 window control commands: *DEBUG 7-10*
 compatibility mode: *DEBUG 1-1, 7-1*
 playback file: *DEBUG 7-1, 7-10*
 record file: *DEBUG 7-1, 7-10*
 record-all file: *DEBUG 7-10*
 runstring: *DEBUG 7-1*
 runstring options: *DEBUG 7-1*
 -d: *DEBUG 7-2*
 -p: *DEBUG 7-2*
 -r: *DEBUG 7-2*
 XDBL: *MAC H-11*
 XE command: *BSP 2-45*
 entered from batch device: *BSP 2-46*
 entered interactively: *BSP 2-47*
 job input control: *BSP 2-45*
 specify input from a device: *BSP 2-47*
 XEXT: *MAC H-7*
 XIF: *MAC B-18, J-3*
 XLA: *MAC 3-16, B-13*
 XLB: *MAC 3-16, B-13*
 XLUEX call: *DMUX 1-2; PROG 2-9*
 XMA: *MAC 3-16, B-13*

XMB: *MAC 3-16, B-13*
 XMM: *MAC B-13*
 XMS: *MAC 3-16, B-13*
 Xon/Xoff handshake: *CMUX 2-31, 5-1*
 disable/enable: *CMUX 2-31*
 force Xon condition: *CMUX 2-31*
 transmit pacing: *CMUX 2-31*
 Xon/Xoff handshake protocol: *EDIT 2-16, 2-17, 3-38, 4-63*
 Xon/Xoff protocol
 definition: *DMUX 2-28*
 setting: *DMUX 2-27*
 XOR: *MAC 3-2, B-2*
 XPOLY: *REL 3-129*
 XQ (run program without wait) command: *CUSR 4-5, 5-101*
 XQPRG subroutine: *PROG 5-92*
 XREIO subroutine: *PROG 5-55*
 XSA: *MAC 3-16, B-13*
 XSB: *MAC 3-16, B-13*

Y

Y command: *EDIT 3-18, 4-90*

Z

Z option: *MAC E-2*
 Z-bit: *CMUX 4-10*
 read request: *DMUX 2-2*
 write request: *DMUX 2-9*
 Z-buffer: *DMUX 2-2*
 zero a passed buffer, ClearBuffer: *REL 7-6*
 zero increment (VIS): *REL 9-9*
 zero-length record: *CMUX 2-5*
 zone punch, SZONE: *REL 10-14*
 ZRevCode: *REL 12-92*
 ZWriteBaud: *REL 12-92*