

CGOS 200 GNA OPERATOR

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Section One
INTRODUCTION

Section 1

INTRODUCTION

The *CGOS 200 GNA Operator Guide* serves a dual purpose. It is designed to introduce routine system interactions and to be a concise reference source for the experienced system user. This release of the Computervision Graphics Operating System (CGOS 200) supports Graphic Networking Architecture (GNA) and up to 10 user tasks.

A Table of Contents, Index, and Glossary provide quick reference to material throughout this publication. This Guide is divided into four sections:

- Section 1 Highlights the Designer V and CV environment.
- Section 2 Introduces system software operation and references the system's Special Characters.
- Section 3 Provides a brief command description of all system commands and lists the most commonly used operator commands.
- Section 4 Appendix definition of Error Codes and Messages.

Due to on-going hardware and software enhancements, some information in this manual may be superseded. Extensive, up-to-date documentation is stored on-line. On-line documentation is accessed with the HELP command. (See HELP, Section 3, for additional documentation.)

CV PUBLICATIONS

A complete list of CV Publications is available by contacting your CV representative. This list includes brief descriptions, prices, and recommended quantities for purchase of current user publications.

NOTATION

Different type sizes and faces are used to distinguish between system and user responses.

	<u>Exact</u>	<u>Variable</u>
User Input	ALL CAPS	Upper and Lower-case
System Output	ALL CAPS, SMALL TYPE FACE	Upper and Lower-case Small Type Face

Introduction

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NOTATION (Continued)

	<u>Symbol</u>	<u>Meaning</u>
Other Conventions	↵	Carriage return.
	n>	Operating System (O/S) level prompt for input.
	[]	Optional material.
	{ }	Choose between two or more items.

TRAINING

Technical training instruction is given at the Services Training Center, Woburn, Mass, and at CV Education Centers in Chicago and Los Angeles. Application Engineers and professional instructors are also available to come directly to your company. The current listing of courses, available in a quarterly brochure, *Educational Services Course Schedule*, is obtainable through the Educational Centers Registrar (617)935-9723.

PRODUCTIVITY SERVICES

CV Productivity Services, available on a contract basis, focuses on the efficiency with which your Designer System is being operated, and its cost-effectiveness for your product.

A two to three day, on-site review of your system in operation consists of operations personnel interviews, and investigations of your programming and operating system environment, overlay structures, file catalogs, and communications with mainframe computers. Resulting recommendations might include suggestions for improving operating procedures, making tasks more cost-efficient, and choosing/training more effective supervisors, operators, and other personnel.

CV T.I.P.S.

A quarterly publication, *Techniques for Increasing Productivity on the System*, is available for all Computervision systems users at no extra cost. For additional information regarding a T.I.P.S. subscription, and submittal of T.I.P.S. material, contact your CV representative.

BUG REPORTING

To report a software bug, please call the Response Center in Woburn, Massachusetts, 800-225-5376 or 617-935-9723. A dispatcher will take the information and an applications engineer will return your call, normally within four hours, to discuss your problem. Each month you will receive a status report of all your software-related calls to the Response Center.

DESIGNER SYSTEM

The Designer System is designed to work optimally with the CGOS 200 GNA. It is composed of the following interactive components.

CGP-200

The CGP-200 performs all data calculations and interactive control functions. It consists of a graphics processor and a magnetic tape unit.

- Graphics Processor

A high-speed data manipulation and storage device that controls all Designer System operations. It contains controllers for the Design Console and all CV input/output devices.

The Central Processor Unit (CPU) is micro-program controlled. Internal Read Only Memory (ROM) chips contain firmware (a microprogram) that is activated by program instructions. Microprogramming permits simultaneous execution of CPU functions, giving much faster processing of program instructions than conventional CPUs. Simplified operator controls and state-of-the art microprogrammed circuitry assures ease of operation, fast response for users, simple field up-grading, and increased system reliability.

Associated with the CPU is a memory board, capable of storing 32,768 17-bit words: 16 bits of data, one parity bit. The memory capacity, depending on the configuration, is expandable to 640K words with the Memory Mapping and Protection Unit (MMP) and additional memory boards. The CGOS supervises all system resources and uses 80K of memory. Each user or task uses 46K of memory. Current CGP configurations accommodate as many as 8 interactive graphic users on the CGOS 200 GNA system.

- Magnetic Tape Unit

Used to write and store design information entered into the system. Once stored on tape, information can always be read back into the system.

Storage Module

An 80 or 300-megabyte disc unit is used for storing design information. The unit records onto a multi-surfaced disc pack. CGOS is stored on a protected portion of this disc.

Instaview Workstation

The typical workstation consists of a 19-inch cathode ray tube (CRT) display, a graphics tablet with pen, a keyboard, and a printer. It is configured, on the CADD3 or 4 system, to be used with a graphics tablet or a CVD-4 (CV Digitizer). Menuing and continuous digitizing are features that enhance the productivity of the workstation.

Introduction

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Instaview Workstation (Continued)

- **CRT Display**

Used for designing, editing, and evaluating graphic drawings. After all insertions, deletions, and modifications are made, the design may be plotted on the plotter or stored for future use.

CRT digitizing is accomplished by using an electronic pen in conjunction with a graphic tablet. The position of the pen appears as an intersection of two lines (crosshair) on the display screen.

- **Graphics Tablet and Pen**

Used for design input, data editing, and command menu selection. When the pen's tip is within one quarter inch of the tablet's surface, the pen's motion moves the cursor on the display screen. Pressing a button on the pen digitizes the point on the display indicated by the cursor.

- **Printer**

Provides permanent, dry copies of any information displayed by the INSTAVIEW terminal.

19/G Workstation

The typical 19/G Workstation consists of a 19/G Design Console (Graphics Display Storage Terminal), a design pen and tablet, and either a Teledisplay or Telewriter II Unit. Menuing and continuous digitizing are features to enhance the productivity of the workstation.

- **Graphics Display Storage Terminal**

This interactive, storage tube graphics display terminal is designed for use as a graphics workstation or as an echo display for the Interact IV and the CV Digitizer.

- **Design Pen and Tablet**

The Design Pen and Tablet are used in conjunction with the 19/G Design Console for data input, data editing, and menu selection. The pen is used to position the cursor on the Graphics Display Terminal and to input digitized data. The top half of the tablet is divided into squares that can be assigned a single command, text, or group of commands which are initiated by pressing the pen down within the appropriate menu square. This action digitizes, that is, records the point on the Display Terminal indicated by the cursor.

19/G Workstation (Continued)

- Telewriter II

A typewriter-style keyboard and hardcopy printer. The unit is used for entering design commands, printing system error messages, system prompts, and general information. It produces an audible tone to indicate improper or illegal commands.

- Teledisplay

A character-oriented, data entry/display terminal used for entering commands, displaying system error messages, system prompts, and general information.

Additional Design System Components

- Instaview-C

CV's color display graphics terminal. As an intelligent graphics terminal, the Instaview-C uses a high-resolution color raster CRT display to provide enhanced graphic discrimination capabilities. Up to 64 colors can be used to differentiate graphic information. The basic console design and manipulation capabilities of the non-color Instaview workstation are incorporated.

- P-1000

This portable, high-speed pen plotter accepts very long drawings and continuous plots. The P-1000 can plot on pre-printed forms, continuous roll, single sheet, and other standard drafting media.

- Compucircuit 150

CV's high-speed precision photoplotter.

- CV Digitizer 4 (CVD-4 and Instaview-D)

The CVD-4 incorporates text only; the Instaview-D incorporates both graphics and text. Both provide a micro-processor controlled, high resolution, high accuracy, free cursor, absolute position digitizing surface. They can be interfaced to the Designer System as either a stand-alone user station, or used in conjunction with a Design Console. The CVD-4 and Instaview-D offer the choice of either a pen or puck input. Their digitizing surfaces are 38 inches by 48 inches. Both are tiltable with adjustable backlighting.

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Additional Design System Components

(Continued)

- Digitizing Puck (for CVD-4 and Instaview-D)

This standard digitizing "pointer" is connected to the CVD-4 or Instaview-D with a lightweight, flexible cable. As a digitizing cursor, the puck aids graphics precision and can be more convenient for close work than the pen. The "pointer" is a cross-hair reticle. Its position appears as an intersection of two lines (crosshair) on the display screen. Five buttons are mounted on the puck: one for digitize, one to enter and leave Stream Mode (implemented through system software), and the others assignable through the system software. Three LED lights are also on the puck: one to indicate proximity of puck to surface, one for Stream Mode, and the third assignable.

Other Peripherals

Contact a CV sales representative for details on various paper tape punches and readers, interactive terminals, communications equipment, and storage units.

- Calcomp 960 Pen/Plotter

Used to plot high-resolution drawings. This unit performs a plotting function only; it is not an interactive device.

APPLICATIONS PACKAGES/ COMMUNICATIONS SUPPORT

Applications Packages

CGOS 200 GNA supports all CADDs 3 and CADDs 4 application packages. Some of the packages available are:

- ACE (Architecture and Civil Engineering)
- MDD (Mechanical Design and Drafting)
- NC (Numerical Control)
- PC/ES (Printed Circuits/Electrical Schematics)
- Wiring Diagrams

Contact your CV representative for a complete list of available software application packages.

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Communications Support

CGOS 200 GNA can communicate with other CV and non-CV systems. CGOS 200 GNA supports a number of communications packages. For data transfer between CGOS 200 systems, Graphic Networking Architecture (GNA) and CVNET are available. For data transfer between CV systems and other systems, CGOS 200 supports 2780, HASP, Honeywell GRTS, Univac 1004, and Sigma 7 protocols. These products require a programmable communications unit (PCU) for their operation. Further details are available upon request.

Section Two
THE OPERATING SYSTEM

Section 2

THE OPERATING SYSTEM

CGOS 200 GNA is a graphics-oriented, multi-user, multi-programming operating system developed by Computervision (CV). Supporting CADD3 and CADD4 interactive graphics CAD/CAM applications, it uses CV's Graphics Processor, the CGP-200.

CGOS 200 GNA is characterized by the following:

- On-line software development aids.
- Multi-user operation of up to eight interactive graphic workstations.
- Sophisticated file management/command processing system.
- Input/Output system designed to interact with and support a large variety of graphics and standard peripheral I/O devices.
- Extensive CPU to CPU communications, including Graphics Networking Architecture (GNA).

PROGRAMMING SUPPORT

Text Editors

CGOS supports three text editors for creating and modifying source files.

EDIT — A simple, line-oriented editor for inputting text.

LONGEDIT — A line-oriented editor that handles up to 256-character line lengths.

CVTECO — A powerful, character-oriented editor.

(See EDIT, LONGEDIT, and CVTECO commands, Section 3.)

Programming Languages

FORTTRAN-S — A subset of ANSI STANDARD FORTRAN.

TPL — A high-level procedural language used for CV systems programming. TPL can go into assembly language when direct control of machine code is required.

The Operating System

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- The Compiler** Compiles a FORTRAN or TPL source file.
- The Loader** Links and loads files of object code. The result is an overlay containing the absolute binary code to be executed at runtime.
- Debugging Aids** A symbolic subroutine trace is supported for runtime debugging along with a debugger designed for application use. (See DEBUG and TRACE command documentation in the *CGOS 200 GNA Programmer Reference Manual*.)

TASK INTERFACE

- Multi-User Environment** CGOS 200 GNA supports up to eight user tasks in the foreground and two more tasks in the background; making up to 10 tasks simultaneously operable. Processor time is priority-allocated. Short, interactive requests are allocated small amounts of CPU time; CPU-bound tasks get larger amounts of time at less frequent intervals.
- BATCH PROCESSING** Background processing support is provided on a resource-available basis. The system maintains a queue for batch jobs. The jobs receive CPU time depending on priority and the overall system load. Any Execute File can be submitted for batch processing. Batch processing commands are summarized in *Batch/Execute File Processing Commands*, Section 3.
- EXECUTE FILES** Generally, O/S commands are entered from the command device (COMDEV). To automate the process of entering a repetitive series of commands, an *Execute File* may be used. An execute file is a standard text file containing system commands. Execute files can invoke other execute files or batch programs.
- SYSTEM COMMANDS** CGOS 200 GNA command syntax is very similar to CADDSS command. There are over 100 standard system commands that an operator trained on a CADDSS system can similarly use. Standard conventions facilitate the addition of new commands to suit specific needs. Users can develop and implement their own commands on a single-user or system-wide basis. (See Section 3 for brief descriptions of system commands.)
- Login/Accounting Login Option** After the system has been booted up from disc, you may Login to a system task. (The left column outlines the procedure; the right column clarifies the interaction.)

The Operating System

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Login/Accounting CTRL-L (or CTRL-Rn) Login Option (Continued)

Key-in either command, depending on the task number you want to access:

- CTRL-L — used in most cases; the Login procedure assigns you the next available task.
- CTRL-Rn — used to Login to a specific task. Type in CTRL-R followed by n (n = desired task number. Your terminal is assigned as the command I/O device (COMDEV) for the task.

NOTE: the system does not respond to a larger task number than the number of tasks available, or a task number that is already logged in.

****FMCLEAR****

If you are the first person to log in after the system is booted up, this message appears. See FMCLEAR command or response to FMCLEAR output.

****TASK n INITIATED****

Output when Login is complete and the task is ready to use the system. (n = task number assigned to you.)

n>

System prompt. The task is ready to accept command input. If file management is enabled, the system attempts to execute the first file in a hierarchy of user-created execute files, if any exist:

1. SYSEXEC.BOOT-UP (Only for the first Login after bootup.)
2. USERNAME.LOGINEXEC (username = your Login name.) The text file USERNAME.LOGINEXEC is executed.

The Operating System

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3. SYSEXEC.LOGINnn (nn = two-digit hexadecimal task number.) Task-specific files are only executed for the task numbered nn.

4. SYSEXEC.LOGIN

The system executes the first file in the hierarchy that exists. When execution is complete, the system prompt is issued. If file management is enabled and none of the files exist, or file management is disabled, the system prompt (n>) is issued immediately after the message: ****TASK n INITIATED****.

FILE STRUCTURE NOT
FOUND ON DISC

If FMINIT was not previously run (new pack) this message appears.

TYPE BOOT PASSWORD

If FMINIT has been run and authorized boot-up was selected, you are asked to enter the authorized boot-up password. (6 Characters.)

INVALID ENTRY,
RESTART LOGIN

This message is output if the password entered does not match the password specified in FMINIT. Restart Login by typing CTRL-L or CTRL-Rn.

TYPE TIME AND DATE
MM-DD-TT(,HH:MM)

Under FMINIT, you are asked to set the system clock. (Based on 24-hour clock, e.g., 1:00 PM = 13:00.)

MM = Month hh = hour
DD = Date mm = minute
YY = year

TYPE NAME, NUMBER

This message is output when system accounting logs and system authorize features are enabled. Enter name (up to 20 alphanumeric characters), comma, and a number (up to 13 digits).

TYPE PASSWORD

System response when the system authorize feature is enabled. Input a valid password (up to six characters). Your password must correspond to the system authorize file entry which is associated with your name and number. As your password is typed, the system will echo blanks.

The Operating System

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INVALID ENTRY

This message is output if the password is not valid for the given name and number. You must then begin again by typing Control L or Control Rn.

ACCOUNTING
LOGIN OPTION

The System Manager retains detailed user accounting information (on-system time, etc.). If accounting is enabled, the account's usage logs (as given by the account name and number) will be activated. Sections 3 and 6 of the *CGOS 200 GNA System Manager Guide* contain detailed information.

**LOGOUT/
Autologout**

LOGOUT

The user can LOGOUT manually or under certain circumstances be logged out automatically.

n> LOGOUT

Enter command.

MINS. ELAPSED: COST:

When authorized Login or accounting Login is enabled, the system responds with the time elapsed since Login and the cost for time used.

TASK_n TERMINATED

This is the final system response in all configurations.

All units attached to the task are released and the task is terminated.

In order to access the system again, the user must perform a Login.

AUTOLOGOUT

The Autologout feature is set by the System Manager at BLDSYS time. If Autologout is enabled, the system will log you out if your task is left idle at O/S level for 15 minutes. With Autologout disabled, there is no limit to idle time. Your task will only be logged out in response to the LOGOUT command.

The Operating System

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Task Interrupt Wait State

To interrupt task execution, enter an ESCAPE or CTRL-B from your COMDEV. Printing on the COMDEV or HARDEV will temporarily be halted. Your task is now in a *wait state*. To exit from the wait state or continue waiting, type one of the characters depicted in the table that follows. Each character triggers a specific action.

<u>Character</u>	<u>Action</u>
^P	Toggles HARDEV on/off; continues to wait.
^U	Toggles COMDEV on/of; continues to to wait.
^B	Continues to wait.
ESCAPE	Continues to wait.
Q	Aborts the command and escapes to system level.
N	Aborts the command, returns to O/S level, and terminates an EXECUTE file in progress.
K	Aborts the command and escapes to system level.
1-9	The specified number of lines are output. The system then re-enters the Interrupt Wait State.
P	Outputs a page. (Lines per page is device dependent.) The value for each device is one of the configuration parameters for the device.
(Other)	Task continues normal execution.

INPUT-OUTPUT SYSTEM

Common I/O devices (magnetic tapes, line printers, card readers, paper tape readers/punches, graphics and alphanumeric terminals, plotters, and data communication devices) are easily attached to any task. Once attached, devices may be accessed and controlled by commands entered at O/S level. CGOS supports *no-wait I/O*, which gives you the capability for entering commands from your task while I/O affecting your task is in progress. To access I/O devices, the system supports certain standard naming conventions.

The Operating System

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I/O Device Names

Every tape unit and auxiliary device in the system can be referred to by one of three names:

- **Unittype** A generic four-character name for a class of units (e.g., TAPE, IOSB, INFO, TTYS, TBIO, TRMN).
- **Uniqname** A unique four-character name for each device (e.g., INFO, INF1).
- **Taskunitname** A two-character, user-assigned name for a device of exclusive access.

TO ASSIGN TASKUNITNAME

A device must have a Taskunitname before it can be used. Use the ATTACH command to assign a Taskunitname to the device you wish to use.

Example

ATTACH CR,IOSB	Attaches IOSB (name CR).
ATTACH TT,TTYS	Attaches teletype (name TT).

Once the device has been attached, use the Taskunitname to access the device from a system command.

Example

SELECT HARDEV = TT	Make device TT the HARDEV.
DETACH TT	Detaches unit TT.
RENAMDEV PT,CR	Renames device PT; (new name CR).

SPECIAL CASES

CM No device may be named CM. Any command using CM accesses COMDEV (your terminal or command device).

SD The terminal you Login on is named SD by the Login process.

The Operating System

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SPECIAL CASES (Continued)

MT

Mag tapes are usually named MT. Any system command needing a tape unit name assumes MT unless you supply another name.

Example:

ATTACH MT, TAPE	Attaches tape.
REWIND MT	Rewinds tape.
REWIND	Rewinds tape.

Special Function Characters

CGOS uses the ASCII character set. When you type characters on your COMDEV, CGOS uses ASCII values to translate them to machine-readable binary code. This section describes the ASCII character set, location of the keyboard characters, and special function characters.

Character positioning varies from keyboard to keyboard. Character key positions are described for each of the following CV devices:

TTY	Teletype (ASR-33)
INFO	Infoton
DEC	Decwriter or Decscope (VT50)
LEAR	Lear Siegler (ADM-3A)
IOSB	Telewriter
INST	INSTAVIEW Keyboard

The Decwriter and Decscope keyboards are similarly arranged. The Decscope lacks certain keys (Repeat, and all lower-case characters) that the Decwriter has.

TO TOGGLE OUTPUT

Output can be directed to either the command device (COMDEV), the hard-copy device (HARDEV), or both.

- CTRL-P toggles the HARDEV.
- CTRL-U toggles the NOPRINT switch (on or off) for the COMDEV.

SPECIAL FUNCTION CHARACTER TABLE

Applicable special function characters are listed and described in the table that follows.

The Operating System

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SPECIAL FUNCTION CHARACTER TABLE (Continued)	<u>Key</u>	<u>Location</u>	<u>Action</u>
	SHIFT	Lower left and lower right	To type any SHIFT, SHIFT key must remain depressed while striking character key (e.g., to type shift-N, depress SHIFT and strike N simultaneously).
	CONTROL (CTRL)	Middle left	Similar to SHIFT. To type a (CTRL) control character, depress CTRL key while striking character key. To type CTRL-SHIFT key, depress both CTRL and SHIFT while striking character key. In this documentation, a control character is represented by an up arrow (^) before the character (e.g., ^A means CTRL-A).
	SHIFT LOCK	IOSB: just above SHIFT INST: just above SHIFT	After hitting SHIFT LOCK, the keyboard just above SHIFT transmits only SHIFT characters. SHIFT condition is cleared by striking the SHIFT key. IOSB: SHIFT lock condition on when IOSB powered up.
	CAPS LOCK	DEC: just above SHIFT	CAPS LOCK transmits A - Z as uppercase.
	BREAK	Far right	Do not strike this key. Useful only on half-duplex systems to cause break in output. If accidentally struck and terminal appears to die, Use ^B (see below).
	REPEAT	TTY: middle right INFO: middle right DEC: lower right LEAR: lower right INST: auto repeat	When REPEAT key is held down, any other depressed key will transmit multiple times.
	^@	CTRL-@	Null (not used).

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SPECIAL FUNCTION CHARACTER TABLE (Continued)

<u>Key</u>	<u>Location</u>	<u>Action</u>
CTRL (^) Letters		
Only those characters listed below have a special significance.		
^B	Break Character	When an application program finds this character, a break-type action should occur. If typed during COMDEV or HARDEV output, Interrupt Wait State is entered. ^B is intercepted by the input device handler and will never be put into the task input stream.
^C ^C	2 CTRL-C's (consecutive)	TASKILL. Aborts all active task I/O; returns task to system level. <i>CAUTION:</i> TASKILL is intended to be an emergency abort. It does not cleanup files or return a task to its pre-determined state. Whenever possible use ESC-Q, etc.
^D	CTRL-D	Toggles the DEBUGGER if the DEBUG or TRACE command has been specified. (See DEBUG and TRACE command documentation, <i>CGOS 200 GNA Programmer Reference Manual</i> .)
^G	CTRL-G	Rings bell (won't echo).
^H	CTRL-H	Backspaces. Software treats ^H like a rubout; i.e., it deletes the last character you typed in. TTY: does not move the print head. INFO: moves cursor to upper left-hand corner.
^I	CTRL-I	Performs a tab.

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SPECIAL FUNCTION CHARACTER TABLE (Continued)	<u>Key</u>	<u>Location</u>	<u>Action</u>
	^J	CTRL-J DEC: middle right LEAR: middle right IOSB: SHIFT-: INST: middle right	Performs a line feed (will not echo).
	^L	CTRL-L	Form Feed. When typed on terminal not attached to any task, will Login as next available task and attach COMDEV as the keyboard device. It has a device dependent effect: INFO: erases the screen LINE PRINTER: page eject (form feed). <i>NOTE:</i> ^L is part of the core constant. If the above actions occur while an undebugged program is running, it is probably printing out core constants.
	^M	CTRL-M	Carriage Return, signaling an end of line. It echoes as a carriage return followed by a line feed.
	^O	CTRL-O (CTRL, Shift 0)	LEAR: locks the keyboard (you can no longer type anything). A switch on the PC board will disable the lock. <i>NOTE:</i> ^O is part of the core constant. If lock-up occurs while an undebugged program is running, it is probably printing out core constants.
	^P	CTRL-P	Hardcopy Toggle. Toggles hardcopy switch for task. When switch on, all system output prints on task HARDEV (or the default HARDEV). The hardcopy toggle is set to off by system command line processor. Toggling is performed by the input device handler and will never be put to the task input stream. Does not work with FUTIL.

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SPECIAL FUNCTION CHARACTER TABLE (Continued)	<u>Key</u>	<u>Location</u>	<u>Action</u>
	^Q	QCTRL-Q	Restarts a line of input. It rubs out all characters typed in back to the previous ^M.
	^R	CTRL-R	If task has terminal attached, ^R is ignored. Otherwise, ^R is followed by a one digit task number. If task is not logged in, it is logged in and attached to the keyboard. If that task is logged in with no COMDEV, it attaches the keyboard to the task and makes the keyboard its COMDEV.
	^S	CTRL-S	On a paper tape, ^S indicates an end-of-file.
	^T	CTRL-T	Trace Toggle. When the switch is on and tracing is in use, trace output is sent to COMDEV.
	^U	CTRL-U	Noprint Toggle. Toggles NOPRINT switch on and off for the task. When the switch is on, system output prints on the task COMDEV (if no COMDEV, the task waits to be attached to the task using ^R; see above). The NOPRINT toggle is set by the system command line processor. Toggling is performed by the input device handler and does not work with FUTIL.
	BACK-SPACE	DEC: upper right IOSB: upper left	Same as ^H.
	TAB	DEC: middle left IOSB: upper right	Same as ^I.
	LINE FEED	Middle right	Same as ^J.

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SPECIAL FUNCTION CHARACTER TABLE (Continued)	<u>Key</u>	<u>Location</u>	<u>Action</u>
	LETTERS A-Z	LEAR: middle IOSB: middle INST: middle	Normally converted to uppercase. Lowercase character can be typed in when lowercase capability is enabled for a task. (See LETTERS "Uppercase".)
	DELETE RUBOUT	TTY: middle right INFO: middle right DEC: middle right LEAR: SHIFT- IOSB: upper right INST: middle right	When DELETE (or RUBOUT) is typed, the system deletes the last character typed in and echoes \. Typing RUBOUT is similar to typing ^H.
	]	TTY: SHIFT-M INFO: SHIFT-M DEC: SHIFT-[LEAR: upper right INST: upper right IOSB: SHIFT-)	
		TTY: SHIFT-N INFO: SHIFT-N DEC: SHIFT-6 LEAR: upper right LEAR: upper right IOSB: SHIFT- INST: middle left	In execute files ^ enters control characters into the command stream. See EXECUTE.
	_	TTY: SHIFT-0 INFO: SHIFT-0 DEC: SHIFT- LEAR: middle right IOSB: SHIFT-DELETE INST: upper right	Sometimes prints as a back-arrow; sometimes prints as an underscore. (No special use)
	'	DEC: upper right LEAR: SHIFT-@ IOSB: middle right INST: SHIFT-@	
	{	DEC: middle right LEAR: SHIFT- { IOSB: upper right INST: SHIFT-]	

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SPECIAL FUNCTION CHARACTER TABLE (Continued)	<u><i>Key</i></u>	<u><i>Location</i></u>	<u><i>Action</i></u>
	\	DEC: SHIFT-\ LEAR: SHIFT-\ IOSB: middle right INST: SHIFT-\ 	
	}	DEC: SHIFT-} LEAR: SHIFT-] IOSB: middle right INST: SHIFT-ESCAPE 	
	~	DEC: SHIFT- LEAR: SHIFT- IOSB: middle left INST: SHIFT- 	

The Operating System

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Card Reader Characters

Card reader characters are listed in the table that follows.

<i>Key Punch Code</i>	<i>029</i>		<i>026</i>	
	<i>Character</i>	<i>Hex</i>	<i>Character</i>	<i>Hex</i>
12-1	A	C1	A	C1
12-2	B	C2	B	C2
12-3	C	C3	C	C3
12-4	D	C4	D	C4
12-5	E	C5	E	C5
12-6	F	C6	F	C6
12-7	G	C7	G	C7
12-8	H	C8	H	C8
12-9	I	C9	I	C9
11-1	J	CA	J	CA
11-2	K	CB	K	CB
11-3	L	CC	L	CC
11-4	M	CD	M	CD
11-5	N	CE	N	CE
11-6	O	CF	O	CF
11-7	P	D0	P	D0
11-8	Q	D1	Q	D1
11-9	R	D2	R	D2
0-2	S	D3	S	D3
0-3	T	D4	T	D4
0-4	U	D5	U	D5
0-5	V	D6	V	D6
0-6	W	D7	W	D7
0-7	X	D8	X	D8
0-8	Y	D9	Y	D9
0-9	Z	DA	Z	DA
0	0	B0	0	B0
1	1	B1	1	B1
2	2	B2	2	B2
3	3	B3	3	B3
4	4	B4	4	B4
5	5	B5	5	B5
6	6	B6	6	B6
7	7	B7	7	B7
8	8	B8	8	B8
9	9	B9	9	B9
11	-	AD	-	AD
0-1	/	AF	/	AF
12	&	A6	+	AB
12-8-2	{	FB	{	FB
12-8-3	.	AE	.	AE

The Operating System

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Card Reader Characters (Continued)

<i>Key Punch Code</i>	<i>029</i>		<i>026</i>	
	<i>Character</i>	<i>Hex</i>	<i>Character</i>	<i>Hex</i>
12-8-6	+	AB	<	BC
12-8-5	(	A8		FD
11-8-5	)	A9		FB
11-8-3	\$	A4	\$	A4
11-8-4	*	AA	*	AA
11-8-6	;	BB	>	BE
11-8-2	!	A1	!	A1
0-8-3	,	AC	,	AC
0-8-6	>	BE	#	A3
0-8-7	?	BF	%	A5
8-3	#	A3	=	BD
8-4	@	C0	@	C0
8-2	:	BA		DF
8-6	=	BD	'	A7
8-5	'	A7	1	FC
none	space	A0	space	A0
12-8-7		FC		A1
11-8-7	~	FE	G	A6
11-9-2	CTRL-R	92	CTRL-R	92
11-9-4	CTRL-T	94	CTRL-T	94
11-9-3	CTRL-U	95	CTRL-U	95
11-7-8	rubout	FF	}	FD
12-4-8	<	BC	}	FD
0-4-8	%	A5	}	FD
7-8	"	A2	}	FD
12-0	ENQ	85	}	FD
11-0	CR	8D	}	FD

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FILE MANAGEMENT

The CGOS 200 GNA hierarchical file system supports sequential and random access file types of unlimited size. Each file contains information such as drawings, text, keyfiles, source code, executable code, or user-developed commands.

Filetypes

All files in the file manager are assigned a file type according to the following scheme:

0	Not defined	C-E	Reserved
1	Catalog	F	Z80 Binary files
2	Object	10-1F	Reserved
3	Text	20-2F	Reserved for CADD S 4
4	Configurations	20	CADD S Parts
5	Reserved	21	TVF's
6	PEP object code	22	Figures
7	Core image (overlay)	30-AF	Reserved
8	Command table	B0-BF	Reserved
9	Loader symbol table		Batch Processing
A	Reserved	C0-FE	Reserved
B	Accounting table	FF	Work Files

The allowable character set for filenames is A-Z, 0-9, &, #, %, \$, @, +, - . Lowercase is forced to uppercase.

Text Files

All catalogs associated with text files have an "&BCD" level. Each text file has &BCD as the next-to-last level of its name. (e.g., Catalog name = "Foo"; "Foo.&BCD" contains "Foo's" text files.) In referring to a text file, the &BCD level of the filename is sometimes omitted. Certain O/S level commands are uniquely associated with text files. When using these commands, omit the &BCD. All other commands require that the &BCD be specified.

File Management Catalog Structure

Filenames consist of one or more levels. A period is the *delimiter* between levels. Each level can be up to 20 characters in length; the total character count for a filename cannot exceed 80 characters. Any file access in command descriptions refers to file manager files.

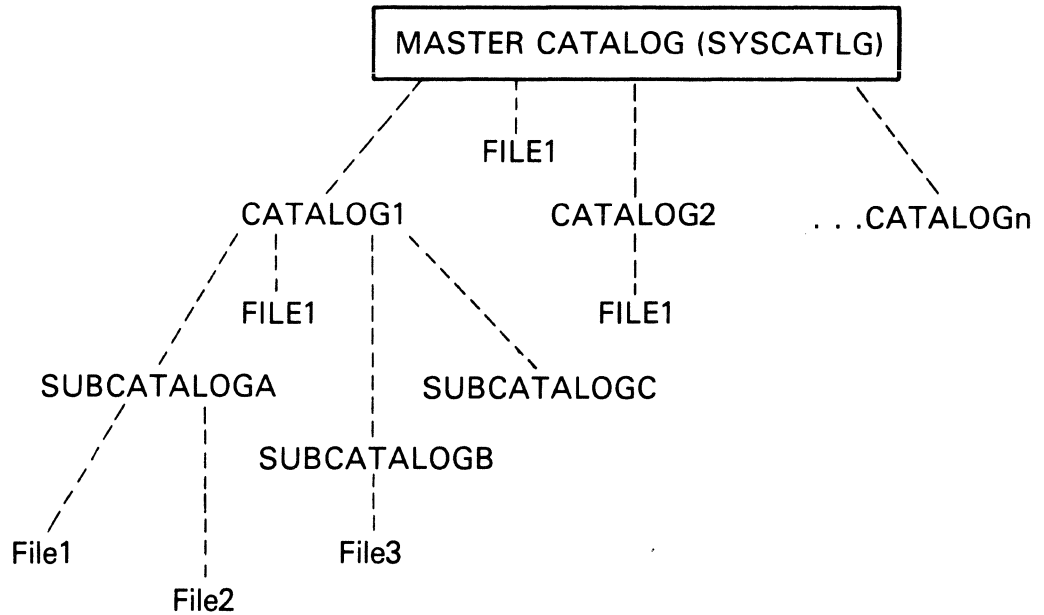
Catalogs have a multi-level structure: files that are members of one catalog may be subcatalogs with additional files. The main level catalog is called SYSCATLG.

The Operating System

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File Management Catalog Structure

(Continued)



Sample Filenames

(Based on the preceding diagram):

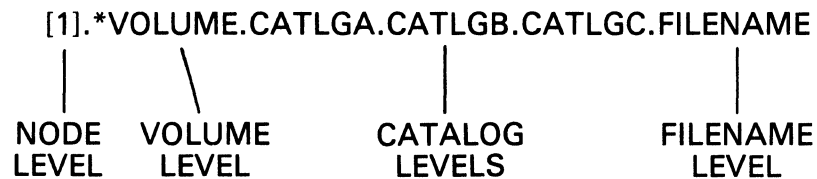
File1
CATALOG1.SUBCATALOGA.File1
CATALOG1.SUBCATALOGB.File3

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File Naming Conventions

To accommodate Graphics Network Architecture (GNA), an additional level has been added to the filename. This level designates the node where the file is located. The default is the node you are working at. The node level, if used, is the highest (leftmost) level. There are now four types of levels in a filename.

EXAMPLE



The above is a complete filename. The file data is located at node 1 in the network on the volume with the name VOLUME. CATLGA.CATLGB.CATLGC.FILENAME specifies a path on the volume to data contained in FILENAME.

The following conventions are associated with the four types of filename levels.

NODE LEVEL

Purpose

When systems are networked under GNA, the node level specifies the system (node) where file data is located. Only one node level is valid in a full name.

Format

[n] where n is an integer of 0-6 inclusive, and the square brackets are part of the node level.

VOLUME LEVEL

Purpose

When an auxiliary disc volume is used, the volume level specifies which volume of the node file data is located at. Default is primary disc. Only one volume level may be used in a full name.

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VOLUME LEVEL (Continued)

Format

A character string of at least one but no more than 20 characters (beginning with an *) that indicates the file manager name.

CATALOG LEVEL

Purpose

These specify a path on the volume to the file data. Multiple catalog levels are valid in a full name.

Format

A character string of at least one but no more than 20 characters indicating the file manager name.

FILENAME LEVEL

Purpose

Specifies entry of the last catalog level in which the file data resides. The filename may be a catalog, but it must be the last level in a full name.

Format

A character string of at least one but no more than 20 characters indicating the file manager name.

File Naming Restrictions

- A full name, including delimiters, may contain no more than 79 characters. When Working Directories are enabled, any filename entered by a user is joined with the directory entry; although the joined name is not generally listed, it is still restricted to 79 characters.
- Levels between delimiters are limited to 20 characters.
- The following characters may be used to indicate the file manager name:

0-9, A-Z, +, -, @, #, \$, &, %

Note that [,] and * are special characters used as node and volume level identifiers only.

- Node and volume levels may be omitted from a name. If the node level is omitted, the default is the primary drive on the node specified. If both are omitted, the default is the primary drive on the local node.

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Disc Volumes

Disc volumes can be utilized under multi-volume control or under single disc control.

MULTI-VOLUME CONTROL

The system's primary disc volume is mounted on physical drive 0. The O/S and the previously mentioned Master Catalog are on this primary volume. Additional (auxiliary) disc volumes may be mounted in drives 1, 2, and 3. The following commands are used with auxiliary disc volumes:

ENABVOL — incorporates an auxiliary volume's file structure into the Master Catalog on the primary volume.

DSABVOL — removes an auxiliary volume's file structure from the Master Catalog on the primary volume.

ATCHVOL — attaches a specific auxiliary disc volume to a task.

DTCHVOL — detaches an auxiliary disc volume from a task.

All volumes, except the primary volume, may be physically dismounted while the system is running.

SINGLE DISC CONTROL

All drives configured on a controller can be initialized (via FMINIT) to be treated as one logical disc. Disc packs initialized for "single" disc control must be used on the same drives they were initialized on; they are treated as one continuous logical disc.

File and Command Protection

Every file and command is designated as a member of a protection group. The System Manager assigns Protection Groups to control user access to specific commands and files.

The File Protection Facility is described in the *CGOS 200 GNA System Manager Guide*.

Section Three
SYSTEM COMMANDS

Section 3

SYSTEM COMMANDS

INTRODUCTION

The CGOS 200 GNA command syntax is very similar to CADD5 4 graphics commands. An operator trained on CADD5 4 can similarly use the 100+ standard system commands. Standard conventions facilitate the addition of new commands. User-developed commands can be standardized for one or all system users.

Although most O/S commands are entered from the command device (COMDEV), the system can be directed to take commands from an *Execute File* (activated with the EXECUTE command). The execute file is a standard text file that contains system commands.

This section summarizes CGOS 200 GNA commands. The summaries are grouped by function and followed by detailed individual command descriptions. Some detailed descriptions are omitted from this manual, but presented in other CGOS 200 GNA manuals, as follows:

- * Indicates System Manager Guide
- ** Indicates Programmer Reference
- *** Command is described in this manual

Both the Table of Contents and the Index serve as excellent quick-reference sources. On-line documentation will reflect the most recent changes to commands described here.

Brief Command Descriptions

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BRIEF COMMAND DESCRIPTIONS

The command descriptions that follow have been placed into categories and grouped by functions.

File Manipulation

FUTIL O/S LEVEL

FUTIL is a multi-function file utility. The following FUTIL commands can be entered at internal command level (reached by typing: FUTIL \downarrow), or at O/S level.

CONVERT*** Copies and converts text files to and from magnetic tape.

CONVERTB*** Copies and converts binary files to and from magnetic tape.

COPY*** Copies files.

COPYTEXT*** Copies text files.

DELETE*** Deletes files.

LIST*** Lists file information.

LISTLP*** Lists file information on printer (HARDEV).

LISTTEXT*** Lists text file information.

MOVE*** Moves files.

PRINT*** Prints text files.

PRINTLP*** Prints text files on HARDEV.

TEXT EDITORS

CVTECO*** Character-oriented text editor.

EDIT*** Line-oriented text editor.

LONGEDIT*** Line-oriented text editor that handles line lengths of up to 256 characters.

OTHER

CHGTYP*** Changes file type.

COMPARE*** Compares two text files, listing differences.

DUMPFIL*** Examines file contents.

FILCOM*** Compares two binary files, listing differences.

PACHFILE*** Lists and modifies files.

PRGCOPY*** Modifies a text file by removing identical lines that are in sequence.

Brief Command Descriptions

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OTHER (Continued)

RENAME*** Renames a file or a catalog.
SORTCAT*** Sorts catalog entries.
SORTFILE*** Sorts a text file.

Batch/Execute File Processing

CANCEL*** Removes a batch or print request.
DO*** Generates a system command to process a text or overlay file.
EXECUTE*** Processes a text file as a series of O/S level commands.
GENCOM*** Generates an execute file.
PAUSE*** Puts a *pause* in an execute file where you want the system to wait.
PRNTJOB*** Lists and prints parameters of a job in the batch queue.
SUBMIT*** Submits a batch request.

Command Table Commands

EDITCMTB*** Edits a command table (CMTB).
LISTCMTB*** Prints a CMTB.
LISTCOM*** Prints active command tables
SYSCMTB* Adds a CMTB to the system CMTB.
USERCMTB*** Designates a file as user CMTB.

Peripheral Devices

TASK-RELATED FUNCTIONS

ATTACH*** Attaches a device to a task.
DETACH*** Detaches a device from a task.

DEVICE CHARAC- TERISTICS

DSABDEV* Disables a device.
ENABDEV* Enables a device.
RENAMDEV*** Renames a device taskunitname.
SETDEV* Sets unit characteristic word values for an attached unit.

Brief Command Descriptions

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TAPE DRIVE	CHECK***	Checks magnetic tape files against the original disc copies.
	DUMPTAPE***	Magnetic tape dump utility.
	GENSLTAP*	Generates a COLDSTART tape.
	REWIND***	Rewinds a tape.
	SETTAPE***	Changes parity and pack options for tape unit.
	TAPETYPE***	Outputs tape unit information.
PAPER TAPE/ PAPER TAPE READER	GETPUNCH***	Outputs parity information to a punch paper tape device (PPTDEV).
	SETPUNCH***	Sets parity for a punch paper tape device (RPTDEV).
LINE PRINTER (HARDEV)	HARDFILE***	Declares a file to receive a copy of all system output to the task.
	FILERCVR***	Recovers a HARDFILE lost in system crash.
	UP***	Sends FORM FEED to HARDEV.
Disc Commands	CHKDISC*	Verifies a disc pack for use.
	COPYDISC*	Copies data from one part of disc to another.
	PACHDISC*	Modifies and/or examines physical disc data.
	TEST***	Checks system operation and disc access.
Information Commands	DATE***	Prints date and time.
	HELP***	Prints on-line documentation.
	HELPLP***	Prints on-line documentation on HARDEV.
	LCLNEWS***	Outputs current administrative and local news.
	SYSNEWS***	Lists information about the O/S.
	STATUS***	Lists system status information.
File Manager Commands	BOOTDEX*	Bootstraps Disc Diagnostic Executive (DDEX).
	FMCHECK***	Checks validity of files under file manager (FM).
	FMCLEAR***	Clears open files under FM.
	FMINIT*	Initializes the FM.
	FMRCVR*	Recovers file manager.

Brief Command Descriptions

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Multi-Volume Commands

ATCHVOL***	Attaches an auxiliary disc volume to a task.
DSABVOL***	Disables auxiliary volume.
DTCHVOL***	Detaches auxiliary volume from a task.
ENABVOL***	Enables auxiliary volume.

Programming Commands

COMPILE**	Compiles a TPL or FORTRAN source file.
CROSSREF**	Lists entry points and external references for object files.
DEBUG**	Allows you to monitor and change program execution.
FORTXREF**	FORTRAN cross-reference utility.
GENINDX**	Outputs specified index from program source files.
LISTLOAD**	Searches a text file for file references, then outputs a list.
LOAD**	Creates a core image file.
LOADLIB**	Creates a load library.
RENUMBER**	Renums a FORTRAN text file.
RUN***	Reads an overlay into core and executes.
TRACE**	Traces subroutine calls in an executing program.

Configuration Commands

BLDSYS*	Builds on O/S under a new configuration (CFG).
COPYCFG*	Copies a configuration (CFG).
EDITCFG*	Edits a configuration (CFG).
LISTCFG*	Lists a configuration (CFG).
NEWCFG*	Creates a new configuration (CFG).

Communications Commands

PROGRAMMABLE COMMUNICATIONS UNIT (PCU)	COMPPCU***	Compares contents of PCU memory to a PCU overlay file in hexload memory.
	LOADPCU***	Transfers a file to PCU for (optional) execution.
	PCUPCH***	Patches PCU overlay files.

Brief Command Descriptions

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GRAPHICS NETWORKING ARCHITECTURE (GNA)	GETSLIB***	Maintains current subfigure library at a GNA satellite node.
	NETDIAG***	Exercises a point-to-point network link for diagnosis.
	NETSTATS***	Outputs timing statistics for a link in a GNA configuration.
	NETTEST***	Exercises network links in a configuration.
Protection Facility Commands	SYSSIZE***	Checks whether sufficient memory is available for a network task.
	AUTHORIZ*	Verifies entries and encodes passwords for Login authorization file.
	CHGPROT***	Changes a file's protection group.
	EDITACT***	Creates, modifies, or deletes access tables.
Memory Processing Commands	LISTPROT***	Lists your access table and default protection group (DPG).
	SETPROT***	Changes your DPG.
	DUMP***	Dumps memory.
	SET***	Sets memory locations.
Working Directory Commands	DSABDIR***	Disables the current working directory.
	ENABDIR***	Enables the specified working directory.
	LISTDIR***	Lists the current working directory.
Miscellaneous Commands		
HEX CONVERSION	FPHEX***	Converts floating point to hexadecimal.
	HEXCALC***	Performs arithmetic operations on hexadecimal numbers.
	HEXFP***	Translates hexadecimal to floating point.
TASK FUNCTIONS	LOGOUT***	Terminates a task.
	SELECT***	Sets task parameters.
ERROR HANDLING	DUMPERR***	Prints system error information.
	ERRLOG*	Outputs a formatted dump of the system error log.

Brief Command Descriptions

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UTILITY COMMANDS

ARCHINDX*	Indexes and references files stored on tape or disc.
ARCHSRCH***	Looks up records in a Data File created with ARCHINDX.
GENFICHE***	Converts text files to microfiche format on tape.
HEADER***	Outputs a two page heading.
IOTEST***	Tests system I/O handlers.
OPLOG*	Processes the operation's log table.
SRCHBCD***	Locates strings in text file(s).

Abbreviating System Commands

- Review the EDITCMTB command (See EDITCMTB command.)
- Type LISTCOM Verifies that command exists.

Example

(Abbreviate ATTACH command to AT)

n>EDITCMTB SYSCMTB ↓ System gives prompt.

#I Enter responses to queries as follows:

<u>Query</u>	<u>Response</u>	<u>Remarks</u>
NAME:	AT	Desired abbreviation.
DLOC:	FFFF	Special response, denotes cross-reference entry.
XNAM:	ATTACH	Maximum of 8 Characters.
STRT:	0000	Relative start location (Max. 4 Characters).
		Queries repeat to allow several abbreviations to be entered in one session.
NAME:	↓	Ends Query cycle.

#T Checks for accuracy and completeness.

F Files changes.

- Type LISTCOM Verifies that abbreviation(s) are incorporated in the SYSCMTB.

Brief Command Descriptions

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SAMPLE PRINTOUT FOR ABBREVIATING COMMANDS

n>LISTCOM ↓
 COMMANDS THAT CAN BE EXECUTED FOR THIS TASK

AEDIT	ASSM	ATCHVOL	ATTACH	AUTHRIZ
BYE	C	CADDS	CATLIST	CATSCAN
CHGTYP	CHDISC	CL	COLORS	COMPARE
CONVERT4	CONVERTB	COPY	COPYCFG	COPYDISC

n>EDITCMTB SYSCMTB ↓

#I
 NAME:
 AT
 DLOC:
 FFFF
 XNAM:
 ATTACH
 STRT:
 0000
 NAME:

#T

1!	AT	ATTACH	+	0000
2!	C	CADDS	+	0000
3!	FPHEX	HEXFP	+	0002

#F

n>LISTCOM ↓

COMMANDS THAT CAN BE EXECUTED FOR THIS TASK

AEDIT	ASSM	AT	ATCHVOL	ATTACH	AUTHRIZ	BATPROC
BOOTDDEX	BYE	C	CADDS	CATLIST	CATSCAN	CHECK

Brief Command Descriptions

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Renaming CADD5 4 Level Commands

The current verb-noun combinations of a CADD5 command may need to be changed if:

- Commands must be translated into another language.
- A more specialized command description is needed.
- Command availability must be limited.

SAMPLE PRINTOUT

```
n> EDIT DATA.VNP ;
#L,DELETE
39!      *DELETE    DES      21    66    0000
40!      *DELETE    DMR      2020  4     0000
41!      *DELETE    GROUP    21    15    0000
42!      *DELETE    NFLAG    2029  7     0000
266!     DELETE     CPLANE   178   3     007E
267!     DELETE     DRAWING  181   2     007C
268!     DELETE     ELEMENT  5026  1     C074
269!     DELETE     ENTITY   21    3     C074
270!     DELETE     EPROPERTY 5026  3     C074
271!     DELETE     FACE     5025  1     4074
272!     DELETE     GPOINT   5026  2     C074
273!     DELETE     HOLE     5029  2     4074
274!     DELETE     IMAGE    180   4     007C
275!     DELETE     LOAD     5026  5     C074
276!     DELETE     PART     53    4     007E
277!     DELETE     PPROPERTY 2024  6     807C  OLD ERS PPROP
278!     DELETE     PROPERTY 2024  2     807C  OLD ERS PROP
279!     DELETE     SET      1061  5     0074
E276
DELETE      PART      53      007F
REMOVE
REMOVE      PART      53      4      007F
#F
n> DELETE DATA.VNP//LIST=LONG ;
DATA.VNP DELETED
DATA
      NOT DELETED; CATALOG NOT EMPTY
n> CADD5 ;
CADD5 4 REV # 2-00-A 1-20-81 15:45:33
      SORTING VERB-NOUN TABLES
      START SORT
      END SORT
      COMPILING VERB-NOUN TABLES

The compilation was successful.
Input device is SD.
DATA.VNP is filed.
#1#
```


ARCHSRCH

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ARCHSRCH

PURPOSE Looks up records in an archive index. The system administrator maintains the archive index and adds records when files are saved on tape or moved using GNA.

SYNTAX ARCHSRCH [filename] ↵
#Command ↵
filename Name of an archive index. (There is usually only one for the system.)
Command LOCATE or QUIT

COMMENTS ARCHSRCH uses two types of files to retrieve information about files in the archive:

- The primary archive index file, *filename*, (created and maintained with ARCHINDX — see *CGOS 200 GNA System Manager Guide*) where all information is stored. This information can include the storage location, file type, filename, and the date each file was archived.
- Several Key Files for looking up records. There can be a Key File for each field in the primary archive index file. The actual number of Key Files is determined when the archive is set up.

Locating Records Whenever files are backed up on tape or otherwise saved, the *FUTIL archive* option can be used to generate information for the archive index. To find file information records stored in the archive index, use the command:

LOCATE [filename] [/OPTIONS]

filename Full filename in standard filename format, or to locate all files with common characters or catalog levels, use WILD CARDS or the MATCH option.

OPTIONS One or more comma-separated entries in the following format:

Option = Contents of key field

DATE Date, and optionally time, of the archiving (e.g., DATE=2-28-81 or DATE=2-28-81:14:00:00). To find a record, the date, and time if given, must be an exact match. For less precise matching of dates, use BEFORE or SINCE.

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Locating Records (Continued)	BEFORE	Locates files archived before date, and optionally, time (same format as DATE).
	SINCE	Locates files archived after date, and optionally, time (same format as DATE). BEFORE and SINCE may be combined to specify a range of dates.
	TYPE	File manager file type — hex number between 0 and FF (e.g., TYPE=3 (Text), TYPE=1 (Catalog)).
	LOCATION	Storage location of archived file: Disc pack, Node name, or Tape label (e.g., LOCATION=TAPE.01, LOCATION=[0].*PACK033).
	COMMENT	Matches a comment of up to 80 characters supplied when the record was added to the archive index.
	MATCH	Allows you to substitute for 0-n characters after one or more characters of the filename has been entered.

Wild Cards

Three characters allow you to substitute for any CARDS character or catalog level in the filename. With these characters, all files matching the rest of the filename will be located.

Wildcard

Description

?	Substitutes for a single alphanumeric character in a filename. With two or more ?'s, two or more characters in the same positions will produce a match. A ? cannot replace the dot (.) used as a catalog level name separator.
? \	Like ? but substitutes 0 to n characters within a catalog level.
!	Substitutes for a full catalog level in the filename. The catalog level must contain one or more characters. When using more than one (!), separate catalog from non-wildcard levels by the usual dot (.).
! \	Substitutes 0 to n full catalog levels.

ARCHSRCH

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EXAMPLES	<u>Specification</u>	<u>Possible Filenames</u>
	CAT?EVEL	CATLEVEL CAT-EVEL CAT6EVEL
	FIL??AME	FILENAME FIL56AME FIL-2AME
	FILE? \	FILE FILE1 FILE123-Q
	? \ LENA? \	LENA FILENAME CATALENA
	CAT!.!G	CAT.CAT1.G CAT.A.G CAT.&BCD.G
	CAT.!!G	CAT.A.B.G CAT.Q.&BCD.G
	CAT.! \ .G	CAT.G CAT.&BCD.G CAT.A.B.C.D.G
	CAT.? \ .FILE	CAT.FILE CAT.&BCD.FILE CAT.A.FILE
	CAT.!.? \ .FILE	CAT.X.FILE CAT.X.&BCD.FILE CAT.Q.A.FILE
	CAT.! \ .? \ .FILE	CAT.FILE CAT.A.FILE CAT.&BCD.FILE CAT.A.&BCD.FILE CAT.A.B.C.FILE

NOTE

Each KEY field entered as a LOCATE option will speed record lookup.

To execute a search with Wild Cards in the filename, or non-key fields alone, each record must be searched in sequence. In general, this is a time-consuming procedure. LOCATE ↓ lists the entire contents of the archive index.

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**THE ARCHSRCH
SESSION**

ARCHSRCH uses two characters to prompt for input:

- # is the general prompt.
- * prompts for a specific response to a question.

Any command or keyword may be issued in abbreviated form. ARCHSRCH needs only enough of the command name to make it unique (e.g., Q, QU, or QUIT are all acceptable input for the QUIT command).

When ARCHSRCH asks for an OK response, Y, YE, YES, or OK are sufficient affirmative answers. N or NO will suffice for a negative response. With critical questions, any other response will cause the prompt to be retyped.

At the end of the session, type QUIT to return to O/S level.

SYNTAX

Break up multi-line commands using a semicolon (;) between syntax elements. A semicolon can also be used to break up the comment field.

Example

```
#LOC TEST.FILE/TYPE=2,B=2-5-81,S=2-5-80; ↓  
> ,LOC=TAPE1
```

When ARCHSRCH detects a syntax error caused by a typing mistake, it retypes the line segment preceding the error. The segment accepted and retyped with an angle-bracket(>) cannot be erased or typed over. Continuing the line with ↓ aborts the command. Any other response, including a space, is assumed to be a correction and continuation.

Example

```
#LOC TEST.FILE/TYPE=2,B=02-5-81,AFTER=02-5-80 ↓  
  
-- NO SUCH FIELD IN THE RECORD  
> LOC TEST.FILE/TYPE=2,B=02-5-81
```

ATCHVOL

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ATCHVOL

PURPOSE	Attaches specific auxiliary disc volume to a task.	
SYNTAX	ATCHVOL volume name	
COMMENTS	ATCHVOL associates the volume with the task that calls it. (The volume must have been previously enabled; see ENABVOL.) While attached, the volume may not be disabled or removed from the drive.	
MESSAGES	VOLUME NAME ON DRIVE <LOGICAL DRIVE NUMBER> ATTACHED TO TASK <TASK NUMBER>	Indicates that the volume is successfully attached.
	<i>Example</i>	
	n> ATCHVOL *OS ↓	Enter command.
	* OS ATTACHED TO TASK n	System response.

ATTACH

PURPOSE	Attaches a device to a task. After message is printed, control automatically returns to the system.
SYNTAX	ATTACH Taskunitname, Unittype or Uniqname. Taskunitname — arbitrary two-character unit name (user-assigned). Unittype — Generic four-character name (see list). When Unittype is specified, ATTACH uses first available unit. Uniqname — Particular unit of Unittype. Designated by generic name's first three letters plus a digit specifying Unittype's unique unit.

Unittypes

TTYS	Teletype
INFO	Infoton
LPTR	Standard Line Printer
TRMN	Terminet 1200 (not Terminet 340 Line Printer)
IOSB	IOS Board

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SYNTAX (Continued)

NMDX	Numeridex
DTMX	Versatec
DCMN	Card Reader
XYNT	Xynetics Plotter
FPTR	Fast Paper Tape Reader
FPTP	Fast Paper Tape Punch
DTMX	Varian 216
DTMX	Varian 208
TBIO	Task based I/O Skeleton Unit
GOUL	Gould 5100 Dot Matrix Printer/Plotter
GOUL	Gould 4800 Dot Matrix Printer/Plotter
VGUB	Video Generation Unit
GPUB	Graphics Processing Unit
PCUC	PCU Control Port
PCUG	PCU General Port

MESSAGES

Uniqname OF TYPE Unittype ATTACHED
AS Taskunitname

Successful attach.

NO UNITS OF TYPE Unittype AVAILABLE

No units of requested type are available.

Uniquename ATTACHED TO TASK
Tasknumber

Type Unittype in the configuration but attached to a task. (Output for all devices of type Unittype.)

Uniqname NOT AVAILABLE

Uniqname used/Uniqname device already attached to a task.

BAD REQUEST

Taskunitname already assigned to another unit, or Unittype is bad.

Example

To attach a magnetic tape drive:

n> ATTACH MT,TAPE ↵

Enter command.

TAP0 OF TYPE TAPE ATTACHED AS MT

System response if TAP0 is the first available magnetic tape drive.

or

NO UNITS OF TYPE AVAILABLE
TAP0 IS ATTACHED TO TASK 4.

Tape drive is being used by task 4.

CANCEL

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CANCEL

PURPOSE Removes BATCH/PRINT request from job queue.

SYNTAX CANCEL JOB = Jobname.
CANCEL PRINT = Jobname (20 characters or less).

CHECK

PURPOSE Checks magnetic tape files against the original disc copies.

SYNTAX CHECK[/Options] Catalog[/Options]

COMMENT CHECK is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL CHECK.)

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CHGPROT

PURPOSE Changes protection group of a file or catalog.

SYNTAX CHGPROT filename,PG a[,PG b]

Any combination RWEDCM or S, G, or P. Filename may be a full filename or a catalog name.

PG = (Protection group); a and b are Hex numbers in the range 0000 - 7FFF.

S,G,P = Default designators (System, Group, Private).

RWEDCM = Attributes of PG range: Read, Write, Execute, Delete, Change, Modify.

COMMENTS CHGPROT changes your file access by changing the file's PG. CHANGE access required to file/catalog's PG; access to new PG required.

To Specify Protection Group

1. State PG as HEX number. If Filename is full name of file, file is given a PG of *a*. If Filename is a catalog name and only PG *a* is specified, all catalog levels from Filename down and all files in any of these catalogs will be given a PG of *a*. If PG *b* is also specified, catalog are given PG *b*; catalog files are given PG *a*.
2. Use default designator with requested combination of attributes. Because a PG is implied by the default designator (S,G,P), the actual PG does not need to be known. This number will be the first PG listed in the current user's access table with the exact combination of attributes input through CHGPROT. In this mode, catalogs and files cannot be given different PGs.

MESSAGES Any file management errors (including protection violations) are output with the Filename associated with the error.

Current Access Table

2000-2000/WRDCS
2500-2500/RP
2400-2400/RECG
2700-2700/WRDC
2800-2900/REWD

CHGPROT

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Example (Protection of FILEA = 2400)

- n> CHGPROT FILEA,SWRDC ↓ Changes PG of FILEA to 2000.
- n> CHGPROT FILEA,GRECWD ↓ Yields message:
- NO PROTECTION GROUP FOUND THAT MATCHES ATTRIBUTES SPECIFIED.
- (Because there is no PG range in your access table with default designator 'G' and attributes 'RECWD'.)
- n> CHGPROT FILEA,2850 ↓ Produces the warning:
- YOU DO NOT HAVE CHANGE ACCESS TO THE NEW FILE PROTECTION GROUP SPECIFIED TYPE OK TO CHANGE ANYWAY.
- OK Change FILEA's PG to 2850; you are unable to make further PG changes to file.
- n> CHGPROT FILEA,PREX ↓ Produces the message:
- INVALID PROTECTION ATTRIBUTES SPECIFIED ('X' is not a valid attribute.)
- n> CHGPROT FILEB,2500 ↓ If FILEB has a PG of 3000, the resultant message is:
- YOU HAVE NO ACCESS PRIVILEGES TO THE NEW FILE PROTECTION GROUP SPECIFIED
- FILEB's protection is unchanged.
- n> CHGPROT FILEC,22400 ↓ If FILEC is PG 2800, the protection is changed to 22400 and task is returned to system level.

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CHGTYP

PURPOSE Changes a file manager file type.

SYNTAX CHGTYP filename,file type

Where file type is an integer between 0 and 0FF (hex). (Leading zeros must be used when the file type begins with an alpha character.) File manager file types are as follows:

Filetypes

0	Not defined	C-E	Reserved
1	Catalog	F	Z80 Binary files
2	Object	10-1F	Reserved
3	Text	20-2F	Reserved for CADDs 4
4	Configurations	20	CADDs Parts
5	Reserved	21	TVF's
6	PEP object code	22	Figures
7	Core image (overlay)	30-AF	Reserved
8	Command table	B0-BF	Reserved for
9	Loader symbol table		Batch Processing
A	Reserved	C0-FE	Reserved
B	Accounting table	FF	Work Files

Example

n> CHGTYP &BCD.FILE,0A ↓

Changes Type 3 (&BCD.FILE) to a Type 0A file.

FILE TYPE CHANGED

System response.

COMPARE

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COMPARE

PURPOSE Compares two text files and lists differences.

SYNTAX COMPARE [cat1.file1{,cat2.file2 /NEWCAT = mycat}]

Standard Format COMPARE accepts various filename and option specifications. The most basic syntax is useful for comparing two files with dissimilar (short) filenames:

```
n> COMPARE cat1.file1,cat2.file2 ↓
```

This will compare Cat1.&BCD.file1 to Cat2.&BCD.file2

NEWCAT(N)

Often, you may want to compare your version of a file to a version in the SYSCATLG. NEWCAT (abbreviation N) facilitates this sort of comparison by requiring that only one filename be entered. COMPARE forms the second filename by adding a catalog level prefix to the first filename (i.e., SYSNEWS.COMMAND.HEADER becomes JQC.SYSNEWS.COMMAND.HEADER). This prefix is entered on the command line instead of a second filename. NEWCAT syntax:

```
COMPARE cat.file/NEWCAT = mycat
```

Compares the original version (cat.file) to the *mycat* version, as if you had entered the command:

```
COMPARE cat.file, mycat.cat.file
```

The default for mycat is your Login username. If you login under MYNAME and type COMPARE cat.file/N, the following command is generated:

```
COMPARE cat.file, myname.cat.file
```

OUTPUT

Each comparison is made on a line-by-line basis. Any differences are output. If no differences are found, a message to this effect is output. For each difference found, COMPARE outputs a line group from cat1.&BCD.file1 (referred to as 'A' below), and a line from cat2.&BCD.file2 (referred to as 'B' below). In each case, an attempt is made to output the line preceding the differences (the same for both files), and the line following the differences (the same for both files). Next to each line number is one of the following keys:

```
(=): Lines the same in both files  
(A): Lines in file (A) different from (B)  
(B): Lines in file (B) different from (A)
```


CONVERT

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CONVERT

PURPOSE

Copies and converts special format magnetic tape files.

SYNTAX

```
CONVERT[/Options]
[Catalog[/[Filenamelist] [/Options]]]
[Catalog[/Options]]
```

COMMENTS

- The tapes converted are generally fixed-block, fixed-record tapes. This command converts text files only.
- Additionally, CONVERT reads or punches paper tape, and reads cards. It provides character set and conversions for several industry standard character sets.
- CONVERT is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL CONVERT.)

CONVERTB

PURPOSE

Identical to CONVERT except that it does only binary file conversions. All files are copied as binary files without any character set conversions.

SYNTAX

```
CONVERTB[/Options]
[Catalog[/[Filenamelist] [/Options]]]
[Catalog[/Options]]
```

COMMENT

CONVERTB is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL CONVERTB.)

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COPY

PURPOSE Copies files from one device or catalog to another.

SYNTAX COPY[/Options]
[Catalog[/[Filenamelist[/Options]]]
[Catalog[/Options]]]

Example

Copies all files in CAT1 with names ending in FILE1 to CAT3:

```
n> COPY CAT1/&BCD.FILE1,FILE1 CAT3 )
```

```
CAT1.SUBCAT1.&BCD.FILE1  
      COPIED TO  
CAT3.SUBCAT1.&BCD.FILE1
```

```
CAT1.SUBCAT1.FILE1  
      COPIED TO  
CAT3.SUBCAT1.FILE1
```

COMMENTS COPY is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL COPY.)

COPYTEXT

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COPYTEXT

PURPOSE Copies text files from one device or catalog to another.

SYNTAX COPYTEXT[/Options]
[Catalog[/[Filenamelist] [/Options]]]
[Catalog[/Options]]

Example

Copies all text files in CAT1.SUBCAT2 to CAT3.SUBCAT2:

```
n> COPYTEXT CAT1.&SUBCAT2 CAT3.SUBCAT2 }  
CAT1.&BCD.SUBCAT2  
      COPIED TO  
CAT3.&BCD.SUBCAT2  
CAT1.SUBCAT2.&BCD.FILE  
      COPIED TO  
CAT3.SUBCAT2.&BCD.FILE
```

COMMENTS COPYTEXT is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL, COPYTEXT.)

CROSSREF

PURPOSE Lists entry points and external references of object files.

SYNTAX CROSSREF

NOTE See *CGOS 200 GNA Programmer Reference Manual* for additional information.

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CVTECO

PURPOSE Edits text files. CVTECO is a powerful character-oriented editor that uses a one-page buffer and a pointer to create and modify text files.

SYNTAX CVTECO [filename]
[/MACRO = file1, MACRO = file2, ... MACRO = fileN]

COMMENT In processing the command line, the system sets up and executes the first CVTECO command.

INPUT/OUTPUT n> CVTECO ↓ This command line enters CVTECO and executes the command \$\$.

TECO Version 5.00 Appears on COMDEV; indicates that you have entered CVTECO.

The system is waiting for a CVTECO command.

OPTIONS

filename A filename input as part of the command line will set up and execute one of these CVTECO commands before the # prompt is displayed:

<u>Command Line</u>	<u>Corresponding CVTECO Command</u>
1. CVTECO oldfile	1 EBoldfile\$EA\$\$
2. CVTECO newfile	2. EWnewfile\$\$

MACRO = oldfile

CVTECO executes the existing text file, oldfile, as a series of CVTECO commands (CVTECO MACRO). Each MACRO file is executed in the order specified in the command line. The CVTECO prompt (#) appears after the entire MACRO, or series of MACROs, has been executed.

CVTECO

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<u>Command Line</u>	<u>Corresponding CVTECO Command</u>
1. CVTECO oldfile/ MACRO = file1, MACRO = file2	1. ERfile1\$2EAERfile2\$ 2EAHXMHKEBoldfile\$EAMM\$\$
2. CVTECO newfile/ MACRO = file1	2. ERfile1\$ 2EAHXMHKEWnewfile\$MM\$\$
3. CVTECO/ MACRO = file1	3. ERfile1\$2EAHXMHKMM\$\$

If there is a text file named .CVTECO in the catalog username.&BCD, that file will be executed as a MACRO each time you (as task *username*) enter CVTECO. This is done by default and need not be specified in the CVTECO command line.

Modifying/Creating Text Files

- CVTECO has input and output text files, and a buffer. CVTECO reads one page from the input file into the buffer, modifies the buffer page, and writes the page into the output file. By repeating this cycle, the output file becomes a modified version of the input file.
- CVTECO uses a similar process to create new text files. There is no input file, the output file and the buffer are empty. Text is inserted into the empty buffer. When the buffer is full, its contents are written to the output file. This process is executed repeatedly to create the output file.

CVTECO Pointer

- The CVTECO pointer indicates a position in the buffer. CVTECO commands are initiated at the pointer position.
- The pointer is always positioned between two characters (except before a page's first character and after the page's last character). Characters can be deleted on either side of the pointer, and can be inserted at the pointer. Following an insertion, the pointer is positioned immediately after the last inserted character.
- The pointer can be moved backward and forward in either of two ways:
 1. Specify position numerically (e.g., *position pointer immediately after 25th character of third line; or, move pointer forward 6 characters*).
 2. Locate pointer position. Located by searching for an occurrence of specific text string (e.g., *position pointer after first occurrence of 'dul' in 'Jack was a dull boy'*). Search command starts searching at pointer position and moves to end of page.

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Command Modifications

- Many commands can accept up to two numbers as arguments. Numbers precede the command letter. Two numbers must be separated by a comma (e.g., "5V", "4,6T").
- Some commands return as values numbers which may be used as arguments to other commands (e.g., "H", "Z", ".").
- Some commands accept one or two text strings as arguments. A text string follows the command letter and is terminated by the ESCAPE character, which echoes on the terminal as a \$ (e.g., "lstring\$", "Rstg1\$stg2\$").
- @ modifies any command requiring a text string argument. @ precedes the command letter. When it is used, the text string is not terminated by ESC. The delimiter character for the text string(s) follows the command letter (e.g., "@l/string/", "@R \ stg1 \ stg2 \ ").
- Some commands can be modified with a colon (:). Prefix the colon to the command letter.
- The N-register (numeric register) is an argument to some commands. Thirty-six N-registers are available; each one has a single-character name, either a digit (0-9), or a letter (A-Z). Twenty-six system N-registers have reserved uses. Each has two-character name, a dot (.) followed by a letter (A-Z). The N-register name follows the command letter (e.g., "Q1", "%A", "72P.W").
- The T-register (text register) is an argument to some commands. Thirty-six T-registers are available to each user. Each T-register has a single-character name, either a digit (0-9) or a letter (A-Z). The T-register name follows the command letter (e.g., "X1", "GA").

Special Characters

The following characters have special meanings in relation to all CVTECO commands. They are used as command delimiters, or to facilitate typing of commands.

<BS>	Backspace erases last character typed.
^Q	Erases entire command.
^R	Retypes entire command.
^X	Erases entire command being typed.
^Z	Quotes next character; permits special characters to be entered as part of a command string.

CVTECO

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<i>Special Characters</i> (Continued)	< ESC >	Terminates a text string; echoes as a dollar sign (\$).
	< ESC > < ESC >	Terminates a command string.
	< RUB >	Rubs out (deletes or erases) last character typed.

CVTECO commands are main single characters. An "E", up-arrow (" ^ ") or right square bracket (" [") modifier is always the first character in commands of two or more characters.

CVTECO COMMANDS GROUPED BY FUNCTION

<i>Character Manipulation Commands</i>	^C	Converts characters to integer values.
	^S	Converts integer into character; inserts result in buffer.
	n: ^S	Converts n to a character; prints it on the COMDEV.
	^T	Reads a character from the COMDEV; converts it into integer.
	: ^T	Reads a character from the buffer; converts it into integer.
<i>Commands that Return a Value</i>	^C	Converts characters to integer values.
	^T	Reads a character from the COMDEV; converts it to integer.
	: ^T	Reads a character from the buffer, converts it to integer.
	#	Indicates current position of mark.
	%	Increments and returns value of the N-register.
	.	Indicates current pointer position.
	0123456789	Denotes decimal numbers.
	A	Gives current bounds of a region (.,# or #,.).
	:F	Searches for and deletes a string.
	H	All of the buffer (0,Z).
Q	Returns N-register value.	

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<i>Commands that Return a Value (Continued)</i>	:R	Searches for and replaces a string.
	:S	Searches for a string.
	Z	Gives number of characters in buffer.
<i>Commands that Manipulate Numeric Values</i>	*	Multiplication.
	+	Addition.
	,	Separates numeric arguments.
	-	Subtraction or unary minus.
	/	Division.
<i>File Commands</i>	EA	Appends text from an input file to the end of the buffer.
	EB	Opens a file for input and output.
	EF	Closes an output file.
	EP	Writes the buffer to an output file and reads a new buffer.
	EQ	Returns to the O/S without filing changes.
	ER	Opens a text file for read.
	EW	Opens a text file for write.
	EX	Closes an output file; returns to O/S.
	EY	Replaces buffer with a new page from input file.
<i>Flow of Control Commands</i>	;	Conditionally exits from an iterative loop.
	<...>	Denotes an iterative loop.
	M	Executes a T-register as CVTECO commands.
	[...]	Conditionally executes a region.
<i>Mark and Region Commands</i>	#	Reads or sets mark position.
	A	Gives current bounds of a region (.,# or #,.).
<i>Miscellaneous Commands</i>	<NULL>	Ignored.
	<LF>	Ignored.
	<↓>	Ignored.
	<ESC>	Terminates string arguments; separates commands.
	<ESC> <ESC>	Terminates a command.

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<i>Miscellaneous Commands (Continued)</i>	<SP>	Ignored.
	!	Puts comments into CVTECO command strings.
	:	Serves as command modifier.
	@	Serves as command modifier for quoted string arguments.
<i>N-Register Commands</i>	^	Serves as control character prefix.
	%	Increments and return values of N-register.
	P	Deposits values into N-register.
<i>Pointer Movement Commands</i>	Q	Returns value of N-register.
	B	Moves pointer backward by N characters.
	C	Moves pointer forward by N characters.
	J	Moves pointer to position N.
	L	Moves pointer to beginning of line.
<i>Printing Commands</i>	S	Searches for a string.
	^E	Prints a string.
	^P	Toggles HARDEV.
	n:^S	Converts n to a character and prints it on the COMDEV.
	^U	Toggles COMDEV.
	=	Prints a number.
	T	Prints part of buffer.
	V	Prints a window around pointer location.
<i>Search Commands</i>	F	Searches for and deletes a string.
	R	Searches for and replaces a string.
	S	Searches for a string.
<i>Text Deletion Commands</i>	D	Deletes characters at pointer position.
	F	Searches for and deletes string.
<i>Text Insertion Commands</i>	<TAB>	Inserts a tab and a text string into buffer.
	^S	Converts integer to character and inserts result into buffer.
	G	Inserts T-register into buffer.
	I	Inserts text string into buffer.

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<i>Text Modification Commands</i>	R	Searches for and replaces a string.
<i>T-Register Commands</i>	G	Inserts T-register into buffer.
	M	Executes T-register as CVTECO commands.
	X	Extracts a text from buffer and puts it into T-register.
	0-9	Available to user.
	A-Z	Available to user.
<i>Commands Sorted Alphabetically</i>	This is a complete list of CVTECO commands sorted by ASCII value.	
	< NULL >	Ignored.
	^C < char >	Returns integer value of next character in command string.
	^E < s > \$	Types string argument on COMDEV or HARDEV.
	< TAB > < s > \$	Inserts tab and string into buffer at current pointer location. (Equivalent to | < TAB > < s >).
	< LF >	Ignored.
	< ↓ >	Ignored.
	^P	Toggles HARDEV.
	n: ^ S	Converts n to a character; prints it on the COMDEV.
	n ^ S	Converts N to a character; inserts it into buffer. (The reverse of ^ T.)
	^T	Waits character to be typed; returns that character's integer value.
	: ^ T	Returns integer value of next character in text buffer, i.e., character following pointer. : ^ T returns zero if pointer is at the of buffer.
	^U	Toggles COMDEV.
	< ESC >	Serves as a separator. ESCAPE can appear between any two commands; but cannot separate a command character from its numerical arguments. ESCAPE also terminates string arguments to commands. Two ESCAPE's terminate a command string.

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<i>Commands Sorted Alphabetically (Continued)</i>	<SP>	Ignored.
	! <i>s</i> >\$	Takes a text string argument which is treated as a comment. (! command does nothing.)
	#	Returns value of mark position.
	n#	Moves mark position to location specified by numeric argument, i.e., position between nth and n+st characters.
	%<n-reg>	Increments N-register and returns its value. (%<n-reg> = "Q<n-reg> + 1P<n-reg> \$Q<n-reg>."
	*	Multiplication, in expressions.
	+	Addition, in expressions.
	,	Separates numeric arguments in commands taking two arguments.
	-	Subtraction or unary minus, in expressions.
	.	Returns the value of the pointer position.
	/	Division, in expressions.
	0123456789	A digit or a stream of digits is a decimal number.
	:	Modifier for other commands.
	n;	Exits from current iterative loop if n=0. Otherwise, semicolon ignored.
	<	Denotes beginning of indefinite iteration loop. Exit from the loop is possible only when a search fails, or by invoking semicolon (";") command. "<" must be followed by a matching ">."
	n<	Denotes beginning of iteration loop. Loop can be executed up to n times. Execution of loop fewer than n times is possible using the semicolon (";") command. "n<" must be followed by a matching ">."
	n=	Prints value of argument on COMDEV.
	>	Denotes end of an iteration loop. ">" must be preceded by a matching "<."

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*Commands Sorted
Alphabetically
(Continued)*

@	Can modify any command taking string arguments. @ allows you to specify the character that terminates the string. (i.e., "<cmd><s1>\${<s2>}" can also be typed as "@<cmd>/<s1>/<s2>/."
A	Indicates numerical argument; region delimited by pointer and mark positions. "A" = ".,#" or "#,."
B	Moves pointer backward 1 position. "B" = "1B."
nB	Moves pointer backward n positions if n is positive; forward n positions if n is negative. "nB" = "-nC."
C	Moves pointer forward 1 position. "C" = "1C".
nC	Moves pointer forward n positions if n is positive; backward n positions if n is negative. "nC" = ".+nJ."
D	Deletes character after pointer. "D" = "1D."
nD	Deletes next n characters after pointer if n is positive; n characters before pointer if n is negative. "nD" = ".,+nK" or ".+n,.K."
EA	Reads characters from file open for input, inserts them in buffer at end. EA reads as many characters as it would take to fill an empty buffer 80% full. Repeated EA commands cause buffer to be paged to disc.
nEA	Performs EA command n times.
EB<s>\$	Opens text file for editing. Filename specified in string argument. File is open for both input and output. "EB<s>\$ = "ERs\$EW<s>\$."
EF	Closes output file.
EP	Moves on to next page of file being edited. Entire buffer written into output file and buffer is emptied. More of input file is read into buffer. "EP" = "HEP\$HK\$EA\$."
nEP	Performs EP command n times.
m,nEP	Writes block of characters from positions m - n to output file. Block of characters is left in editing buffer.

CVTECO

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<i>Commands Sorted Alphabetically (Continued)</i>	EQ <s1> \$ <s2> \$	Aborts all editing; returns to O/S. Any editing done is lost. When first string argument is not empty CVTECO passes control to command "<s1> <output-filenames> <s2>".
	ER <s> \$	Opens a text file for input. Name of file specified by string argument. All subsequent EA commands read from this file.
	EW <s> \$	Opens a text file for output. Name of file specified by string argument. All subsequent EP commands write to this file.
	EX <s1> \$ <s2> \$	Finishes all edit operations; closes all files; returns to O/S. Any pages of input file not read into editing buffer are read in. All characters in editing buffer are written to output file. EX is normal way to finish editing, but when the first string argument is not empty, CVTECO passes control to command "<s1> <output-filename> <s2>".
	EY	Deletes all characters from editing buffer and reads a page in from file open for input. EY = "HK\$EA\$."
	nEY	Performs EY command n times.
	F <s> \$	Searches for first occurrence of the string argument after pointer; deletes it. Pointer remains at position of string. F<s> \$ = ".,ZF<s> \$."
	nF <s> \$	Performs F<s> command n times.
	m,nF <s> \$	Moves cursor to position specified by m; searches for first occurrence of string argument after position m and before position n; deletes string; pointer remains at position of string. m,nF<s> \$ = "m,nS<s> \$Q.B,.K".
	:F	:F identical to F command, but error not given when string not found. Value -1 is returned if search successful; 0 returned if search fails.
	G <t-reg>	Inserts text in indicated T-register into buffer at current pointer position.
	nG <t-reg>	Performs G<t-reg> command n times.
	H	Numerical argument meaning entire buffer. H = "0,Z."

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<i>Commands Sorted Alphabetically (Continued)</i>	I<s>\$	Inserts string argument text into buffer at current pointer position.
	J	Moves pointer position to beginning of buffer. J = "0J."
	nJ	Moves pointer position to location specified by numeric argument (between nth and n+st characters).
	K	Kills current line. Deletes all characters at current pointer position (up to and including end of line). K = 1K.
	nK	Kills n lines of buffer. If n = positive, nK deletes all characters between current pointer position (up to and including nth end of line). If n = zero or negative, nK deletes all characters (from 1-nth end of line before pointer position, up to current pointer position).
	m,nK	Kills all characters between mth and nth character positions in buffer.
	L	Moves pointer down to start of next line. L = "1L."
	nL	Moves pointer to beginning of line specified by numeric argument. If n = positive, pointer moves downward n lines from current pointer position. If n = zero, pointer moves to beginning of current line. If n = negative, pointer moves backward n lines.
	M<t-reg>	Executes indicated T-register as a CVTECO command string. All arguments preceding M command are passed to first command in T-register; any type of argument can be passed across end of T-register. The only restriction is that neither a conditional nor an interative loop may cross the "edge" of the T-register.
	nP<n-reg>	Sets indicated N-register to value of numeric argument.
Q<n-reg>	Returns value of indicated N-register.	

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*Commands Sorted
Alphabetically
(Continued)*

R<s1> \$<s2> \$	Searches for first occurrence of first string argument after pointer; replaces it with second string argument. Pointer is left following new instance of second string argument. R<s1> \$<s2> \$ = ".,ZR<s1> \$<s2> \$."
nR<s1> \$<s2> \$	Performs R<s1> \$<s2> \$ command n times.
m,nR<s1> \$<s2> \$	Moves cursor to position specified by m. Searches for first occurrence of first string argument after position m and before position n. Second string argument replaces first one; pointer is left following new instance of second string argument. m,nR<s1> \$<s2> \$ = "m,nF<s1> \$l<s2> \$."
:R	Identical to R commands, except that error is not given when string is not found. :R returns value -1 when search is successful; 0 if search fails.
S<s> \$	Searches for first occurrence of string argument after pointer; leaves pointer following that string.
nS<s> \$	Performs S<s> \$ command n times.
m,nS<s> \$	Moves cursor to position specified by m; searches for first occurrence of string argument after position m and before position n. Pointer set to position at end of string.
:S	Identical to S commands, except that error is not given when string not found. :S returns value -1 when search successful; 0 if search fails.
T	Types current line, including all characters starting from current pointer position to end of current line. T = 1T.
nT	Types out buffer lines. If n = positive, types all characters from current pointer position to end of nth following line. If n = zero, types out all characters from start of current line to pointer position. If n = negative, types all characters from start of -nth line before current line to pointer position.
m,nT	Types out all characters between mth and nth character positions.
V	Performs V command with default argument. V = Q.VV.

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*Commands Sorted
Alphabetically
(Continued)*

nV	Types out n-line window of buffer around current pointer position. $V = -jTkT$ where $j = n/2$ and $k = n-j$.
X<t-reg>	Extracts text to end of current line from buffer; places it into indicated T-register. $X<t-reg> = 1X<t-reg>$.
nX<t-reg>	Extracts buffer lines and places them in specified T-register. If $n =$ positive, extracts all characters from current pointer position to end of nth following line. If $n =$ zero, extracts all characters from start of current line to pointer position. If $n =$ negative, extracts all characters from start of -nth line before current line to pointer position.
m,nX<t-reg>	Extracts all characters between mth and nth character positions; places them in indicated T-register.
Z	Returns number of characters in buffer.
n[E	Begins a conditional. All commands following "n[E" until the next "]" are executed if n.E.0.
n[G	Begins a conditional. All commands following "n[G" until the next "]" are executed if n.G.0.
n[L	Begins a conditional. All commands following "n[L" until the next "]" are executed if n.L.0.
:S<s>[S	Begins a conditional. All commands following ":S<s>[S" until the next "]" are executed if search is successful.
n[~E	Begins a conditional. All commands following "n[~E" until the next "]" are executed if n.NE.0.
n[~G	Begins a conditional. All commands following "n[~G" until the next "]" are executed if n.LE.0.
n[~L	Begins a conditional. All commands following "n[~L" until the next "]" are executed if n.GE.0.
:S<s>[~S	Begins a conditional. All commands following ":S<s>[~S" until the next "]" are executed if search is unsuccessful.

CVTECO

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<i>Commands Sorted Alphabetically (Continued)</i>	m,n[E	Begins a conditional. All commands following "m,n[E" until the next "]" are executed if m.E.n.
	m,n[G	Begins a conditional. All commands following "m,n[G" until the next "]" are executed if m.G.n.
	m,n[L	Begins a conditional. All commands following "m,n[L" until the next "]" are executed if m.L.n.
	m,n[~E	Begins a conditional. All commands following "m,n[~E" until the next "]" are executed if m.NE.n.
	m,n[~G	Begins a conditional. All commands following "m,n[~G" until the next "]" are executed if m.LE.n.
	m,n[~L	Begins a conditional. All commands following "m,n[~L" until the next "]" are executed if m.GE.n.
	]	Ends a conditional. Must be preceded by a matching "[" command.
	^ <letter>	Converts following character into a control character; causes that control character to be executed as a command.
	a ... z	Lowercase commands are equivalent to uppercase counterparts.
	<i>Break Character</i>	^B
^C^C		Task abort characters. Two consecutive C's cause CVTECO to abort; control returns to O/S. All edits are lost, except those put into files already closed with an "EF" command.

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<i>Other</i>	0-9	Available to user.
	A-Z	Available to user.
	.A	Argument to V command executed automatically after every search.
	.B	Pointer position before previous search command.
	.D	A nonzero value causes command string to be echoed when it is executed.
	.S	Pointer position at start of string found by last successful search command.
	.V	Default argument to V command.
	.W	Width of carriage on COMDEV/HARDEV.

DATE

PURPOSE Types out current system date and time. Control automatically returns to O/S level.

SYNTAX DATE

Example

```
n> DATE ↓
    12-10-80, 7:31:02
```


DELETE

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DELETE

PURPOSE

Deletes disc files and catalogs.

SYNTAX

DELETE[/Options]
[Catalog[/[Filenamelist] [/Options]]]

Example

Deletes files in CAT1.SUBCAT1.SUBSUBCAT:

```
n> DELETE CAT1.SUBCAT1.SUBSUBCAT//ASK ↓
```

```
    CAT1.SUBCAT1.SUBSUBCAT.&BCD.FILE
```

```
    TYPE "OK" TO DELETE
```

```
    OK ↓
```

```
        CAT1.SUBCAT1.SUBSUBCAT.&BCD.FILE DELETED
```

```
    CAT1.SUBCAT1.SUBSUBCAT.FILE
```

```
    TYPE "OK" TO DELETE
```

```
    OK ↓
```

```
        CAT1.SUBCAT1.SUBSUBCAT.FILE DELETED
```

COMMENT

DELETE is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL, DELETE.)

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DETACH

PURPOSE Unattaches a unit from particular task.

SYNTAX DETACH Taskunitname

Taskunitname = two-character name assigned by task to this unit (see Attach).

- COMMENTS**
- If you are detaching the COMDEV, HARDEV, PPTDEV, or CARDEV, the unit is also released in this capacity. (See SELECT command.)
 - When COMDEV is detached, the execution mode remains unchanged. If the COMDEV is detached and the task attempts to perform I/O to the COMDEV, task execution is suspended until the COMDEV is reattached. Avoid this problem by selecting NOECHO before detaching the COMDEV. (See SELECT command.)
 - Control automatically returns to the system.

MESSAGES

MT UNATTACHED	Indicates successful detach of taskunitname MT.
BAD REQUEST	Taskunitname is bad.
CANNOT RELEASE COMDEV LEAVING ANOTHER UNIT NAMED SD	Task COMDEV is being detached; the Taskunitname is not SD; and another unit attached called SD.

DO

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DO

PURPOSE

Generates system command to process a text or overlay file.

SYNTAX

DO filename[/Options]

Options Apply to the system command that DO executes.

Generating Commands

COMPILE If first two characters of any line are 'C '; if SUBROUTINE or FUNCTION are first words on any line (beginning in column 7 or beyond); or if E:F, E:O, or ASSM are first words in any line (past column 2).

LOAD If words INSERT, CORORG, BLOCK, or LOADSYM begin any line.

EXECUTE If words COMPILE, LOAD, PRINT, PRINTLP, OR DO begin any line.

RUN When file is not a text file; if nothing above applies; and if file is in an overlay created by the loader WRITE command.

COMMENTS

- DO executes a system command based on file contents.
- If the file is a text file containing key words as listed below, either LOAD, COMPILE, or EXECUTE is invoked.
- If file isn't a text file, or DO cannot determine proper action, it attempts to execute the RUN command.
- Since file contents do not always follow rigid rules, DO may refuse to process files acceptable to COMPILE, LOAD, EXECUTE, or RUN.

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DSABDIR

PURPOSE Disables current user-specified working directory.

SYNTAX DSABDIR

COMMENTS Disables search list created with ENABDIR. The file manager uses this list to search for files. All further file references are searched for in the primary system catalog.

MESSAGES

NO TASK BASED DIRECTORY IS ENABLED FOR THIS TASK	No directory exists for the task.
DIRECTORY DISABLED	Successful DSABDIR.

DSABVOL

PURPOSE Disables an auxiliary volume, allowing it to be physically removed from the system.

SYNTAX DSAVBOL volume name

DSABVOL :ALL

COMMENTS

- Disable given volume previously detached (or all auxiliary volumes if :ALL argument given). (See DTCHVOL). The volume name is removed from the primary disc catalog.
- When the volume is disabled, the following information is output. The volume can now be physically removed from the system.

VOLUME	# VI	"Volumename"
PACK ID	PARTS PACK	"Pack ID"
DISABLED ON DRIVE	# 1	"Logical drive number"

MESSAGES

HARDWARE DISC ERROR	Disc Error or drive not on line.
WRONG VOLUME ON DRIVE	Expected volume not on drive.
VOLUME IN USE	Volume still attached to a task or a file is still in use.
VOLUME NOT ENABLED	Requested volume not in system primary catalog.

DTCHVOL

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DTCHVOL

- PURPOSE** Detaches an auxiliary disc volume from a task.
- SYNTAX** DTCHVOL volume name
- COMMENT** DTCHVOL removes association of a volume to a task. When detached from all tasks, the volume may be disabled (see DSABVOL).

DUMP

- PURPOSE** Dumps task memory.
 - SYNTAX** DUMP XXXX1 [-YYYY1] . . .[,XXXXN [-YYYYN]]
- Where XXXX and YYYY = lower and upper hex bounds, respectively.

FORMAT Each line of the dump has the format:

START	HEX DATA	HEX DATA
ADDR	FOR	FOR
(HEX)	START ADDR	START ADDR
	+0	+7

|-----|
dump of 8 hex words

Format is followed by each byte's ASCII representation (non-displayable characters output as periods). Four dots (....) represent core constant (OCOF). Lines identical to preceding line not printed. First identical line indicated by four dots(....) in place of start address. Control automatically returns to system upon dump completion.

Example

DUMP 0-20					Dump core locations 0-20. System outputs,				
0000	7809	4907	0501	7A9F	0D63	0000	14D4	0000	.....T..
0008	1516	7C05	0007	0000	711E	7833	7808	78A9)
0010	0260	711E	0001	0000	29AC	2986	11A3	1F83
0018	15CC	C005	FF01	1F85	C005	16CC	271B	20F6	.L@..@..L...v
0020	7AF1								

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DUMPERR

PURPOSE Prints system error information.

SYNTAX DUMPERR

MESSAGES

1. Type of system error:
ERROR CALL XXXX
(XXXX = argument that called system error routine.)
2. Location where system error generated.
Location which violated mapper protection (FF04 and FF05 errors only).
3. Contents of ACO,1,2, and 3 on system error.
4. Roll table on system error.

Example

```
n> DUMPERR ↓
```

```
FROM LOCATION 203B System output.  
AT LOCATION 7900  
ACO-3  
0888 17C6 2171 7900  
ROLLTAB  
2000 0E71  
**ERROR CALL FF04**  
WRITE VIOLATION: ATTEMPT TO WRITE READ-PROTECTED MEMORY
```

DUMPFIL

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PURPOSE Examines file contents.

SYNTAX DUMPFIL catalog.file

Catalog.file = the file to be examined.

INPUT/OUTPUT n> DUMPFIL Enter command along with Catalog.file.

System prompt. Indicates that it is waiting for a command.

Buffer Management Commands **OFFSET** OFFSET [or OF] = va1

Establishes an offset to the start of the buffer. The first word in the buffer will have an address of val (base 16).

FILESIZE FILESIZE [or FS]

System responds with file size in hex words. In the following commands, all occurrences of the word *locn*, where n is a decimal digit, represent buffer addresses in the range:

$OFFSET \leq locn \leq FILESIZE - 1$

Buffer Examination Commands **DUMP** DUMP [locn] [locn]
D [loc1-loc2], [loc1-loc2],...

Dump prints (in hex) all values between loc1 and loc2. When no ranges are specified, entire file is dumped. Output format is:

loc1 XXXX XXXX XXXX XXXX XXXX XXXX
loc1 +8

SEARCH SEARCH [loc] [loc]
SR [loc1-loc2], [loc1-loc2],... = value

SEARCH prints all buffer locations that fall into specified ranges with contents equaling value. When range is not specified, entire buffer is searched. Output format is:

loc1 value
loc2 value

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<i>Miscellaneous Commands</i>	SUM	SUM [or SU] loc1-locn SUM adds values of consecutive words in the buffer. SUM only produces single-precision results.
<i>Terminating Commands</i>	QUIT	QUIT [or Q] QUIT returns you to O/S. QUIT is the only way to exit the processor.
MESSAGES	BAD COMMAND	DUMPFIL does not recognize command.
	BAD LOCATION	Buffer address being examined or modified is outside permitted address range. In commands specifying ranges: if either end of a range is beyond the buffer limits, command is not performed for that range. When multiple ranges are specified: command is performed for all ranges that satisfy the boundary check.
	NEGATIVE RANGE	Upper bound of a range pair is less than the lower bound.
NOTE	See also PACHFILE.	

DUMPTAPE

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DUMPTAPE

PURPOSE Magnetic tape dump.

SYNTAX DUMPTAPE [Tapename]

Where Tapename = user-assigned task name for tape unit (see ATTACH). Default is MT if Tapename omitted.

INPUT/OUTPUT n> DUMPTAPE ↓ Enter command.

The system returns with a prompt (#), indicating it is waiting for a command.

Commands

- R Rewind.
- B N1-N2,... Hex bounds list; dump bounds for each record; negative bound counts for end of record (e.g., 0, FFFF = first and last words). Default bounds are the entire record.
- D N Dump N records from the current tape position.
- SR N Skip N records (-N = backwards).
- SF N Skip N files (-N = backwards).
- Q Quit.

MESSAGES **BAD KEYWD** Invalid command entered.

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EDIT

PURPOSE Manipulates text files. EDIT is a line-oriented editor that prompts for text-processing commands.

SYNTAX EDIT Catalog.file [OPTIONS]

OPTIONS NEWCAT = newcatalog

EDIT attempts to open the file newcatalog.catalog.&BCD.file for editing. If it doesn't exist, EDIT searches for catalog.&BCD.file. If that file is found, it is opened for editing as newcatalog.catalog.&BCD.file. (The original version, catalog.&BCD.file, is unaffected by the edit session). NEWCAT = newcatalog can be abbreviated with N = newcatalog.

NEWCAT

Your Login Name will be used as newcatalog. NEWCAT is equivalent to NEWCAT = Login name. The abbreviation for NEWCAT is N.

To Invoke EDIT

Sample dialogues for opening a file to be edited at O/S level:

- Without NEWCAT

n> EDIT Catalog.File ↵

Tells EDIT to open the file for editing. If file exists in catalog.&BCD it will be opened. Otherwise, the system responds:

TYPE OK
TO CREATE NEW FILE:

Enter OK ↵ to create the file newcatalog.catalog.&BCD.file for editing.

Any other response aborts EDIT and returns control to the O/S.

EDIT

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To Invoke EDIT (Continued)

With NEWCAT

n> EDIT catalog.file/NEWCAT = newcatalog ↓

newcatalog.catalog.&BCD.file is opened if it exists. Otherwise, EDIT copies catalog.&BCD.file into newcatalog.catalog.&BCD.file and opens it for editing. If neither file exists, EDIT prints the message:

TYPE OK
TO CREATE NEW FILE:

Enter OK ↓ to create
newcatalog.catalog.&BCD.file.

Any other response aborts EDIT and returns control to the O/S.

Once the file is open, the # prompt indicates that EDIT is ready to accept commands. To end the session and return to O/S level:

- F ↓ saves the work.
- Q ↓ terminates without saving any changes.

Other *F* commands (FC,FE,etc.) will save the buffer and then enter an O/S level command.

Line Numbers

EDIT is a line-oriented editor. Most commands operate on lines or sequences of lines specified by decimal line numbers. Line numbers are internal to the editor; they are not physically represented in the the file being edited.

- Any command that accepts a range of lines will also accept a single line.
- When a line number beyond the end of the file is given as a command argument, EDIT substitutes the last line number of the file. This is true for every command except D (Delete), which will generate an error if a line number argument exceeds the last line.
- Insertion lines are forced into the range of one to the last line of the file.
- With insertion commands (C,I,M and X), a destination line of 0 inserts text before the first line of the file.

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Renumbering

The following EDIT commands automatically renumber the file:

- T,TH,TV (TYPE LINES)
 - L,LD,LDC,LE (LOCATE LINE)
 - S (SUBSTITUTE TEXT)
 - A,F,FC,FE,FL,FR,FS,FX (FILE CHANGES)
 - J (JUSTIFY LINES)
- Text inserted or modified after renumbering is not available for inspection (or modification) until another renumbering command is issued.
 - The message: EDIT BUFFER IS FULL is output when a great deal of text has been modified without renumbering. To continue editing, issue one of the renumbering commands.
 - An error or ESC Q entered from the keyboard can interrupt the execution of many EDIT commands. This type of interruption does not affect text already modified. Reissue the command to modify any remaining text. When an error interrupts command execution, EDIT will indicate the extent of buffer modification prior to the error.

String-Oriented Commands

L and S are string-oriented commands. They search the file, or portions of the file for a particular sequence of characters (a string). There are two types of strings, *Word* strings and *normal* strings.

- Word strings are limited to alphanumeric characters. When a word string is specified in an L or S command, that sequence of characters will only be recognized within text if it is surrounded by special characters, blanks, or line boundaries (end-of-line, beginning-of-line). In the L and S command syntax, word strings are represented literally; delimiters are not allowed.

Alphanumeric Characters — The characters 0-9, and A-Z are alphanumeric. No special characters are alphanumeric.

- Normal strings can be composed of any characters. There are no constraints as to whether a normal string must be surrounded by special characters when it occurs in text. When used in an L or S command, however, a normal string must be surrounded by a pair of matching delimiters.

Delimiters — In string search syntax, any special character except a space or an & can function as a delimiter.

EDIT

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Sample String Search

n> EDIT JPR.SAMPLE ↵

Opens the file for editing; T lists the file's contents.

#T

```
1!! SAW 1DOG AT THE ZOO
2!1DOG WAS MARCHING
3!HERE'S 1DOG; A HOTDOG,
4!! SAW 2!DOGS TODAY
5!THERE ARE NO DOGS HERE
6!HERE IS 1DOGGIE
7!! SAW1DOG ON THE STREET
```

L,1DOG

```
1!! SAW 1DOG AT THE ZOO
2!1DOG WAS MARCHING
3!HERE'S 1DOG; A HOTDOG,
```

Word string search for all lines containing string *1dog*.

L,/1DOG/

```
1!! SAW 1DOG AT THE ZOO
2!1DOG WAS MARCHING
3!HERE'S 1DOG; A HOTDOG,
4!! SAW 2!DOGS TODAY
6!HERE IS 1DOGGIE
7!! SAW1DOG ON THE STREET
```

Normal string search for all lines containing string, *1dog*. Observe changed results.

Commands

(A carriage return (↵) must terminate all commands.)

A SYNTAX A catalog.file

Files changes in an auxiliary file. The buffer is written to catalog.&BCD.file (this name Places the modified file from the current session in *catalog.&BCD.file*, which must not have the same name. A does not does not terminate EDIT.

B Enables work in upper and lower-case. Entry default is the task's entry case state. When EDIT terminates, the task case state returns to its condition at entry.

C SYNTAX C linea [lineb], linec

Copies specified lines. Inserts a copy of the block from linea to lineb after linec.

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*Commands
(Continued)*

- D** **SYNTAX** D linea [-lineb]
- Deletes specified line(s).
- E** **SYNTAX** E line [/columna [-columnb]]
- Edits a line between specified column positions, enabling you to modify the line character by character. The section to be edited is between columna and columnb. If neither columna nor columnb is specified, the whole line is edited. If columna only is specified, the line is edited from columna to line's end.
- Delimited characters are typed out without the line number; the carriage returns to the first column under this line, and modification characters are entered under specific characters to be modified. Columns beyond the end of this line act like trailing spaces and may be modified just like any other character in the line. Modification characters affect the character under which they appear.

*Modification
Characters*

- Space** No effect; retains old character.
- ^** Blanks out old character and turns it into a space.
- ** Deletes old character.

Note

Valid characters may be deleted when **** is used to delete spaces beyond the end of the line.

- [** Inserts all characters following the **[** before the old character; including all modification characters described here except **]**.
-]** Terminates insertion started by **[**. Acts like a normal character unless it follows **[** insertion.
- ↓** Terminates modification instructions and types the line with requested modifications. Also terminates insertion started by **[**.
- Other** Any other characters will replace existing characters.

EDIT

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Modification Characters (Continued)

Modifications may be entered after] terminates an insertion started by [. Although additional modifications begin with the character that [appears under, they are not aligned with the modification line owing to the [] pair and any intervening characters.

Once ↓ terminates the modification instructions, a modified line is typed out without a line number and may be further modified. Characters in the line that follow the ↓ position are modified as if spaces had been typed beneath them, i.e., they remain the same.

↓ at the beginning of the modification line terminates *E*.

F SYNTAX **F**

Quits and files all changes. Terminates EDIT and files text modifications. Changes from the current session become a permanent part of the file.

FC SYNTAX **FC** [/options]

Files the modified file and invokes the compiler. Identical to *F* except that it compiles the changed file. All options are passed to COMPILE for validation.

FE SYNTAX **FE**

Files and EDITs the modified file. Identical to *F* command except that it reopens the save file for editing. This is as if you terminated with *F* and then invoked EDIT from the O/S.

FL SYNTAX **FL** [/options]

Files and LOADs the modified file. Identical to *FC* except that it invokes LOAD instead of COMPILE. Its options are those of LOAD.

FR SYNTAX **FR** command [filename] [/options]

Files and runs the specified command. Identical to *F* except that it invokes a specific command after saving the file. Both *filename* and command-specific options are options of the specified command. If the character string \$\$ replaces *filename*, the name of the saved file minus the &BCD catalog level is used in its place.

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**Modification
Characters
(Continued)**

- FS** **SYNTAX** **FS**
- Files and SUBMITs for execution. Identical to *F* except that the modified file is submitted to be executed by the batch processor.
- FX** **SYNTAX** **FX**
- Files and EXECUTEs. Identical to *F* except that it invokes EXECUTE to input system-level commands from the saved file.
- I** **SYNTAX** **I [line]**
- Inserts text after line. If line omitted, text will be inserted before line 1.
- J** **SYNTAX** **J [linea [lineb]], [T]n**
- Left-justifies lines. The lines are adjusted so that the first non-blank character is moved to column *n* (or tab stop *Tn*). EDIT types the original line, followed by the modified version. Lines that are already justified properly will not be modified or listed. If line numbers are omitted, the whole file is justified.
- Note**
- System tab stops are positioned with < tab >
or < control-I > keys. Column and tab stop
numbering starts at 1.
- L** **SYNTAX** **L[linea [-lineb]], string**
- Locates lines containing string. Searches the line or range of lines for specified text string. If a line contains one or more occurrences of the string, EDIT types the line preceded by its line number. If no line numbers are specified, the whole file is searched.
- LD** **SYNTAX** **LD[linea [lineb]], string**
- Locates and deletes lines. Identical to *L*, except that each line is deleted (*D* command executed for that line) after it is typed out.

EDIT

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Modification Characters (Continued)

- LDC** **SYNTAX** LDC[linea [-lineb]], string
- Locates and deletes on response. Identical to LD, except that you are prompted for confirmation of the delete. A Y response means to delete the line, any other response will go on to the next line without deleting the line in question.
- LE** **SYNTAX** LE[linea [-lineb]], string
- Locates and edits. Identical to L, except that each line found is edited (E executed for that line) before going on to next line.
- M** **SYNTAX** M linea [-lineb],-linec
- Moves specified lines. Identical to the sequence:
- C linea [-lineb], linec
 - D linea [-lineb]
- If linec is not specified, linea-lineb will still be deleted.
- N** **SYNTAX** Nn
- Allots n spaces at the start of the line for a line number. Whenever EDIT lists a line, it prefixes the current line number to the text. This line number is separated from the body of the line by an exclamation point (!). n is the number of digits (including the exclamation point and leading spaces) that the line number can occupy. If the digits in a line number exceed n, only the right hand digits will be printed. The default spacing for line numbers is 6.
- Q** **SYNTAX** Q
- Quits without filing changes. Control returns to the O/S. No changes from the editing session are filed. This is really a user-abort of the editor.

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*Modification
Characters
(Continued)*

R SYNTAX R linea [-lineb]

Replaces specified line(s). R linea [-lineb] is equivalent to:

D linea [-lineb]
I linea

Caution

R linea [-lineb] will delete linea [-lineb] regardless of whether replacement lines are entered. Once R has been typed, the deletion cannot be revoked.

S SYNTAX S [linea [-lineb]], stringa, stringb

Substitutes one text string for another. Searches for stringa; replaces stringa with stringb. Within the line range, every occurrence of stringa is replaced, including multiple occurrences within a single line. Each time a substitution is made, old and new versions of the line are typed out. If no lines are specified, the whole file is searched.

Note

Do not include leading spaces in stringa or stringb.

T SYNTAX T [linea [-lineb]]

Types lines. If specified, linea through lineb will be listed. If lineb is omitted, linea through the end of the file will be listed. T with no line numbers will list the entire file. EDIT renumbers the file before typing requested lines.

TH SYNTAX TH [linea [-lineb]]

Types pages with version and page numbers. Identical to TV, except that output is broken up into pages. Each page is headed by filename, date, time, and page number.

EDIT

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Modification Characters (Continued)

- TV** SYNTAX TV[linea [-lineb]]
- Types with version. Identical to T, except that full filename (including &BCD catalog level) and the file's date and time are typed before any requested lines are typed.
- U** SYNTAX U
- Forces new text to uppercase. Existing text is kept in original case. Case default depends on the current case state of the task. This case state will be restored at the end of the editing session.
- W** SYNTAX W[n]
- Sets maximum number of characters in line. All file lines are truncated to n characters in length. I, E, R, C, M and S commands all truncate the lines resulting from their execution. T does not physically truncate any lines; T only types n initial characters in the lines. L does not locate any text beyond n characters in the lines. The default for n upon entry to the editor is 72. The limits for n is: $0 \leq \text{numchars} \leq 80$. If W is specified without the n argument, the width is returned to the default (72).
- X** SYNTAX X catalog.file, linea [-lineb], linec
- Extracts lines from external file. Copies linea through lineb from file catalog.&BCD.file; places them after linec in the file being edited.

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EDITCMTB

PURPOSE Edits command table (CMTB).

SYNTAX EDITCMTB filename [,N]

Where filename = name of File Manager COMMTAB to be edited. Use N option for file that does not yet exist.

- COMMENTS**
- EDITCMTB prompts (#), indicating that it is waiting for an EDITCMTB command.
 - ITCMTB commands are single or double-character mnemonics followed, if appropriate, by parameters.
 - All line numbers are in decimal. If a line number (given as parameter) exceeds the number of lines in the COMMTAB, the number of the last line is used. A single line number may be substituted for a range of line numbers.
 - Insertions, deletions, replacements, copying, moving, and extracting do not take place immediately; they happen when COMMTAB lines are renumbered. To renumber, enter one of the following commands: Type, File, or Locate.
 - Lines in a COMMTAB file are limited to 655. This includes deleted, replaced, and old position moved lines until renumbering takes place. The message, NOT PROCESSED: COMMTAB FULL, indicates that the limit is reached. Renumbering may then alleviate the problem, unless the renumbered COMMTAB contains 655 lines.

COMMANDS

<u>Command</u>	<u>Syntax</u>	<u>Meaning</u>
INSERT	I [LINE #]	0 assumed if line # is omitted. Insert subsequent lines after specified line. Terminate insertion with RETURN in response to an argument query for a line. Enter a line by responding to argument queries as follows:

EDITCMTB

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COMMANDS (Continued)

Normal Entry Query Response

NAME: Command name (max. characters: 8).
DLOC: Hex offset in overlay file.
If anything but FFFF entered for DLOC, normal entry queries are asked: CORC, CORL, STRT, FILE (max. characters: 4).
CORC: Hex core count.
CORL: Hex core location (max. characters: 4).
STRT: Hex start location (max. characters: 4).
FILE: Filename of overlay to execute (max. characters: 80).

If reply of FFFF is entered for DLOC, queries following DLOC will be as follows:

Cross-reference Entry Query Response

NAME: Command name (max. characters: 8).
DLOC: FFFF (max. characters: 4).
XNAM: Cross-referenced command name (max. characters: 8).
STRT: Hex relative start location (max. characters: 80).

Note: You can't cross-reference to an entry that has been cross-referenced.

<u>Command</u>	<u>Syntax</u>	<u>Meaning</u>
DELETE	D line a [-line b]	Deletes specified lines.
REPLACE	R line a [-line b]	Replaces specified lines by lines subsequently typed in. REPLACE is equivalent to: D line a [-line b] I line a Terminate replacement by hitting RETURN in response to an argument query for a line.

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COMMANDS
(Continued)

TYPE	T [line a [-line b]]	Types specified lines. All lines are typed if there is no specification. Lines are numbered in the following format:
-------------	-----------------------------	--

Normal Entries

COMMAND	FILE	CORE	START
NAME	DLOC	COUNT	LOC
CORE	IMAGE	FILE	NAME

Cross-Reference Entries

COMMAND	REFERENCED		
NAME	COMMAND	+	OFFSET
	NAME		

**TYPE WITH
VERSION**

TV [line a [LINE B]]	Types filename, date, and time of file creation, and specified lines (as with the Type command).
-----------------------------	--

QUIT	Q	Terminates EDITCMTB without updating COMMTAB file.
-------------	----------	--

FILE	F	Updates COMMTAB file; terminates EDITCMTB.
-------------	----------	--

EDIT	E	Edits a line. Line fields are output like the Type command. To change fields, retype them at appropriate field position; new values will replace old fields. Entries cannot be changed from normal to cross-referenced entries or vice versa. Once entire entry is redisplayed (with modifications) and no more changes are made, EDITing of that line is complete. For normal entries, two lines of fields are displayed (and may be modified) for each entry.
-------------	----------	---

EDITCMTB

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COMMANDS (Continued)

Example

Line 3 = ABC 2 100 2900 0
X.Y

Edited Line 3 Output

```
#
E3
  ABC 2 100 2900 0
  A      600 2900 200
X.Y
X.YY
  A      2 600 2900 200
X.YY
#
```

<u>Command</u>	<u>Syntax</u>	<u>Meaning</u>
COPY	C line a [-line b], line c	Inserts a copy of <i>line a - line b</i> after line c.
MOVE	M line a [-line b], line c	Same as COPY except that <i>line a-line b</i> are deleted after copy is made.
EXTRACT	X filename, line a [-line b], line c	COPY <i>line a-line b</i> from COM-MTAB file, <i>filename</i> is inserted after line c.
LOCATE NAME LN name		Locates all instances of command name <i>name</i> , either as a command name or cross-referenced command name; prints all lines containing <i>name</i> .
LOCATE FILE LF filename		Locates all instances of file with name <i>filename</i> as a core image file; prints all lines containing <i>filename</i> .
SORT	S	Alphabetically sorts entries in COMMTAB by command name.

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ENABDIR

PURPOSE	Enables user-defined working directory for current task.	
SYNTAX	ENABDIR {catalog[OPTION],filename = F}, ...	
INPUT	catalog	Specifies a catalog as one of the entries in a task-oriented directory. This directory is a search list for files referenced by the task. When existing files are referenced, only the catalogs listed in the search list (in the order specified), will be searched.
	OPTIONS	=G, =L, or =C may be appended to each catalog name. These options indicate one or two catalogs where files will be created. ENABDIR allows GLOBAL and LOCAL <i>create</i> catalogs. If more than one catalog is flagged as the GLOBAL or LOCAL catalog, the last entry takes precedence.
	= G	Catalog is flagged as GLOBAL. Files will generally be created in this catalog.
	= L	Catalog is flagged as LOCAL. Under GNA, the LOCAL catalog may be used for files created at the satellite node.
	= C	Flags the catalog as CREATE (GLOBAL and LOCAL, unless otherwise specified).
		The first catalog entry is initially set to be both the GLOBAL and LOCAL create catalog. =G or =L will override this default.
	filename = F	Designates a text file containing catalog names to form the search list. In the text file, catalog names must start in the first column of each line; use the OPTIONS =G, =L, or =C just as you would on the command line. Comments may be added to the file to document catalog usage. Indicate comment lines with a double asterisk (**) in column one. =F must be appended to the filename, this distinguishes it from a catalog name.

ENABDIR

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COMMENTS

- More than one filename may be used. The option = F may not be specified from within a text file.
- To continue a command line, use a semicolon (;) before the ↵.
- Catalog names may not exceed 78 characters in length.
- Catalogs in the search list need not currently exist on the system. Volumes, however, must be in existence.
- A working directory cannot exceed six catalog entries.

MESSAGES

DIRECTORY CURRENTLY
ENABLED TYPE OK TO
OVERWRITE

Output when a directory is currently enabled for the task.

Type 'OK' to enable a new working directory.

DIRECTORY ENABLED

Printed when directory is successfully enabled. Otherwise, appropriate error message is output.

Example

```
n> ENABDIR JQC = G,SYSCATLG = L ↵
DIRECTORY ALREADY EXISTS
TYPE OK TO OVERWRITE
OK ↵
        DIRECTORY ENABLED
n> LISTDIR ↵
        CREATE CATALOGS ARE:
GLOBAL:  JQC
LOCAL:  SYSCATLG
        1)JQC
        2)SYSCATLG
```

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ENABVOL

PURPOSE Enables an auxiliary volume that may be used by the file manager.

SYNTAX ENABVOL logical drive number.

COMMENTS Puts volume name of pack mounted on given logical drive in the primary volume system catalog; enables the volume for use by file manager.

The following is output when volume is enabled:

```
VOLUME = volume name
PACK ID = pack ID
ENABLED ON DRIVE = logical drive number
```

NOTE To access the volume by a task, the volume should first be attached (see ATCHVOL). The volume may be accessed without ATCHVOL. (The prime purpose of ATCHVOL is to prevent the disc from being disabled while it is in use.)

MESSAGES	HARDWARE DISC ERROR	Caused by disc error or not on line.
	PROTECTION VIOLATION	You are not allowed access to pack.
	VOLUME NAME ALREADY EXISTS	Primary volume catalog already contains entry of same name as volume name.

EXECUTE

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EXECUTE

PURPOSE Processes an *execute* file containing O/Y level commands.

SYNTAX EXECUTE catalog.file

Commands are contained in the text file *catalog.&BCD.file*.

COMMENTS The contents of the execute file are processed as if they were commands typed in from the COMDEV. The execute file can include all forms of task input, including: O/S commands, subcommands (such as within EDIT or COPY), answers to prompts, CADDs entry and CADDs commands.

During file execution, only pause/break characters and COMDEV DETACH characters are accepted from COMDEV (see SPECIAL CHARACTERS).

All commands, except FMCLEAR, are legal in an EXECUTE file. Files may be nested by including an EXECUTE command within a file. Characters <, |, and % have special meanings described later. A pair of these characters should be used to represent a single one.

Special Characters To allow EXECUTE files to be edited and printed, control characters and special functions must be represented within the file as special sequences of printing characters.

NOTE Every line of a text file must end with <CR>; however, this carriage return may be part of a non-executable comment so that it has no effect. Extra <CR> may be included by using the following abbreviations, allowing multiple commands on one line of the text file.

Abbreviations Use for documentation, benchmarks, and EXECUTE files.

<u>Syntax</u>	<u>Meaning</u>
<CR>	Extra carriage return
<LF>	Line feed
<BELL>	Rings bell on COMDEV, if echoed*
<TAB>	Horizontal tab
<VTAB>	Vertical tab*
<BACKSP>	Backspace
<PAGE>	Form feed, start new page on printer
<ESC>	Escape (or Alternate Mode)*
<ESCAPE>	Escape (or Alternate Mode)*

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Abbreviations (Continued)

<u>Syntax</u>	<u>Meaning</u>
< RUB >	Rubout
< RUBOUT >	Rubout
< NULL >	Null character
< PRINT >	Toggle HARDEV on/off (Control-P)**
< ECHO >	Toggle COMDEV echoing on/off (Control-U)**
< ABORT >	Ignore whole line (Control-Q)
< CTRL-X >	Control-X, X = any alphabetic character
< CTRL-P >	Toggles HARDEV, equivalent to < PRINT >
< CTRL-Q >	Ignore whole line, equivalent to < ABORT >
< ^ X >	Control-X, X = any alphabetic character
< ^ P >	Toggle HARDEV, equivalent to < PRINT >
< ^ Q >	Ignore whole line, equivalent to < ABORT >
< * >	Ignored
< *	Ignored, used to continue to next line or
<	Ignored, used to continue to next line
<<	<
< VAR >	Accept variable input from user (Implemented in CADDS only)

*Used only in CVTECO Execute files.

**Used only in O/S Execute files (not in CADDS).

For those terminals that do not support the following characters; the characters themselves may be used when available:

< TILDE >	~ (tilde)
< UNDRSCOR >	_ (underscore)
< VERTBAR >	| (vertical bar)
< BACKSLSH >	\ (backslash)
< LFTBRACE >	{ (left brace)
< RGTBRACE >	} (right brace)
< CARET >	^ (caret or up-arrow)

Short Forms

Short forms consist of a caret (^), or up-arrow, followed by one of several characters. They minimize key strokes but decrease readability.

<u>Syntax</u>	<u>Meaning</u>
^X	Control-X (X = any alphabetic character; i.e., ^A, etc.)
^I	Tab
^U	Toggle COMDEV
^P	Toggle HARDEV
^M	Carriage return ↵

EXECUTE

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Short Forms (Continued)

<u>Syntax</u>	<u>Meaning</u>
^\ ^\$ ^^ (%) %%	Rubout Escape or Alternate Mode CTRL ^ (caret or up-arrow) Reserved for future symbols. % (Reserved).

Obsolete Symbols

The following symbols are no longer recognized. Use the new syntax version instead.

<u>Old Syntax</u>	<u>New Syntax</u>	<u>Meaning</u>
!	<PRINT>	Printer on/off
#	<ECHO>	User console echoing on/off
\$R	<RUBOUT>	Rubout
\$C	<*CONTINUED	Continue to next line
\$	LOGOUT	Stop Execute file

Comments Within File

< * >
< * COMMENT LINE ENDING IN CARRIAGE RETURN

Comments are not executed or printed. Commands in an EXECUTE file which begin with an * are printed but not executed. * may be used to issue prompts or explanations.

Terminating an EXECUTE File

Input is taken from the EXECUTE file until:

- The end of a non-nested file is reached; input is accepted on the COMDEV or on any attached CADDs device with a usable keyboard.
- Another EXECUTE command designating a second file is encountered in the file. The contents of the files will be nested such that input comes from the second file; when finished, execution of the first file resumes where it left off. Any number of files may be nested within each other.
- The task is terminated (i.e., by a LOGOUT command within the Execute file, by stopping CPU, or by TASKILL.)

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*Terminating an
EXECUTE File
(Continued)*

- A break character is typed and recognized on the command device. There are several special cases:
 - The ESCAPE key causes the task to pause after the next line is typed, and remain paused until another key is hit;
 - <ESCAPE> Q terminates the command or printing in progress and allows the next command in the Execute file to start immediately;
 - <ESCAPE> N terminates the command in progress and all Execute files (including nested ones).
 - <ESCAPE> K immediately returns to O/S command level.

CADDS Caution

ESCAPE-Q, ESCAPE-N, or TASKILL (^C^C) are not recommended within CADDS because they immediately terminate current command (CADDS), without filing the active part.

NOTES

- CADDS recognizes *task-break* character (Control-B) after each command and within certain long commands such as VERIFY or PLOT. Typing CTRL-B usually causes the current CADDS command and execution of a file to pause; following CTRL-B with Q aborts both the current command and all Execute files.
- Many CADDS commands including RPNT and ZOOM simply assume a Q will be typed and terminate themselves and any Execute files immediately. In these cases, it is impossible to resume execution or to go to the next command after pausing. A few commands only suppress output after recognizing a CTRL-B; they may appear to have paused, but both the command and any Execute files will continue to run.
- The EXECUTE command maintains the characters of the file and nested files in a temporary file named SYSEXECUTExxxx (where xxxx is replaced with the task number). Once execution of the file has begun, the original file may be modified or deleted (it may even be deleted by a command within itself) without affecting the execution.
- Since this temporary file must remain in use, the FMCLEAR command is not allowed within an Execute file.

EXECUTE

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Sample EXECUTE Files

```
<* THIS FILE SAVES ALL FILES IN
<*CATALOGS 'CD3PRTS' AND 'DATA'

SORTCAT CD3PRTS *<ALPHABETIZE 1ST>
ATTACH MT, TAPE
REWIND MT
<*
FUTIL
COPY CD3PRTS,;MT//NLEV
ADD DATA //NLEV
<CR><CR> *EXTRA <CR>'S TO COMPLETE SAVE>
DETACH MT
* SAVE COMPLETE *PRINT MESSAGE
<CR>
```

(Refer to GENCOM command.)

```
EXECUTE
FILE
GENCOM CHANGE.TEMP
<*
<* INCLUDE THE FOLLOWING THREE HEADER LINES:
<*
*
* THIS EXECUTE FILE CHANGES CALLS FROM ROUTINE 'MVBYT'
* TO 'MVBYTT'.
*<CR>
<*
<* SPECIFY COMMAND SKELETON:
<*
EDIT $1,-1,-2$
S,/MVBYT./,/MVBYTT./<CR>F<CR>
<*
<* SPECIFY ALL TEXT FILES IN DESIRED CATALOG(S):
<*
WJL//NLEV,TYPE=<CR>
<*
<* ALSO INCLUDE THE FOLLOWING THREE TRAILER LINES:
<*
*
* CHANGE COMPLETE !!!
*
<*
<* SAVE, EXECUTE AND DELETE THIS FILE:
<*
<CR>F
EXECUTE CHANGE.TEMP
DELETE CHANGE.&BCD.TEMP
```

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**Sample EXECUTE
Files (Continued)**

```
< * SOME CADD5 FILES ARE LINKED:
< *
DELETE DO.&BCD/RELINK
GENCOM DO.RELINK
< * EXTRA CARRIAGE RETURN TO
< * AVOID HEADER LINES:
< CR>
LOAD $1,-1,-2$< CR>
CLD//NLEV,TYPE=3
CLD1000//NLEV,TYPE=3
CLD2000//NLEV,TYPE=3
CLD3000//NLEV,TYPE=3
CLD4000//NLEV,TYPE=3
CLD5000//NLEV,TYPE=3
CLD6000//NLEV,TYPE=3
CLD9000//NLEV,TYPE=3
CLDFMAKE//NLEV,TYPE=3
CLDMAKE//NLEV,TYPE=3< CR>< CR>< CR>F
    < * 'F' SPECIFIES TO GENCOM
    < * THAT DO.RELINK IS TO BE FILED.
    < * THE EXTRA CARRIAGE RETURNS
    < * CAUSE THE FILE SPECIFICATION
    < * LOOP TO TERMINATE AND TO
    < * AVOID TRAILER LINES IN THE
    < * EXECUTE FILE.

DATE
EXECUTE DO.RELINK
DATE
```

Variable Input

If the characters VAR are encountered by CADD5 during the execution of a file, CADD5 pauses to allow you to type or digitize variable input. Since any amount of input is allowed, you must signal the end of your input by typing CTRL-X. The file then resumes executing.

VAR CMD# CADD5 gives this prompt before each command when entire commands are used as variable input.

Typical uses of variable input include: a digitize to locate entities, the name of a part or subfigure to activate or file, contents of a text string being inserted, numerical values for modifiers or machining questions, or PAGE and ZOOM commands before plotting a part.

A comment placed in the file just before the variable input may be used to prompt you.

EXECUTE

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Example of Variable Input

```
< *
< * EXECUTE FILE TO INSERT A BORDER & TITLE BLOCK
< * FOR A STANDARD SIZED DRAWING
< *
  *INS STG: * LINES COULD ALSO BE USED
  *BORDER X0 Y0, X10 Y0, X10 Y8, X0 Y8, X0 Y0;*
  *TITLE BLOCK X7 Y0, X7 Y1, X10 Y1; *
  *DIVIDERS IN BLOCK X7 Y.5, X10 Y.5; X8.5 Y0, X8.5 Y.5

< * PROMPT TO OPERATOR:
  * PLEASE TYPE DRAWING NAME & NUMBER, THEN CONTROL-X <BELL>
< * INS TEXT 'DRAWING: <VAR>' HGT .3 FONT 4 CJT: < * X8.5 Y.6
< *
< * PROMPT TO OPERATOR:
< * PLEASE TYPE YOUR NAME, CTRL-X; AND THE DATE, CTRL-X BELL
  INS TEXT "BY: <VAR> 'DATE: <VAR>" < *
  HGT .2 FONT 1 CJT: X7.75 Y.1, X9.25 Y.1
< *

ZOOM WINDOW: X-1 Y-1, X11 Y9
```

FILCOM

PURPOSE

Compares two binary files.

SYNTAX

FILCOM catalog1.file1,catalog2.file2[/LIST]

OPTIONS LIST Prints a HEXDMP of non-identical sectors in each file.

COMMENTS

- The comparison is made word for word, sector by sector. If one file is shorter than the other, a message is printed indicating which file ended first.
- When a sector is encountered that is different, a message is printed indicating sector number and FIRST word that is different.

MESSAGES

FILES IDENTICAL Output when files are identical.

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FILERCVR

PURPOSE	Recovers a HARDFILE lost during a system crash.	
SYNTAX	FILERCVR Filename Where Filename = name of HARDFILE open during system crash.	
COMMENTS	Depending on crash, it may be impossible to recover complete HARDFILE output. FILERCVR was designed so that it recovers the larger file; it has garbage at the end. This is not a bug. The garbage may be removed by using the regular text editor.	
MESSAGES	HARDFILE RECOVERED	Indicates successful completion of the command.

FMCHECK

PURPOSE	Checks validity of files under file management.	
SYNTAX	FMCHECK [catalog] [,NOTCHECK] [,PRNTZERO] [,NOSTAT]	
	If catalog is absent, validity check is run on all files; otherwise, it's run only on the files in catalog and all subcatalogs of catalog.	
	OPTIONS	
	NOTCHECK	Outputs the name and new checksum of all type 3,4,8, or 9 files that have new checksums computed for zero CHKSUM words. This message is output: ZERO CHECKSUM - NEW CHECKSUM GENERATED
	PRNTZERO	Outputs names of all zero CHKSUM type files along with the message: NOT CHECKED - ZERO CHECKSUM (ZERO - CHECKSUM TYPE)
	NOSTAT	Suppresses processing output. Allows summary output.

FMCHECK

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COMMENTS

- FMCHECK is run only on enabled volumes for non-temporary files that are not opened for MODIFY and not access-protected. Files must meet the following validity criteria:
 - The file must not have zero length.
 - For files not of type 2,3,4,8, or 9, the CHKSUM word of the file entry (word 23) must be zero.
 - For type 3,4,5,8, or 9 files, either the CHKSUM word is zero, or the CHKSUM of the total file (all full sectors—including any file data, but not trailing sectors) equals the CHKSUM word.
 - For type 2 files, either the CHKSUM word is zero and the internal object file CHKSUM (word 2) is correct, or the CHKSUM of the object file (excluding trailing words in the last sector) equals the CHKSUM word.
- During FMCHECK, violations of the above criteria are printed out along with the name of the file in error. File management or system errors terminate FMINIT. Error messages are printed along with the name of last file processed and final statistics.
- If a catalog is ACCESS or READ-protected it is not checked; the catalog name is output along with the message:

PROTECTED - NOT CHECKED

OUTPUT

Name of requested catalog and names of first-level subcatalogs are printed (unless NOSTAT option used). At FMCHECK's completion, the following summary is output. (All statistics = decimal numbers; except Totsect = hexadecimal.)

TOTAL FILES PROCESSED: Total
FILES CHECKSUMED CORRECTLY:
Checked,
FILES IN ERROR: Errcnt
FILES WITH ZERO CHECKSUMS:
Unchecked,
FILES WITH ACCESS ERRORS:
Fmerrcnt
FILES WITH NEW CHECKSUMS
GENERATED: Gendsums

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OUTPUT
(Continued)

TOTAL SECTORS USED BY
CATALOGS: Totsect

Total	Number of non-catalog files on which validity check was run.
Checked	Number of files CHKSUM'ed with no violation found.
Errcnt	Number of files with validity errors.
Unchecked	Number of files of zero checksum type not in error.
Fmerrcnt	Number of files on which file manager access errors occurred.
Gendsums	Number of files of checked type with new checksums generated for previous zero checksums.
Totsect	Total sectors used by catalog hexadecimal.

NOTE

ESCAPE Q terminates FMCHECK and outputs the last file checked along with a summary of the file checked to that point.

FMCLEAR

PURPOSE

Closes any open files in file management (FM) file structure.

SYNTAX

FMCLEAR [Catalog] [/ {[Filelist] [/Options]}]

Filelist = list of subcatalogs and/or filenames within specified Catalog. To clear SYSCATLG, SYSCATLG must be input on the command line as the catalog level.

OPTIONS **NOLIST** Suppresses certain messages resulting from clearing of file/catalog entries. (See *MESSAGES* at the end of this section.) NOLIST responds with its own message in only one circumstance:

TEMPORARY FILE DELETED

or

TEMPORARY FILE RENAMED TO:

This is output if the new version of a file, opened for create with supersede, is deleted or renamed.

FMCLEAR

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COMMENTS

- FMCLEAR sets use count to zero; clears file status word and left byte of protection word in all files marked in use in file structure.
- Whenever control passes back to the system command level, the system automatically closes any open files, as indicated by entries in the FM channels (i.e., unclosed channels).
- FMCLEAR is run at bootup time to clear any files left open as a result of a reboot or SAVCOR operation where the system was not able to close opened files before the system reboot. FMCLEAR can also be run at any other time to clear files which have been left open as a result of an inconsistency in either disc file structures or FM channel data structures.
- FMCLEAR is illegal in an EXECUTE file or when there is an open HARD-FILE.

SINGLE USER MODE ONLY

All other users must be off system; files open on FM channels are cleared with no prior check made. When a name is specified, the FMCLEAR method is different.

Boot-Up FMCLEAR

Automatically run when first user logs in. It looks at the FM channels to determine what files to clear. Volume entries are also cleared at that time.

FMCLEAR SYSCATLG or FMCLEAR SYSCATLG// Options

Searches entire catalog structure, including any enabled volumes, for files to be cleared. Only one user may be logged in (time consuming search for large file structures); if other users are logged in, additional checks would have to be made to determine if the file is opened on a channel.

FMCLEAR with a FM Name list searches the specified catalog structures on disc for files to be cleared.

MULTI-USER OR SINGLE USER MODE

For the following method of FMCLEAR, other users may be on the system. Individual catalogs or files may be cleared with other users on the system; FM checks to see if files are opened on channels.

- FMCLEAR Wholecatalog ↓

Clears all levels of catalog Wholecatalog.

- FMCLEAR Mycatalog/File1,File2 Subcatalog1, File3 ↓

Clears Mycatalog.File1, Mycatalog.File2, Mycatalog.File3. It will clear Mycatalog.Subcatalog1 for all levels.

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RENAMING

New temporary files, opened for create with supersede, may be preserved by a renaming operation.

CATALOG.FILENAME
 ENTER NEW LAST LEVEL
 NAME FOR TEMPORARY FILE

This message is output when a file is marked open for create with supersede. Input new filename (single name, max. 20 characters). Filename is checked in CATALOG for uniqueness.

An error message (followed by a prompt) indicates that the new filename is not unique. Provide a different filename, or delete the new, temporary file:

TEMPORARY FILE
 RENAMED TO:
 CATALOG.NEWNAME
 TEMPORARY FILE DELETED

The new (or newly revised) filename is unique; the new, temporary file is given same file type as the original.

Output when \downarrow is used to delete the new file.

CATALOG.FILENAME
 ORIGINAL FILE CLEARED

In either case, the original file is preserved and cleared with this message.

MESSAGES

CATALOG.CATALOG or FILENAME
 FILE CLEARED — or —
 CATALOG CLEARED

Output for every cleared file or catalog. May be suppressed; see NOLIST.

CATALOG.FILE
 WORKFILE DELETED

Results when original version of a file is opened for create or supersede. May be suppressed; see NOLIST.

CATALOG.FILE
 WORKFILE DELETED

File of type 'FF' hex (also known as a WORKFILE) is unconditionally deleted. May be suppressed; see NOLIST.

FILE MARKED FOR DELETION:
 FILE DELETED

Marks, for deletion, an original file simultaneously open for read and for supersede, when supersede finishes before read. File is not deleted until open for read is done. Files of this status are always unconditionally deleted with this message. May be suppressed by NOLIST.

FORTXREF

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FORTXREF

- PURPOSE** Produces a full cross-referenced listing of a FORTRAN source program.
- SYNTAX** FORTXREF catalog.file
- NOTE** See the *CGOS 200 GNA Programmer Reference Manual* for additional information.

FPHEX

- PURPOSE** Converts a floating point number to its hexadecimal equivalent.
- SYNTAX** FPHEX floating point number
- Floating point number = character representation of a floating point number, including numerics, minus sign, and decimal point.
- COMMENT** FPHEX outputs a two-word hexadecimal representation of the number and returns control to the O/S.

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FUTIL

PURPOSE A device-independent file utility that provides facilities for copying, deleting, printing, and listing files. FUTIL is a multi-function O/S level command that has various internal commands (subcommands) for specific utility functions.

SYNTAX FUTIL ↓
 COMMAND [SOURCE] [DESTINATION] ↓
 COMMAND [SOURCE] [DESTINATION] ↓

 QUIT ↓

COMMAND Any FUTIL subcommand, listed below.

SOURCE Source of the files to be processed.

DESTINATION Destination of the files to be processed.

QUIT Exits FUTIL to return to O/S level.

Command syntax will be described in depth.

FUTIL Subcommands Unless indicated, these commands are recognized in FUTIL and also at O/S command level.

ADD Appends file manager files to magnetic tape file being created. ADD is not recognized as a command at O/S command level.

ADDTEXT Performs ADD for text files only. ADDTEXT is not recognized as a command at O/S command level.

CHECK Checks magnetic tape files against the original disc versions.

CONVERT Copies/converts special format magnetic tape files and character sets (works on text files only).

FUTIL

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FUTIL *Subcommands* (Continued)

CONVERTB	Copies/converts special format magnetic tape file (used for binary file conversion only).
COPY	Copies files.
COPYTEXT	Copies text files.
DELETE	Deletes disc files.
LIST	Lists catalog and file information.
LISTLP	Lists catalog and file information on HARDEV only.
LISTTEXT	Lists text catalog and file information.
MOVE	Copies files, deletes originals.
PRINT	Prints text files.
PRINTLP	Prints text files on HARDEV only.
QUIT	Exits FUTIL internal command level and returns to O/S command level.

Examples

The most common FUTIL operations are:

- COPYING disc files.
- SAVING files on magnetic tape.
- RESTORING files from magnetic tape.
- PRINTING text files.

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FUTIL
Subcommands
(Continued)

Examples of all of these operations are presented here. All examples are based on the following sample file structure:

<u>FILENAME</u>	<u>DATE</u>	<u>TIME</u>	<u>TYPE</u>
CAT1.&BCD.SUBCAT2	03/05/80	11:44:29	03 [text]
CAT1.SUBCAT1.&BCD.FILE1	01/03/80	13:24:27	03 [text]
CAT1.SUBCAT1.&BCD.FILE2	11/14/79	09:22:13	03 [text]
CAT1.SUBCAT1.&BCD.FILE3	05/23/80	12:53:04	03 [text]
CAT1.SUBCAT1.&BCD	11/14/79	09:22:12	01 [catalog]
CAT1.SUBCAT1.FILE1	01/03/80	14:15:33	02 [object]
CAT1.SUBCAT1.FILE2	05/24/80	15:30:22	02 [object]
CAT1.SUBCAT1.FILE3	05/23/80	13:15:52	02 [object]
CAT1.SUBCAT1.SUBSUBCAT.&BCD.FILE	08/08/80	14:14:14	03 [text]
CAT1.SUBCAT1.SUBSUBCAT.FILE	08/08/80	14:14:16	02 [object]
CAT1.SUBCAT1.SUBSUBCAT	08/08/80	14:14:12	01 [catalog]
CAT1.SUBCAT1	05/22/79	17:49:32	01 [catalog]
CAT1.SUBCAT2.&BCD.FILE	12/29/79	10:21:02	03 [text]
CAT1.SUBCAT2.&BCD	12/29/79	10:20:59	01 [catalog]
CAT1.SUBCAT2	12/29/79	10:20:58	01 [catalog]
CAT1	11/13/78	18:03:46	01 [catalog]
CAT2.SUBCAT1.FILE1	03/17/79	10:53:15	20 [part]
CAT2.SUBCAT1.FILE2	03/17/79	10:53:25	21 [part]
CAT2.SUBCAT1.FILE3	03/17/79	10:53:33	22 [part]
CAT2.SUBCAT2.FILE	09/23/80	18:35:20	FF [temp]

Note

You can produce a similar listing of any portion of your own file structure with the FUTIL LIST command:

LIST/LIST = DT CATALOG

COPYING DISC FILES

Copying disc files is the easiest and most common FUTIL operation. These representative examples are based on the file structure described above:

COPY CAT1 CAT3

Copies everything in the primary catalog CAT1 to a new catalog CAT3. For example, the file CAT1.SUBCAT1.FILE1 is copied to a new file CAT3.SUBCAT1.FILE1. None of the original files in CAT1 are changed.

COPY CAT1.SUBCAT1 CAT3

Copies everything in the subcatalog SUBCAT1 of CAT1 into a new catalog CAT3. The subcatalog SUBCAT1 is not part of the new name. For example, the file CAT1.SUBCAT1.FILE1 is copied to a new file CAT3.FILE1. None of the original files in CAT1.SUBCAT1 are changed.

FUTIL

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COPYING DISC FILES (Continued)

COPY CAT1.SUBCAT1//LEVEL = 1 CAT3.SUBCAT1

Copies only those files in the first level of subcatalog SUBCAT1 in CAT1. These files are copied to CAT3.SUBCAT1. The files copied are:

CAT1.SUBCAT1.FILE1 ≥ CAT3.SUBCAT1.FILE1
CAT1.SUBCAT1.FILE2 ≥ CAT3.SUBCAT1.FILE2
CAT1.SUBCAT1.FILE3 ≥ CAT3.SUBCAT1.FILE3

COPY CAT1.SUBCAT1.FILE1 > CAT3.SUBCAT2.FILE2

Copies only the specified file.

Note

The > symbol is an optional way to separate source and destination fields. This command is the same as:

COPY CAT.SUBCAT1.FILE1 CAT3.SUBCAT2.FILE1

COPY CAT1/FILE1/LEVEL = N CAT3

Copies all files in CAT1 that have names ending with FILE1. Files copied are:

CAT1.SUBCAT1.&BCD.FILE1
CAT1.SUBCAT1.FILE1

COPY CAT1.SUBCAT1/&BCD.FILE1,FILE2 > CAT3

Copies particular files in CAT1.SUBCAT1. These files are:

CAT1.SUBCAT1.&BCD.FILE1
CAT1.SUBCAT1.FILE2

COPY CAT1//TYPE = 3 CAT3

COPY CAT1//TYPE = TEXT CAT3

Both of these commands do the same thing. All of the text (type 3) files in CAT1 are copied. These files are:

CAT1.&BCD.SUBCAT2
CAT1.SUBCAT1.&BCD.FILE1
CAT1.SUBCAT1.&BCD.FILE2
CAT1.SUBCAT1.&BCD.FILE3
CAT1.SUBCAT1.SUBSUBCAT.&BCD.FILE
CAT1.SUBCAT.&BCD.FILE

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COPYING DISC FILES (Continued)

COPYTEXT CAT1.SUBCAT2 CAT3.SUBCAT2

Copies the following text files:

CAT1.&BCD,SUBCAT2
CAT1.SUBCAT2.&BCD.FILE

SAVING FILES

FUTIL is frequently used to create backup tapes. This section contains examples of common commands and sequences of commands for backing up files on tape. After files are written to tape, use CHECK to validate tape files against their originals.

COPY CAT1 :MT1//LABEL = "VOLSER",CHECK

Places all CAT1 files onto the first file of a stacked tape. The first record of the tape must be a VOL1 label. After all files have been saved, a check pass is run to validate the data. Files retain their original names when written to tape.

FUTIL

**COPY CAT1 > :MT1//LABEL = "VOLSER",CHECK
ADD CAT2
QUIT**

Saves the entire contents of CAT1 on tape, performs a check pass, and then saves files in CAT2. Runs check pass on appended CAT2 files, since CHECK remains in effect for all successive ADDs.

COPY CAT1 > :MT1.CAT3//LABEL = "VOLSER",CHECK

Identical to the first example in this section, except that the CAT1 portion of each filename is changed to CAT3 when the file is written to tape. A check pass is the final step.

FUTIL

**COPY CAT1 :MT1.CAT3//LABEL = "VOLSER",CHECK
ADD CAT2 CAT4
QUIT**

Identical to the second example in this section except that CAT1 portion of filenames is changed to CAT3, and CAT2 portion of filenames is changed to CAT4.

RESTORING FILES

Sample commands for restoring files that have been backed up on magnetic tape:

COPY :MT1

Restores all files contained in the first file of a stacked tape. The files are restored with the names they have on tape.

FUTIL

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RESTORING FILES (Continued)

COPY :MT1.CAT1 CAT3

Restores all files on tape that have an initial catalog name of CAT1. Files are restored with the CAT1 portion of the name changed to CAT3.

PRINTING TEXT FILES

This section contains examples of the PRINT and PRINTLP commands.

PRINT CAT1.SUBCAT1//LEVEL = 1

Prints the following files on the COMDEV (terminal). The files are printed with the filename and a date heading, but no line numbers.

```
CAT1.SUBCAT1.&BCD.FILE1
CAT1.SUBCAT1.&BCD.FILE2
CAT1.SUBCAT1.&BCD.FILE3
```

PRINT/DIGITS = 6 CAT1.SUBCAT1//LEVEL = 1

Identical to the previous example, except that files are now printed with line numbers.

PRINTLP CAT1.SUBCAT1//LEVEL = 1

Identical to the preceding command, except that files are printed on the line printer. Line numbers are printed for each file and each file has the filename and date as a header.

PRINTLP CAT1.SUBCAT2.FILE

Prints one file on the line printer.

```
CAT1.SUBCAT2.&BCD.FILE
```

FUNCTIONAL OVERVIEW

This section is a functional overview of FUTIL documentation.

Most FUTIL commands can be used in either of two modes: the external mode or the internal mode. The internal mode is reached by typing FUTIL in response to the O/S prompt (n>); enter FUTIL commands in response to the (#) prompt.

Standard command syntax is identical for internal and external modes. It has three components: Command field, Source field, and Destination field.

- Command field is mandatory, it identifies the command. Source and Destination fields are optional for some commands.
- Source field identifies input.

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FUNCTIONAL OVERVIEW
(Continued)

- Destination field directs output.
- Source and destination fields, include any of the following elements:
 - Devices
 - Tape record numbers
 - Catalogs
 - Filenames
- Each of the three fields accepts options.

Exceptions to standard command syntax include:

- Syntax errors (FUTIL allows for correction)
- Multiple line commands

FUTIL commands:

<u>Normal commands</u>	<u>Text commands</u>	
ADD	ADDTEXT	
CHECK	CONVERT	--- \ MICARDS
CONVERTB		\ IPC
COPY	COPYTEXT	\ EIAIN
DELETE	LISTTEXT	\ EIAOUT
LIST	PRINT	
LISTLP	PRINTLP	
MOVE		
QUIT		

For added flexibility in command use, FUTIL supports various options. There is an *Optionlist* associated with each component of the standard command syntax. In the following chart, Optionlists are as follows (abbreviations in parentheses): Command field (C), Source field (S), and Destination field (D).

FUTIL

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FUNCTIONAL OVERVIEW (Continued)

File spec options

BEFORE	(S)
EXCEPT	(S)
LEVEL	(S)
NLEV	(S)
SINCE	(S)
SUBCAT	(S)
TYPE	(S)

Conversion options

CONVERT	(C)
FORMAT	/BLKSIZ (S,D)
	\ RECCNT
	\ RECSIZ
LASTBLK	(D)
LBS	(S,D)
LEADCHAR	(D)
LEADER	(D)

List command options

ALL	(C)
DLOC	(C)
FULL	(C)
LABELS	(C)
LIST	(C)
SYSTEM	(C)
TEMPFILS	(C)
USER	(C)

Magnetic tape options

CHECK	(D)
COLD	(S,D)
LABEL	(D)
NOCHECK	(D)
OVERLAST	(D)
RSTFIL	(S,D)
SAVFIL	(S,D)
TAPEFILE	(S,D)
USERLBS	(D)

Printing options

COPIES	(C,D)
DIGITS	(C,D)
FILEHEAD	(C,D)
LENGTH	(C,D)
LINES	(C,D)
MARGIN	(C,D)
PAGENUMS	(C,D)
WIDTH	(C,D)

Miscellaneous options

ARCHIVE	(C)
ASK	(S)
CHECKSUM	(S)
DISKPOS	(D)
DRWUPDAT	(C)
LIST	(C)
NEWCHAR	(D)
NEWDATE	(D)
NOARCHIVE	(C)
NOPROTECT	(D)
NOSHIFT	(D)
OLDDATE	(D)
PROTECT	(D)
RELACE	(D)
SHIFT	(D)
SRCHLIM	(S)

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Note

Any FUTIL option may be used in either the Source, Destination, or Command fields without generating an error. To avoid possible ambiguities, however, use Options in the fields specified above.

**FUNCTIONAL
OVERVIEW
(Continued)**

The FUTIL-O/S interface sometimes produces unusual results, particularly in the following areas:

- Response to system toggles
- Working directories
- Interrupt handling
- Error handling
- Execute file handling
- Illegal characters in filenames

FUTIL supports several formats for creating system disc file back-up tapes. Tape label and data formats must conform to certain conventions:

- Data formats
 - Blocked tape formats
 - FUTIL format tapes
 - SAVFIL/RSTFIL format tapes
- Tape labels
 - Label groups
 - Files — file sections — file sets
 - Required labels

Execution Modes

FUTIL has two modes of command execution:

- Commands within FUTIL
- FUTIL O/S commands

***Commands within
FUTIL***

Typing FUTIL in response to the O/S command prompt (n > FUTIL), activates the internal command execution mode. FUTIL then prompts for commands (#). Commands and errors are then handled without returning to O/S level. Typing QUIT, in response to the FUTIL prompt, returns you to O/S command level.

FUTIL

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Commands Within FUTIL (Continued)

FUTIL commands are listed below. Formal abbreviations, (in parentheses), can be entered in internal command mode, as a response to the (#) prompt.

ADD	(A)	DELETE	(D)
ADDTEXT	(AT)	LIST	(L)
CHECK		LISTTEXT	(LT)
CONVERT		LISTLP	(LL)
CONVERTB		MOVE	(M)
COPY	(C)	PRINT	(P)
COPYTEXT	(CT)	PRINTLP	(PL)
		QUIT	(QU)

The internal command mode has these advantages:

- Faster execution of commands
- Use of abbreviated commands
- Exclusive use of certain commands
- Ability to append new files or continue to search for files on a reel of tape without rewinding the tape for each new command

FUTIL O/S Commands

The standard FUTIL internal commands, except for ADD, ADDTEXT, and QUIT, are available outside of FUTIL as identical O/S commands. They are entered in response to the O/S command prompt, (n> Command), without first entering FUTIL. In this case, FUTIL returns directly to O/S level upon completion of the command or detection of an error.

FUTIL O/S level commands cannot be renamed or cross-referenced with a SYSCMTB or USERCMTB. O/S level commands cannot be abbreviated.

Command Syntax

Command Components

FUTIL has a standard command syntax with three components:

- Command
- Source File Specification
- Destination File Specification

The *fields* are combined in this sequence:

Command [Source [> Destination]]

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**Command
Components
(Continued)**

- Spaces may be used freely, except in the following cases:
 - There must be a space separating the Command field from the Source and the Destination fields.
 - There can be no space between a Command name and the slash denoting the Command Optionlist (if specified).
 - Names, including full filenames, cannot contain any spaces.
 - There must be either a greater-than sign (>), or one or more spaces between Source and Destination fields.
- Command is mandatory; Source and Destination are optional, depending upon the Command.
 - If Source or Destination is omitted, ://LEVEL=N is the assumed default.
 - If the Destination is specified, there must be a Source specification.
 - Omitting Source or Destination may yield undesired effects. To avoid problems, state the Source and Destination fields explicitly.

The three command components are further subdivided. In command syntax, the subdivided elements are separated by slashes (/):

```
Command = Command[/Optionlist]
Source = [Catalog][/FilenameList][/Optionlist]
Destination = [Catalog][/Optionlist]
```

- The Command portion consists of the Command name and optional Optionlist.
- Source consists of three elements, and Destination consists of Catalog and Optionlist:
 - Catalog Includes the device and primary catalog name.
 - FilenameList List of filenames (Source only).
 - Optionlist Another list of options.

Options and Optionlists

Most options can be used in any Optionlist without generating an error. However, some options have unpredictable effects if used in an inappropriate Optionlist. Both the Overview options chart and descriptions show the Optionlist(s) associated with each option. To avoid problems, use an option in the appropriate list.

FUTIL

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Command Components (Continued)

The three Optionlists are:

- The Command Optionlist — options not related to Source or Destination fields and options specifically related to command function.
- The Source Optionlist — options related to the Source device and file specifications.
- The Destination Optionlist — options related to the Destination device and files.

<u>Field/Element</u>	<u>Meaning and Use</u>
CATALOG	Specifies either a device, or a catalog or filename, or both.
COMMAND	Basic FUTIL function.
DESTINATION	Destination of files to be processed. This field may contain a catalog name or device ID.
FILENAMELIST	List of one or more filenames separated by comma (e.g., COMMAND.FUTIL, COMMAND.&BCD.FUTIL).
OPTIONLIST	List of options separated by commas (e.g., NLEV,REPLACE=YES).
SOURCE	Source of the files to be processed. This field may contain a catalog name, device ID, or filename (e.g., SYSNEWS, SYSNEWS.LCLNEWS, :MT1, :MT1. SYSNEWS).

Catalogs

In FUTIL syntax, the device name is specified as part of the catalog. The catalog may have the full name of a single file in standard system filename format. When not specified, SYSCATLG is implied. The catalog name is illegal unless the device specified supports named fields.

This is the Catalog syntax:

- If both a device and a catalog(or filename) are used, the device must be joined to the rest of the catalog/filename by a dot (.), as in device.catalog
- Primary disc is the default device. It can also be specified by a colon (:) without a taskunitname.

Catalogs
(Continued)

- Any device specification must be the first Catalog level (prior to the site ID, volume name, and primary catalog or filename).
- If a device specification is not allowed within a particular Source or Destination field, a colon may be still be used. In this case, the colon is merely a place holder. For example, the ADD command does not allow a device in the Destination. The following command, however, is still valid.

ADD catalog:

```
FILE
CATALOG.SUBCATALOG.FILE
[1].CATALOG.SUBCATALOG.FILE
[1].*VOLUME.CATALOG.FILE
:MT1.CATALOG.SUBCATALOG.FILE
:.FILE
:LP
:
```

Devices

The device is the physical unit where files are stored. Files are assumed to be on disc, unless the command or options imply otherwise.

The device element of the Source and Destination fields is specified as follows:

:XY[n]

XY Can be either:

- A taskunitname; the two-character name of a device attached to the task.
- A generic device type; a two-letter symbol indicating the type of device. In this case, the first device specified and attached to the task is used.

n The exact file number (position on the tape) of the tape file to be processed. If n is used, the XY device must be a magnetic tape unit.

- If n is not specified or n = 0, the first tape file on the reel is implied. A tape rewind is always implied.

FUTIL

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Devices (Continued)

- If $n = 1$, the first tape file is also implied. This differs from $n = 0$ in the case of a multi-reel file. (When $n = 1$, an error results unless the first reel is mounted; when $n = 0$, the first file on the reel is read, regardless of which reel is mounted.) A tape rewind is always implied by $n = 1$.
- If $n = -1$, the last tape file on the reel is implied.

Note

A tape file is not the same as a file manager file. A single tape file may contain many file manager files. File manager files are the normal, named system (disc) files. Tape files are numbered with respect to a particular reel of tape.

GENERIC DEVICE TYPES

- MT = Magnetic tape drive (Source or DEVICE Destination)
- LP = HARDEV (Destination). The only device that need not be attached to the task. The system default HARDEV is automatically attached when :LP is specified and there is no task HARDEV. When LP is specified, the Destination catalog name is not allowed.
- CM = Task COMDEV (Destination). The Destination catalog element is not allowed.
- PT = PPTDEV (Destination). RPTDEV (Source). A catalog name is not allowed with this device.
- CD = Card reader (Source). A catalog name is not allowed with this device.

TAPE RECORD NUMBERS

When the Source device is a magnetic tape unit, the *Record Number List* (or *Numberlist*) may be used in place of the catalog name. This feature is available only for standard FUTIL format tape files and older SAVFIL/RSTFIL format tapes. The Numberlist is a series of numbers and number ranges enclosed in parentheses. (Each File Manager file saved on tape has a sequence number that indicates its position in the main tape file. The only way to identify a sequence number of a particular file is to use the LIST or LISTTEXT commands to list the tape file in question.) The Filenamelist field must be empty when the Numberlist is used. A dot (.) must separate this Numberlist from the device.

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**TAPE RECORDS
NUMBERS
(Continued)**

The format of the Numberlist specification is:
(n1[-n2][,n3[-n4][,...]])

Example of a Source specification:
:MT1.(4-5,8,20-22,30)

Sequence numbers of specified files:
4, 5, 8, 20, 21, 22, 30

Filenames

In a Source field, the catalog may be a filename. In this case, the Destination catalog is also assumed to be a filename and only one file is processed. The Filenamelist must be empty.

Examples: LIST CAT2.SUBCAT2.FILE//LIST = SP
PRINTLP CAT1.SUBCAT2.FILE//DIGITS = 6

**FILENAME
CHANGES** When copying files from one place to another FUTIL often renames the copied files. The catalog element (of both the Source and Destination fields) determines the new base catalog name.

- Name changes involve only that part of the full filename that matches the Source Catalog.
- The device is not considered part of the modified portion of the filename.
- In the transfer from Source to Destination, filenames are processed in one of five ways:
 1. No change; the filename is copied unchanged. The Destination device may differ from the Source device, but the actual name of the file is not modified. The filename will not be modified if the Destination catalog is blank; or if only a device is specified, with no period following it, in the Destination catalog.

FILE = = > FILE
COPY :MT
COPY :MT :
COPY : :MT
COPY :MT1.FILE
COPY :MT1.FILE FILE

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Filenames (Continued)

2. Complete change; the catalog name is changed entirely from Source to Destination. This catalog is accomplished by specifying a catalog name in both the Source and Destination catalogs.

```
CATALOGA.FILE == > CATALOGB.FILE
COPY CATALOGA CATALOGB
COPY :MT.CATALOGA CATALOGB
COPY :.CATALOGA :MT2.CATALOGB
```

3. Prefixing; the primary Destination catalog name is attached to the front of the primary catalog name of the Source. Add a prefix by specifying an ! after the catalog name in the Destination.

```
CATALOGA.FILE == > CATALOGB.CATALOGA.FILE
COPY CATALOGA CATALOGB.!
COPY CATALOGA :MT1.CATALOGB.!
COPY :MT1.CATALOGA CATALOGB.!
```

4. Suffixing; the primary Destination catalog name is attached to the end of the primary Source catalog name. Add a suffix by specifying an ! after the device and before the catalog name in the Destination catalog.

```
CATALOGA.FILE == > CATALOGA.CATALOGB.FILE
COPY CATALOGA !.CATALOGB
COPY CATALOGA :MT1!.CATALOGB
COPY :MT2.CATALOGA !.CATALOGB
```

5. Stripping; the primary Source catalog name is removed from the full name of the Destination file. Strip the Source catalog name by specifying a device followed by a period, but not a catalog name, in the Destination catalog.

```
CATALOGA.FILE == > FILE
COPY CATALOGA :.
COPY :MT1.CATALOGA :.
COPY CATALOGA :MT1.
```

Filename list

The Filename list is used to identify the names of files in the base catalog specified (or implied) in the Source field. Each name in the field may consist of several catalog levels. Names in the list are separated by commas (,). Wild cards may be used in the Filename list to replace characters in the filename. The SUBCAT and EXCEPT options modify the search for files named in the Filename list.

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Wild Cards

Three characters allow you to substitute for any character or catalog level in the filename. With these characters, all files matching the rest of the filename can be included in the Filenamelist

<u>Wildcard</u>	<u>Description</u>
?	Substitutes for any alphanumeric character in a filename. With two or more ?'s, two or more characters in the same positions will produce a match. A ? cannot replace the dot (.) used as a catalog level name separator.
? \	Like ? but substitutes 0 to n characters. If ? \ is the only specification for a catalog level, the catalog level may be omitted from the matched name.
!	Substitutes a full catalog level name. The catalog level must contain one character to result in a match. When more than one ! is used, separate catalog from non-wildcard levels by the usual dot (.).
! \	Substitutes 0 to n full catalog levels.

Examples

<u>Specification</u>	<u>Possible Filenames</u>
CAT?EVEL	CATLEVEL CAT-EVEL CAT6EVEL
FIL??AME	FILENAME FIL56AME FIL-2AME
F?LENA?E	FILENAME F1LENA-E
FILE? \	FILE FILE1 FILE123-Q
CAT? \ LOG	CATLOG CATABCDLOG CAT5LOG
? \ LENA? \	LENA FILENAME CATALENA

FUTIL

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Wild Cards (Continued)

Examples

<u>Specification</u>	<u>Possible Filenames</u>
CAT.I.G	CAT.CAT1.G CAT.A.G CAT.&BCD.G
CAT.II.G	CAT.A.B.G CAT.Q.&BCD.G
CAT.C1.I	CAT.C1.FILE CAT.C1.XX
CAT.I \ .G	CAT.G CAT.&BCD.G CAT.A.B.C.D.G
CAT.I \	CAT CAT.FILE CAT.&BCD.QQQ
CAT.CAT?.FILE	CAT.CATX.FILE CAT.CAT1.FILE
CAT?.FILE	CAT.R.FILE CAT.A.FILE
CAT.? \ .FILE	CAT.FILE CAT.&BCD.FILE CAT.A.FILE
CAT.I.? \ .FILE	CAT.X.FILE CAT.X.&BCD.FILE CAT.Q.A.FILE
CAT.I \ .? \ .FILE	CAT.FILE CAT.A.FILE CAT.&BCD.FILE CAT.A.&BCD.FILE CAT.A.B.C.FILE

File Searching

Use the LEVEL option to control file searches:

- If the filenamelist is empty, FUTIL defaults to a complete traversal of the primary catalog. This is equivalent to specifying LEVEL=N or NLEV.
- With names in the filenamelist, the default is a LEVEL=0 search of the primary catalog.

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File Searching
(Continued)

- Use the LEVEL option (LEVEL = n) to control the depth of the search, e.g., to search only a single level of the primary catalog when the filenamelist is blank, or to search multiple levels when there are names in the filenamelist.
- The SUBCAT option enables a search of up to n levels beyond the subcatalog names specified in the FilenameList.

Examples

In the following examples a ! stands for an arbitrary catalog name.

CATALOG
— or —
CATALOG//LEVEL = N returns:
 CATALOG
 CATALOG.!
 CATALOG.!!
 CATALOG.!!!
 etc.

CATALOG/NAME
— or —
CATALOG/NAME/LEVEL = N returns:
 CATALOG.NAME
 CATALOG!.NAME
 CATALOG.!!!.NAME
 etc.

CATALOG//LEVEL = 0 returns only:
 CATALOG

CATALOG/NAME/LEVEL = 0 returns only:
 CATALOG.NAME

CATALOG//LEVEL = 1 returns:
 CATALOG
 CATALOG.!

CATALOG/NAME/LEVEL = 1 returns:
 CATALOG.NAME
 CATALOG!.NAME

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File Searching (Continued)

CATALOG/NAME/LEVEL = 3 returns:

CATALOG.NAME
CATALOG!.NAME
CATALOG!!!.NAME
CATALOG!!!!.NAME

CATALOG/SUBCATALOG/SUBCAT

— or —

CATALOG/SUBCATALOG/LEVEL = N, SUBCAT returns:

CATALOG.SUBCATALOG
CATALOG.SUBCATALOG!
CATALOG.SUBCATALOG!!!!
etc.

CATALOG/SUBCATALOG/LEVEL = 0, SUBCAT returns:

CATALOG.SUBCATALOG

CATALOG/SUBCATALOG/LEVEL = 1, SUBCAT returns:

CATALOG.SUBCATALOG
CATALOG.SUBCATALOG!

CATALOG.SUBCATALOG/LEVEL = 3, SUBCAT returns:

CATALOG.SUBCATALOG
CATALOG.SUBCATALOG!
CATALOG.SUBCATALOG!!
CATALOG.SUBCATALOG!!!!

ADDITIONAL SYNTAX INFORMATION

Correction of Syntax Errors

FUTIL provides for correction of syntax errors caused by typing errors. An up-arrow (^) points to the punctuation at the start of the incorrect syntax element; appropriate error messages are printed. FUTIL prompts for correction with an angle-bracket (>) followed by the portion of the line accepted as correct; FUTIL does not type the incorrect part of the line. The segment accepted and retyped by FUTIL cannot be erased or typed over. Continuing the line with } aborts the command. Any other response, including a space, is assumed to be a correction and continuation.

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Multiple Line Commands

Long, complex FUTIL commands may extend over more than one physical line (80 characters). These commands can only be broken up immediately after a syntax element (see list), or between element punctuation. Certain punctuation, such as commas (,), must occur on the new line, not the old.

Commands may be continued after these syntax elements:

- Command (name)
- Source
- Destination
- Filenamelist
- Optionlist
- Any complete filename in a Filenamelist
- Any complete option in an Optionlist

A semicolon (;) at the end of the current line indicates that the next line is a continuation of the same command. After FUTIL processes the line up to the continuation, an angle-bracket (>) prompts for the continuation line. Separator punctuation following the break (except for required spaces) must begin on the new line.

Note

A limited number of file and catalog names are allowed on a FUTIL command line. If this limit is exceeded, an error results — additional filenames are not allowed.

Blanks or spaces may be used freely where continuation breaks are allowed. There must be at least one blank or continuation break between the Command field and the rest of the command, and one between the Source and Destination fields.

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Abbreviating Keywords

A *keyword* is a Command or option name, or a non-literal option value. Command names may only be abbreviated from within FUTIL, as the abbreviations are not recognized at O/S command level. Other keywords can be abbreviated both within FUTIL and at O/S command level.

1. **Formal.** A formal abbreviation is available for some keywords. It must be precisely spelled out. For example, the command COPYTEXT has the formal abbreviation CT.
2. **Minimal.** Most keywords may be abbreviated by the minimum number of characters needed to identify the keyword within its appropriate context. Any number of additional characters may be typed, up to the full name. For example, YES may be typed as Y, YE, or YES. More than one or two letters may be required to uniquely identify some options (e.g., NOS is the minimum abbreviation for NOSHIFT, NOP for NOPROTECT, etc.)

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Normal Commands ADD (A)

Appends data to magnetic tape files. ADD must follow immediately after the COPY command used to initiate the magnetic tape file; or another ADD command.

ADD is not an O/S command; it is only available inside FUTIL.

SYNTAX

ADD[/Options]
[Catalog[/Filenamelist][[/Options]]]
[Catalog[/Options]]

COMMENTS

ADD is identical to COPY, except that its Destination field cannot have the device specification.

Magnetic tapes must be in FUTIL or SAVFIL/RSTFIL format.

All tape options relating to destination tape device must have been specified in the Optionlist of the COPY command preceding the ADD. The only exceptions are the CHECK and NOCHECK options which remain effective for subsequent ADDs until respecified.

CHECK

Checks magnetic tape files against the original disc copies.

SYNTAX

CHECK[/Options] Catalog[/Options]

COMMENTS

The Source must be a magnetic tape unit.

Magnetic tapes must be in FUTIL or SAVFIL/RSTFIL format.

Neither the Catalog and Filenamelist of the Source field, nor the entire Destination field, are allowed.

Only tape related options are allowed in the Optionlist.

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Normal Commands (Continued)

CONVERTB

Identical to CONVERT except that it does only binary file conversions. All files are copied as binary files without any character set conversions.

SYNTAX

```
CONVERTB[/Options]
[Catalog[/Filenamelist][[/Options]]]
[Catalog[/Options]]
```

COMMENTS

CONVERTB does not process text files.

COMDEV or line printer are not allowed as Destination devices.

COPY (C)

Performs basic FUTIL file transfer functions. Copies files from one device or catalog to another.

SYNTAX

```
COPY[/Options]
[Catalog[/Filenamelist][[/Options]]]
[Catalog[/Options]]
```

COMMENTS

If the Destination is a COMDEV device specification, COPY is the same as PRINT (&BCD catalog level needed).

If the Destination is a HARDEV device specification, COPY is the same as PRINTLP (&BCD catalog level needed).

DRWUPDAT OPTIONS

COPY/DRWUPDAT simplifies the restoration of updated versions of parts. (It assumes that speed is not critical and that very few parts are being restored in an single command specification.) DRWUPDAT is only

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Normal Commands
(Continued)

valid for the COPY command. The full specification of the COPY command may be used with the following exceptions:

- The Source device must support a catalog structure (i.e., it must be the disc, a FUTIL format tape, or a SAVFIL/RSTFIL format tape).
- Disc must be the Destination device.
- At least the terminating level of each part name must be specified in the Filenamelist of the Source rather than in the catalog name.

Because a part name is actually a subcatalog in the file structure, the SUBCAT option is automatically in effect when this option is specified. The actual execution of the command is accomplished in two phases.

- Restoration phase — searches the Source catalog for valid part names and restores them.
- Deletion phase — searches the Destination catalog for valid part names and deletes them.

As a filename change may be indicated by the command specification, the deletion phase operates only on those parts that have a valid destination name.

DELETE (D)

Deletes specified files (disc files and catalogs only).

SYNTAX

```
DELETE[/Options]  
[Catalog[/Filenamelist]][/Options]]
```


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Normal Commands (Continued)

LIST (L)

Lists contents of disc catalogs or magnetic (L) tapes.

SYNTAX

```
LIST[/Options]  
[Catalog[/Filenamelist][[/Options]]  
[Catalog[/Options]]
```

COMMENTS

There is only one valid Destination field; a device specification for either the COMDEV or HARDEV. The default is the COMDEV. Files are listed on the Destination device.

Magnetic tapes must be in FUTIL or SAVFIL/RSTFIL format.

File Listing Format

Information for each file listed is printed the same way, irrespective of FORMAT the items actually listed. Options designate desired information for the list. If file information is not available, the appropriate list field is blank. Information for each file is printed on one or more lines of up to 80 characters.

The tape file position number and full file name are always listed. When no list options are specified, each file's creation date and time are listed. If options are specified, only information requested is listed.

Information is listed in order, left-to-right, top-to-bottom. All numerical information is HEXIDECIMAL.

- File position number — always listed (tape)
- Filename — always listed
- Creation date and time — default
- Full size in sectors (disc)
Contiguous Flag
 - “ ” - file is contiguous
 - “***” - file is not contiguous
 - “Vn” - entry is a volume enabled on disk drive n. ($0 \leq n \leq 3$)
- File type

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Normal Commands
(Continued)

- Protection code
- CHKSUM
- DLOC (disc)
 Contiguous flag (as above)
- First contiguous chunk (disc)
- Catalog flags (disc)
- Last access date
- User attribute words

Magnetic Tape Listing Format

Information is listed for each file and for certain magnetic tape formats.

1. SAVFIL/RSTFIL format tapes. Tape file type (i.e., SAVFIL) and creation date/time precedes individual file.
2. FUTIL format tapes. Tape file label information precedes that for individual files.

All numerical information is in DECIMAL and the information is printed, in order, on one line.

- File number (the n of :MTn).
- File section number (1 only if the file extends across more than one reel of tape.)
- Tape file creation date (Julian date).
- Tape file expiration date (The Julian date 99/999).
- The version of FUTIL that created this tape file (tape file name).
- The version of the O/S current when the tape file was created.
- File set ID (VOLSER of the first reel in the set).
- VOLSER of the current reel.
- Text content of the USR3-USR9 labels, if they exist.

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Normal Commands
(Continued)

LISTLP (LL)

Lists contents of disc catalogs or magnetic tapes. LISTLP resembles LIST, except the Destination is omitted; output always goes to the line printer.

SYNTAX

LISTLP[/Options]
[Catalog[/Filenamelist]][/Options]]

MOVE (M)

Moves files from one device, catalog, or file to another.

SYNTAX

MOVE[/Options]
[Catalog[/Filenamelist]][/Options]]
[Catalog[/Options]]

COMMENTS

MOVE is identical to the COPY command, except when the operation is on disc files. In that case, the original source files are deleted upon successful completion of the copy.

Caution

Moving a file to itself deletes the file.

QUIT (QU)

Exits FUTIL internal command level to return to the O/S prompt. QUIT is not valid at O/S level.

SYNTAX

QUIT

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Text Commands

FUTIL text commands operate only on type 3 and 5 files (with &BCD as the next-to-last level in the full filename; e.g., A.B.&BCD.C). When specifying catalog or filenames for these commands, omit the &BCD. (e.g., A.B.&BCD.C must be specified as A.B.C.).

Text commands (Formal abbreviations) and substitutions:

- ADDTEXT (AT) — substitute ADD
- CONVERT — need Filenamelist specification
- COPYTEXT (CT) — substitute COPY
- LISTTEXT (LT) — substitute LIST
- PRINT (P) — substitute COPY
- PRINTLP (PL) — substitute COPY

NOTE

A Source specification of A.B.C can refer to both the catalog A.B.C.&BCD and the file A.B.&BCD.C. The files in the catalog and the single file are all processed. If only the single file or full catalog is desired, use the non-text form of the command with an &BCD catalog level. An appropriate Filenamelist specification can also filter the desired filenames.

ADDTEXT (AT)

Identical to the ADD command, but limited to text files.

SYNTAX

```
ADDTEXT[/Options]
[Catalog[/Filenamelist][/Options]]
[Catalog[/Options]]
```

CONVERT

Copies/converts special format magnetic tape files. Generally used with fixed-block, fixed-record tapes. CONVERT is limited to text files.

Additionally, CONVERT reads or punches paper tape; and reads cards. It provides conversions for several industry standard character sets.

SYNTAX

```
CONVERT[/Options]
[Catalog[/Filenamelist][/Options]]
[Catalog[/Options]]
```

Text Commands
(Continued)

COMMENTS

CONVERT is a special version of the COPY command with a slightly different syntax. It is used for special magnetic tape formats (Blocked Tape Format/Device), and for character set conversions. CONVERT transfers text files to and from non-CV machines and non-standard devices such as paper tape or cards.

- The Source may be a magnetic tape unit, paper tape reader, card reader, or CV text file or catalog.
- The Destination may be a magnetic tape unit, paper tape punch, or CV text file.
- The Filenamelist is only allowed when the Source is a catalog, or a FUTIL or SAVFIL/RSTFIL format magnetic tape.

CONVERT has several tables for converting standard character sets. Character set conversions are described under the CONVERT option.

File specification format depends upon the physical devices used.

1. If the Source is a non-standard device (blocked tape device, card reader or paper tape reader), the Destination may be:
 - Full name of a disc file to be created from the tape file (without &BCD catalog).
 - A HARDEV or :LP. (The only way to PRINTLP a text file on a blocked tape device.)
 - The COMDEV or :CM. (The only way to PRINT a text file on a blocked tape device.)
 - Another non-standard device (blocked tape device or paper tape punch).
2. If the Destination is a non-standard device (blocked tape device or paper tape punch), the Source may be:
 - A disc catalog or filename, without the &BCD level. In this case only, the Filenamelist and the file specification options are valid. If more than one file is CONVERTed each file goes into a separate file on the Destination device. For the paper tape punch this puts a leader between the files; for the blocked tape device this means that the n of the :MTn is incremented by one for each file.
 - Another non-standard device (blocked tape device, a card reader or paper tape reader). In this case, only one file is CONVERTed.

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Text Commands
(Continued)

OPTIONS

CONVERT supports four special operations through specific uses of either the CONVERT option or the FORMAT option. These operations were individual O/S commands on versions of the O/S prior to CGOS 200.

- **MICARDS**

Users of MICARDS can get the same results by using CONVERT with the following special use of the FORMAT option:

FORMAT = (RECSIZ = 80, RECCNT = 1)

- **IPC**

Users of IPC can get the same results by using CONVERT with the following special use of the FORMAT option:

FORMAT = (RECSIZ = 80, RECCNT = 20)

- **EIAIN, EIAOUT**

Users of EIAIN and EIAOUT can get the same results with the following CONVERT formats:

- CONVERT = EI-C (EIAIN)
- CONVERT = EA-C (EIAIN, ASCII)
- CONVERT = C-EI (EIAOUT)
- CONVERT = C-EA (EIAOUT, ASCII)

COPYTEXT (CT)

Identical to the COPY command except that it only copies text files.

SYNTAX

COPYTEXT[/Options]
[Catalog[/Filenamelist][Options]]
[Catalog[/Options]]

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Text Commands (Continued)

LISTTEXT (LT)

Identical to the LIST command except that it only lists text files.

SYNTAX

```
LISTTEXT[/Options]  
[Catalog[/Filenamelist][Options]]  
[Catalog[/Options]]
```

PRINT (P)

Prints text files on a COMDEV or HARDEV. The systemprinting toggles (^P and ^U) direct output. As a text command, PRINT only processes text files.

SYNTAX

```
PRINT[/Options]  
[Catalog[/Filenamelist][Options]]
```

COMMENTS

Files printed go into a hardfile if one is active. HARDEV format information does not go into the hardfile.

Unless otherwise specified, PRINT prints each file without line numbers.

PRINT formats the files for the COMDEV as it prints them. If the files are going to a HARDEV, HARDEV formatting is used. Formatting options are specified in the Optionlist.

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Text Commands
(Continued)

PRINTLP (PL)

Prints text files on a HARDEV. Types out error error message and stops if no HARDEV is available. PRINTLP ignores the system printing toggles (^P and ^U). As a text command, PRINTLP only processes text files.

SYNTAX

PRINTLP[/Options]
[Catalog[/Filenamelist]][/Options]]

COMMENTS

Files printed will not be written to a hardfile.

Unless otherwise specified, PRINTLP prints each file with line numbers.

PRINTLP formats files as it prints them. The format specifiers are all available as options in the Optionlist.

OPTIONS

Enter options, separated by commas, in one of the three Optionlist fields. Some options apply to a particular command or a device; some have a general application with possible exceptions. Options disallowed for particular commands are flagged as errors or completely ignored. When an option is stated more than once in a command, the last use prevails.

File Specification
Options

The following options are used to identify particular files to be processed by a command.

BEFORE	SINCE
EXCEPT	SUBCAT
LEVEL	TYPE
NLEV	

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File Specification Options (Continued)

BEFORE

Belongs to the Source Optionlist.

Selects files last accessed prior to a given date.

SYNTAX

BEFORE = date

Date is in the form:

mm-dd-yy[:hh[:mm[:ss]]]

(month-day-year:hours:minutes: seconds)

Default is all dates.

EXCEPT

Belongs to the Source Optionlist.

Ordinarily files listed in the Filenamelist are the Source files that are to be processed. EXCEPT selects all files in the Source catalog EXCEPT those specified in the Filenamelist.

SYNTAX

EXCEPT

Filenamelist field must not be empty.

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*File Specification
Options (Continued)*

LEVEL

Belongs to the Source Optionlist.

Defines depth of file search and name-matching process.

SYNTAX

LEVEL = n

or

LEVEL = N

Default is LEVEL = N.

LEVEL = N

Searches the primary Catalog and any subcatalogs to their maximum depth.

- With an empty Filenamelist, the entire contents of the catalog satisfy the search.
- With names in the Filenamelist, all files in the primary Catalog whose names terminate with a Filenamelist name satisfy the search.

LEVEL = n

Searches the primary Catalog to the nth level ($n \geq 0$).

- With an empty Filenamelist and $n=0$, only the primary Catalog satisfies the search.
- With an empty Filenamelist and $n>0$, all files with up to n name levels beyond the primary Catalog name satisfy the search.
- With names in the Filenamelist and $n \geq 0$, only files in the primary Catalog that match names in the Filenamelist satisfy the search.
- With names in the Filenamelist and $n>0$ then all files up to n intermediate levels that terminate in a Filenamelist name satisfy the search.

COMMENT

When the SUBCAT option is used, the search is up to n levels beyond the subcatalog name(s) specified in the Filenamelist.

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File Specification Options (Continued)

NLEV

Belongs to the Source Optionlist.

Searches all levels of the primary Source catalog. If the Filenamelist has names, any files from the primary Source catalog are used if their terminating levels match a name in the list.

NLEV is equivalent to LEVEL = N.

SYNTAX

NLEV

SINCE

Belongs to the Source Optionlist.

Only use those files dated after date.

SYNTAX

SINCE = date

Date is in the form:

mm-dd-yy--[:hh[:mm[:ss]]]

(month-day-year:hours:minutes: seconds)

Default is all dates.

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*File Specification
Options (Continued)*

SUBCAT

Belongs to the Source Optionlist.

Each name in the Filenamelist becomes a catalog within the primary Source catalog. The names in the Filenamelist must exist in the lowest levels of the Source catalog, i.e., those names are appended directly onto the primary catalog name.

SYNTAX**SUBCAT**

Valid only when the Filenamelist field is not empty.

TYPE

Belongs to the Source Optionlist.

Specifies file types to be processed. All files have a system type attribute that defines the use of the file to certain utilities or programs.

SYNTAX

```
TYPE = n
TYPE # n
TYPE = name
TYPE # name
TYPE = (n1[-n2][,name1][,...])
TYPE # (n1[-n2][,name1][,...])
```

n, n1, n2 are hex numbers between 0 and 0FFx. (All hex numbers must start with a digit.)

name, name1 are names one to eight characters long starting with a letter and consisting of letters and digits.

= means equal.

means not equal or EXCEPT.

Default is all types — TYPE = (0-0FF)

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File Specification Options (Continued)

COMMENTS

There are several ways to indicate file types (see above). A type can be a single hex number; it can be a generic type name; it can be a range of hex numbers; or it can be some combination of all of these. Any time more than a single type is specified, the whole list must be enclosed within parentheses. Commas separate individual specifications within the parentheses.

Generic file types are a means of specifying the file type with a name instead of a hex number. Single types, ranges of types or a combination of both may be specified by a single generic name.

When given in the TYPE option, the string of single numbers or ranges (separated by commas) is substituted for the specified name. (Use of generic types in the command specification slows down command execution.) The list of type names and substitution strings is kept in a special text file which must be opened, read and then closed for each generic type name specified.

Defined Generic Types

ACCT	=	0B
BATCH	=	0B0-0BF
CATALOG	=	1
COMTAB	=	8
CNFG	=	4
C4PARTS	=	20-22
GENERAL	=	0
OBJECT	=	2
OVERLAY	=	7
PEPOBJ	=	6
SYMFILE	=	9
TEMP	=	OFF
TEXT	=	3,5
UNDEF	=	0
ZB0FIN	=	0F

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Conversion Options The following options are only used for the CONVERT and CONVERTB commands:

CONVERT	(CONVERT only)
FORMAT	(CONVERT & CONVERTB)
BLKSIZ	
RECCNT	
RECSIZ	
LASTBLK	(CONVERTB only)
LBSL	(CONVERT & CONVERTB)
LEADCHAR	(CONVERT only)
LEADER	(CONVERT & CONVERTB)

CONVERT

Belongs to the Command Optionlist.

Converts character set *i* (on the Source device) to character set *o* (on the Destination device).

SYNTAX

CONVERT = *i-o*

i can be: A, BD, BI, C, E, EA, or EI.

o can be: A, BD, BI, C, E, EA, or EI.

Default is CONVERT = C-C

COMMENTS

Applies to text conversion. It is valid only with the CONVERT command.

The following standard character sets are supported for conversion in both directions:

A — Standard 7-bit ASCII

BD — DEC 6-bit BCD

BI — IBM 6-bit BCD

C — CV's internal character set (8-bit ASCII, high-order bit is always on).

E — EBCDIC

EA — Special EIA even parity ASCII. (Only valid on a PPTDEV or RPTDEV).

EI — Special EIA character set. (Only valid on a PPTDEV or RPTDEV).

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Conversion Options (Continued)

FORMAT

Can be either a Source or Destination option. Describes the physical data structure on a blocked tape device. Sub-options (option1, option2) identify the actual data format of the tape.

SYNTAX

FORMAT = (option1 = n1, [option2 = n2])

option1 — may be BLKSIZ, RECCNT, RECSIZ

option2 — may be BLKSIZ, RECCNT, RECSIZ

option1 may not be the same as option2. n1 and n2 are decimal numbers.

COMMENTS

The tape format is determined according to the formula (BLKSIZ = RECCNT*RECSIZ). Only two of the sub-options are necessary. If only one is specified (or the FORMAT option is not specified at all), defaults are used for the format. These defaults are based on the maximum BLKSIZ and the maximum RECSIZ. If used with the CONVERTB option, only BLKSIZ is applicable.

OPTIONS

- **BLKSIZ**

The number of bytes in a data block on the blocked tape device. n/2 is the number of words in the data block. This must be an even number.

SYNTAX

BLKSIZ = n

$2 \leq n \leq 8192$

COMMENTS

BLKSIZ is a sub-option of the FORMAT option.

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Conversion Options
(Continued)

- **RECCNT**

Number of logical data records in a physical block on the blocked tape device.

SYNTAX

RECCNT = n
 $n \geq 1$

COMMENT

RECCNT, a sub-option of the FORMAT option, is not allowed in the CONVERTB command.

- **RECSIZ**

The number of bytes in a data record on the blocked tape device. The number of words will be $(n + 1)/2$ — not necessarily an even number. There may be more than one data record in a data block. However, if RECSIZ is odd, there must be an even number of records in the physical block.

SYNTAX

RECSIZ = n
 $1 \leq n \leq 255$

COMMENT

RECSIZ, a sub-option of the FORMAT option, is not allowed with the CONVERTB command.

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Conversion Options
(Continued)

LASTBLK

Belongs to the Destination Optionlist.

Specifies the number of bytes in the last physical block to actually write out to magnetic tape.

SYNTAX

LASTBLK = n

$0 < n < 8196$

n must be even.

n is the maximum size of the last block to be output.

If n is less than actual size of the last block, the words are written out to the tape.

The default is to write out the entire block.

COMMENTS

LASTBLK can only be used with CONVERTB.

LASTBLK enables you to write only valid data to the last physical block on the tape. Of course, it is still your responsibility to ensure the validity of all data sets to the tape. The case where a disc file's final sector contains only valid data is extremely rare.

LBLS

Specifies that the blocked tape being converted has ANSI standard tape labels. Can be either a Source or Destination option. Affects the Source device if used as a Source option, and the Destination device if used as a Destination option.

SYNTAX

LBLS

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Conversion Options **LEADCHAR**
(Continued)

Belongs to the Destination Optionlist.

Specifies a special character to use for leader on paper tape. The LEADER option specifies how many feet of this special leader character to punch before at the beginning and end of the tape. This leader is punched in addition to the standard 00 leader punched. Only valid for PPTDEV.

SYNTAX

LEADCHAR = ch
LEADCHAR = /ch

ch is any valid character.

Default is 0 (no character).

COMMENTS

The slash (/) is an escape to enable certain characters to be specified as leader (such as -space- and -/-). The desired character immediately follows the slash.

LEADER

Belongs to the Destination Optionlist.

Specifies the number of feet of leader and trailer to punch on a paper tape. It is only valid for the PPTDEV.

SYNTAX

LEADER = n

$0 \leq n \leq 273$

Default is 1.

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List Command Options

Individual LIST command options are valid for disc files, tape files, or both. LIST options belong in the Command Optionlist, although they control the output format of the listing.

LIST options:

DLOC	(disc only)
FULL	(disc & magnetic tape)
FULLNAME	(disc only)
LABELS	(magnetic tape only)
LIST	(disc & magnetic tape)
SYSTEM	(disc only)
TEMPFILS	(disc only)
USER	(disc & magnetic tape)

DLOC

Belongs to the Command Optionlist.

Lists the absolute disc location for specified files. This option is only valid for listing information about disc files. Also includes the contiguous flag, if not listed with the file size.

SYNTAX

DLOC

FULL

Belongs to the Command Optionlist.

Lists these five items for each file: creation date and time, file size in sectors (plus contiguous flag if disc), file type, file protection group, and file checksum. This option is equivalent to LIST = DSTPC.

SYNTAX

FULL

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*List Command
Options (Continued)*

FULLNAME

Belongs to the Command Optionlist.

When listing files on the disc, will list the full pathname (including the working directory name) for each file listed.

SYNTAX

FULLNAME

LABELS

Belongs to the Command Optionlist.

Prints information only about the tape file or files requested (the label or header information). Does not list information for FM files. The information listed is described with the LIST command.

SYNTAX

LABELS

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*List Command
Options (Continued)*

LIST

Belongs to the Command Optionlist.

Lists the information specified by x for each file. x can be any combination of the following letters.

D = creation date and time.

S = file size in sectors (plus contiguous flag if disc).

T = file type.

P = protection group.

C = file checksum.

SYNTAX

LIST = x

x can be one or more of: D, S, T, P, C.

EXAMPLES LIST = S, LIST = PT, LIST = DSTPC, etc.

SYSTEM

Belongs to the Command Optionlist.

Requests that the following information be listed for each file: system flags (15th word of the catalog entry), absolute disc location of the file (same as DLOC option), and size in sectors of the first contiguous chunk allocated. Valid for disc files only.

SYNTAX

SYSTEM

TEMPFILS

Belongs to the Command Optionlist.

Requests that all temporary files in the catalog also be included in the listing. Valid for disc files only.

SYNTAX

TEMPFILS

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*List Command
Options (Continued)*

USER

Belongs to the Command Optionlist.

Lists user information for the file; including last access date and two user attribute words.

SYNTAX**USER**

*Magnetic Tape
Options*

These options control magnetic tape data formats, data integrity checks and tape positioning.

Tape options:

ALL
CHECK/NOCHECK
COLD
LABEL
OVERLAST
RSTFIL/SAVFIL
TAPEFILE
USERLBLS

ALL

Belongs to the Source Optionlist.

Lists information about tape files on a reel or in tape file sets, depending on particular tape format used. The information printed also depends upon the format in question.

SYNTAX**ALL**

FUTIL

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Magnetic Tape Options (Continued)

CHECK

Specifies whether a check pass is to be done while copying files to magnetic tape.

SYNTAX

CHECK

COMMENTS

The option is currently implemented for disc-to-tape copy and is ignored when the copy is tape-to-tape. CHECK is valid only for the command in which it is specified (except for the ADD/ADDTEXT commands). Further, it applies only to SAVFIL/RSTFIL and FUTIL format tapes. Due to the check pass mode of operation, it is usually faster to create the tape first and then use the CHECK command for the check pass on the new tape file.

The check pass is not the default, but must be explicitly requested.

COLD

Can be either a Source or Destination option.

Indicates the presence of a foreign file on a tape reel.

SYNTAX

COLD

COMMENTS

COLD should only be used if there is system coldstart file as the first file on the reel. When the COLD option is specified, the VOL1 label follows the coldstart file and all files and file number specifications refer to those files following the coldstart file on the reel in question. Applies only to SAVFIL/RSTFIL and FUTIL format tapes.

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*Magnetic Tape
Options (Continued)*

LABEL

Belongs to the Destination Optionlist.

Specifies whether or not a VOL1 label is to be written on the first reel of tape in a copy to tape function.

SYNTAX

LABEL

LABEL = /xxxxxx/

/ is any delimiter character.
x is a legal tape label character.
0 to 6 different characters may be used.

COMMENTS

If LABEL is not invoked as an option then a VOL1 label must already exist on the reel. Of course, this option only has meaning if the tape format being created supports ANSIII tape labels. (FUTIL format or Blocked Tape Format with the LBL5 option.)

The first specification causes FUTIL to prompt for the VOLSER number. The VOLSER must be entered at the COMDEV even if an execute file is running.

The second specification indicates actual VOLSER number to be placed in the VOL1 label. There is no COMDEV prompt or input. The characters comprising the VOLSER must be between two identical delimiters (the /'s). The first non-blank character following the = is the delimiter. The VOLSER number can be from 0 to 6 characters long. If less than 6 characters are entered, VOLSER is left-justified and blank-filled.

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Magnetic Tape (Continued)

NOCHECK

Belongs to the Destination Optionlist.

Cancels the CHECK option. NOCHECK is used primarily with the ADD/ADDTEXT command to cancel a CHECK from the initiating COPY or a previous ADD command. When NOCHECK is requested, no check pass is done on saved files.

SYNTAX

NOCHECK

OVERLAST

Belongs to the Destination Optionlist.

OVERLAST overwrites the specified tape file number. Normally, the new tape file follows the tape file specified in the command. This option is meaningless unless the copy is to magnetic tape and TAPEFILE = LAST, TAPEFILE = 1 or :MT-1 has been used to specify the tape file to write to.

SYNTAX

OVERLAST

RSTFIL

Can be either a Source or Destination option.

OVERLAST is only for creating or reading of tapes compatible with CADD3 3 Rev 10 (and earlier) systems. Indicates that the tape file is to be written/read in the SAVFIL/RSTFIL format, instead of the normal FUTIL backup tape format. This option may be used to force the SAVFIL/RSTFIL format under all conditions in which the FUTIL format might be used. The ADD command may also be used with the SAVFIL option, but the option must be specified with the initiating COPY command and can not be specified with any of the subsequent ADD's.

SYNTAX

RSTFIL

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*Magnetic Tape
Options (Continued)*

SAVFIL

Can be either a Source or Destination option.

RSTFIL is only for the creation or reading of tapes compatible with CADD3 3 Rev 10 (and earlier) systems. Indicates that the tape file is to be written/read in the SAVFIL/RSTFIL format instead of the normal FUTIL backup tape format. This option may be used to force the SAVFIL/RSTFIL format under all conditions in which the FUTIL format might be used. The ADD command may also be used with the SAVFIL option, but the option must be specified with the initiating COPY command and can not be specified with any of the subsequent ADD's.

SYNTAX

SAVFIL

TAPEFILE

Can be either a Source or Destination option.

Positions the tape to the tape file specified. It has the same effect as the file number in the tape device specification (n of :MTn).

SYNTAX

TAPEFILE = option

option can be FIRST, LAST or n
 $-1 \leq n \leq 65,574$

Default is FIRST.

FIRST

Positions to the first tape file on the tape reel.

LAST

Positions to the last tape file on the tape reel.

n

Positions to the specific numbered tape file in the file set.

n = -1 is the same as LAST;

n = 0 is the same as FIRST.

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Magnetic Tape Options (Continued)

COMMENTS

TAPEFILE overrides any position information, see the section on devices.

Tape file definition depends on tape format.

USERLBLS

Belongs to the Destination Optionlist.

Allows you to specify information about a magnetic tape file in the ANSI labels preceding the data in that particular file. This information is written on the tape as arbitrary text strings in the standard labels USR3-USR9. (USR1 and USR2 labels are reserved for future use and contain blanks.)

SYNTAX

USERLBLS

COMMENTS

After writing the HDR1 label for the tape file, FUTIL creates the two blank labels USR1 and USR2. FUTIL then prompts with a greater-than sign (>) for the text to go into the rest of the USR labels. A single line of text, terminated with a), goes into a single label. Up to 76 characters are allowed for any one line 7 lines (7 labels) may be entered. A single empty line), immediately following the prompt, terminates entry of the label text. If all 7 lines are entered, FUTIL won't prompt for the 8th line but just start the normal processing for the command. If the tape file in question extends across several reels, new USR labels are constructed for each section of the file as described above.

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*Magnetic Tape
Options (Continued)*

The text for the labels must be entered from the COMDEV, even when an execute file is running.

This option applies to all tape formats that support ANSI tape labels.

Printing Options

Printing options control text output on the HARDEV and COMDEV. Certain options are relevant only to HARDEV formatting; others apply to all printed output. Exclusive HARDEV options are ignored if specified for COMDEV output. If the text is printed on both the COMDEV and HARDEV, HARDEV characteristics take precedence.

Printing options are:

COPIES
DIGITS
FILEHEAD
LENGTH
LINES
MARGIN
PAGENUMS
WIDTH

COPIES

Belongs in Command Optionlist if the printing Destination device is omitted. Belongs in the Destination Optionlist if the Destination device is either COMDEV or HARDEV.

Specifies the number of copies of each file to print. All the files specified are printed consecutively before the next set of duplicates is printed.

SYNTAX

COPIES = n

n is any permissible integer greater than 0.

Default is 1.

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Printing Options (Continued)

DIGITS

Belongs in Command Optionlist if the printing Destination device is omitted. Belongs in the Destination Optionlist if the Destination device is either COMDEV or HARDEV.

Specifies number of characters to use for printing line numbers of the text files being printed.

SYNTAX

DIGITS = n

$0 \leq n \leq 11$

Default is DIGITS = 0 for PRINT (:CM).

Default is DIGITS = 6 for PRINTLP (:LP).

DIGITS = 0 is always true for LIST (the option is ignored if specified for list).

COMMENTS

This count includes the / separating each line number from the line proper.

When the number of characters in the line exceeds n, the n rightmost characters in the line (including / are printed.

Line numbers are always right justified and blank filled.

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Printing Options
(Continued)

FILEHEAD

Belongs in Command Optionlist if the printing Destination device is omitted. Belongs in the Destination Optionlist if the Destination device is either COMDEV or HARDEV.

Specifies the page headline for each file printed. The value of the option defines the headlines as follows:

ALL

The filename and file date are printed at the top of each physical page of each file. (Applies only to the physical HARDEV.)

ONE

The filename and date are printed only at the top of the first page of each file.

NO

No headline is printed for any file.

SYNTAX

FILEHEAD = option

option is any one of: ALL or ONE or NO.

Default is FILEHEAD = ONE

COMMENTS

When specified for the LIST command, this option is ignored.

LIST

command default is FILEHEAD = ALL.

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Printing Options (Continued)

LENGTH

Belongs in Command Optionlist if the printing Destination device is omitted. Belongs in the Destination Optionlist if the Destination device is either COMDEV or HARDEV.

Defines the number of physical lines on a page. A page eject is sent to the line printer after n lines have been printed. If n = 0, no automatic page ejects are done.

SYNTAX

LENGTH = n

n = 0

or

$12 \leq n \leq \text{maximum HARDEV page length.}$

Default is maximum HARDEV page length.

COMMENTS

Applies to printing on the physical HARDEV and has COMDEV or HARDFILE output. The maximum page length and the default page length are dynamically determined when the print request is initiated. If the value for LENGTH exceeds the page length of the HARDEV, the length is set to the default.

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Printing Options
(Continued)

LINES

Belongs in Command Optionlist if the printing Destination device is omitted. Belongs in the Destination Optionlist if the Destination device is either COMDEV or HARDEV.

Specifies the range of lines to print for all the files being printed. n1 is the first line printed and n2 is the last line printed. The default is to print the entire file. n2 is optional.

SYNTAX

LINES = n1[-n2]

$1 \leq n1 \leq 4,294,967,295$

$1 \leq n2 \leq 4,294,967,295$

$n1 \leq n2$

Default for n1 is 1.

Default for n2 is file end.

MARGIN

Belongs in Command Optionlist if the printing Destination device is omitted. Belongs in the Destination Optionlist if the Destination device is either COMDEV or HARDEV.

Specifies a top and bottom margin for a printed page; both of n lines. These margins are in addition to any that the HARDEV itself may define.

SYNTAX

MARGIN = n

$0 \leq n \leq 10$

Default is MARGIN = 0.

COMMENTS

Applies only to printing on the HARDEV and is ignored for COMDEV and HARDFILE output. Default is the full page length of the HARDEV.

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Printing Options (Continued)

PAGENUMS

Belongs in Command Optionlist if the printing Destination device is omitted. Belongs in the Destination Optionlist if the Destination device is either COMDEV or HARDEV.

Sequentially numbers the pages of each file printed. Applies only to HARDEV output and does not affect output to the COMDEV or a HARDFILE.

SYNTAX

PAGENUMS

WIDTH

Specifies the number of characters to print on a physical line.

SYNTAX

WIDTH = n

$12 \leq n \leq \text{maximum carriage width of the HARDEV} \leq 255$

Default is the maximum carriage width of the HARDEV

or

maximum carriage width of the COMDEV if there is no task HARDEV.

COMMENTS

The maximum and default are dynamically determined from the HARDEV at print initiation time, or from the COMDEV if there is no HARDEV. Whenever a HARDEV becomes available for printing (as when P is typed during a PRINT command), width changes to HARDEV default (unless WIDTH < maximum is specified). Even if output is directed to both HARDEV and COMDEV, default and maximum widths are determined by HARDEV information.

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Printing Options
(Continued)

Entering a WIDTH > maximum invokes the default value. If a printed line is longer than the allowed width, the line is continued on as many physical lines as possible. Each continuation is flagged.

Default for the LIST & LISTTEXT commands is 80.

Miscellaneous Options

The following options perform miscellaneous functions.

ARCHIVE/NOARCHIVE
ASK
CHECKSUM
DISKPOS
DRWUPDAT
LIST
NEWCHAR
NEWDATE/OLDDATE
PROTECT/NOPROTECT
REPLACE
SHIFT/NOSHIFT
SRCHLIM

ARCHIVE

Belongs to the Command Optionlist.

Interfaces with ARCHSRCH, the file indexing utility program. Under the ARCHIVE option, FUTIL retains the following information about destination files for ARCHSRCH future reference:

- FILENAME Without site, volume or tape file number.
- STORAGE disc: Site and volume number.
LOCATION tape: VOLSER and tape file number.
- FILE TYPE
- DATE and TIME of archiving.

SYNTAX

ARCHIVE

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Miscellaneous Options (Continued)

COMMENTS

ARCHIVE is valid only when the Destination device is disc or FUTIL format tape and only for these commands:

ADD, ADDTEXT, COPY, COPYTEXT, MOVE

ARCHIVE, if used with any valid command except MOVE, will remain in effect for subsequent ADD and ADDTEXT commands unless NOARCHIV is specified.

When ARCHIVE is in effect, FUTIL undergoes a special termination procedure at the end of each session. It prompts you for a valid ARCHSRCH archive file name. Information about each file processed is passed to ARCHSRCH for storage. Entering ↵ instead of a filename aborts the process and prevents storage of archive information.

ASK

Belongs to the Source Optionlist.

Prompts for OK response before processing each file. If any other response is entered, FUTIL skips to the next file without processing the current file.

SYNTAX

ASK

COMMENTS

The OK response must come from the COMDEV even if an execute file is running. Applies to all commands except LIST and LISTTEXT.

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*Miscellaneous
Options (Continued)*

CHECKSUM

Belongs to the Destination Optionlist.

Indicates whether CHKSUMs will be validated when files are copied. The CHKSUM is an internal check for data validity in a file. When the CHKSUM for the original version does not match the CHKSUM for the copy, this implies that file data is no longer good.

SYNTAX

CHECKSUM = option

Option is one of YES, NO, ASK.

Default is CHECKSUM = ASK.

NO

Doesn't validate CHKSUM; without data checks.

YES

Validates CHKSUM for each file copied. If a CHKSUM is bad, flags the file with an error and does not copy that file.

ASK

Validates CHKSUM for each file copied. If the file has a bad CHKSUM, asks for permission (OK) to copy the file.

DISKPOS

Belongs to the Destination Optionlist.

Specifies the section of the disc where the file manager is to start allocating new files.

SYNTAX

DISKPOS = n

$1 \leq n \leq 32$

COMMENTS

Ensures that certain files are located as close as possible to the low addresses on the disc to speed up file access. If this option is not specified, file space is allocated starting at the end of the previous allocation. Valid only for a copy to disc.

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Miscellaneous Options (Continued)

DRWUPDAT

Belongs to the Command Optionlist.

Specifies the drawing update process for the COPY command. Can only be used with the COPY command. See COPY command for more information.

SYNTAX

DRWUPDAT = option

option is either FIRST or ASK.

FIRST

Searches the Source for a part that matches the specification. The first part found is updated and the copy then terminated.

ASK

Searches the Source for all parts matching the specification. Each time a part is found, you are asked if it is OK to update it. The OK response updates the part and then looks for the next one. Any other response just looks for the next part.

LIST

Belongs to the Command Optionlist.

Lists the name of each file processed after it has been successfully processed.

SYNTAX

LIST = option

option is one of LONG, SHORT, NO.

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*Miscellaneous
Options (Continued)*

Default is LONG.

LONG

Lists the name of the file being copied from; the type of the copy (COPIED for disc-to-disc, SAVED for disc-to-tape, RESTORED for tape-to-disc, DELETED for files deleted, CONVERTED for the CONVERT/CONVERB commands); and the resulting (written to) file. This is a three-line message.

NO

Does not list any of the processed files.

SHORT

Only lists the name of the original file.

COMMENTS

If an error occurs while a file is being copied, it is not listed. This listing is only used when files are physically copied, moved or deleted. May also be used when files are printed on the HARDEV only.

The listing produced by this option is responsive to the P and U toggles.

NEWCHAR

Belongs to the Destination Optionlist.

Restores files whose names may contain illegal characters. NEWCHAR's primary use is in easing the movement of files from O/S earlier revisions.

SYNTAX

NEWCHAR

or

NEWCHAR = c

c is any legal filename character.

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Miscellaneous Options (Continued)

Default is NEWCHAR.

NEWCHAR = c automatically turns on the LIST = LONG option.

NEWCHAR

Automatically replaces all illegal characters in the filename with the specified character. FUTIL attempts to restore this file with the newname. Errors are handled normally.

NEWCHAR = c

FUTIL prompts for a valid replacement filename. Should the proposed name be invalid, FUTIL continues to ask for a replacement until a good one is entered. The file is then restored under the new name.

If \downarrow is entered in response to a prompt, FUTIL indicates that the file in question is in error. The file is not restored, and FUTIL goes on to the next file.

NEWDATE

Belongs to the Destination Optionlist.

Specifies that the new file is to have the current date and time as the creation date. (This is the system date.)

SYNTAX

NEWDATE

COMMENTS

The OLDDATE option retains the original date and time of the original file. (OLDDATE is the default.)

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*Miscellaneous
Options (Continued)*

NOARCHIV

Belongs to the Command Optionlist.

Deactivates file archiving (see ARCHIVE option). May be used anywhere that ARCHIVE is allowed.

SYNTAX

NOARCHIV

COMMENTS

If specified with COPY, COPYTEXT, ADD or ADDTEXT; NOARCHIV remains in effect for subsequent ADD or ADDTEXT commands until a new ARCHIVE option is specified.

Once ARCHIVE has been specified, NOARCHIV does not turn off the special exit processing needed for archiving.

NOPROTECT

Belongs to the Destination Optionlist.

If the destination is the disc, indicates that files are to be assigned the task default protection group.

If the destination is magnetic tape, indicates that the protection is not saved at all with the files.

SYNTAX

NOPROTECT

COMMENTS

Automatic for copying from SAVFIL/RSTFIL format tapes, because protection can not be retained for that format; and for any other formats or devices that do not support protection.

Default only for disc-to-disc copies.

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Miscellaneous Options (Continued)

NOSHIFT

Belongs to the Destination Optionlist.

Indicates that all lowercase text is to remain as lowercase in the course of the copy or print.

SYNTAX

NOSHIFT

COMMENTS

Confirms the normal state of affairs. The SHIFT option is used to indicate that there is to be conversion from lowercase to uppercase.

OLDDATE

Belongs to the Destination Optionlist.

OLDDATE specifies that the new file is to have the same creation date and time as the original file.

SYNTAX

OLDDATE

COMMENTS

NEWDATE gives the new file the current system date as its creation date.

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*Miscellaneous
Options (Continued)*

PROTECT

Belongs to the Destination Optionlist.

Indicates that the destination files have the same protection group as original files.

SYNTAX

PROTECT

COMMENTS

Default setting except for:

- SAVFIL/RSTFIL format tapes, and all other devices that don't support protection. (Can't be protected at all).
- Disc-to-disc copies. (Default is NOPROTECT.)

FUTIL tapes created with the PROTECT option have the same protection checks as disc files.

REPLACE

Belongs to the Destination Optionlist.

Establishes conditions for overwriting existing file with new version. REPLACE is valid for commands whose Destination is disc (file manager).

SYNTAX

REPLACE = option

Option is any one of: YES, NO, ASK, NEWER, ASKNEWER.

Default is ASK.

YES

Always replace old file with new version of file.

NO

Never replace old file with new version of file.

ASK

Ask user if *OK* to replace old version of file with new version.

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Miscellaneous Options (Continued)

NEWER

Replace only if new file exists and has a creation date subsequent to that of an old version of the file.

ASKNEWER

Combines NEWER and ASK.

If new file has a later date, ask if it is *OK* to replace the old version.

SRCHLIM

Belongs to the Source Optionlist.

Sets limits for the file search method. Under certain conditions, there may be several files with the same filename. SRCHLIM specifies how these duplicate filenames are to be handled.

SYNTAX

SRCHLIM = option

option is FIRST or ALL.

Default is FIRST.

FIRST

Only searches for the FIRST occurrence of the specified filenames. Terminates the current command as soon as all of the specified files are found; or when the search medium is exhausted, even if all the specified files have not been located.

ALL

Continues to search for specified files until the search medium has been exhausted; for magnetic tape, until EOF; for disc, until the primary catalog is completely traversed.

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*Miscellaneous
Options (Continued)*

SHIFT

Belongs to the Destination Optionlist.

Indicates that all lowercase text is to be converted to uppercase in the course of the copy or print.

SYNTAX

SHIFT

COMMENTS

In most cases, the line-printer handler does the case conversion automatically (for printing only).

NOSHIFT turns off this option.

FUTIL/SYSTEM
INTERACTIONS

*Response to
System Toggles*

FUTIL does not respond normally to system print toggles (^P and ^U). The response to these toggles is determined by the following situations.

- Syntax and execution error messages print on the task COMDEV unless the SELECT NOECHO command has been used. These messages also go into a HARDFILE if one is active. The ^U toggle is completely ignored. The ^P toggle directs the messages to the HARDEV if it is toggled on.
- File listing messages do respond to the toggles. The LIST option defines their content.

They are of the type:

X
COPIED TO
Y

or

X DELETED

- Text printed with the PRINT, LIST and LISTTEXT commands responds normally to both toggles; unless directed to the Destination device :LP.
- Text printed with the PRINTLP and LISTLP commands does not acknowledge any of the toggles.

FUTIL

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Working Directories If enabled, working directories remain in effect for FUTIL commands. They can be temporarily disabled, however. To disable a working directory for a file or command specification, prefix an equal sign (=) to the catalog name.

- To disable a working directory for the Source catalog, prefix the equal sign to the Source catalog name. Likewise for the Destination catalog.
- The equal sign is not allowed in the Filenamelist.
- If either the Source or Destination is the implied SYSCATLG, use an equal sign without a catalog name.
- During execution, the equal sign NEVER prints out as part of the file name; this includes listing (LIST option), the LIST command, and error messages.

Examples using the equal sign (=) with a working directory:

COPY =PCC :MT	Copies disc catalog PCC to PCC on tape.
COPY PCC=:MT	Copies the subcatalog PCC from the working directory catalog to PCC on tape.
LIST =//LEVEL=1	Lists the first level of SYSCATLG.
LIST =//LEVEL=1	Lists the first level of the first working directory catalog.
COPY : =	Copies the working directory catalog to SYSCATLG.

Interrupt Handling FUTIL accepts standard system interrupts (<ESC>-Q, <ESC>-N, <ESC>-K). In addition, the one-line or page print (<ESC> -1, 1....) works when output is directed to the HARDEV or COMDEV. These interrupts are detected at all points during command execution except command entry and tape file initialization searches (looking for the new file specified as :MTn).

Once the interrupt is detected, activity related to the command stops; open files are closed; and the current open destination file is deleted. Cleanup is performed before the the next input prompt. For example, if you request a check pass, it is performed on the files just saved on magnetic tape.

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Interrupt Handling (Continued) Whether FUTIL returns to the O/S prompt (n>) or its own internal prompt (#) depends upon the current execution mode (internal command or O/S command). Both the ESC-K interrupt and the ^C ^C task abort cause an immediate return to O/S command level without any cleanup.

Error Handling If an error occurs during command execution, only files actually being processed are affected. Although the error is detected and an error message printed, FUTIL goes on to process the next file in the series. If several errors occur in short order without a successful copy in between, FUTIL aborts the current command as though in response to <ESC>-Q.

NOTES Error messages are printed on the task COMDEV unless the SELECT NOECHO command has been used.

Errors that demand an operator response always wait for a response from the COMDEV. The response cannot come from an execute file.

Execute File Handling FUTIL accepts input from standard execute files. However, under certain conditions, FUTIL demands input from the task COMDEV even if an execute file is currently running:

- Any message requesting a TYPE OK, for whatever reason, waits for that OK to be typed in from the COMDEV. This includes the cases where FUTIL asks whether or not an existing file can be replaced, or asks if a file with a bad checksum should still be copied.
- Syntax errors expect all command line corrections from the COMDEV.
- When you create multi-reel tapes, you are expected to indicate at the COMDEV that the subsequent reels are mounted and ready to continue.

Illegal Characters in Filename CGOS 200 GNA allows any of the following characters in a filename: 0-9, A-Z, , #, \$, %, + . -, and &. Previous versions of the O/S supported additional filename characters. This change complicates restoration of files created on earlier systems. When FUTIL encounters illegal characters in a filename, it asks you to enter a complete new name.

Alternatively, the NEWCHAR option can specify replacements for illegal characters.

FUTIL

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Illegal Characters in Filenames (Continued)

Because FUTIL does not permit specification of illegal characters in a filename, you must specify the filenames without the illegal characters. There are several ways in which this can be done:

- Use the NLEV or SUBCAT options (with the ASK option if not all the files are wanted).
- Use wildcards in place of the illegal characters in the filename(s).
- Do a LIST of the tape to get the tape record numbers of the desired files and then restore the files by record number instead of name.

MAGNETIC TAPE FORMATS

FUTIL supports ANSI standard tape labels and two different formats for system disc file backup tapes. SAVFIL/RSTFIL format tapes are compatible with the CGOS 100 and earlier operating systems, and the FUTIL format tapes are for foreign tape formats for data transportation to and from other CGOS 200 GNA systems.

In addition, FUTIL supports a fixed-record, fixed-block tape format (called Blocked Tape Format) to access tape made on other systems.

Data Formats

Blocked Tape Formats

Blocked tapes are magnetic tapes with a special format. They move information back and forth between CV and non-CV systems.

A blocked tape reel contains a series of data files. Each file is terminated by one tape mark. Each file consists of a series of fixed size data blocks. Each data block contains a number of fixed size records.

The size of the data blocks is described in bytes; 8-bit bytes for 9-track tape and 6-bit bytes for 7-track tape. Data blocks must contain even number of bytes because of hardware constraints on CV tape drives. The minimum number of bytes in a block is 2 and the maximum is 8192.

When blocked tapes are created by FUTIL, each word is broken up into two bytes so that only 4096 words can be written in a block. When blocked tapes are read by FUTIL, bytes are packed two to a word. Each byte from the tape is right-justified zero-filled into its appropriate byte in a word. 7-track tapes use the least significant 6 bits in a byte. 7-track tapes are assumed unpacked.

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Data Formats (Continued)

Data blocks may be further broken up into records. It is assumed that the number of bytes in a record evenly divides the number of bytes in a block. The difference between blocks and records is that a block is a physical entity on the tape but a record has only a logical existence. Data records on the tape are left-justified zero-filled for binary tapes and left-justified blank-filled for text.

There are two varieties of blocked tapes, labeled and unlabeled. The labeled tapes have ANSI standard tape labels in addition to to the data and unlabeled tapes contain only the blocked data.

FUTIL Format Tapes

FUTIL has a standard backup tape file format. File manager files on disc are copied to tape in a special backup format. All commands that deal with magnetic tape expect this format, unless otherwise specified. Any number of tape files may be stacked on reels of tape. Backup file format is:

- An HDR label group
- A sequence of file manager file images. Each file image consists of:
 - An IDREC data block(similar to the FUTIL IDREC block)
 - The file data in 10 (hex) sector blocks (1000 hex words)
- An EOF label group

If the backup file is split between reels, the split occurs between two file manager file images. No file manager file image is ever split between reels.

Like disc files under file manager control, tape files are access protected.

SAVFIL/RSTFIL Format Tapes

FUTIL also supports the older SAVFIL/RSTFIL format backup tapes for CGOS 100 O/S compatibility. SAVFIL files live on so-called *stacked tapes*. A stacked tape is a series of files, each one consisting of:

- A special header block unique to the type of file format. (Types other than SAVFIL are unknown.)
- A series of file manager file images. Each file image consists of:
 - An IDREC block (similar to the FUTIL IDREC block)
 - The file data in 10 (hex) sector (1000 hex words) blocks
- Two terminating tape marks. The last file on the stacked tape is terminated by three tape marks.

FUTIL

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Tape Labels

A tape label is an 80 character record. The first three characters are the label type (name) and the fourth character is the label number. Label types are VOL, HDR, EOVS, and USR. Numbers range from 1-9.

Tape labels provide standardized information about the contents of a reel or reels of tape. They also help to control access to a reel of tape.

LABEL GROUPS

Labels come in label groups.

- The HDR label group precedes a file or file section. It consists of (in order):

VOL1-VOL9 (only if it is the first label group on the tape reel)

HDR1-HDR9

USR1-USR9

It is terminated by one tape mark.

Only the VOL1 and HDR1 labels are necessary.

- The EOF label group terminates a file or file section. It consists of (in order):

EOF1-EOF9

USR1-USR9

It is preceded by one tape mark and, if a HDR label group follows, terminated by one tape mark. The last label group in the file set is terminated by at least three tape marks.

- The EOVS label group replaces the EOF label group if the last file on the reel continues onto another other reel or if the file set continues onto another reel. It consists of (in order):

EOVS1-EOVS9 (replaces the EOF1-EOF9 labels) USR1-USR9

It is preceded by one tape mark and terminated by at least two tape marks.

FILES

A file is preceded by an HDR label group and terminated by an EOF label group.

Tape Labels
(Continued)

FILE SECTIONS

A file section is caused by the split of a file across two or more reels of tape. Every file section is preceded by an HDR label group. All file sections of a file are terminated by an EOVS label group except the final section, which is terminated by an EOF label group.

FILE SETS

A file set consists of several files numbered in sequence and may be continued across several reels of tape. Whenever a file is continued onto a new reel of tape, the last file on the old reel of tape is also continued (i.e., terminated with an EOVS label group). In that case, the first file section on the new reel may be empty (an HDR label group followed by a tape mark followed by an EOF label group).

REQUIRED LABELS

If a tape format includes ANSI labels, the following tape labels are supported and required.

VOL1

The first record on a reel (volume) of tape. It identifies the reel and who can access it.

HDR1

The first record of a tape file or tape file continuation. Identifies the file, position of the file in its file set, whether or not this section of the file is continued from another reel, the system the file was created under, and whether there is general access.

EOF1

The last record of a tape file. Contains the same information as the HDR1 label for that file plus the physical data block count of that portion of the between it and the immediately preceding HDR label group.

EOVS

Same as the EOF1 label except it indicates that the file is continued on another reel.

In addition, the USR1-USR9 labels are supported. The USR1 and USR2 label are reserved for future use and the USR3-USR9 labels consist of user defined text.

GENCOM

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GENCOM

PURPOSE Generates an execute file. The execute file is generally constructed by processing one or more catalogs. You control the format for processing these catalogs.

SYNTAX GENCOM filename

COMMENTS GENCOM creates a text file named *filename*. The structure and content of this file is based on: the file specification, the header lines, trailer lines, and command skeletons.

INPUT/OUTPUT n> GENCOM Filename At O/S level, enter command and name of execute file.

ENTER HEADER LINES Terminate header lines with empty line.

ENTER COMMAND SKELETONS Input accepted until empty line entered.

ENTER FILE SPECIFICATION GENCOM responds with this prompt after all command skeletons have been entered.

ENTER TRAILER LINES Output when all file specifications are entered. After an empty line, GENCOM prompts for a one-character response indicating one of several actions:

F = FILE, E = FILE & EDIT,
X = FILE & EXECUTE, Q = QUIT,
S = FILE & SUBMIT, <CR> = LOOP

If a ↵ is entered instead of a character, GENCOM repeats the entire round of prompts, appending the newly-generated results to the existing contents of the execute file.

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Building the Execute File

GENCOM prints a series of prompts to guide you through the process of creating the execute file. These prompts call for specific kinds of input:

ENTER HEADER LINES

Header lines are copied literally to the execute file. They are inserted at the beginning of the file, or before each series of commands on multiple loops through GENCOM.

ENTER COMMAND SKELTONS

Command skeletons control the format of the command lines. They consist of TEXTSTRINGs and NAMESPECs.

- **TEXTSTRING**

A textstring is string of characters to be included literally in each command line generated for the execute file. TEXTSTRINGs are terminated by NAMESPECs or end of line.

Example: COMPILE \$1, -1, -2\$/LIST ^U ^P
 (TEXTSTRINGs = "COMPILE" and "/LIST ^U ^P").

- **NAMESPEC**

Place the NAMESPEC where the filename is to appear in each line of the execute file. The NAMESPEC acts as a *mask* that ensures a uniform format for filenames that appear in the execute file. By processing the NAMESPEC, GENCOM selectively includes/excludes particular catalog levels of each filename.

NAMESPEC Syntax: \$Start,End,Skip\$

Start, End, and Skip are positive or negative integers that identify levels of a catalog or filename (any or all of the three may be omitted):

Start = Starting level (Default = 1)
End = Ending level (Default = -1)
Skip = Skip level (Default = 0)

GENCOM

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Building the Execute File (Continued)

For the NAMESPEC, filenames are numbered as follows:

Catalog Levels	name1.name2.name3 nameN				
Positive Numbering	1	2	3	. . . . .	N
Negative Numbering	-N	-N+1	-N+2	. . . . .	-1

Positive (negative) integers identify levels from left to right (right to left).

SAMPLE NAMESPECs

\$1,-1,-2\$ Includes all levels between top catalog (level 1) and filename (level -1), except for next to last level (level -2), which is typically the &BCD level of a text filename.

\$ 2 , - 1 \$ Includes all levels between level 2 and the filename. No intermediate levels are skipped.

ENTER FILE SPECIFICATION

It accepts ONE file specification of the following form, processes it, then waits for another.

Catalog Name/Name List/Options

Catalog Name	Catalog from which filenames will be extracted to generate execute file commands.	
Name List	Files in catalog <i>Catalog Name</i> to process. If omitted, all files in <i>Catalog Name</i> will be processed.	
Options	/NLEV	Process all sub-catalogs of <i>Catalog Name</i> .
	TYPE = n	Only process type n files.
	SINCE	date Only process files since date.
	BEFORE	date Only process files before date.

As each file specification is entered, resulting filenames are applied to the command skeleton, producing finished command lines.

GENFICHE

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GENFICHE

PURPOSE	Converts text files to RDOS-readable format on tape in order to produce microfiche listings of these files.
SYNTAX	GENFICHE
INPUT/OUTPUT	GENFICHE prompts you for input of the following form:
	# CATALOG Specifies that all text files in this catalog are to be converted to RDOS-readable format.
	# CATALOG/FILE1,FILE2,FILE3,,FILEN Specifies that only those text files in file list of this catalog are to be converted to RDOS-readable format if they exist.
	#FILE.E Specifies that this text file is to be converted to RDOS readable format if it exists.
	#↓ When entered, GENFICHE ends file process and returns you to system level.

GENINDEX

PURPOSE	Scans a source file to generate an index of entry points, globals, or subroutines.
SYNTAX	GENINDEX ENTPNTS,GLOBALS,SUBRS[/OPTIONS] ENTPNTS Entry points associated with each file. GLOBALS Global variables and file references. SUBRS Subroutines referenced by each file.
NOTE	See <i>CGOS 200 GNA Programmer Reference Manual</i> for additional information

GETPUNCH

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GETPUNCH

PURPOSE Outputs information about parity in data to a specified punch paper tape device.

SYNTAX GETPUNCH XX

Where XX = two-character taskunitname for device that's been attached and declared PPTDEV.

MESSAGES UNIT IS SET TO PUNCH Output upon successful command completion.
Parity information follows.

Any other message indicates an error.

NOTE See SETPUNCH for list of available data parities.

HARDFILE

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HARDFILE

PURPOSE Routes (spools) all output that can be sent to the COMDEV or HARDEV to a text file.

SYNTAX HARDFILE {filename/option}

The default option is:

Create a filename: "SPOOL.date.user-name.time"

COMMENTS If filename is present, all HARDEV output is sent to text file of that name.

MESSAGES	Filename IS THE HARDFILE	Response when a HARDFILE is created.
	FILENAME CLOSED	Printed when filename and/DEFAULT option not present. A file open for HARDFILE output is closed.

Note

A task may have only one HARDFILE open at a time.

ALREADY HAVE HARDCOPY FILE	Filename command issued when a hardcopy file is already open.
NO HARDCOPY FILE	HARDFILE command with no filename; issued when no hardcopy file is open.
FILE ALREADY EXISTS TYPE OK ↵ TO OVERWRITE	Output if a file of the same name as the filename exists. ↵ causes it to be overwritten. Any other response will abort the HARDFILE command.
ILLEGAL OPTION	An option not defined is specified.

HEADER

PURPOSE Prints a large character header on the HARDEV or COMDEV.

SYNTAX HEADER [/Option1, . . . ,OptionX]

Option: LP — Print output on HARDEV also.
 NOCM — No output on COMDEV.
 XQT — Allow input from execute files.

When no options specified; input on COMDEV and output on COMDEV only.

INPUT — Three text lines (lines may be blank).
OUTPUT — Header on the HARDEV or COMDEV.

COMMENTS

- The command prints the following information twice:
System date/time, and task user name/number.
- Three lines of LARGE characters where the character size of the first line = 21 × 18; character size of lines two and three = 7 × 9.
- If header is called from an EXECUTE file without the XQT option, the task waits for your input from the COMDEV.

HELP

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HELP

PURPOSE

Prints documentation on your COMDEV.

SYNTAX

HELP

To Access HELP

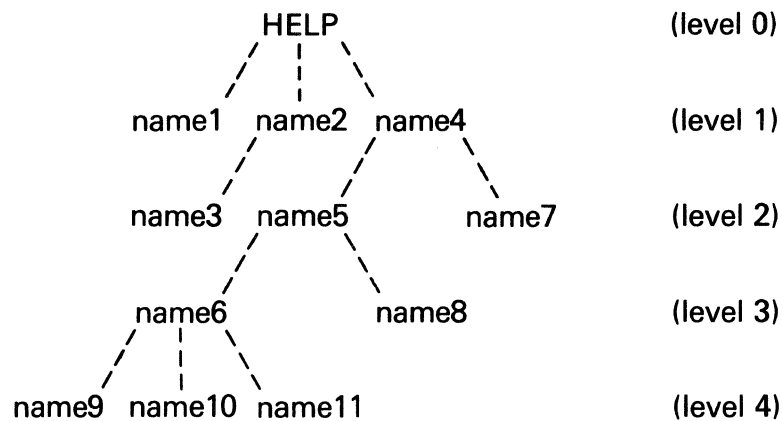
n>HELP ↓ Type HELP ↓ in response to a prompt at the Operating System (O/S) level (n>). Documentation is printed on your COMDEV.

?] While the HELP program is running, a ?] asks for your input. Respond with document name, sub-category, or a *special command* (see below).

A ↓ in response to the ?] exits HELP and returns to O/S level.

- Levels

HELP uses multiple levels of documentation to explain various O/S features.



Each name (name2, name4, name5, name6) may have a text document and further sub-category levels beneath it. Terminating names (name1, name3, name7, name8, name9, name10, name11) are documents without further sub-categories.

From any level, only documentation at lower levels can be referenced. To get this documentation, type the name of the document in response to the ?]. If the name typed has further sub-categories, you are moved to the next level. If the name is a document with no further sub-categories, you remain at the same level.

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SYNTAX
(Continued)

- **To List Documents**

From level 0 (HELP), the following commands enable you to access the documents described.

<u>Command</u>	<u>Description</u>
name1	Name1 printed; you remain at level 0.
name2	Name2 printed; you go to level 1; the next level (name3) is listed for your choice of documents.
name4 name5.	Name5 printed; you go to level 2; and documents at the next level (name6, name8)are listed.
name2 name3.	Name3 printed; you remain at level 0 (name3 has no sub-categories).

- **Examples**

These commands, in response to the level 0 HELP prompt ?], will access the documents described.

<u>Command</u>	<u>Description</u>
?] INFO DEVICES	Prints information about system devices; you remain at level 0.
?] COMMAND LIST	Prints information about the command LIST; you remain at level 0. For information on any O/S level command mentioned in this manual, just type: n> HELP COMMAND Commandname ↵ in response to the O/S prompt.

HELP

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SYNTAX (Continued)

- Special Commands

Several commands make accessing documents more convenient. Type these commands in response to the ?] prompt instead of a name:

/L	Lists the sub-categories and documents at the current level.
/B	Backs up one level and lists the sub-categories and documents at that level.
/R	Repeats the last text document printed.
/Q	Leaves HELP to return to the O/S.
/S and /A	HELP has two sets of documentation; system documentation and other (CADDs, user, etc.) documentation.
/S	Places you at level 0 of System documentation (the level of initial access to HELP).
/A	Accesses the alternate set of documentation, and puts you at level 0. This alternate set includes everything but System documentation. Type S to return to System documentation.
HELP	Prints this document.

HELPLP

PURPOSE	Accesses HELP and prints on-line documentation on HARDEV.
SYNTAX	HELPLP [OPTIONS]
COMMENTS	HELPLP invokes HELP. See HELP command documentation.

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HEXCALC

PURPOSE Performs arithmetic operations on hexadecimal or decimal numbers.

SYNTAX HEXCALC

INPUT/OUTPUT

n> HEXCALC ↓ Command sets its accumulator to zero, sets its base to hexadecimal, and responds with a prompt(#).

Type a base change or number in the current base (optionally preceded by a unary and/or binary operation).

Base Changes

T Change base to decimal.
S Change base to hexadecimal.

Unary Operations

None	Plus
+	Plus
-	Minus
%	Compliment

Binary Operations

None	Addition
*	Signed multiplication
/	Signed division
M	Modulo
&	Logical and
!	Logical or
'	Exclusive or
:	Unsigned multiplication
;	Unsigned division

Number input is modified according to unary operators provided, if any. Binary operation is applied to the accumulator; modified input is stored in the accumulator.

HEXCALC

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INPUT/OUTPUT
(Continued)

=XXXX HEX

The accumulator is typed out this way if current base = hexadecimal.

=XXXXXX DEC

Accumulator typed out this way if current base = decimal.

Respond with another number with operators; a base change; or a ↵ to terminate.

RESULT: =XXXX HEX,D
=XXXXXX DEC

HEXCALC's output of the resultant accumulator.

You may exit from HEXCALC with ↵, or start another sequence of calculations.

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HEXFP

PURPOSE Translates hexadecimal representation of a floating point number to its floating point representation.

SYNTAX HEXFP XXXX,YYYY

Where XXXX = first word of hex representation of a floating point number; YYYY = the second word.

COMMENT HEXFP outputs the floating point representation of the number and returns to the system.

IOTEST

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IOTEST

PURPOSE

Tests system I/O handlers. Desired values for the following may be entered from the COMDEV: ARGLIST, BUFFER, and CTRLBLK (for executing the system I/O calls READ, WRITE, and CONTROL. In addition, TIS input can be dumped onto the COMDEV.

COMMANDS

The following commands may be input from the COMDEV. The prompt is an asterisk (*).

INPUT

- * DAN,M = HEXDUMP ARGLIST(N) - ARGLIST(M)
- * DBN,M = HEXDUMP BUFFER(N) - BUFFER(M)
- * SAN,M = SET ARGLIST(N) TO THE VALUE M
- * SBN,M = SET BUFFER(N) TO THE VALUE M
- * SUXX = SET TASKUNITNAME TO THE ASCII CHARACTERS 'XX'
- * SWM = SET CTRLBLK TO VALUE M (BIT 0 IS HIGH ORDER)
 - * BIT 0 ON = SPECIAL RETURN
ERROR VAL RETURNED IN CTRLBLK(1)
 - * BIT 0 OFF = NORMAL RETURN
 - * ERRORS GO TO SYSTEM ERROR
HANDLER
 - * BIT 15 ON = NOWAIT I/O
 - * BIT 15 OFF = WAIT I/O
- * XC = E:E CONTROL.(UNITNAME,ARGLIST,BUFFER,CTRLBLK)
- * XR = E:E READ.(UNITNAME,ARGLIST,BUFFER,CTRLBLK)
- * XT = HEXDUMP NEXT TIS INPUT FROM UNITNAME
- * XW = E:E WRITE.(UNITNAME,ARGLIST,BUFFER,CTRLBLK)

MESSAGES

The following messages are output at the COMDEV:

INVALID UNIT

Output if unit specified in SU command is not the taskunitname for a device attached to this task, or, if an I/O call is attempted before a valid unit is selected.

At the completion of an IOCALL, one of the following messages is printed on the COMDEV:

WAIT I/O F:N = XXXX

Where XXXX = HEX value function returned by the I/O call.

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MESSAGES
(Continued)**NO-WAIT I/O F:N =XXXX**

Where XXXX = HEX value function returned by TESTIO. Note: Period (.) is printed on the COMDEV each time a GIVEUP is executed while waiting for I/O call to terminate.

SPECIAL ERROR RETURN**CTRLBLK(1) = XXXX**

Where XXXX = error number generated by the I/O call.

If no input is received from currently specified unit within 5 seconds after the XT command is input, the following message is printed on the COMDEV:

TIME OUT

LCLNEWS

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LCLNEWS

PURPOSE Outputs current administrative and local news, for purposes of onsite user notification. It is automatically invoked by logging in.

 Local news is input by editing **SYSNEWS.LCLNEWS**.

SYNTAX **LCLNEWS**

COMMENT Control automatically returns to system level if there is no local news.

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LIST

PURPOSE Lists the content of disc catalogs or magnetic tapes.

SYNTAX LIST [/Options]
 [Catalog[/[Filenamelist] [/Options]]]
 [Catalog[//Options]]

Example

n> LIST CAT1//LIST = DT ↓

<u>FILENAME</u>	<u>DATE</u>	<u>TIME</u>	<u>TP</u>
CAT1.&BCD.SUBCAT2	03/05/80	11:44:29	03
CAT1.SUBCAT1.&BCD.FILE1	01/03/80	13:24:27	03
CAT1.SUBCAT1.&BCD	11/14/79	09:22:12	01
CAT1.SUBCAT1.FILE1	01/03/80	14:15:33	02
CAT1.SUBCAT1.FILE2	05/24/80	15:30:22	02
CAT1.SUBCAT1.FILE3	05/23/80	13:15:52	02
CAT1.SUBCAT1.SUBSUBCAT.&BCD.FILE	08/08/80	14:14:14	03
CAT1.SUBCAT1.SUBSUBCAT.FILE	08/08/80	14:14:16	02
CAT1.SUBCAT1.SUBSUBCAT	08/08/80	14:14:12	01
CAT1.SUBCAT1	05/22/79	17:49:32	01
CAT1.SUBCAT2.&BCD.FILE	12/29/79	10:21:02	03
CAT1.SUBCAT2.&BCD	12/29/79	10:20:59	01
CAT1.SUBCAT2	12/29/79	10:20:58	01
CAT1	11/13/78	18:03:46	01

NOTE LIST is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL, LIST.) DELETE.

LISTALL

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LISTALL

PURPOSE Lists all existing catalogs or files with the same name on a Graphics Networking Architecture (GNA) system.

SYNTAX LISTALL <option> Command String

Example

```
n>LISTALL <REFERENCE.FILE>MYCATALOG//SINCE=2-15-81
```

This command sets up and executes a file that lists any catalog or file in MYCATALOG created since 2-15-81 on Networking Nodes 0, 1, 2 and in the directory MYDIRECTORY.

COMMAND STRING The entered command string must be valid relative to the FUTIL LIST command.

OPTION Users may set up their own reference file to control what Networking nodes or directories are searched. The optional reference file is listed on the command line delimited by "<" and ">".

REFERENCE FILE FORMAT The reference file is a text file that includes the nodes or directories to be searched, each on a line by itself.

Example

```
REFERENCE.&BCD.FILE
4-22-81 16:41:03
 1|[0]
 2|[1]
 3|[2]
 4|MYDIRECTORY
```

COMMENT LISTALL will incorporate a command string into a file. The file will then list all cases of the command string according to networking nodes or directory names listed in a reference file setup by the System Manager. This default reference file is named: SYSTEM.&BCD.LISTALL.

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LISTCMTB

PURPOSE Lists contents of a file manager command table.

SYNTAX LISTCMTB Filename

Filename = Name of existing COMMTAB file.

MESSAGES Command table filename, date/time of file creation, and COMMTAB entries are listed.

For normal entries:

COMMAND	FILE	CORE	CORE	START
NAME	DLOC	COUNT	LOC	LOC

CORE IMAGE FILE NAME

For cross-referenced entries:

COMMAND	REFERENCED	+	OFFSET
NAME	COMMAND		NAME

LISTCOM

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LISTCOM

PURPOSE Prints all active command tables.

SYNTAX LISTCOM [FULL]

OUTPUT When full option not used, listing includes command name only.

Full Option Used

Listing for normal entries includes:

COMMAND NAME	DISC LOC	CORE COUNT	CORE LOC	START LOC	PROT GRP	COM TAB	OVLY FNAM
-----------------	-------------	---------------	-------------	--------------	-------------	------------	--------------

Listing for each cross-referenced command includes:

COMMAND NAME	CREF COM NAME	+ DISPLACEMENT
-----------------	------------------	----------------

Single character identifiers under COM TAB heading indicate the command's origin:

C = SYSCOMMAND TABLE
F = SYSTEM FM COMMAND TABLE (SYSCMTB)
H = Commands that are hardcoded into the system.
S = SYSTEM COMMAND TABLE
U = USERCOMMAND TABLE

COMMENTS

- If no USERCMTB is assigned, no user command table is output.
- If SYSCMTB is empty, no system file manager command table is output.

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LISTDIR

PURPOSE Lists working directory for a task. The directory must be currently enabled.

SYNTAX LISTDIR

COMMENT A working directory is a user-defined search list for files referenced by the task. To enable a working directory, use the ENABDIR command.

Example

```
n>ENABDIR JQC = G,SYSCATLG = L ↓
DIRECTORY ALREADY EXISTS
TYPE OK TO OVERWRITE
OK ↓
    DIRECTORY ENABLED
n>LISTDIR ↓
    CREATE CATALOGS ARE:
GLOBAL: JQC
LOCAL:  SYSCATLG
        1)JQC
        2)SYSCATLG
```

MESSAGES

NO TASK BASED DIRECTORY
IS ENABLED FOR THIS TASK

CREATE CATALOGS ARE:

GLOBAL: catalog name

LOCAL: catalog name

1) catalog1

2) catalog2

. .

. .

. .

3) catalogn file.

Printed when directory is currently disabled.

If directory is enabled, lists catalogs where files will be created.

These catalogs will be searched in this order when the file manager searches for an existing file.

LISTLOAD

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LISTLOAD

- PURPOSE** Searches a text file for commands that reference other files. From these command references, a list of files is created and output to a file or the COMDEV. Optionally, LISTLOAD can generate a system command for each file referenced.
- SYNTAX** LISTLOAD Output filename/KEYWORDS[,OPTIONS]
- NOTE** Refer to the *CGOS 200 GNA Programmer Reference Manual* for additional information.

LISTLP

- PURPOSE** Lists contents of disc catalogs, or magnetic tapes. LISTLP is like LIST except that output always goes to the line printer.
- SYNTAX** LISTLP[/Options] [Catalog[/[Filename]list] [/Options]]
- NOTE** LISTLP is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL, LISTLP.)

LISTPROT

- PURPOSE** Outputs a formatted listing of a your active access table and default protection group (DPG).
- SYNTAX** LISTPROT
- OUTPUT**
- | USER | USERNAME |
|--------------------------------|---|
| LINE #. | Start of range — end of range/attributes. |
| . | . |
| . | . |
| . | . |
| DEFAULT PROTECTION GROUP: XXXX | |
- NOTE** Refer to the appropriate section in the *CGOS 200 GNA System Manager Guide* for more information on the Protection Facility.

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LISTTEXT

PURPOSE Identical to the LIST command except that it processes only text files.

SYNTAX LISTTEXT [/Options]
 [Catalog[/[FilenameList][Options]]]
 [Catalog[/Options]]

Example

n> LISTTEXT CAT1//LIST = DT ↓

<u>FILENAME</u>	<u>DATE</u>	<u>TIME</u>	<u>TP</u>
CAT1.&BCD.SUBCAT2	03/05/80	11:44:29	03
CAT1.SUBCAT1.&BCD.FILE1	01/03/80	13:24:27	03
CAT1.SUBCAT1.&BCD	11/14/79	09:22:12	01
CAT1.SUBCAT1.SUBSUBCAT.&BCD.FILE	08/08/80	14:14:14	03
CAT1.SUBCAT2.&BCD.FILE	12/29/79	10:21:02	03
CAT1.SUBCAT2.&BCD	12/29/79	10:20:59	01

NOTE

LISTTEXT is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL, LISTTEXT.)

LOADLIB

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LOADLIB

PURPOSE

Creates a load library.

SYNTAX

LOADLIB catalog.name [OPTIONS]

NOTE

Refer to *CGOS GNA Programmer Reference Manual* for further information.

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LOADPCU

PURPOSE Moves a file from the CGOS file system to the specified PCU for (optional) execution.

SYNTAX LOADPCU TASKUNITNAME, FILENAME, STARTOPTION

TASKUNITNAME = Task name for the PCU.
 FILENAME = Name of file to be loaded into PCU.
 STARTOPTION = Specifies whether PCU is to start executing downloaded program. Lists starting address, if appropriate (see examples below).

Examples

n> ATTACH PC,PC00 ↓
 n> LOADPCU PC,OVLY,PCU.TEST ↓

This *downloads* OVLY.PCU.TEST into PC00; PCU starts execution at start address specified in OVLY.PCU.TEST.

n> LOADPCU PC,OVLY.PCU.TEST,100 ↓

Functions like previous example except that PCU starts executing at location 100 (HEX).

n> LOADPCU PC,OVLY.PCU.TEST,* ↓

Like previous examples except that PCU does not start executing downloaded program.

COMMENT You must attach the PCU to be loaded using the ATTACH command, before running the LOADPCU command. The contents of FILENAME should be in MOSTEK format. (See Engineering Specification for PCU).

LOGOUT

PURPOSE Terminates a task.

SYNTAX LOGOUT

COMMENT All units attached to the task are unattached and the task is terminated. (See LOGOUT and Autologout Procedure, Section 2.)

LONGEDIT

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LONGEDIT

PURPOSE

Manipulates text files. Like EDIT, LONGEDIT is a line-oriented editor that prompts for text-processing commands. LONGEDIT has a more limited command syntax than EDIT, but it can handle lines of up to 256 characters.

SYNTAX

LONGEDIT filename [,N][/MODE,CNT1,CNT2]

OPTIONS **N** Open a new file. Generates an error if filename exists.

MODE Either D or F; designates line length formats for the COMDEV and for output (printer or other interactive devices):

D Display mode; allows you to set COMDEV line length. Output line length will always be 72.

F Format mode; allows you to set line lengths on the COMDEV and output devices.

CNT1 Display record character count. The number of characters that appear on each line of the COMDEV.

CNT2 File record character count. The number of characters that appear on each line of the output device (line printer or other peripheral). If MODE is set to F, CNT2 defaults to a length of 256. When MODE is D, CNT2 will always be set to 72, regardless of the value input on the command line.

If MODE is omitted from the command line, character counts default to 72.

Caution

Editing an existing file with a new, shorter file record character count will cause each edited line to be chopped off at the new line length. Any characters beyond the new line length will be lost.

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INPUT/OUTPUT

Once the file is open, the # prompt indicates that LONGEDIT is ready to accept commands. To end the session and return to O/S level:

F ↵ saves the work.

Q ↵ terminates without saving any changes.

- **Examples**

To create the file CAT.FILE using a COMDEV record length of 50 and an output file record length of 100:

```
n> LONGEDIT CAT.FILE,N/F,50,100 ↵  
FORMAT MODE  
DISPLAY RECORD LIMIT = 50  
OUTPUT FILE RECORD LIMIT = 100  
#
```

To edit the existing file CAT.FILE using a COMDEV record length of 25:

```
n> LONGEDIT CAT.FILE/D,25  
DISPLAY MODE  
DISPLAY RECORD LIMIT = 25  
OUTPUT FILE RECORD LIMIT = 72  
#
```

When Display mode or Format mode is chosen, MODE and record length parameters are always echoed on the COMDEV.

- **Line Numbers**

Most LONGEDIT commands process lines or sequences of lines. Lines are represented by decimal line numbers. Line numbers internal to the editor; they are not physically represented in the the file being edited.

- Any command that accepts a range of lines will also accept a single line.
- When a line number beyond the end of the file is given as a command argument, LONGEDIT substitutes the last line number of the file. This is true for every command except D (Delete), which will generate an error if a line number argument exceeds the last line.

LONGEDIT

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INPUT/OUTPUT (Continued)

- Insertion lines are forced into the range of one to the last line of the file.
- With insertion commands (C,I,M, and X) a destination line of 0 inserts text before the first line of the file.
- Renumbering
 - Certain LONGEDIT commands automatically renumber the file:
 - T (TYPE LINES)
 - L (LOCATE LINE)
 - S (SUBSTITUTE TEXT)
 - A,F (FILE CHANGES)
 - Text inserted or modified after renumbering is not available for inspection (or modification) until another renumbering command is issued.
 - The message, EDIT BUFFER IS FULL is output when a great deal of text has been modified without renumbering. To continue editing, issue one of the renumbering commands.
 - An error or ESC Q entered from the keyboard can interrupt the execution of many LONGEDIT commands. This type of interruption does not affect text already modified. Reissue the command to modify any remaining text. When an error interrupts command execution, LONGEDIT will indicate the extent of buffer modification prior to the error.
- String-Oriented Commands

L and S are string-oriented commands. They search the file, or portions of the file for a particular sequence of characters (a string). There are two types of strings, *Word* strings and *normal* strings.

 - Word strings are limited to alphanumeric characters. When a word string is specified in an L or S command, the string will only be recognized within text if it is surrounded by special characters, blanks, or line boundaries (end-of-line, beginning-of-line). In the L and S command syntax, word strings are represented literally; delimiters are not allowed.

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INPUT/OUTPUT (Continued)

Alphanumeric Characters

The characters 0-9, and A-Z are alphanumeric. No special characters are alphanumeric.

- Normal strings can be composed of any characters. A normal string need not be surrounded by special characters when it occurs in text. When used in an L or S command, however, a normal string must be surrounded by a pair of matching delimiters.

- Delimiters

In string search syntax, any special character except a space or an & can function as a delimiter.

- Sample String Search

```
n> LONGEDIT JPR.SAMPLE
#T 1!! SAW 1DOG AT THE ZOO
   2!1DOG WAS MARCHING
   3!HERE'S 1DOG; A HOTDOG,
   4!! SAW 2!DOGS TODAY
   5!THERE ARE NO DOGS HERE
   6!HERE IS 1DOGGIE
   7!! SAW1DOG ON THE STREET
```

Opens the file for EDITING; T file's contents

```
L,1DOG
  1!! SAW 1DOG AT THE ZOO
  2!1DOG WAS MARCHING
  3!HERE'S 1DOG; A HOTDOG
```

Word string search for lines containing string, *1dog*

```
L,/1DOG/
  1!! SAW 1DOG AT THE ZOO
  2!1DOG WAS MARCHING
  3!HERE'S 1DOG; A HOTDOG,
  4!! SAW 2!DOGS TODAY
  6!HERE IS 1DOGGIE
  7!! SAW1DOG ON THE STREET
```

Normal string search for lines containing string, *1dog*. Note changed results.

- Commands

() must terminate all commands.)

A SYNTAX A catalog.file

Files changes in an auxiliary file. The buffer is written to catalog.&BCD.file (this name Places the modified file from the current session in "catalog.&BCD.file," which must not have the same name. "A" does not terminate LONGEDIT.

LONGEDIT

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INPUT/OUTPUT (Continued)

C SYNTAX C linea [– lineb], linec

Copies specified lines. Inserts a copy of the block from linea to lineb after linec.

D SYNTAX D linea [– lineb]

Deletes specified line(s).

E SYNTAX E line [/columna [– columnb]]

EDITS a line between specified column positions. This special command modifies single lines character by character. The section to be EDITED is between columna and columnb. If neither columna nor columnb is specified, the whole line is EDITED. If columna only is specified, the line is EDITED from columna to line's end.

Delimited characters are typed out without the line number; the CRs to the first column under this line, and modification characters are entered under specific characters to be modified. Columns beyond the end of this line act like trailing spaces and may be modified just like any other character in the line. Modification characters affect the character under which they appear.

- Modification Characters

Space No effect; retains old character.

^ Blanks out old character and turns it into a space.

\ Deletes old character.

Note

Valid characters may be deleted when \ is used to delete spaces beyond the end of the line.

[Inserts all characters following the [before the old character; including all modification characters described here except].

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**INPUT/OUTPUT
(Continued)**

-]** Terminates insertion started by [. Acts like a normal character unless it follows [insertion.
- ↓** Terminates modification instructions and types the line with requested modifications. Also terminates insertion started by [.
- Other** Any other characters will replace existing characters.

Modifications may be entered after] terminates an insertion started by [. Although additional modifications begin with the character that [appears under, they are not aligned with the modification line owing to the [] pair and any intervening characters.

Once ↓ terminates the modification instructions, a modified line is typed out without a line number and may be further modified. Characters in the line that follow the ↓'s position are modified as if spaces had been typed beneath them, i.e., they remain the same.

↓ at the beginning of the modification line terminates "E."

F SYNTAX F

Quits and files all changes. Terminates LONGEDIT and files text modifications. Changes from the current session become a permanent part of the file.

I SYNTAX I [line]

Inserts text after line. If line omitted, text will be inserted before line 1.

L SYNTAX L[linea [- lineb]], string

Locates lines containing string. Searches the line or range of lines for specified text string. If a line contains one or more occurrences of the string, LONGEDIT types the line preceded by its line number. If no line numbers are specified, the whole file is searched.

LONGEDIT

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INPUT/OUTPUT (Continued)

M SYNTAX M linea [- lineb], linec

Moves specified lines. Identical to the sequence:

C linea [- lineb], linec

D linea [- lineb]

If linec is not specified, linea-lineb will still be deleted.

N SYNTAX Nn

Allots n spaces at the start of the line for a line number. Whenever LONGEDIT lists a line, it prefixes the current line number to the text. This line number is separated from the body of the line by an exclamation point (!). n is the number of digits (including the exclamation point and leading spaces) that the line number can occupy. If the digits in a line number exceed n, only the right hand digits will be printed. The default spacing for line numbers is 6.

Q SYNTAX Q

Quits without filing changes. Control returns to the O/S. No changes from the EDITING session are filed. This is really a user-abort of the EDITOR.

R SYNTAX R linea [- lineb]

Replaces specified line(s). R linea [- lineb] is equivalent to:

D linea [- lineb]

I linea

Caution

R linea [- lineb] will delete linea [- lineb] regardless of whether replacement lines are entered. Once R has been typed, the deletion cannot be revoked.

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**INPUT/OUTPUT
(Continued)**

S SYNTAX S [linea [– lineb]], stringa, stringb

Substitutes one text string for another. Searches for stringa; replaces stringa with stringb. Within the line range, every occurrence of stringa is replaced, including multiple occurrences within a single line. Each time a substitution is made, old and new versions of the line are typed out. If no lines are specified, the whole file is searched.

Note

Do not include leading spaces in stringa or stringb.

T SYNTAX T [linea [– lineb]]

Types lines. If specified, linea through lineb will be listed. If lineb is omitted, linea through the end of the file will be listed. T with no line numbers will list the entire file. LONGEDIT rennumbers the file before typing requested lines.

X SYNTAX X catalog.file, linea [– lineb], linec

Extracts lines from external file. Copies linea through lineb from file catalog.&BCD.file; places them after linec in the file being EDITED.

MOVE

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MOVE

PURPOSE Moves files from one device, catalog, or file to another.

SYNTAX MOVE[/Options]
[Catalog[/[Filenamelist] [/Options]]]
[Catalog[/Options]]

Caution

Moving a file to itself deletes the file.

COMMENTS

- MOVE is identical to the COPY command, except when the operation is on disc files. In that case, the original source files are deleted upon successful completion of the copy.
- MOVE is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL, MOVE.)

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PACHFILE

PURPOSE Examines or modifies files.

SYNTAX PACHFILE CATALOG.FILE

Where CATALOG.FILE is the file to be patched.

INPUT/OUTPUT n> PACHFILE ↓ Enter command along with Catalog.file.

System prompts, indicating that it is waiting for a command.

- Buffer Management Commands

OFFSET OFFSET [or OF] = va1

Establishes an offset to the start of the buffer. The first word in the buffer will have an address of val (base 16).

FILESIZE FILESIZE [or FS]

System responds with file size in hex words. In the following commands, all occurrences of the word *locn*, where n is a decimal digit, represent buffer addresses in the range:

$$\text{OFFSET} \leq \text{locn} \leq \text{FILESIZE} - 1$$

- Buffer Examination Commands

DUMP DUMP [locn] [locn]
D [loc1-loc2], [loc1-loc2],...

Dump prints (in hex) all values between loc1 and loc2. When no ranges are specified, entire file is dumped. Output format is:

```
loc1 XXXX XXXX XXXX XXXX XXXX XXXX
loc1 +8
```

PACHFILE

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INPUT/OUTPUT (Continued)

SEARCH

SEARCH [loc] [loc]

SR [loc1-loc2], [loc1-loc2],... = value

SEARCH prints buffer locations within a specific range whose contents equal value. When no range is given, the entire buffer is searched. Output format is:

loc1 value
loc2 value

- Buffer Modification Commands

SET

SET [or SE] loc = value1,value2...,valuen

Sets the contents of buffer locations loc to loc + n1 to values value1, value2,...,valuen.

SET [loc] [loc]

SE [loc1-loc2] [loc1-loc2],... = value

Sets the contents of buffer locations (within specified ranges) to value.

MOVE

MOVE [or M] count,loc1,loc2

Moves a portion of the buffer. Count words are moved from loc1 to loc2.

WRITE

WRITE [or W] loc1,...locn = /insert string/

WRITE sets buffer contents literally; the actual string characters, not ASCII values are inserted at each loc. The string fills the next n/2 words, (n = number of characters in the string). Any special character can be used to delimit the string; use the same character to begin and end the string.

- Miscellaneous Commands

SUM

SUM [or SU] loc1-locn

SUM adds values of consecutive words in the buffer. SUM only produces single-precision results.

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**INPUT/OUTPUT
(Continued)****• Terminating Commands****FILE****FILE [or F]**

FILE writes buffer contents back to original disc location. File reflects all buffer content changes. When the file is re-written, control returns to O/S. Note: PACHFILE does not have a quit command; all changes must be filed.

MESSAGES**BAD COMMAND****PACHFILE does not recognize command.****BAD LOCATION**

Buffer address being examined or modified is outside permitted address range. In commands specifying ranges: if either end of a range is beyond the buffer limits, command is not performed for that range. When multiple ranges are specified: command is performed for all ranges that satisfy the boundary check.

NEGATIVE RANGE

Upper bound of a range pair is less than the lower bound.

NOTE**See DUMPFIL.**

PAUSE

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PAUSE

PURPOSE

Puts a pause within an execute file where you want the system to wait. PAUSE is used for requesting tapes to be mounted and other operator action. Execution resumes when you enter a valid response.

SYNTAX

PAUSE [OPTION]

OPTIONS MAX = X X = minutes the system will wait for your response. If no response is made, the task is logged out. Default = 60 minutes.

INPUT

Responses from COMDEV:

CONTINUE Resumes execution.

* Same as CONTINUE.

NOBELL Supresses output of audible tone every 10 seconds.

QUIT Kills the execute file and returns to system level.

OUTPUT

Execution of the execute file either continues or exits.

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PCUPCH

PURPOSE	Patches PCU overlay files.	
SYNTAX	PCUPCH CATALOG.FILE [,RELDLOC[,BASE]]	
	CATALOG.FILE	File to be patched.
OPTIONS	RELDLOC	Sector displacement from beginning of file where patching is to start.
	BASE	Base location assigned to first word of file's patched portion.
		The default for both RELDLOC and BASE is zero.
INPUT/OUTPUT	n> PCUPCH ↵	Enter command. PCUPCH then reads that portion of the file that is to be patched into core.
	#	System response. You may input any of these commands:
	BASE	[= NEWBASE]
		(>0) is the new value to be given to BASE. If = <i>newbase</i> is present, BASE assigns the new value to <i>base</i> . Otherwise, the command outputs the current value to <i>base</i> .
	DUMP	HEX-BOUNDS-LIST
		HEX-BOUNDS-LIST is a list of locations to be dumped of the form:
		XXXX1 [YYYY1],...,XXXXn [- YYYYn]
		in which XXXX1 (and YYYY1) must be greater than or equal to BASE. The specified locations are dumped from the overlay file. In the DUMP, ASCII characters: 'R', 'L', 'N' represent the ASCII characters carriage return, line feed and null, non-printing characters. These characters cannot be changed.
	FILE	Writes the patched portion of the Overlay file to the disc file. PCUPCH terminates.

PCUPCH

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INPUT/OUTPUT (Continued)

FILESIZE	Outputs the total sector count for the file.
PACHSIZ	Outputs the number of words in the portion of the file being patched. The number of words in the portion of the file being patched is either the number of words in the file remaining beyond the REDLOC, or the size of the core image buffer for PCUPCH, whichever is smaller. The core image buffer size for PCUPCH is the address of the taskunitname table for the task minus '3E00'x.
Q	Terminates PCUPCH without filing.
SET	SETLOC = VAL1...,VALN (N15)
SETLOC	A hex location greater than or equal to BASE. VAL1...,VALN A list of ASCII values to be placed in SETLOC and locations following SETLOC. The given values are placed in the specified locations of the overlay file. Then the checksum of the modified record is recalculated.

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PRGCOPY

PURPOSE Modifies a text file by removing all text lines identical to the preceding line.

SYNTAX PRGCOPY FILENAME

FILENAME Name of the text file to be processed. For example,

```
n> PRGCOPY HELP.SUBRS ↓
n>
```

PRINT

PURPOSE Prints text files on a COMDEV or HARDEV. The system printing toggles (^P and ^U) direct output. Files other than text files cannot be printed with PRINT.

SYNTAX PRINT[/Options]
[Catalog[/[Filenamelist] [/Options]]]

Example

Prints text file CAT1.SUBCAT1.&BCD.FILE1 on COMDEV.

```
n> PRINT CAT1.SUBCAT1.FILE1 ↓
```

```
CAT1.SUBCAT1.&BCD.FILE1 ↓
```

```
1-8-81 22:14:35
```

```
· · ·
· · ·
· · ·
```

```
(Contents of file)
(are listed here)
```

```
· · ·
· · ·
· · ·
```

```
n
```

NOTE PRINT is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL, PRINT.)

PRINTLP

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PRINTLP

PURPOSE Prints text files on a HARDEV. If there is no HARDEV, types out an error message and stops. PRINTLP ignores the system printing toggles (^P and ^U). PRINTLP will not print files of other types, since &BCD is assumed as the next to last level of the filename.

SYNTAX PRINTLP[/Options]
[Catalog[/[Filenamelist] [/Options]]]

Example

Prints contents of text files in CAT1.SUBCAT1 on line printer.

```
n> PRINTLP CAT1.SUBCAT1//LEVEL = 1 ↓
```

CAT1.SUBCAT1.&BCD.FILE1	(PRINTING)
CAT1.SUBCAT1.&BCD	(PRINTING)
CAT1.SUBCAT1.SUBSUBCAT&BCD.FILE	(PRINTING)

NOTE PRINTLP is a FUTIL subcommand as well as an O/S level command. The FUTIL section contains additional documentation. (See the FUTIL Overview or the Index under FUTIL, PRINTLP.)

PRNTJOB

PURPOSE Lists and prints job parameters of a job in the system BATCH queue.

Job Parameters

Priority
Status of each job step
Name of submitter

SYNTAX PRNTJOB Jobname
Jobname Name of the job (20 character maximum).

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RENAMDEV

PURPOSE Assigns a new taskunitname to an already attached unit.

SYNTAX RENAMDEV Oldname,Newname

Oldname = Current two-character name for attached unit.

Newname = New user-selected two-character name assigned to this unit (see ATTACH).

COMMENT Control returns automatically to system level.

MESSAGES UNIT NAMED OLDNAME changed to NEWNAME. Renaming successful.

NEW NAME ALREADY
IN USE

BAD REQUEST OLDNAME is bad.

RENAME

PURPOSE Renames a file or a catalog.

SYNTAX RENAME CATALOG.OLDFILE,NEWFILE

OLDFILE = File or catalog to be renamed.

NEWFILE = New file or catalog name to be assigned.

Example

n> RENAME MANUAL.SECTION-7,
SECTION-8 ↵

Type to rename the file
MANUAL.SECTION-7 to
MANUAL.SECTION-8.

FILE RENAMED

System response.

RENUMBER

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RENUMBER

PURPOSE	Renumbers the statement numbers in a FORTRAN source program and formats code within DO loops.
SYNTAX	RENUMBER catalog.file
NOTE	Refer to <i>CGOS 200 GNA Programmer Reference Manual</i> for additional information.

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REWIND

PURPOSE Positions a tape at the load point.

SYNTAX REWIND [TAPENAME]

TAPENAME User-assigned taskunitname for the tape unit (see ATTACH).

MESSAGES BAD TASK UNIT NAME Specified taskunitname does not exist in system.

TAPE UNIT NOT ATTACHED Tape unit is not attached.

RUN

PURPOSE Reads into core and executes an overlay file.

SYNTAX RUN FILENAME {, arguments for overlay}

The *filename* argument is mandatory. Arguments are relevant only to a particular overlay. The overlay must have been created with the loader using a CWRITE statement.

RUN ASSUMES:

Core location = starting location.
Priority switch & highest allowable priority = 0.
DLC = 0.

or

Filename with arguments for overlay.

Filename as overlay file in catalog SYSCOMMAND, with the form equivalent to: RUN SYSCOMMAND.NAME.

SELECT

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SELECT

PURPOSE Selects task parameters.

SYNTAX SELECT OPTION [,OPTION...]

OPTIONS

LP = OFF No line printer task to be dispatched. If printer already dispatched, you must finish current file and logout. All print toggles output to spool files for later printing.

LP = ON Line printer task may be dispatched. All print toggles output to spool files.

LP = KILL Stops printing, deletes current file, logs out.

LP = QUIT Stops printing, logs out, does not delete current file.

LP = WAIT Stops printing. Waits for further instructions.

LP = RESTART Restarts printing of current file from beginning.

LP = CONTINUE Continues printing current file from current line.

LP = DELETE Deletes current file, continues printing files in queue.

BATCHMAX = N Sets N as maximum number of concurrently executable BATCH tasks.

BATCHCM(= N) Selects your monitor device as unique unit N.

BATWAIT = S Selects number of seconds BATCH processor will wait for user.

UPPRCASE Converts all lower-case characters to upper-case.

LOWRCASE Enables lower-case characters to be typed.

BACKGRND Puts task into background priority CPU queue.

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SYNTAX
(Continued)

FOREGRND[= N] Puts task on specified (N,N=1-3) CPU queue (default of CPU Queue 1).

ECHO Sends all output to COMDEV.

NOECHO Suppresses all COMDEV output.

TIME Enables command timing, outputting time taken by last command executed.

NOTIME Disables command timing.

NOFORM Disallows form-feeds (page-ejects) on hard copy device (HARDEV).

SYNTAX NOFORM

DOFORM Allows form-feeds (page ejects) on hard copy device (HARDEV).

DOFORM = default at LOGIN time. (Used only after you disables normal processing of form-feeds by means of NOFORM.

SYNTAX DOFORM

ERRLEVEL = VALUE. VALUE can be long, normal, or short. Subsequent error messages follow accordingly.

XXXDEV = YY XXXDEV declares attached unit as task specific device, and YY as its TASKUNITNAME.

SYNTAX XXXDEV = TASKUNITNAME

(XXXDEV can = CARDEV, COMDEV, HARDEV, PPTDEV, or RPTDEV)

TASKUNITNAME = two-character, user-assigned name for attached unit.

SELECT

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MESSAGES

TASKUNITNAME IS XXXDEV

Taskunitname successful.

BAD REQUEST

Taskunitname is bad.

TASKUNITNAME IS NOT XXXDEV

If declaration is successful, previously declared XXXDEVs are undeclared.

COMMENT

Control returns automatically to system level.

SET

PURPOSE

Sets user task memory locations to given values.

SYNTAX

SET LOC = Val1, Val2, . . . ,ValN

Sets: LOC = Val1

LOC + 1 = Val2

.

.

.

LOC + N-1 = Valn

Example

n> SET 100=0 ↓ Typed to set core location 100(hex) to 0. Location 100(hex) is set to zero. Control returns to command level.

Caution

SET should only be used for extraordinary O/S debugging. SET is capable of destroying irrecoverable system and disc data.

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SETPROT

PURPOSE Changes current user's default protection group (DPG).

SYNTAX SETPROT [PG]. Any combination RWEDCM or S, G, or P. Filename may be a full filename or a catalog name.

PG = (Protection group) where a and b represent HEX numbers in the range 0000 — 7FFF.

S,G,P = Default designators. (System, Group, Private).

RWECDM = Attributes of PG range: Read, Write, Execute, Delete, Change, Modify.

COMMENTS Whenever a file/command is created, a default protection group (DPG) is assigned automatically. SETPROT enables you to write files/commands in any protection group to which you have write access.

To Specify DPG:

1. State desired DPG as a hex number (range 0000-7FFF).
2. Input a default designator (System, Group, or Private) with desired combination of attributes. This input is compared to your current access table. When identical attributes exist there, the PG number takes the place of the one initially assigned to the DPG. You must then list the new DPG in your access table as a PG with write access.
3. At each Login, the DPG is automatically assigned as stated in the Authorize file regardless of the last SETPROT.

*Example*USER ACCESS TABLE

2000-2001/RWDS
2006-2006/R
2009-200A/RWD

<u>Command</u>	<u>New DPG</u>
n> SETPROT 2006 ↓	ERROR-NO WRITE ACCESS
n> SETPROT 2010 ↓	2010
n> SETPROT SRWD ↓	2000

SETPUNCH

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SETPUNCH

PURPOSE Allows user-selected parity for data output to a punch paper tape device. The device must be attached to task and be declared a PPTDEV.

SYNTAX SETPUNCH PARITYCOM

PARITYCOM = One of the following parity selection commands:

NOPARITY (Transparent data transfer)

ODD

EVEN

MARK

SPACE

MESSAGES PARITY SET Command successfully completed.

ERROR Command in error.

SETTAPE

PURPOSE Changes parity and pack options on a tape unit.

SYNTAX SETTAPE TAPENAME, PAROPT, PACKOPT

TAPENAME User-assigned task name for tape unit (see ATTACH).

PAROPT 0 = Odd parity.

E = Even parity.

PACKOPT N = Unpacked.

P = Packed.

METHOD The following are the default values for PAROPT and PACKOPT when a tape unit is attached:

	<u>7-track drives</u>	<u>9-track drives</u>
PAROPT	0	0
PACKOPT	P	U

COMMENT Control returns automatically to system level.

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SORTCAT

PURPOSE Sorts a catalog; filenames are alphabetized by ASCII value.

SYNTAX SORTCAT [CATALOG]

METHOD SORTCAT sorts all subcatalogs of a specified catalog to N levels.

SYSCATLG is the default catalog. In this case, all catalogs on any enabled auxiliary volumes are sorted. Note that SYSCATLG can only be sorted in a single user mode.

COMMENTS Using TASKILL to abort a SORTCAT is not recommended; it may leave some catalogs task-protected. Should catalogs become task-protected, use FMCLEAR catalogname (on same task the SORTCAT was performed) to clear them.

MESSAGES

CANNOT SORT SYSCATLG WITH
OTHER TASKS LOGGED IN

More than one task is active when
you tried to sort SYSCATLG.

ONLY FIRST xxx NAMES IN
SOME CATALOG SORTED

Catalog contains more than 700
(decimal) entries.

The latter entries remain in original
order.

Caution

Working directories must be disabled prior to
executing SORTCAT.

SORTFILE

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SORTFILE

PURPOSE Sorts a text file under file management.

SYNTAX SORTFILE FILENAME [/OPTION1,...OPTIONn]

FILENAME = Name of file manager file to be sorted.

OPTIONS

CASE Sorts upper-case and lower-case characters as if they were identical.

FIELD [= BEGIN,COUNT] Selects field within a line upon which each line is sorted. Characters are numbered starting at zero. The default field, if this option is not specified, is the first eight characters in each line (BEGIN = 0, COUNT = 8).

MRGCOPY [= BEGIN,COUNT] If the sort pass generates multiple lines with identical sort fields, MRGCOPY blanks out the field in all lines except the first. If the MRGCOPY field is not specified, the default is BEGIN = 0 and COUNT = 8.

PSTAT Outputs status information at regular intervals during the sort.

REVERSE Sorts file in reverse ASCII order.

STABLE Sorts file using a stable sort algorithm.

Example

n> SORTFILE A.B.C. ↓

Sorts file A.B.&BCD.C according to contents of first eight characters in each line of file.

n> SORTFILE A.B.C /FIELD=0,72,MRGCOPY ↓

Sorts according to contents of first 72 characters in each line. If the first eight characters of multiple consecutive lines are identical, duplicate first 8 characters of each line are blanked out.

n> SORTFILE A.B.C /PSTAT,REVERSE,STABLE ↓

Sorts file in reverse ASCII order, using a stable sort on the default FIELD; prints periodic sort status information.

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SRCHBCD

PURPOSE Locates occurrences of strings in a set of text files.

SYNTAX **SRCHBCD CATALOG NAME/NAME LIST/OPTIONS**

CATALOG NAME Name of the catalog containing the files to be searched. SYSCATLG is the default.

NAME LIST List of files within the catalog to be searched. If omitted, the entire catalog is searched.

Using **NAME LIST** in conjunction with **NLEV** (below) causes all files in subcatalogs of **CATALOG NAME** whose terminating file names appear in **NAME LIST** to be searched.

OPTIONS (Separate with commas.)

/NLEV Processes all levels of catalog and all subcatalogs with a name list, processes only those files whose names terminate with the **NAME LIST** option.

NOFORM Replaces all form-feeds in **SRCHBCD** output with five line feeds.

{SINCE BEFORE} Searches only those files dated since (before) the date given. This must appear as the last option in the list:

{SINCE	Date	Time
BEFORE}	MO-DY-YR	HR:MIN:SEC

SUBCAT Interprets **NAME LIST** as a subcatalog list; assumes **NLEV**.

INPUT/OUTPUT **n> SRCHBCD ↓** Enter command along with Catalog name, Name list, and desired Option(s).

Prompt; **SRCHBCD** is waiting for command. A ↓, in response to prompt, or an error, exits to O/S.

Input a string, prefixed by one of three commands: L, S, or G.

SRCHBCD

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INPUT/OUTPUT (Continued)

L Actual-string

L = LCTEXT; Actual-string = actual BCD string surrounded by spaces. SRCHBCD echoes the string and proceeds to search appropriate files. A space or a \downarrow LF> is treated as a special character (not a letter, digit, or ampersand &).

S, Actual-string

G, Actual-string

If a $\langle \downarrow$ LF> and/or space is used as a delimiter for the search-string, SRCHBCD recognizes all occurrences of ACTUAL-STRING. Otherwise, SRCHBCD will only recognize occurrences of ACTUAL-STRING that are preceded and followed by special characters. Use S or G instead of L if searching for the name of a Subroutine or Global.

An S or G search examines object file(s) instead of text file(s). If the corresponding object file for a &BCD file does not exist, then the &BCD (text) file will be searched. If the string does not occur in the existing object file, the &BCD file will not be searched.

FILENAME, DATE,
TIME

Output for each file containing the string, along with a listing of lines in the file that contain that string.

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STATUS

PURPOSE Lists system status information.

SYNTAX STATUS [OPTION – 1[,OPTION – 2[...[,OPTION-N]]]]

- *Options*

Options enable disc volume status to be printed, including:

1. System configuration.
2. System version.
3. File manager status for each disc drive:
 - Logical drive number.
 - Current date and time.
 - Pack ID.
 - Creation date and time of last file manager initialization of volume.
 - Volume name.
 - Volume protection group.
 - Total number of sectors available for files and catalogs on the volume.
 - Largest number of contiguous sectors available on the volume.

FM = VOLUME-LIST Status of indicated volumes.

FM Status of all enabled volumes.

FM = M[,...N] Status of volumes indicated by logical drive numbers M through N.

4. Information about attached system devices:
 - Task number associated with an attached device.
 - Unique device names.
 - Device codes.

STATUS

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SYNTAX (Continued)

VER	System version/date.
DEV	Info on all attachable units in the system.
DEV=USER	Info on units attached to task only.
DEV=PPTDEV	Info on PPTDEV type units only.
DEV=RPTDEV	Info on RPTDEV type units only.
DEV=HARDEV	Info on HARDEV type units only.
DEV=COMDEV	Info on COMDEV type units only.
DEV=CARDEV	Info on CARDEV type units only.
DEV=ALLDEV	Info on units of all types.
DEV=USERCMDV	Info on task COMDEV only.
DEV=DFLTHROV	Info on default HARDEV only.

- *Additional Options*

SELECT Prints COMDEV operational characteristics and information about associated I/O devices for your task, including:

1. COMDEV Characteristics:

- DOFORM/NOFORM
- ECHO/NOECHO
- UPPERCASE/LOWRCASE
- Maximum CPU priority queue:
BACKGROUND
FOREGROUND (1, 2, OR 3)
- DEFAULT ERROR MESSAGE LEVEL
(Long, Normal, Short)

2. Task Devices:

- HARDEV
- PPTDEV
- RPTDEV
- CARDEV
- COMDEV

3. Task Operation

- COMDEV toggle.
- HARDEV toggle.
- HARDFILE, SPOOLING OR HARDFILE
- Active execute files.
- Active USERCMTB's.

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SYNTAX (Continued)

SELECT = ALL Above information for system user tasks.

SELECT = N[,..m] Above information for listed tasks only.

TASK Allows you to print the following about each user task on the system:

1. Task number.
2. Task user name.
3. User-set text string.
4. Last user command.
5. Task status.
 - Not logged in.
 - Executing.
 - I/O WAIT.
6. Current CPU queue:
 - FOREGROUND high, medium, low
 - BACKGROUND.
 - Use IN K words.
 - A-PORT memory.
 - B-PORT memory.

TASK = N[,..M] Above information and full command line is printed for listed tasks.

TASK = FULL Both above information and your last command line.

STAT You may print information about the system and task statistics blocks:

1. Task number.
2. Percentage CPU time used since LOGIN.
3. Percentage CPU time idle since LOGIN.
4. Seconds of CPU time used since LOGIN.
5. Disc reads requested since LOGIN.
6. Disc writes requested since LOGIN.
(If ***** appears, counter has overflowed more than 32767 disc reads/writes).

STATUS

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SYNTAX (Continued)

BATCH

Lists the batch operating parameters.

1. Maximum BATCH tasks allowed.
2. Current count of batch tasks.
3. Count of pending batch requests.
4. Earliest starting time of pending batch jobs.
5. BATCH operator counsole.
6. Maximum time to wait for an operator.
7. Line printer status.
8. Count of pending line printer requests.

ALL

Prints information as though you had entered any of these commands:

STATUS FM, DEV, TASK,
VER, SELECT, STAT

If no options are selected, the default status command is:

STATUS TASK,VER

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SUBMIT

PURPOSE Adds to new or existing Batch job files:

Single line commands
Execute files (job steps).

SYNTAX SUBMIT Filename

Filename = name of executable file submitted to batch processor.

MESSAGE BAD REQUEST Output when no filename given.

SYSNEWS

PURPOSE Outputs current system news.

SYNTAX SYSNEWS

COMMENT System news is input by editing SYSNEWS.SYSNEWS. Control automatically returns to system level if there is no system news.

SYSSIZE

PURPOSE Computes the difference between the system's physical memory capacity and its maximum memory usage under the current configuration. This information is used to check whether sufficient memory is available to accommodate a network task.

SYNTAX SYSSIZE

METHOD Memory availability information output.

ERRORS No error indicators.

TAPETYPE

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TAPETYPE

PURPOSE Outputs information about attached tape units.

SYNTAX TAPETYPE [TAPENAME]

TAPENAME User-assigned taskunitname for a tape unit (see ATTACH).

METHOD Information is output in this format:

```
[9] [ODD]
MT: [ ] TRACK, UN PACKED, [ ]
[7] [EVEN]
```

COMMENT After tape unit information is output, control is returned to the O/S.

TEST

PURPOSE Checks to see whether the system is functioning properly and if disc access is possible.

SYNTAX TEST

MESSAGES **SUCCESS** Test is successful.

ERROR MESSAGE There is a problem.

COMMENT Control returns automatically to the O/S.

UP

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UP

PURPOSE	Sends the FORM FEED command to the HARDEV.
SYNTAX	UP [N] N = Number of form feeds; default = 1.
COMMENT	Control returns automatically to system level.
MESSAGES	COUNT MUST BE LESS THAN 10 Printed when N is more than 10.

USERCMTB

PURPOSE	Specifies a file as your command table, or indicates that there is no table.
SYNTAX	USERCMTB [Filename] Filename Names an existing user command table.
COMMENT	Until you logout or execute another USERCMTB command, your user command table is available only to the task performing the USERCMTB command. USERCMTB with no filename argument removes current user command table, if any.
MESSAGE	USERCMTB Output after current user command table is removed.

Section Four
SYSTEM ERRORS

Section 4 SYSTEM ERRORS

This section lists all CGOS error codes and messages. The following chart lists on-line filenames, the hexadecimal range of error codes, and the particular type of error. Material in the chart is explicitly broken down into fifteen sections that relate to specific devices and commands.

Please refer to on-line documentation if there is any question regarding the codes and messages.

SOFTWARE FAILURES

Software failures, though labeled as such, are sometimes caused by a hardware failure. Software failures can cause data problems so subtle and widespread as to invalidate all data on a disc pack. Consult with the System Manager for relevant recovery procedures.

ERROR LIST

A list of on-line filenames and Error Message File Ranges follows.

<u>Error</u>	<u>File/Error Range</u>	<u>Error Lists</u>
System Error	SYSNEWS.ERROR.SYS (0301-FF07)	System error codes/meanings.
Device Errors (F006)	AC0	Contains encoded error description. See DUMPERR.
	SYSNEWS.ERROR.F006DEV (0000-0012 - Devices)	Left byte error code descriptions.
	SYSNEWS.ERROR.F006TYP (0001-0035 - Errors)	Right byte error code descriptions.
File Management Errors	SYSNEWS.ERROR.FM (C004-C141)	File Management error codes/descriptions.
FUTIL Errors	SYSNEWS.ERROR.FUTIL.RUNNERS (A000-A019 I/O Handler) (A020-A024 - Disc) (A030-A031 - Paper Tape & Card Reader) (A040-A069 - Magnetic Tape) (A070-A093 - Miscellaneous)	

System Errors

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ERROR LIST

(Continued)

<u>Error</u>	<u>File/Error Range</u>	<u>Error Lists</u>
FUTIL Errors (Continued)	SYSNEWS.ERROR.FUTIL.SCANERRS (A180-A1B2 - FUTIL Scanner)	
	SYSNEWS.ERROR.FILESCAN (A100-A114 - Utility)	
LOADER	SYSNEWS.ERROR.LOADER.MAJOR (8001-8052)	
	SYSNEWS.ERROR.LOADER.MINOR (8080-9092)	
	SYSNEWS.ERROR.LOADER.DIAGNOSTICS (80D1-80D5)	
Others	SYSNEWS.ERROR.UTIL (9801-980A)	
	SYSNEWS.ERROR.SRCHBCD (8001-800B)	
	SYSNEWS.ERROR.EDIT (8001-8014)	
	SYSNEWS.ERROR.TECO (8000-8119)	

Describing Errors

The amount of information output to users when errors occur can be modified to suit particular needs. Use the SELECT command to specify one of three possible information levels:

SELECT ERRLEVEL = SHORT	Error number only.
SELECT ERRLEVEL = NORMAL	Error number and a brief description.
SELECT ERRLEVEL = LONG	The error number, descriptive title, and detailed description.

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Changing Error Message Content

Error messages can be adapted to meet special site requirements. The following printout illustrates the steps involved when error message content is changed.

```
5>EDITCMTB CMTB.FILE, N ↓
**ERROR CALL C007**
--FILE OR CATALOG ALREADY EXISTS
(COPEN, RENAME)
```

Command causes error message. Part of which is to be replaced.

```
5>SRCHBCD SYSNEWS.ERROR//NLEV ↓
SRCHBCD SYSNEWS.ERROR//NLEV
5-6-8 0:32:59
```

Instruct the system to find the error message for C007.

```
#L, C007
SYSNEWS.ERROR.&BCD.FM
5-6-8 0:05:07
```

Type Search command (locate) for C007.

```
34! = = C007
```

Line of text is given containing C007; terminate with ESC-Q when you get data.

```
#
5>EDIT SYSNEWS.ERROR.FM ↓
#T34-39
34! = = C007
35!--FILE OR CATALOG ALREADY EXISTS
36!(COPEN,RENAME)
37! = =
38! = = C008
39!--ATTEMPT TO DELETE A NON-EMPTY CATALOG
#R35-36
--COULD NOT CREATE FILE OR CATALOG;
--FILE OR CATALOG ALREADY EXISTS
```

Use Editor to change message.

```
#F
5>EDITCMTB CMTB.FILE, N ↓
**ERROR CALL C007**
--COULD NOT CREATE FILE OR CATALOG;
--FILE OR CATALOG ALREADY EXISTS
```

Retype the original command; gets new error message.

System Errors

SYSNEWS.ERROR.SYS

```
0100 UNKNOWN FORMAT CODE (&SCNFMT)
0101 FORMAT DOES NOT MATCH DATA TYPE (&SCNFMT)
0103 BAD SCALE FACTOR (&FORMIN,&FORMOUT)
0104 NESTING TOO DEEP IN FORMAT (&FORMIN,&FORMOUT)
0105 I/O BUFFER OVERFLOW (&ONECHAR)
0106 BAD CHARACTER COUNT FOR ALPHA FORMAT — A1 OR A2 ALLOWED (&ALPHA)
0184 EXPONETIATION WITH BASE EQUAL TO ZERO AND WITH A NEGATIVE INTEGER EXPONENT
0185 OVERFLOW FROM EXPONENTIATION WITH INTEGER BASE AND AN INTEGER EXPONENT
0186 ARGUMENT EQUAL TO OR LESS THAN ZERO. OR EXPONENTIATION WITH BASE EQUAL TO OR LESS THAN ZERO AND WITH A REAL EXPONENT (ALOG, DLOG)
0190 OVERFLOW (TAN,DTAN)
0191 OVERFLOW IN LIBRARY ROUTINE OR FROM EXPONENTIATION WITH A REAL EXPONENT (EXP,DEXP,DPOWER2)
```

System Errors

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System Errors (Continued)

0192	UNDERFLOW IN LIBRARY ROUTINE OR FROM EXPONENTIATION WITH A REAL EXPONENT (EXP,DEXP,DPOWER2)
0193	ARGUMENT LESS THAN ZERO (SQRT, DSQRT)
0195	BOTH ARGUMENTS EQUAL TO ZERO (ATAN1,DATAN2)
0196	DOUBLE INTEGER DIVISION BY ZERO, OR DOUBLE INTEGER REMAINDER MODULO ZERO
0301	BAD INPUT STRING LENGTH REQUESTED (TYPIN)
0302	HARDFILE — MORE CHARACTERS THAN BUFFER SIZE (TYPOUT)
0303	A PRINT REQUEST WAS DIRECTED TO THE HARDEV BUT THERE WAS NO HARDEV ATTACHED TO THE TASK (GLP)
0304	PRINT REQUEST TO UNKNOWN DEVICE REQUESTED (GLP)
0400	NEGATIVE STRING LENGTH
0401	BAD STRING LENGTH SUPPLIED (INITCHAR)
0402	BAD CHARACTER POINTER TO STRING (NXTCHAR)
0403	THE LINE BEING RESTORED WAS MEANINGLESS (RSTRSCAN)
0404	THE SCAN POSITION BEING RESTORED IS NOT A VALID POSITION (RSTMARK)
0405	AN ERROR IN THE SCAN LINE WAS DISCOVERED (REINITCH)
0501	TOO MANY CHARACTERS FOR A HEXADECIMAL NUMBER (HEXNUM)
0502	NO CHARACTERS WHERE HEXADECIMAL NUMBER EXPECTED (HEXNUM)
0503	CHARACTER IN A HEXADECIMAL NUMBER IS NOT A HEXADECIMAL DIGIT (HEXNUM)
0603	BAD BUFFER SIZE ON PACKED TAPE INPUT
0701	MISSING FILE NAME (CATOPT)
0702	MISSING SLASH (CATOPT)
0703	MISSING EQUAL SIGN (=) (CATOPT,SKIPEQ)
0704	BAD FILE TYPE (CATOPT)
0705	BAD DATE (CATOPT)
0706	BAD OPTION (CATOPT)
0707	MISSING COMMA (CATOPT)
0708	MISSING NOT-EQUAL SIGN (#) (SKIPEQ)
0709	MISSING EQUAL/NOT-EQUAL SIGN (= OR #) (SKIPEQ)
0801	NON-ALPHABETIC CHARACTER WHERE AN IDENTIFIER IS EXPECTED (IDENT)
0802	TOO MANY CHARACTERS IN AN IDENTIFIER THE MAXIMUM NUMBER OF CHARACTERS IS 8. (IDENT)
0901	NO CHANNEL AVAILABLE (RUN)
0902	NOT AN OVERLAY (RUN)
0903	BAD START LOCATION (RUN)
0904	BAD CORE TOP (RUN)
0905	NOT ENOUGH CORE (RUN)
0906	MISSING FILE NAME (DO)
0907	THE DO COMMAND COULDN'T FIGURE OUT WHAT TO 'DO' TO THIS FILE (DO)
0A00	A DEVICE ERROR OCCURRED ON THE COMDEV OR HARDEV WHILE TRYING TO INITIALIZE THE PRINTER/FORMATTER (CHGPRFMT,PRINTLIN)
0A01	UNABLE TO OBTAIN A PHYSICAL DEVICE FOR PRINTING (CHGPRFMT)
0A02	ILLEGAL CARRIAGE CONTROL REQUESTED (PRINTLIN)
0A03	VALUE GIVEN IS ILLEGAL FOR THE OPTION REQUESTED (CHGPRFMT)
0A04	ILLEGAL OPTION (CHGPRFMT)
BADC	BAD COMPUTED GOTO INDEX (&COMPGO)
0E01	NO CHARACTERS WHERE AN INTEGER IS EXPECTED (INT)
0E02	NON-NUMERIC CHARACTER WHERE AN INTEGER IS EXPECTED (INT)
0E03	TOO MANY CHARACTERS IN AN INTEGER (INT)
0E04	ALPHABETIC CHARACTER IN AN INTEGER (INT)
E010	ILLEGAL PAGE SLOT IDENTIFIER
E014	BAD TASK BLOCK POINTER (PATASK)
E020	ILLEGAL SYSTEM PAGE IDENTIFIER
E024	CALLER DOES NOT OWN THE PAGE SPECIFIED BY SPID
E030	ILLEGAL TYPE OF MEMORY
E040	NO PAGE AVAILABLE
E050	ILLEGAL PERMISSION (ALLOWING A READ OR A WRITE) WITH A NULL SPID
E051	PROTECTION VIOLATION: PAGE CANNOT BE ACCESSED AS SPECIFIED BY PERMIT
E060	ILLEGAL PROTECTION ATTRIBUTE
E070	PAGE SPECIFIED BY SPID IS IN THE CALLER'S PAGE FRAME
E080	INVALID TASK STATUS BLOCK (TSB) (COPYINIT,COPYBLK,COPYCLS)
D000	NETWORK LINK DOWN — NETWORK TASK LOGGED OUT

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System Errors (Continued)

D011	INVALID LINK ID
D012	UNABLE TO ATTACH PCUC DEVICE
D013	UNABLE TO ATTACH PCUG DEVICE
D014	UNABLE TO ACCESS PCU DEVICE
D020	INVALID DESTINATION SITE ID IN A NETWORK REQUEST
D021	INVALID SYS ROUTINE ID
D022	NO NETWORK IN CONFIGURATION
D100	NETWORK TASK DOWN
D101	PCU HARDWARE ERROR
D102	WORD COUNT DOESN'T MATCH
D103	HEADER READ TIMEOUT
D104	HEADER MATCH TIMEOUT
D105	DATA READ TIMEOUT
D106	WRITE TIMEOUT
D200	GENERAL SOFTWARE ERROR CODE (FOR NETWORK TASK)
D201	SEGMENT STEP OUT OF RANGE
D202	INVALID ECB OWNER
D203	BAD HEADER
D300	BLOCK SIZE GREATER THAN NETWORK TASK BUFFER ALLOWS
F001	TTY OUTPUT REQUESTED BY TASK WHICH DID NOT HAVE TTY
F002	TRIED TO TAPE, TREAD, TWRITE OR USE TAPE ON A UNIT WHICH IS NOT A TAPE UNIT
F003	BAD UNIT NAME ON I/O REQUEST
F004	BAD I/O REQUEST COMPONENT DOES NOT EXIST
F005	INVALID IOFLAG ADDRESS
F007	ATTEMPT TO UNLOCK A QUEUE WHICH THE TASK DOES NOT HAVE (AC0 = ADDRESS OF QUEUE)
F008	REQUIRED ACTION ON UNIT NOT ATTACHED TO TASK
F009	END OF TAPE
F00A	BAD UNIT ARGUMENT IN DISC I/O CALL THIS ERROR USUALLY INDICATES THAT A CATALOG OR RIB SECTOR OF THE FILE MANAGER HAS BEEN CLOBBERED.
F00B	BAD COUNT ARGUMENT OR BUFFER ADDRESS IN DISC I/O CALL
F00C	BAD ARGUMENTS TO USETAPE
F00D	TRIED TO DO LBLGO ON A BAD LABEL A LABEL IS BAD IF THE RETURN ADDRESS IS NEGATIVE OR THE CORE CONSTANT.
F00E	TRYING TO DO AN RPT1 (OR PPT1 OR CARD1) WITH NO RPTDEV (OR PPTDEV OR CARDEV) IN THE CASE THAN THERE ARE NO RPTDEV'S (OR PPTDEV'S OR CARDEV'S) IN THE CONFIGURATION, AC1 CONTAINS THE LOCATION CALLING RPT1 (OR PPT1 OR CARD1) + 1.
F00F	EXCEED DISC AREA TOP ON A DREAD OR A DWRITE AC2 CONTAINS THE REQUESTED DLOC RELATIVE TO START OF TASK DISC AREA.
F011	INVALID TASKBLOCK POINTER FOR INTER-TASK ARGUMENT COPY (PASSARGS)
F012	REQUEST TO QUEUE A TASK FOR CPU THAT IS ALREADY QUEUED (ENQDQ — THIS ERROR DOES NOT PRINT, SYSTEM HALTS WITH F012 IN AC0)
F013	INVALID NEWPC ON REQUEST TO QUEUE A TASK FOR CPU (ENQDQ THIS ERROR DOES NOT PRINT, SYSTEM HALTS WITH F013 IN AC0)
F014	INVALID WORD COUNT FOR INTER-TASK ARGUMENT COPY (PASSARGS)
F015	GETUVAL READ PROTECTION ERROR (IODONE)
F016	PUTUVAL WRITE PROTECTION ERROR (IODONE)
F017	FATAL ERROR IN PARTIAL SECTOR (WAIT) I/O (SDREAD/SDWRITE)
F020	INVALID ARGUMENT TO SETTRACE
F021	INVALID ARGUMENT TO SUBTRACE
F023	BAD SPID IN &TRSET — E020 —
F024	ROLL TABLE OVERFLOW MAXIMUM NUMBER OF SUBROUTINE NESTING IS 47
F025	OVERLAY TABLE OVERFLOWED MAXIMUM NUMBER OF OVERLAYS IN CORE AT ONCE IS 16
FF02	UNDEFINED SUBROUTINE
FF03	WILD JUMP
FF04	WRITE VIOLATION: ATTEMPT TO WRITE READ-PROTECTED MEMORY
FF05	ACCESS VIOLATION: ATTEMPT TO READ OR WRITE ACCESS-PROTECTED MEMORY
FF06	INSTRUCTION VIOLATION: ATTEMPT TO DISABLE MAP FROM TASK SPACE
FF07	DEFER VIOLATION: NINTH LEVEL OF INDIRECTION EXCEEDED

System Errors

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DEVICE ERRORS

This printout defines the device on which the F006 Error occurred.

0000	MAGNETIC TAPE
0001	DISC
0002	TELETYPE
0003	LINE PRINTER
0004	IOS
0005	NUMERIDEX
0006	INFOTON
0007	XYNETICS
0008	PCUG
0009	TERMINET
000A	PAPER TAPE READER
000B	PAPER TAPE PUNCH
000C	CARD READER
000D	PCUC
000E	TASK BASED I/O
0010	INSTAVIEW
0011	GRAPHICS PROCESSING UNIT
0012	DOT-MATRIX PRINTER/PLOTTER

F006 TYPE ERRORS

This printout defines the type of error which caused the F006 error. The error was detected by PERROR.

0001	CALL IS NOT A WRITE OR CONTROL
0002	BAD LENGTH ARGUMENT (CONTROL)
0003	BAD LENGTH ARGUMENT (WRITE)
0004	MEMORY PROTECTION VIOLATION (CONTROL,WRITE) WHILE ACCESSING BUFFER
0005	INVALID ARGUMENT (READ,WRITE)
0006	BAD ARGLST(0) (CONTROL)
0007	BAD ARGLST(0) (READ,WRITE)
0008	BAD LENGTH ARGUMENT (READ,WRITE)
0009	MEMORY PROTECTION VIOLATION (READ,WRITE) WHILE ACCESSING BUFFER
000A	MEMORY PROTECTION VIOLATION (WRITE) WHILE ACCESSING BUFFER
000B	MEMORY PROTECTION VIOLATION (CONTROL) WHILE ACCESSING ARGLST
000C	MEMORY PROTECTION VIOLATION (WRITE) WHILE ACCESSING ARGLST
000D	MEMORY PROTECTION VIOLATION (WRITE,CONTROL) WHILE ACCESSING ARGLST
000E	MEMORY PROTECTION VIOLATION (READ,WRITE) WHILE ACCESSING ARGLST
0010	BAD LENGTH ARGUMENT (READ)
0011	MEMORY PROTECTION VIOLATION (READ) WHILE ACCESSING BUFFER
0012	MEMORY PROTECTION VIOLATION (READ) WHILE ACCESSING ARGLST
0013	INVALID ARGUMENT (CONTROL)
0014	END OF TAPE
0155	EXCEEDED MTRECMX WHILE PERFORMING TAPE OPERATION
0016	HARDWARE ERROR DETECTED IN TAPE I/O

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F006 TYPE ERROS (Continued)

0017	COMMAND NON-EXISTENT
0018	TAPE I/O ATTEMPTED WHEN TAPE UNIT NOT READY
0019	ERROR IN TAPE I/O
0020	INPUT ABORTED WITH ERROR DETECTED
0021	INTERFACE SIGNALLED ERROR
0022	DEVICE ALREADY IN USE
0023	GPU DID NOT RESPOND TO NIOP
0024	HARDWARE ERROR IN DISC I/O OR DISC IS NOT ON-LINE
0025	BAD DLOC ON DISC PACK
0026	INVALID DRIVE NUMBER ARGUMENT
0027	DISC ERROR NOT RECOVERABLE BY RETRIES
0028	DISC ERROR ON RECALIBRATE ATTEMPT
0031	WORDCNT OR DCH BUFFER ADDRESS GREATER THAN '7FFF'X (LOCKDCH)
0032	WORDCNT PLUS BUFFER ADDRESS GREATER THAN '7FFF'X (LOCKDCH)
0034	PERMISSION FOR PAGE NOT CONSISTENT WITH TRANSFER TYPE REQUESTED (LOCKDCH)
0035	ONE (OR MORE) OF THE PAGES ON WHICH THE DCH BUFFER RESIDES HAS A NULL SPID (LOCKDCH)

FILE MANAGER ERRORS

FM errors are used by PERROR (SYSOV.PERROR) to output appropriate error message to user COMDEV. See PERROR for details of table format.

C004	CATALOG LEVEL IN COMPLETE FILE NAME IS NOT A CATALOG OR VOLUME (COPEN, REOPN,MOPEN,DELETE,RENAME)
C005	CATALOG IN COMPLETE FILE NAME NOT FOUND (COPEN,ROPEN,MOPEN,DELETE, RENAME)
C006	FILE NOT FOUND (COPEN,ROPEN,MOPEN,DELETE,RENAME)
C007	FILE OR CATALOG ALREADY EXISTS (COPEN,RENAME)
C008	ATTEMPT TO DELETE A NON-EMPTY CATALOG (DELETE)
C009	FILE STRUCTURE IS OFF-LINE OR DOES NOT EXIST (ALL)
C00A	UNDEFINED FILE MANAGER ENTRY POINT CALLED (BRANCH)
C010	ATTEMPT TO MODIFY OR SUPERSEDE A CATALOG (COPEN,MOPEN)
C011	ATTEMPT TO OPEN FOR READ A FILE ALREADY OPEN FOR MODIFICATION (ROPEN)
C012	PROTECTION VIOLATION, FILE IS ACCESS PROTECTED (COPEN,ROPEN,MOPEN,DELETE, RENAME)
C016	FILE IS TASK PROTECTED (COPEN,ROPEN,MOPEN,DELETE,RENAME)
C017	FILE OR CATALOG IN USE (RENAME,DELETE)
C018	ATTEMPT TO WRITE ACCESS A FILE NOT OPEN FOR WRITE (FWRITE)
C019	ATTEMPT TO SHORT-OPEN A NON-CONTIGUOUS FILE (ROPEN)
C01A	ATTEMPT TO OPEN FOR MODIFY A FILE THAT IS IN USE (MOPEN)
C01B	ATTEMPT TO OPEN FOR CREATE WITH SUPERSEDE A FILE ALREADY OPENED FOR MODIFY OR CREATE WITH SUPERSEDE (COPEN)
C01C	ATTEMPT TO READ PAST END OF FILE (FREAD)
C01D	ATTEMPT TO WRITE PAST END OF FILE (FWRITE)
C01E	ATTEMPT TO READ A NEGATIVE WORD COUNT (FREAD)
C01F	ATTEMPT TO WRITE A NEGATIVE WORD COUNT
C020	NOT ENOUGH CONTIGUOUS SECTORS AVAILABLE (COPEN,CLOSE,FWRITE)
C021	DISC SPACE EXHAUSTED FOR NEW FILE DATA ON LOGICAL FILE UNIT (COPEN,CLOSE)
C022	DISC SPACE EXHAUSTED FOR NEW FILE ENTRY ON LOGICAL FILE UNIT (COPEN,CLOSE)
C023	DISC SPACE EXHAUSTED ON EXPANDING CLOSE ON THIS FILE UNIT FILE IS CLOSED PROPERLY, BUT WITH ORIGINAL FILE SIZE (CLOSE)
C030	INVALID STATUS WORD IN CHANNEL BLOCK (CLOSE)
C034	STATUS WORDS IN FILE ENTRY AND CHANNEL BLOCK ARE INCONSISTENT (CLOSE)
C035	INVALID STATUS WORD IN FILE ENTRY (COPEN,ROPEN,MOPEN)
C036	STATUS WORD AND USE COUNT IN FILE ENTRY ARE INCONSISTENT (COPEN,ROPEN, MOPEN)
C037	INVALID USE COUNT IN FILE ENTRY (COPEN,ROPEN,MOPEN)
C038	INVALID STATUS WORD, USE COUNT, OR INCONSISTENCY BETWEEN THE TWO WHEN CLOSING A FILE. FILE NOT CLOSED. (CLOSE)

System Errors

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FILE MANAGER ERRORS (Continued)

C03A	HARDWARE DISC ERROR (ALL)
C03B	PUSH DOWN LIST OVERFLOW (CATWALK)
C040	ATTEMPT TO ACCESS A CHANNEL WHICH IS ALREADY IN USE BY THIS TASK (COPEN,ROPEN,MOPEN) IN READCHAN/WRITCHAN
C041	ATTEMPT TO ACCESS A CHANNEL WHICH IS NOT IN USE (FREAD,FWRITE) IN READCHAN/WRITCHAN
C043	ILLEGAL CHANNEL USED FOR A READ, WRITE, OR CLOSE REQUEST (CLOSE,FREAD,FWRITE) IN READCHAN/WRITCHAN
C045	CHANNEL SPACE EXHAUSTED. NO CHANNEL HAS BEEN ALLOCATED. (COPEN,ROPEN,MOPEN) IN ALLOCHAN
C046	ATTEMPT TO CLOSE A FILE WHICH HAS A ZERO USE COUNT AND/OR IS NOT MARKED AS IN-USE (CLOSE)
C047	OWNER OF CHANNEL IS NOT THIS TASK (CLOSE,FREAD,FWRITE,RENAME) IN READCHAN/WRITCHAN
C048	THERE ARE NO OPEN CHANNELS FOR THIS TASK (CLOSE)
C049	ALL CHANNELS OWNED BY THIS TASK ARE MARKED AS NO-CLOSE OR ARE SYSTEM CHANNELS WHICH CANNOT BE CLOSED (CLOSE)
C04A	AN ERROR HAS BEEN DETECTED IN THE DISC RESIDENT COPY OF THE FILE CHANNEL DATA STRUCTURES.
C04B	AN ERROR HAS BEEN DETECTED IN THE FILE MANAGER RESIDENT COPY OF THE FILE CHANNEL DATA STRUCTURES.
C050	INVALID CHARACTER IN FILE NAME (COPEN,ROPEN,MOPEN,DELETE,RENAME)
C051	LEVEL IN FILE NAME EXCEEDS 20 CHARACTERS (COPEN,ROPEN,MOPEN,DELETE,RENAME)
C052	NO CHARACTERS IN FILE NAME (COPEN,ROPEN,MOPEN,DELETE,RENAME)
C053	ATTEMPTING TO CREATE A FILE WITH ZERO OR LESS SECTORS (COPEN)
C054	FILE NAME CONSISTS OF MORE THAN ONE LEVEL OR DOES NOT TERMINATE PROPERLY (RENAME)
C055	COMPLETE FILE NAME EXCEEDS 80 CHARACTERS (COPEN,ROPEN,MOPEN,DELETE,RENAME,CATWALK)
C056	ATTEMPT TO USE A VOLUME SPECIFICATION WITHIN A DIRECTORY CATALOG
C057	COULD NOT CONSTRUCT FULL FILENAME FROM DLOC AND INDEX OF FILE ENTRY (BUILDNAM)
C061	INVALID ALLOCATION REQUEST (COPEN,CLOSE,FWRITE)
C062	RIB ERROR DURING DEALLOCATION (CLOSE,DELETE)
C070	VOLUME INFORMATION IN CORE DOES MATCH REQUESTED VOLUME (ENABVOL, DSABVOL)
C071	VOLUME NAME AND FILE ENTRY ARE INCONSISTANT THIS USUALLY MEANS AT LEAST PART OF THE FILE STRUCTURE IS BLOWN (COPEN,MOPEN,ROPEN,RENAME,DELETE,XOPEN)
C072	VOLUME IS IN USE OR ATTACHED (DSABVOL)
C073	DEFAULT VOLUME STARTING DLOC IS NON-ZERO (DFLTVOL)
C074	VOLUME NAME IN PRIMARY DISC VOLUME ENTRY DOES NOT MATCH VOLUME NAME OF AUXILIARY VOLUME
C075	ATTEMPT TO USE A VOLUME NAME AS A NEWNAME (RENAME)
C076	MORE THAN ONE VOLUME LEVEL IN A FILENAME THIS ERROR USUALLY MEANS THAT AT LEAST PART OF THE FILE MANAGER IS BLOWN (COPEN,ROPEN,MOPEN,XOPEN,RENAME,DELETE)
C077	REQUESTED VOLUME NOT ENABLED (COPEN,ROPEN,MOPEN,XOPEN,RENAME,DELETE,DSABVOL,DFTLVOL)
C078	REQUESTED VOLUME ALREADY ENABLED (ENABVOL)
C079	REQUESTED VOLUME ENABLED ON ANOTHER DRIVE (ENABVOL)=
C07A	REQUESTED VOLUME IS IN USE AS A DIRECTORY (DSABVOL)
C080	DIRECTORY FILE IS EMPTY (DOTXTFIL)
C081	COUNT OF DIRECTORY ENTRIES EXCEEDS MAXIMUM (ADDTODIR)
C082	DIRECTORY DISABLE CHARACTER NOT PERMITTED IN DIRECTORY ENTRY (ADDTODIR,ENABDIR)
C083	DIRECTORY ENTRY EXISTS AND IS NOT A CATALOG (ADDTODIR)
C084	FORMAT ERROR IN DIRECTORY ENTRY (ADDTODIR,DOTXTFIL,ENABDIR)
C085	COUNT OF DIRECTORY ENTRIES IS LESS THAN 1 (ENABDIR,LISTDIR,WRITEDIR)
C086	INVALID OPTION SPECIFIED (ADDTODIR)
C087	DIRECTORY ENTRY APPEARS MORE THAN ONCE (ADDTODIR)

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FILE MANAGER ERRORS

(Continued)

C088	DIRECTORY TEXT FILE NOT FOUND (DOTXFIL)
C089	A TASK BASED DIRECTORY IS ALREADY ENABLED FOR THIS TASK
C08A	NO TASK BASED DIRECTORY IS ENABLED FOR THIS TASK
C090	BAD OPTION (TSKDATA)
C091	ATTEMPT TO OBTAIN TASK GLOBAL DATA FROM THE FM TASK (TSKDATA)
C0A0	THE DISC RESIDENT VERSION OF THE CLUSTER ALLOCATION TABLE CONTAINS AN INVALID BITMAP FOR THE SYSTEM AREA OF THE DISC. THE INTEGRITY OF FILES CURRENTLY ON THE DISC IS PRESERVED. HOWEVER, NO FURTHER ALLOCATION OF DISC SPACE IS POSSIBLE. THIS IS A FATAL FILE MANAGER ERROR AND SHOULD BE REPORTED TO THE SYSTEM ADMINISTRATOR IMMEDIATELY. (GETCAT)
C0A1	THE CORE RESIDENT VERSION OF THE CLUSTER ALLOCATION TABLE CONTAINS AN INVALID BITMAP FOR THE SYSTEM AREA OF THE DISC. THE INTEGRITY OF FILES CURRENTLY ON THE DISC IS PRESERVED. HOWEVER, NO FURTHER ALLOCATION OF DISC SPACE IS POSSIBLE. THIS IS A FATAL FILE MANAGER ERROR AND SHOULD BE REPORTED TO THE SYSTEM ADMINISTRATOR IMMEDIATELY. (GETCAT)
C0A2	AN ATTEMPT HAS BEEN MADE TO ALLOCATE DISC SPACE IN THE SYSTEM PORTION OF THE DISC. THIS IS A FATAL FILE MANAGER ERROR AND SHOULD BE REPORTED TO THE SYSTEM ADMINISTRATOR IMMEDIATELY. (SETCAT)
C0A3	AN ATTEMPT HAS BEEN MADE TO ALLOCATE DISC SPACE IN THE SYSTEM PORTION OF THE DISC. THIS IS A FATAL FILE MANAGER ERROR AND SHOULD BE REPORTED TO THE SYSTEM ADMINISTRATOR IMMEDIATELY. (SETCAT)
C0A4	AN ATTEMPT HAS BEEN MADE TO DE-ALLOCATE DISC SPACE IN THE SYSTEM PORTION OF THE DISC. THIS IS A FATAL FILE MANAGER ERROR AND SHOULD BE REPORTED TO THE SYSTEM ADMINISTRATOR IMMEDIATELY. (SETCAT)
C0B0	FILE OR CATALOG DOES NOT REQUIRE CLEARING
C0B1	ATTEMPT TO CLEAR A FILE OR CATALOG WHICH IS OPENED ON A CHANNEL BY ANOTHER TASK
C0B2	ATTEMPT TO CLEAR A FILE WHICH IS A WORKFILE (TYPE=FF)
C0B3	COULD NOT CONSTRUCT FULL FILENAME FROM DLOC AND INDEX OF FILE ENTRY FOUND IN THE CHANNEL AREA ON DISC (FMCLEAR ERROR)
C0B4	ATTEMPT TO DELETE A FILE WHICH IS OPENED ON A CHANNEL BY ANOTHER TASK
C0B5	ATTEMPT TO CLEAR A FILE OR CATALOG WHICH IS OPENED ON A CHANNEL BY THIS TASK
C0B6	ATTEMPT TO DELETE A FILE WHICH IS OPENED ON A CHANNEL BY THIS TASK
C100	NO CHANNEL AVAILABLE (GETFILE)
C101	TEXT FILE IS ALREADY OPEN USING THE SAME FSB FSB(0) 1 (GETFILE)
C102	TEXT FILE IS NOT OPEN (GETSTART)
C103	TEXT FILE IS NOT OPEN (GETCLOSE)
C104	TEXT FILE IS NOT OPEN (GETLINE)
C105	FORMAT ERROR IN TEXT FILE (GETLINE)
C108	TEXT FILE BUFFER IS NOT ALREADY IN MEMORY (GETCLEAR)
C109	TEXT FILE IS NOT OPEN (GETMARK)
C10A	TEXT FILE IS NOT OPEN (GETPOS)
C10B	SAVED POSITION BELONGS TO DIFFERENT TEXT FILE (GETPOS)
C10C	LINE TOO LONG (GETLINE)
C110	NO CHANNEL AVAILABLE (PUTFILE)
C111	TEXT FILE IS ALREADY OPEN USING THE SAME FSB FSB(0) 1 (PUTFILE)
C113	TEXT FILE IS NOT OPEN (PUTCLOSE)
C114	TEXT FILE IS NOT OPEN (PUTLINE)
C117	TEXT FILE IS NOT OPEN (PUTABORT)
C120	NO CHANNEL AVAILABLE (READFILE)
C121	TEXT FILE IS ALREADY OPEN USING THE SAME FSB FSB(0) 1 (READFILE)
C122	TEXT FILE IS NOT OPEN (READPOS)
C123	TEXT FILE IS NOT OPEN (READCLOS)
C124	TEXT FILE IS NOT OPEN (READBLOK)
C126	TEXT FILE IS NOT OPEN (READSECT)
C129	BINARY FILE IS NOT OPEN (READMARK)
C130	NO CHANNEL AVAILABLE (WRITFILE)
C131	A FILE IS ALREADY OPEN USING THE SAME FSB FSB(0) 1 (WRITFILE)
C133	BINARY FILE IS NOT OPEN (WRITCLOS)
C134	BINARY FILE IS NOT OPEN (WRITBLOK)

System Errors

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FILE MANAGER MANAGER (Continued)

C140	NO CHANNEL AVAILABLE (MODIFILE)
C141	A FILE IS ALREADY OPEN USING THE SAME FSB FSB(0) 1 (MODIFILE)
C201	THE BUFFER MANAGEMENT SYSTEM IS NOT ENABLED.
C202	ILLEGAL FILE IDENTIFIER PASSED TO THE BUFFER MANAGEMENT SYSTEM.
C203	INACTIVE FILE IDENTIFIER PASSED TO THE BUFFER MANAGEMENT SYSTEM.
C204	ATTEMPT TO SET THE SIZE OF A FILE TO A NEGATIVE NUMBER IN THE BUFFER MANAGEMENT SYSTEM.
C205	ATTEMPT TO ATTACH TOO MANY FILES TO THE BUFFER MANAGEMENT SYSTEM.
C206	ATTEMPT TO SETDOWN THE BUFFER MANAGEMENT SYSTEM WHEN IT IS ALREADY OFF.
C207	ATTEMPT TO SETDOWN THE BUFFER MANAGEMENT SYSTEM WHEN A FILE IS ATTACHED TO IT.
C208	ATTEMPT TO SETUP THE BUFFER MANAGEMENT SYSTEM WHEN IT HAS ALREADY BEEN SET UP.
C209	ATTEMPT TO READ PAST THE END OF A FILE USING THE BUFFER MANAGEMENT SYSTEM.
C20A	ATTEMPT TO LOCK A SECTOR THAT IS NOT IN MEMORY
C20B	ATTEMPT TO BRING A BUFFER INTO MEMORY WHEN NO MORE ADDRESS SPACE IS AVAILABLE
C20C	ATTEMPT TO CHANGE A WINDOW BUFFER THAT DOES NOT BEGIN ON A PAGE BOUNDARY
C20D	ILLEGAL USETYPE PASSED TO THE BUFFER MANAGEMENT SYSTEM
C20E	WINDOW PAGE TABLE OVERFLOW
C20F	NEGATIVE WORD COUNT PASSED TO THE BUFFER MANAGEMENT SYSTEM
C300	THE BATCH FILE IS NOT OPEN FSB(0) 2 (BATCLEAR)
C301	THE BATCH FILE IS NOT OPEN FSB(0) 2 (BATCLOSE)
C302	THE FSB HAS A BAD INITIAL VALUE FSB(0) 1 (BATOPEN)
C303	INVALID OPTION (BATRREQ)
C304	THE STEP DOES NOT EXIST (BATRREQ)
C305	INVALID STEP (BATWREQ)
C306	BAD OPTION (BATWREQ)
C309	THE BATCH FILE IS NOT OPEN (BATHEADR)
C30A	THE BATCH FILE IS NOT OPEN (BATWSDAT)
C30B	THE BATCH FILE IS NOT OPEN (BATRSDAT)
C30C	BAD BATCH FILE NAME (BATOPEN)

FMCLEAR ERRORS

SYSNEWS.ERROR.FMCLEAR

8001	A SLASH (/) WAS EXPECTED IN THE COMMAND LINE
8002	INVALID FMCLEAR OPTION SPECIFIED
8003	UNKNOWN CHARACTER(S) AT END OF COMMAND LINE
8004	FMCLEAR IS AN ILLEGAL COMMAND WITHIN AN EXECUTE FILE
8005	FMCLEAR IS AN ILLEGAL COMMAND WHEN A HARDFILE IS OPEN
8006	FMCLEAR OF OPEN CHANNELS NOT ALLOWED WHILE OTHER USERS ARE LOGGED IN
8007	FMCLEAR OF SYSCATLG NOT ALLOWED WHILE OTHER USERS ARE LOGGED IN
8008	FMCLEAR OF SYSCATLG NOT ALLOWED FOR REMOTE NODES
8009	BATCH TASK LOGGED IN. FMCLEAR NOT ALLOWED

Messages Only in This Group:

8800	BOTH THE DISC RESIDENT AND FILE MANAGER RESIDENT CHANNEL AREAS HAVE BEEN RE-INITIALIZED.
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FUTIL ERRORS

Error Code Range — A000 - A0FF

Contains the error messages printed for all the runtime errors. Subsidiary Ranges and SYM.EQU.FUTIL include.

IO HANDLER ERRORS	A000 - A01F	(ERR-IO)
DISC ERRORS	A020 - A02F	(ERR-DISC)
PAPER TAPE AND CARDS	A030 - A03F	(ERR-CRPPT)
MAGNETIC TAPE ERRORS	A040 - A06F	(ERR-TAPE)
ALL OTHER FUTIL ERRORS	A070 - A09F	(ERR-MISC)

FUTIL

Runtime Errors

SYSNEWS.ERROR.FUTIL.RUNNERS

A000	ATTEMPT TO DO IO BEFORE INITIALIZATION OF HANDLER INTERNAL FUTIL SOFTWARE ERROR (IOCNTL)
A001	UNIDENTIFIABLE READ ERROR (IO) (IOCNTL)
A002	UNIDENTIFIABLE WRITE ERROR (IO) (IOCNTL)
A003	READ PROCESS IO ERROR (TESTPROC)
A004	WRITE PROCESS IO ERROR (TESTPROC)
A005	UNIDENTIFIABLE IO ERROR (CLOSER)
A006	UNIDENTIFIABLE IO ERROR (CLOSEW)
A007	UNIDENTIFIABLE IO ERROR (FILEINFO)
A008	UNIDENTIFIABLE IO ERROR (FIXFILE)
A009	UNIDENTIFIABLE IO ERROR (GETBUF)
A00A	UNIDENTIFIABLE IO ERROR (GETEMBUF)
A00B	UNIDENTIFIABLE IO ERROR (NEXTFILE)
A00C	UNIDENTIFIABLE IO ERROR (OPENR)
A00D	UNIDENTIFIABLE IO ERROR (OPENW)
A00E	UNIDENTIFIABLE IO ERROR (PUTBUF)
A00F	ILLEGAL IO CALL (CLOSER)
A010	ILLEGAL IO CALL (CLOSEW)
A011	ILLEGAL IO CALL (FILEINFO)
A012	ILLEGAL IO CALL (FIXFILE)
A013	ILLEGAL IO CALL (GETBUF)
A014	ILLEGAL IO CALL (GETEMBUF)
A015	ILLEGAL IO CALL (OPENR)
A016	ILLEGAL IO CALL (OPENW)
A017	ILLEGAL IO CALL (PUTBUF)
A018	NO FREE FIR'S OR BIR'S AVAILABLE INTERNAL FUTIL SOFTWARE ERROR (GETREC, INITIO, GETEMBUF)
A019	BAD TYPE ARGUMENT INTERNAL FUTIL SOFTWARE ERROR (GETREC)

FUTIL DISC ERRORS

A020	CANNOT COPY A SINGLE VOLUME OR CATALOG
A021	CHECK PASS ERROR — CAN'T OPEN THE ORIGINAL DISC FILE
A022	CHECK PASS ERROR — THE DISC FILE BEING CHECKED HAS A NEW DATE
A023	CHECK PASS ERROR — THE CHKSUM OR FILE SIZE OF THE DISC FILE BEING CHECKED HAS BEEN CHANGED
A024	ATTEMPT TO SUPERSEDE A FILE WITH A CATALOG

FUTIL PAPER TAPE AND CARD READER ERRORS

A031	CARD READER ERROR
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System Errors

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FUTIL MAGNETIC TAPE ERRORS

A040	CHECK PASS ERROR — DATA IN THE FILE BEING CHECKED DOESN'T MATCH THE DATA IN THE ORIGINAL FILE
A041	CHECK PASS INITIALIZATION ERROR CHECK PASS ABORTED
A042	CHECK PASS ERROR — MAXIMUM ERROR COUNT EXCEEDED CHECK PASS ABORTED
A043	CHECK PASS ERROR
A044	CHECK PASS FATAL ERROR
A045	CHECK PASS — USER INTERRUPT CHECK PASS ABORTED
A046	CHECK PASS — FILE NAME CHANGE ON SAVE; FILE NOT CHECKED
A048	BAD SAVFIL HEAD RECORD
A049	EMPTY SAVFIL
A04B	THE TAPE BLOCK READ IN IS LARGER THAN THE CALCULATED BLKSIZ
A04C	THE SPECIFIED BLOCKED TAPE FILE CONTAINS NO DATA
A04D	THE TAPE BLOCK READ IN WAS TERMINATED BY A PARTIAL RECORD
A050	ATTEMPT TO WRITE AN HDR1 LABEL AFTER AN EOVI LABEL
A051	ATTEMPT TO WRITE AN HDR1 LABEL AFTER A RECORD THAT ISN'T A VOL1, EOF1 OR EOVI LABEL
A052	END-OF-TAPE ENCOUNTERED WHILE ATTEMPTING TO WRITE AN HDR1 LABEL. LABEL NOT WRITTEN
A053	END-OF-TAPE ENCOUNTERED WHILE ATTEMPTING TO WRITE A VOL1 LABEL. (EITHER A VOL1 LABEL IS BEING WRITTEN IN THE WRONG PLACE OR THE TAPE IS TOO SHORT TO CONTAIN EVEN A SINGLE 80 CHARACTER BLOCK)
A054	UNKNOWN LABEL TYPE IN A WRITE LABEL REQUEST (WRITELBL)
A055	A TAPE LABEL FIELD HAS AN ILLEGAL CHARACTER (THIS ERROR MEANS THERE IS BAD DATA IN THE LABELINF ARRAY)
A056	THERE IS NO VOL1 LABEL AS THE FIRST RECORD ON THIS REEL OF TAPE
A057	UNABLE TO ESTABLISH A USABLE POSITION ON THIS REEL OF TAPE. THIS USUALLY MEANS THAT A VOL1, HDR1, EOF1 OR EOVI LABEL CAN'T BE FOUND.
A058	TAPE FILE DESIRED IS NOT CONTINUED ON THIS REEL OF TAPE
A059	TRIED TO WRITE THE USER LABELS (USR1...USR9) IN THE WRONG PLACE. THESE LABELS MUST IMMEDIATELY FOLLOW THE HDR LABELS FOR THE TAPE FILE.
A060	EMPTY FILE — FILE NOT COPIED TO TAPE
A061	BAD FILE CHKSUM — THIS USUALLY MEANS THAT THE DATA IN THE FILE HAS BEEN TRASHED
A062	FILE SIZE DISCREPANCY — THE SAVED VERSION OF THE FILE IS TOO BIG
A063	FILE SIZE DISCREPANCY — THE SAVED VERSION OF THE FILE IS TOO SMALL
A064	END-OF-TAPE ENCOUNTERED — ERROR
A065	AN ERROR OCCURRED WHILE TRYING TO SAVE THE COMMAND STATE IN A TEMP FILE. NO CHECK PASS CAN BE DONE; NO CONTINUATION REEL IS POSSIBLE.
A066	COULDN'T LOCATE THE DESIRED TAPE FILE
A067	ATTEMPT TO WRITE ON A TAPE REEL THAT HAS NO WRITE RING
A068	BAD IDREC — BAD FILE IMAGE HEADER RECORD (TAPE ERROR)
A069	TAPE DRIVE NOT READY OR NOT ON LINE

GENERAL FUTIL ERRORS

A070	UNIDENTIFIABLE ERROR DURING COMMAND INITIALIZATION (CMNDCTRL)
A071	ERROR IN IO CLEANUP
A072	ERROR IN IO INITIALIZATION
A073	THE MAXIMUM NUMBER OF CONSECUTIVE ERRORS HAS BEEN EXCEEDED
A07A	OVERLAY CONTROL READ ERROR
A080	ERROR OCCURED WHILE TRYING TO READ IN THE CONVERSION TABLE OVERLAY
A090	UNEXPECTED END-OF-FILE IN TEXT FILE (GETLINE)
A091	A TEXT LINE IN THE FILE WAS GREATER THAN 255 CHARACTERS. (GETLINE)
A093	TRIED TO "PUT" A LINE GREATER THAN 255 CHARACTERS INTO THE OUTPUT TEXT FILE (PUTLINE)
A198	

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FUTIL Scanner Errors

UTIL.FILSCAN ERROR RANGE A100 - A17F
FUTIL ERROR RANGE A180 - A1FF

SYSNEWS.ERROR.FILSCAN

(File Scanner Errors/UTIL.FILESCAN)

A100 SCAN BUFFER OVERFLOW — CANNOT ACCEPT ANY MORE FILE NAMES.
A101 A FILE NAME, SLASH (/) OR END-OF-LINE (CR) WAS EXPECTED
A102 A COMMA (,), SLASH (/) OR END-OF-LINE (CR) WAS EXPECTED
A103 A SLASH (/) OR END-OF-LINE (CR) WAS EXPECTED
A104 WILD CARDS (! OR ?) ARE ONLY ALLOWED IN THE FILENAMELIST
A105 EMPTY CATALOG LEVEL
A106 THE EXPECTED SIZE OF A COMPLETE FILE NAME EXCEEDS 80 CHARACTERS
A107 A CATALOG LEVEL CONTAINED MORE THAN 20 CHARACTERS
A108 ILLEGAL CHARACTER IN A FILE NAME OR CATALOG LEVEL
A109 A VOLUME NAME OR NETWORK NODE NAME IS NOT ALLOWED IN THIS CATALOG
A10A EXCEPT OPTION THE EXCEPT OPTION IS ILLEGAL WHEN THE FILENAMELIST IS EMPTY
A10B A VOLUME NAME OR NODE NAME IS NOT ALLOWED IN THE FILENAMELIST
A10C SYSCATLG IS NOT ALLOWED IN THE FILENAMELIST
A10D AN EXCLAMATION POINT (!) IS ILLEGAL WITH A CATALOG LEVEL NAME SEGMENT
A10E SINCE/BEFORE OPTIONS A BAD DATE WAS SPECIFIED FOR A SINCE OR BEFORE OPTION
A10F TYPE OPTION A BAD HEX FILE TYPE WAS SPECIFIED
A110 EXCEPT/SUBCAT OPTIONS THE EXCEPT AND SUBCAT OPTIONS ARE ILLEGAL WITH AN
 EMPTY FILENAMELIST
A111 THIS CATALOG/FILENAME SPECIFICATION IS NOT ALLOWED IN THIS COMMAND (THE
 DEVICE SPECIFIED DOES NOT SUPPORT NAMED FILES)
A112 THE DESTINATION SPECIFICATION IS NOT ALLOWED IN THIS COMMAND (DELETE, PRINT,
 PRINTLP)
A113 TYPE OPTION GENERIC TYPE ERROR. (ERROR IN OPTION OR IN GENERIC TYPE FILES.)
A114 TYPE OPTION A RIGHT PARENTHESIS ')' MUST TERMINATE THE TYPE SPECIFICATION

SYSNEWS.ERROR.FUTIL.SCANNERS

A180 AN ILLEGAL VALUE IS SPECIFIED FOR AN EQUIVALENCED OPTION (OPTION = VALUE)
A181 UNKNOWN OPTION
A182 ILLEGAL SEPARATOR CHARACTER
A183 ILLEGAL COMMAND OR FUNCTION
A184 EMPTY ARGUMENT LIST NOT ALLOWED FOR THIS COMMAND
A185 THE VALUE OF AN EQUIVALENCED OPTION WAS OUT OF RANGE (OPTION = VALUE)
A186 UNABLE TO IDENTIFY A REQUESTED COMMAND PROCESS OVERLAY FUTIL SOFTWARE
 ERROR (OVLYSET)
A190 BAD UNIT OR UNIT NOT ATTACHED
A191 ILLEGAL "TO" DEVICE. THE FOLLOWING DEVICES ARE VALID: MAGNETIC TAPE, PAPER
 TAPE, LINE PRINTER OR COMDEV
A192 ILLEGAL "FROM" DEVICE. THE FOLLOWING DEVICES ARE VALID: MAGNETIC TAPE,
 PAPER TAPE OR CARD READER
A193 A RIGHT PARENTHESIS (}) CLOSSES THE TAPE RECORD NUMBER LIST
A194 ILLEGAL MAG TAPE FILE NUMBER (N OF :MTN)
A195 A DIGIT WAS EXPECTED
A196 AN ILLEGAL CHARACTER WAS SPECIFIED IN AN INTEGER
A197 THE INTEGER HAS MORE THAN FIVE DIGITS
A198 DELETE OR MOVE OF SYSCATLG//NLEV IS NOT PERMITTED
A199 ONLY DISC FILES CAN BE DELETED
A19A THE CARD READER AND PAPER TAPE DEVICES ARE ONLY ALLOWED WITH THE CONVERT
 OR CONVERTB COMMANDS
A19B THE ADD COMMAND DOES NOT ALLOW A 'TO' DEVICE SPECIFICATION

System Errors

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FUTIL Scanner Errors (Continued)

A19C	THE ADD COMMAND CAN ONLY BE USED INSIDE OF FUTIL. ADD ONLY APPLIES TO FUTIL FORMAT OR SAVFIL FORMAT TAPES AND MUST FOLLOW A COPY COMMAND OR ANOTHER ADD COMMAND
A19D	THE CHECK COMMAND MUST HAVE ONLY A VALID TAPE DEVICE SPECIFIED.
A19E	NO OTHER FILE SPECIFICATIONS ARE ALLOWED WITH A TAPE RECORD LIST. (SOURCE, DESTINATION OR FILENAMELIST)
A19F	THE 'TO' DEVICE FOR THE LIST COMMAND MUST BE BLANK, THE HARDEV, OR THE COMDEV
A1A0	THERE IS NO TAPE UNIT SPECIFIED FOR A SAVFIL OPTION REQUEST
A1A1	THERE IS NO TAPE UNIT SPECIFIED FOR A RSTFIL OPTION REQUEST
A1A2	DRWUPDAT OPTION THE "FROM" DEVICE MUST BE MAGNETIC TAPE OR DISC. THE "TO" DEVICE MUST BE DISC
A1A3	DRWUPDAT OPTION THIS OPTION IS ONLY VALID WITH THE 'COPY' COMMAND.
A1A4	DRWUPDAT OPTION AT LEAST ONE FILENAME MUST BE SPECIFIED IN THE FILENAMLIST.
A1A5	CONVERT OPTION ILLEGAL CONVERSION SET DESCRIPTOR. A CHARACTER SET DESCRIPTOR MUST BE EITHER ONE OR TWO LETTERS (A-Z)
A1A6	CONVERT OPTION A DASH MUST SEPARATE THE INPUT CONVERSION CHARACTER SET FROM THE OUTPUT CONVERSION CHARACTER SET
A1A7	CONVERT OPTION UNABLE TO ACCESS THE CHARACTER CONVERSION TABLES DIRECTORY FILE
A1A8	CONVERT OPTION A CONVERSION TABLE DOES NOT EXIST FOR THE REQUESTED CHARACTER SET(S)
A1A9	FORMAT OPTION ILLEGAL PUNCTUATION IN THE FORMAT OPTION. THE PROPER SYNTAX S: FORMAT = (OPTION = VALUE) -OR- FORMAT = (OPT1 = VAL1 , OPT2 = VAL2)
A1AA	FORMAT OPTION THE TAPE BLOCK SIZE (BLKSIZ) CALCULATED IS NOT AN EVEN NUMBER OF BYTES
A1AB	FORMAT OPTION THE CALCULATED BLOCK SIZE IS NOT AN EVEN MULTIPLE OF THE CALCULATED RECORD SIZE (BLKSIZ = RECSIZ RECCNT)
A1AC	FORMAT OPTION A SUB-OPTION HAS BEEN SPECIFIED TWICE (BLKSIZ, RECSIZ OR RECCNT)
A1AD	FORMAT OPTION ILLEGAL SUB-OPTION, MUST BE BLKSIZ, RECSIZ OR RECCNT.
A1AE	CONVERT OPTION THE EI AND EA CHARACTER SETS ARE ONLY VALID FOR PAPER TAPE DEVICES
A1AF	LABEL OPTION ERROR IN TAPE LABEL ENTRY. ILLEGAL CHARACTER, TOO MANY CHARACTERS OR NO TERMINATOR CHARACTER A1B0 CONVERT OPTION OUTPUT CHARACTER SET MUST BE 'C' FOR HARDEV OR COMDEV OUTPUT
A1B1	CONVERT OPTION INPUT CHARACTER SET MUST BE 'C' FOR CARDEV INPUT
A1B2	CONVERT OPTION A FILE MANAGER ERROR OCCURED WHILE TRYING TO READ IN ONE OF THE CHARACTER CONVERSION TABLES.
A1B3	CONVERT OPTION ONE OF THE CONVERSION CHARACTER SETS MUST BE CVASCII (C)

EDITOR ERRORS

SYSNEWS.ERROR.EDIT

8001	TAB STOP SPECIFIER IS TOO LARGE OR IS NEGATIVE
8002	A COMMA (,) WAS EXPECTED
8003	EXTRA CHARACTERS FOUND AT THE END OF THE LINE
8004	INVALID COLUMN NUMBER SPECIFICATION
8005	INVALID EDITOR COMMAND

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EDITOR ERRORS (Continued)

8006	INVALID NUMBER OF DIGITS SPECIFIED ("N" COMMAND)
8007	2ND COLUMN LESS THAN 1ST COLUMN IN COLUMN BOUNDS SPECIFICATION
8008	BAD CHARACTER(S) IN COLUMN BOUNDS SPECIFICATION
8009	ATTEMPT TO INITIALIZE A CASE THAT IS PRESENTLY SET (B OR U COMMAND)
800A	EDIT BUFFER IS FULL
800B	LINE NUMBER NOT FOUND IN EDIT BUFFER
800C	INVALID FILENAME SPECIFICATION
800D	MISSING LINE NUMBER SPECIFICATION
800E	A DISC LOCATION REQUESTED WITHIN FILE EXCEEDS THE FILE LENGTH
800F	A CHARACTER WAS REQUESTED FROM THE LAST SECTOR IN THE FILE, BUT THE POSITION WITHIN THE SECTOR EXCEEDS THE COUNT OF VALID CHARACTERS.
8010	A ZERO LINE NUMBER WAS ENCOUNTERED FOR A FILE PAGE-IN REQUEST (GETTAB)
8011	AN ATTEMPT WAS MADE TO OPEN A FILE WHICH IS NOT A TEXT FILE (TYPE=03) (LOADTEXT)
8012	LINE NUMBER OUT OF BOUNDS
8013	NO CHANNEL AVAILABLE
8014	EXPANDED COMMAND STRING OVERFLOW
8015	ERROR ON ATTEMPT TO OPEN EDITOR TEMPORARY FILE

FILERCVR ERRORS

8001	FILE SPECIFIED IS NOT AN UNRECOVERED HARDFILE
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LOADER MAJOR ERRORS

8001	ATTEMPT TO READ THE SIZE OF A SYMBOL THAT IS NOT A GLOBAL
8002	ATTEMPT TO EXECUTE WHEN A BLOCK HAS OVERFLOWED
8005	ATTEMPT TO STORE A WORD AT AN ADDRESS LESS THAN THE CORORG START ADDRESS, OR (IF A SECOND PARAMETER IS GIVEN WITH THE CORORG STMT) AT AN ADDRESS GREATER THAN THE CORORG START ADDRESS PLUS THE BUFFER LENGTH INDICATED BY THE SECOND CORORG PARAMETER. THIS ERROR OCCURS BECAUSE AN ATTEMPT IS MADE TO LOAD A PROGRAM OR INITIALIZE A GLOBAL AT A BAD ADDRESS.
8006	ATTEMPT TO READ A WORD FROM AN ILLEGAL ADDRESS THIS ALMOST ALWAYS INDICATES THAT THE CURRENT BLOCK (OR, MORE RARELY, AN EARLIER BLOCK) HAS OVERFLOWED.
800D	FORMAT ERROR IN OBJECT FILE DATA BLOCK HAS A BAD COUNT
800E	SET LOCATION BLOCK IN OBJECT FILE TRYING TO SET LOCATION AT A SYMBOL THAT IS NOT YET DEFINED. THIS ERROR OCCURS WHEN TPL SOURCE CODE TRIES TO DATA INITIALIZE (VECTOR VALUES) A GLOBAL OF INDEFINITE LENGTH (DIMENSIONED WITH A *) AND THE LOCATION OF THAT GLOBAL IS NOT YET DEFINED
8010	INTERNAL ERROR IN OBJECT FILE
8011	BAD CHARACTER WHERE A SLASH (/) IS EXPECTED IN THE LOADER (OS) COMMAND LINE
8012	CORORG COMMAND SPECIFIES A BLOCK OUTSIDE THE RANGE 0000-8000.
8013	NESTED INSERTS IT IS ILLEGAL TO USE THE INSERT COMMAND WHILE INSIDE AN INSERT FILE
8015	BAD CHARACTER WHERE AN EQUAL SIGN (=) IS EXPECTED IN A FILL COMMAND
8016	SYMBOL IN A GLOBAL COMMAND IS ALREADY DEFINED
8017	BAD CHARACTER WHERE A PARENTHESIS () OR {} IS EXPECTED IN A GLOBAL COMMAND
8018	BAD CHARACTER WHERE A COMMA (,) IS EXPECTED IN ANY OF THE FOLLOWING COMMANDS: GLOBAL, SYM, TV, UNDEF
8019	ILLEGAL FUNCTION
801A	ATTEMPT TO EXECUTE WHEN A SYMBOL IS NOT DEFINED
801B	BAD CHARACTER WHERE A RIGHT SQUARE BRACKET (]) IS EXPECTED IN A FUNCTION EXPRESSION
801C	SYMBOL SPECIFIED IN A SET COMMAND HAS AN UNDEFINED LOCATION
801D	BAD CHARACTER WHERE A RIGHT PARENTHESIS (}) IS EXPECTED IN A SET COMMAND
801E	BAD CHARACTER WHERE AN EQUAL SIGN (=) IS EXPECTED IN A SET COMMAND
801F	ATTEMPT TO DEFINE A SYMBOL THAT ALREADY HAS A DEFINITION USING AN EQU COMMAND
8021	BAD LOADER COMMAND: KEYWORD NOT RECOGNIZED
8022	ILLEGAL OPTION ON LOADER (OS) COMMAND LINE
8023	OVERLAY FILE WILL BE BIGGER THAN 'FFFF' SECTORS
8024	INTERNAL LOADER ERROR ATTEMPT TO DEFINE A SYMBOL THAT IS ALREADY DEFINED

System Errors

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LOADER MAJOR ERRORS (Continued)

8028	SYMBOL TABLE OVERFLOW: TOO MANY SYMBOLS HAVE BEEN CREATED
8029	XRWAD TABLE OVERFLOW
802A	TOO MANY TOTAL ENTRY POINTS, CALLED SUBROUTINES AND GLOBALS REFERENCED FROM AN OBJECT FILE
802B	ATTEMPT TO EXECUTE WITH THE LOW END OF CORORG BUFFER BELOW 2000 HEX, OR THE HIGH END ABOVE 4000 HEX. THE LOW END OF THE CORORG BUFFER IS THE ADDRESS FOLLOWING THE 'CORORG' KEYWORD IN THE MAKE FILE. THE HIGH END OF CORORG BUFFER IS EITHER: 1) THE LOW ADDRESS PLUS THE SPECIFIED SIZE OF CORORG BUFFER, IF A SIZE IS SPECIFIED BY THE USER; OR 2) 8000 HEX.
802C	START ADDRESS SPECIFIED IN AN EXECUTE COMMAND HAS AN ADDRESS OUTSIDE THE OVERLAY THAT WAS CREATED
802D	THE OVERLAY FILE EXISTS IN THE NEWCAT CATALOG BUT CANNOT BE MODIFIED BECAUSE IT IS IN USE
802E	PART OF THE BLOCK TO BE WRITTEN TO THE DISC FALLS OUTSIDE THE OVERLAY AS DEFINED IN THE CORORG COMMAND
802F	LEFT PARENTHESIS (() IN AN EXPRESSION DOES NOT HAVE A MATCHING RIGHT PARENTHESIS ())
8030	SYMBOL REFERENCED IN AN EXPRESSION IS NOT DEFINED
8031	TWO OPERATORS OR TWO OPERANDS IN A ROW IN AN EXPRESSION
8032	NULL STRINGS ARE ILLEGAL
8033	COMMAND DOES NOT HAVE ENOUGH NUMERICAL ARGUMENTS
8034	COMMAND HAS TOO MANY NUMERICAL ARGUMENTS
8035	FIRST OPERAND OF A BOOLEAN EXPRESSION IS A STRING LONGER THAN TWO CHARACTERS
8036	ILLEGAL BOOLEAN OPERATOR
8037	SECOND OPERAND OF A BOOLEAN EXPRESSION IS A STRING LONGER THAN TWO CHARACTERS
803B	ENTRY POINT NOT FOUND IN LOAD LIBRARY
803C	INTERNAL LOADER ERROR
803E	ATTEMPT TO DATA INITIALIZE A GLOBAL USING A SET COMMAND EXCEEDS THE LIMITS OF THE GLOBAL
803F	AN ATTEMPT BEING MADE TO RESOLVE AN ESI MODE RELOCATION USING PC RELATIVE ADDRESSING, BUT THE REFERENCE AND THE LOADER-GENERATED PZE ARE NOT WITHIN THE NOVA ADDRESSING RANGE (- 128 TO + 27 WORDS)
8040	W DATA SECTION OF OBJECT FILE BEING LOADED HAS BECOME LARGER THAN 100 HEX. THE LOADER WILL EXPAND THE LOW DATA SECTION OF AN OBJECT FILE IN ORDER TO CREATE LINKAGES TO OTHER SUBROUTINES AND TO GLOBALS. THE RESULTING SIZE AFTER EXPANSION CANNOT BE LARGER THAN 100 HEX. THIS ERROR CONDITION CAN ALMOST ALWAYS BE SATISFIED BY MOVING LOCAL INTEGER ARRAYS INTO A COMMON AREA (FORTRAN) OR CONVERTING THEM TO GLOBALS (TPL) IN THE OBJECT FILE IN QUESTION, THEN RECOMPILING THAT OBJECT FILE AND RELOADING.
8042	OVERLAY FILE NAME IS NOT SPECIFIED
8043	OVERLAY FILE IS LARGER THAN 'FFFF' SECTORS LONG
8044	AN OBJECT FILE CREATED FROM A TPL SOURCE FILE HAS REFERRED TO A GLOBAL OF INDEFINITE LENGTH (USING A * DECLARATION), BUT THE GLOBAL IS UNDEFINED WHEN THE OBJECT FILE IS LOADED
8045	ATTEMPT TO SAVE A SYMBOL TABLE THAT CONTAINS AN UNDEFINED SYMBOL
8046	FILE NAME IS NOT SPECIFIED FOR A LOADSYM OR SAVESYM COMMAND
8047	FILE SPECIFIED FOR A LOADSYM COMMAND IS NOT A LOADER DATA FILE
8048	FILE SPECIFIED FOR A LOADSYM COMMAND IS NOT A SAVED SYMBOL TABLE
8049	SYMBOL TABLE IN THE FILE SPECIFIED FOR A LOADSYM COMMAND IS IN AN OLD FORMAT AND CANNOT BE USED BY THE CURRENT VERSION OF THE LOADER.
804A	FILE SPECIFIED FOR A LOADSYM COMMAND HAS A BAD CHECKSUM
804B	THE ARGUMENTS TO A BLOCK COMMAND ARE IN THE WRONG ORDER. THE STARTING ADDRESS OF THE BLOCK IS LARGER THAN THE ENDING ADDRESS OF THE BLOCK.
804C	NO MORE LINES IN INPUT FILE. THIS CAN HAPPEN WHEN AN INSERT FILE IS NOT TERMINATED BY AN END COMMAND, OR A MAKE FILE IS NOT TERMINATED BY AN CWRITE, END, EXECUTE OR WRITE COMMAND.
804E	BLOCK COMMAND SPECIFIES A BLOCK THAT IS OUTSIDE OF ADDRESSABLE MEMORY.
804F	ATTEMPT TO ALLOCATE A NEGATIVE NUMBER OF WORDS THIS CAN HAPPEN WHEN A GLOBAL COMMAND SPECIFIES A BAD GLOBAL SIZE.
8050	FILL STATEMENT IS DATA INITIALIZING A SYMBOL THAT IS NOT A GLOBAL

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LOADER MAJOR ERRORS

(Continued)

8051	SET STATEMENT IS DATA INITIALIZING A SYMBOL THAT IS NOT A GLOBAL
8052	FUNCTION VALUE IS NOT AN INTEGER
8053	OBJECT FILE WAS COMPILED BY AN OLD VERSION OF THE COMPILER WHICH IS INCONSISTENT WITH THE CURRENT LOADER.

LOADER MINOR ERRORS

8080	ATTEMPT TO CHANGE THE MODE OF A SYMBOL
8081	ATTEMPT TO SET THE ESI OF A SYMBOL TO A VALUE GREATER THAN 'FF'
8086	AN ENTRY POINT OF THE OBJECT FILE BEING LOADED ALREADY HAS ANOTHER DEFINITION
8088	FORMAT ERROR IN OBJECT FILE THE LAST WORD OF THE OBJECT FILE BEING LOADED IS NOT THE END-OF-FILE FLAG ('FFFF')
808A	INTERNAL CHECKSUM ERROR IN OBJECT FILE
808B	EXTERNAL CHECKSUM ERROR IN OBJECT FILE
808C	THE OBJECT FILE BEING LOADED IS REFERRING TO A GLOBAL THAT IS SMALLER THAN THE DECLARATION IN THE SOURCE FILE
808D	BAD CHARACTER WHERE A SLASH IS EXPECTED IN A LOAD OR LOADLIB COMMAND
808E	LOAD LIBRARY FILE IS NOT A LOADER DATA FILE
808F	LOAD LIBRARY FILE IS A LOADER DATA FILE BUT DOES NOT CONTAIN A LOAD LIBRARY
8090	LOAD LIBRARY FILE IS IN AN OLD FORMAT AND CANNOT BE USED BY THE CURRENT VERSION OF THE LOADER
8091	FILE TO BE LOADED IS NOT A TYPE 2 (OBJECT) FILE
8092	LOADER STATEMENT HAS EXTRA CHARACTERS AT THE END OF THE LINE

LOADER DIAGNOSTIC ERRORS

80D2	AN EXTERNAL REFERENCE FILL IN CHAIN STARTS AT LOCATION ZERO. THIS OCCURS WHEN CODE IS LOADED INTO A BLOCK STARTING AT 0000, AND THAT LOCATION MUST BE FILLED IN WITH AN EXTERNAL REFERENCE.
80D4	AN OBJECT FILE IS REFERRING TO A GLOBAL THAT WAS NOT DEFINED AS A GLOBAL. A GLOBAL MUST BE DEFINED USING A LOADER GLOBAL COMMAND OR ALLOCATED WHEN AN OBJECT FILE IS LOADED
80D5	A SUBROUTINE CALL OR DEFINITION HAS THE WRONG NUMBER OF ARGUMENTS THIS ERROR CAN OCCUR IN THREE WAYS: (1) THE SUBROUTINE WAS PREVIOUSLY DEFINED AND A CALL USES A DIFFERENT NUMBER OF ARGUMENTS (2) THE SUBROUTINE WAS PREVIOUSLY CALLED AND A CALL USES A DIFFERENT NUMBER OF ARGUMENTS (3) THE SUBROUTINE WAS PREVIOUSLY CALLED AND A DEFINITION SPECIFIES A DIFFERENT NUMBER OF ARGUMENTS

SORTCAT ERRORS

SYSNEWS.ERROR.SORTCAT

8101	SORT ABORTED
8102	CANNOT SORT SYSCATLG WITH OTHER TASKS LOGGED IN
8103	NO SORT PERFORMED
8104	FILE IS NOT A CATALOG
8105	CANNOT SORT CATALOGS WITH DIRECTORY ENABLED YOU HAVE TWO CHOICES: 1) SPECIFY CATALOG EXPLICITLY BY PREFIXING COMPLETE CATALOG WITH DIRECTORY-OVERWRITE CHARACTER, =. 2) DISABLE THE DIRECTORY AND PERFORM THE SORT.
8106	CANNOT SORT SYSCATLG WITH BATCH TASK LOGGED IN

SRCHBCD ERRORS

SYSNEWS.ERROR.SRCHBCD

8001	A SLASH (/) WAS EXPECTED IN THE COMMAND LINE
8002	ERROR IN "SINCE" DATE FORMAT
8003	ERROR IN "BEFORE" DATE FORMAT
8004	INVALID OPTION IN COMMAND LINE

System Errors

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SRCHBCD ERRORS

(Continued)

8005	INVALID CHARACTER(S) AT END OF COMMAND LINE
8006	A COMMA (,) WAS EXPECTED IN THE COMMAND LINE
8007	INVALID SRCHBCD COMMAND
8009	SPECIAL CHARACTER DELIMITERS NOT ALLOWED WITH "S" OR "G" COMMAND
800A	SEARCH STRING HAS AN IDENTIFIER LONGER THAN 8 CHARACTERS ("G" OR "S" SEARCH)
800B	NO CHANNEL AVAILABLE

SUBMIT ERRORS

Used by PERROR (SYSOV.PERROR) to output appropriate error message to user COMDEV. See PERROR for details of table format.

8001	BAD OPTION
8002	NO SLASH (/) WHERE ONE IS EXPECTED
8003	NO EQUAL SIGN (=) WHERE ONE IS EXPECTED
8004	NO JOB NAME SPECIFIED
8005	BAD TASKUNITNAME
8006	NO COMMA (,) FOUND WHERE ONE IS EXPECTED
8007	BAD DEVICE NAME
8008	MISSING QUOTE (" OR ')
8009	MISING ENDING QUOTE (" OR ')
800A	VOLUME NAME DOES NOT BEGIN WITH A STAR (*)
800B	ATTEMPT TO DELETE A STEP THAT DOES NOT EXIST

CVTECO ERRORS

8001	NO CHARACTERS ARE PRESENT WHEN A COMMAND WANTS A STRING ARGUMENT
8002	ILLEGAL COMMAND
8003	TWO OPERATORS IN A ROW IN AN EXPRESSION
8004	OR / USED AS A PREFIX OPERATOR
8005	E COMMAND NOT FOLLOWED BY A LETTER
8006	E COMMAND FOLLOWED BY AN ILLEGAL LETTER
8007	FILENAME MISSING FROM E COMMAND
8008	SEARCH STRING IS TOO LONG (IN AN F, R OR S COMMAND)
8009	SEARCH STRING NOT FOUND (IN AN F, R OR S COMMAND)
800A	CVTECO INVOKED BY A BAD OS COMMAND LINE
800B	"" WITHOUT MATCHING ""
800C	ILLEGAL Q-REGISTER NAME
800D	NO NUMERICAL ARGUMENT TO A P COMMAND
800E	"" COMMAND NOT FOLLOWED BY A LETTER
8012	REPLACEMENT STRING IN R COMMAND IS TOO LONG
8013	TEXT WILL NOT FIT INTO A T-REGISTER
8014	CANNOT EXTRACT TEXT FROM AN EMPTY T-REGISTER
8015	MACRO CONTAINS UNMATCHED "" OR "["
8016	"" WITHOUT MATCHING ""
8017	E COMMAND NOT FOLLOWED BY A LETTER
8018	E COMMAND FOLLOWED BY AN ILLEGAL LETTER
8019	ILLEGAL ARGUMENT TO S COMMAND
801A	"]" WITHOUT MATCHING "["
801B	"]" WITHOUT MATCHING "["
801C	ILLEGAL "[" WITH ONE NUMERIC ARGUMENT
801D	ILLEGAL "[" WITH TWO NUMERIC ARGUMENTS
801E	WRONG NUMBER OF NUMERIC ARGUMENTS FOR A "[" COMMAND
801F	ARGUMENT TO THE "V" COMMAND IS NOT POSITIVE
8020	BAD OPTION ON THE CVTECO COMMAND LINE
8021	NO "=" FOLLOWING THE /MACRO OPTION
8801	ANOTHER FILE ALREADY OPEN FOR OUTPUT
8802	NO FILE OPEN FOR OUTPUT IN EP & EX COMMANDS
8803	TEXT LINE IS LONGER THAN 255 CHARACTERS AND CANNOT BE WRITTEN TO A TEXT FILE
8804	NO FILE OPEN FOR OUTPUT IN EF & EX COMMANDS
8901	INSERT OVERFLOWS THE TEXT BUFFER
8902	MOVE POINTER OFF THE END OF THE BUFFER

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CVTECO ERRORS (Continued)

8903	DELETE ARGUMENTS ARE IN THE WRONG ORDER
8904	DELETE ARGUMENTS ARE OFF THE END OF THE BUFFER
8905	DISC BUFFER OVERFLOW
8906	SCAN ARGUMENTS ARE IN THE WRONG ORDER
8907	SCAN ARGUMENTS ARE OFF THE END OF THE BUFFER
8908	REQUEST FOR CHARACTER OFF THE END OF THE BUFFER
8909	MOVE MARK OFF THE END OF THE BUFFER

UTIL ERRORS

SYSNEWS.ERROR.UTIL

9801	HEAP SIZE ALLOCATED IS TOO SMALL.(GTBLK) MUST BE AT LEAST 6 WORDS.
9802	ILLEGAL SIZE IN REQUEST FOR BLOCK FROM GTBLK. EITHER REQUEST FOR LESS THAN 0 OR NO FREE BLOCK BIG ENOUGH.
9803	HEAP NOT INITIALIZED (FRBLK) SINCE HEAP NOT INITIALIZED, NO BLOCKS HAVE BEEN ALLOCATED. FRBLK ARGUMENTS MUST BE SPURIOUS
9804	ILLEGAL BLOCK AS ARGUMENT TO FRBLK EITHER THE SIZE OR THE LOCATION OF THE BLOCK IS NOT LEGAL.
9805	PART OF BLOCK IS ALREADY FREE (FRBLK) PART OF THE BLOCK IS NOT ALLOCATED AND HENCE CAN'T BE FREED
9808	DEVICE NOT RECOGNIZED OR NOT APPROPRIATE FOR OPERATION EITHER AN INPUT DEVICE IS BEING USED FOR OUTPUT, AN OUTPUT DEVICE IS BEING USED FOR INPUT, OR THE DEVICE IS NOT RECOGNIZED BY LINEIO.
9809	FILE IS NOT IN APPROPRIATE STATE. EITHER STATUS IS NOT "OPENED FOR WRITE" IN PTLN OR NOT "OPENED FOR READ" IN GTLN
980A	ILLEGAL LINE LENGTH GIVEN TO PTLN LINE LENGTH IS EITHER LESS THAN 0 OR GREATER THAN 255.
980C	NO RESET DONE ON STACKIN PACKAGE
980D	STACKIN'S INTERNAL STACK HAS OVERFLOWED TOO MANY PUSH-BACKS
980E	TOO MANY LISTS IN COMMAND LINE (CMNDLN) MAXIMUM SPECIFIED IN SYM.DEFS.UTIL.CMNDLN
980F	TOO MANY FIELDS IN COMMAND LINE (CMNDLN) MAXIMUM SPECIFIED IN SYM.DEFS.UTIL.CMNDLN
9810	COMMAND LINE TOO LONG (CMNDLN) MAXIMUM SPECIFIED IN SYM.DEFS.UTIL.CMNDLN

GLOSSARY

GLOSSARY

Absolute Coordinates	Values of X, Y, or Z coordinates with respect to the origin of the coordinate system. Contrast with "Incremental Coordinate."
Absolute Layer	The layer on which text will be placed. If the ALAY5 modifier is used when a text node is inserted, text placed on the text node will be placed on layer 5.
Access Time	The interval between the instant at which data is required from or for a storage device, and the instant at which the data actually begins moving to or from the device.
Accumulator (AC)	A CPU register used to hold operands.
Accuracy	The number of significant digits of information in data, i.e., the number of digits after the decimal point. CADD5 4 is accurate to seven digits.
ACKO; ACK1	Use in DLE sequences in Binary Synchronous Communications, these replies indicate that the previous transmission block was accepted by the receiver, and that it is ready to accept the next transmission block. Use of ACKO and ACK1 alternately provides sequential checking control for a series of replies. ACKO is also an affirmative (RxRDY) reply to a station selection (multipoint), or to an initialization sequence (line bid) in point-to-point operations.
Acoustic Coupler	A device that permits computer data to be transmitted over the public telephone network.
ACS	<u>A</u> dvanced <u>C</u> ommunications <u>S</u> ervice; a planned data transmission network.
ACU	<u>A</u> utomatic <u>C</u> alling <u>U</u> nit. A dialing device that permits a business machine to dial calls automatically over the communications network.
ADCCP	<u>A</u> dvanced <u>D</u> ata <u>C</u> ommunications <u>C</u> ontrol <u>P</u> rocedure. This is the ANSI version of bit-oriented DLC.
Address (ADR)	A number that designates a location where information is stored.
Addressing Capability	The number of locations that a single address can specify.

Alphanumeric	The subset of characters that includes the 26 alphabetic characters and the 10 numeric characters.
Alphanumeric Display Device	A device capable of displaying a fixed set of letters, digits, and special characters, in one or more fonts. It allows the user to enter commands and to receive messages from the system. The device consists of a typewriter style keyboard and a display (CRT) on which text is viewed. See "Command Device."
ALU	<u>A</u> rithmetic/ <u>L</u> ogic <u>U</u> nit.
Amplitude Modulation (AM)	A method of transmission whereby the amplitude of the carrier frequency is modified in accordance with the amplitude of the intelligence signal.
Annotation	The process of inserting nodal text on a schematic diagram or printed circuit drawing.
ANSI	<u>A</u> merican <u>N</u> ational <u>S</u> tandards <u>I</u> nstitute.
Aperture Correspondence Table	A text file which provides interface information to be used by a photoplotter. The main body of the table is made up of lines that describe the apertures on the wheel.
APL	<u>A</u> utomatic <u>P</u> rogram <u>L</u> oad: A built-in automatic sequence that allows the user to start the system by pressing a switch. Also the name of <u>A</u> <u>P</u> rogramming <u>L</u> anguage.
Application Program	A program that performs a function specific to a particular end-user's need or to a class of needs. An application program can be any program that is not part of the basic operating system.
APT	<u>A</u> utomatically <u>P</u> rogrammed <u>T</u> ools: a program language used to prepare numerical control (NC) tapes. Associative APT output geometry will be in canonical form and the toolpaths will be related to the geometry via tags.
APT Canonical Output	APT Canonical is a specific mathematical formulation of 3D geometry to be output from the CADDs system. This data is used as input to a user's APT system which executes on another computer.
Arc @ Width	A term used to describe arcs and circles which have a photoplotter aperture width associated with them.
ARQ	<u>A</u> utomatic <u>R</u> equ ^e st for Repeat (of transmission).

ASCII	<u>A</u> merican <u>S</u> tandard <u>C</u> ode for <u>I</u> nformation <u>I</u> nterchange. One of the character codes (7-bit plus parity code) used in computer applications.
Assembler	A computer program that converts symbolic instructions into equivalent machine instructions.
Associative APT Output	A feature that outputs CADDs geometry and toolpaths in APT format. The geometry is in canonical form and the toolpaths are related to the geometry via tags. Associative APT output can be used by CADDs users as input to their APT system on other computers.
Asynchronous	Pertaining to related events where all changes do not occur at the same time.
Asynchronous Transmission	Transmission in which time intervals between transmitted characters may be of unequal length. Transmission is controlled by start and stop bits.
Attention Point	A small box (□) placed on the display of an entity to indicate selection of that entity. The exact location varies according to the entity type.
Autoroute	A CV software package which automatically adds interconnections to a PC board by merging a signal list with the PC board drawing.
B-Spline	A mathematical method for representing smooth curves, especially suited for machining and graphic display. The mathematical definition of a curve which passes through three-dimensional space, e.g., locus of points which define a corkscrew. The curve is mathematically continuous for both the 1st and 2nd derivatives, and provides the basis for much mechanical design and subsequent machining operations.
B-Spline Surface	The mathematical description of a three-dimensional surface which passes through a set of B-splines. Current applications include turbine blade design of jet engines and sculptured surface for automotive design.
Back Annotation	A process where information is extracted from a completed printed circuit board and inserted onto the logic elements of the schematic which describes the PC board. The information extracted is usually pin numbers and component reference numbers for each component on the PC board.
Backplane	The PC board in the rear of the CGP that interfaces between the other boards and the I/O cables.
Bandwidth	The range of frequencies assigned to a channel or system.

Baseband Signaling	Transmission of a signal at its original frequencies, without modulation.
Basic Interface Logic	The essential components needed by an I/O unit to communicate with the CPU. Basic interface logic includes: data register(s), busy, done and interrupt flip-flops, device select and device identification logic, as well as a priority circuit.
Batch	A group of jobs run on a computer at a single time without human intervention.
Baud – Baud Rate	A measure of signaling speed equal to the number of discrete conditions or signal events per second. In asynchronous transmission, baud is the unit of signaling speed corresponding to 1 unit interval per second, and is the same as bits per second, only if each signal event represents one bit exactly.
Baudot Code	A code for the transmission of teleprinter data in which 5 bits represent 1 character. It is named for Emile Baudot, a pioneer in printing telegraphy.
Binary	The number system with a base of two used to represent the internal logic of all digital numbers.
Binary Code	A code that uses two distinct characters, usually the numbers 0 and 1.
Binary Synchronous Communications (BISYNC)	An IBM defined character controlled communications protocol.
Bit	A binary digit — the smallest unit of information in a binary system of notation. It corresponds to a 0 or 1 and one digit position in a physical memory.
Bit-Oriented Protocol (BOP)	A data link control characterized by 1 standard frame format, zero insertion and deletion, CRC-CCITT preset to "1"s, Flag, Abort, and IDLE unique control bit patterns, and synchronous transmission in HDX or FDX modes.
Bit Transfer Rate	The number of bits transferred; usually expressed in bits per second. A group of characters transmitted as a unit. Same as Frame.
Block Check Character (BCC)	Part of a transmission verification algorithm.

BOM	<u>B</u> ill of <u>M</u> aterial: A parts list for a printed circuit board or equipment drawing. Part type, quantity, and other properties are listed from which items may be ordered for the manufacturing process.
Boot-Up	The term used to identify the system start-up process.
Bootstrap Loader	A technique or routine whose first instructions are sufficient to load the remainder of itself and to start a complex system of programs.
BOT	<u>B</u> eginning of <u>T</u> ape: A reflective marker applied to the back side of a magnetic tape which identifies the beginning of the tape's recordable surface.
BPI	<u>B</u> its <u>P</u> er <u>I</u> nch.
BPS	<u>B</u> its <u>P</u> er <u>S</u> econd transmitted or received; serial data rate.
Break	A long (GT 200 msec) space on an asynchronous communications line that is intended to alert the receiving CPU. Minimum duration is 1 character time.
Broadband	See Wideband.
Buffer	A storage area used to hold (temporarily) information being transferred between two devices or between a device and memory. A buffer is often a special register or a designated area in memory. Also used to compensate for differences in the rates of data flow between two devices.
Bug	A flaw in the design or implementation of a program which may cause erroneous results.
Bullet	A symbol which indicates electrical and logical connectivity of nets. A bullet does not indicate a physical connection at that point. A bullet in CADDs is represented by a nodal subfigure or by a connect node not associated with a nodal subfigure, i.e., a stand-alone connect node.
Bus	A circuit used as a power supply or data exchange line between two or more devices.
Byte	A binary element string, usually operated upon as a unit, and typically shorter than a computer word (e.g., eight bits).
CAD	<u>C</u> omputer <u>A</u> ided <u>D</u> esign.

CADDS	<u>C</u> omputer <u>A</u> ided <u>D</u> esign and <u>D</u> rafting <u>S</u> ystem.
CAM	<u>C</u> omputer <u>A</u> ided <u>M</u> anufacturing.
Carrier	A continuous frequency capable of being modulated with a signal.
Carrier System	A means of obtaining a number of channels over a single path, modulating each channel upon a different carrier signal, and then demodulating at the receiving point to restore the intelligent signals to their original forms.
Catalog	An index which may be used to locate a particular file or group of files. More generally, a group of files belonging to one family of files.
CCITT	<u>C</u> omite <u>C</u> onsultatif <u>I</u> nternationale de <u>T</u> elegraphie et <u>T</u> elephonie. An international consultative committee which sets international communications standards.
CD3PRTS	The catalog name for all CADDS 3 parts.
CE	<u>C</u> ustomer <u>E</u> ngineer.
Cell	Physical location of a single data bit in memory.
Central Office	Location where communications common carriers terminate customer lines and house the equipment that interconnects these lines.
Central Processing Unit (CPU)	A unit of the processor that includes the circuits controlling the interpretation and execution of instructions.
CGOS	<u>C</u> omputervision <u>G</u> raphics <u>O</u> perating <u>S</u> ystem.
CGP	<u>C</u> omputervision <u>G</u> raphics <u>P</u> rocessor.
Channel	The part of a communications system that connects a communications source with its destination. A path for electrical transmission between two or more points. Also called a circuit, facility, line link, or path.
Channel Capacity	The maximum baud rate which can be handled by the channel.
Character	An alphabetic, numeric, or special graphic symbol.
Character String	A series of characters arranged in a meaningful sequence.
Circuit	The complete electrical path providing 1- or 2-way communications between two points. See also Channel.

Circuit Switching	A method of communications, where an electrical connection between calling and called stations is established on demand for exclusive use of the circuit until the connection is released. See also Packet Switching and Message Switching.
Clear	To erase the contents of a storage location by replacing the contents, normally with zeros or spaces.
CLINK	CADDS graphics coreload initiation routine; the process of transferring control from one coreload to another.
Clock	A device that generates regular periodic signals for synchronization.
CMORT	<u>CV Multiprogramming Reliability Test</u> : A system test to exercise and verify the reliability of CV system installations.
Code	A system of symbols and rules used for representing information. Code usually refers to instructions executed by a computer.
Coefficient	A number by which a variable or mathematical expression is to be multiplied.
Command	A word, mnemonic, or character which, by virtue of its syntax in a line of input, causes a computer system to perform a predefined operation.
Command Device	A device that provides communication between an operator and a system. See Alphanumeric Display, LIS, and Telewriter.
Command Line	Entry which follows certain rules of syntax to cause a particular event to occur.
Common Carrier	In data communications, a public utility company which is recognized by an appropriate regulatory agency as having a vested interest and responsibility in furnishing communications services to the general public (e.g., Western Union and the Bell System). See also Specialized Common Carrier and Value Added Service.
Communication Control Character	A functional character that controls or facilitates transmission over data networks. See also Control Character.
Compiler	A computer program that translates instructions written in a higher order symbolic language (such as FORTRAN) into a series of machine instructions.

Component	A symbol which has a physical meaning. Examples include switch, resistor, capacitor, etc. A component in CADD5 is represented by a nodal subfigure.
Component Element	A physically identifiable element of a component. Component elements are actually part of the component but are drawn as separate symbols, e.g., split-equipment (also called an element). Examples include contact, coil of relay, and switches of a circuit breaker. A component element in CADD5 is represented by a nodal subfigure.
Component Label	Text associated with a component which identifies the component. In CADD5, a component label is nodal text attached to a text node associated with the component nodal subfigure. It may also be called Component Name.
Component Layer	The layer of the schematic containing component names (such as R1, D2, etc). A CLAY modifier may be used with the LST NET command, default is layer 2.
Component Name	The reference designator placed on a PC component and on the corresponding element in the schematic drawing.
Computer Network	An interconnection of computer systems, terminals, communications facilities, and data collecting devices.
Concentrator	A communications device that provides communications capability between many low-speed, usually asynchronous channels and one or more high-speed, usually synchronous, channels. It's normal for different speeds, codes, and protocols to be accommodated on the low-speed side. The LS channels usually operate in contention and require buffering. The concentrator may have the capability to be polled by a computer, and may itself poll terminals.
Conditioning	The addition of equipment to leased voice-grade lines to provide specified minimum values of line characteristics required for data transmission e.g., equalization and echo suppression.
Configuration	The combination of computer and peripheral devices at a single area of installation.
Connect Node CNOD	A location shown graphically as a diamond (\diamond), used as an attachment point for nodal lines. Connect nodes may have text nodes associated with them. Connect nodes are often associated with a nodal subfigure.

Contention	Circumstance of having several processes simultaneously requesting exclusive use of a single resource (such as a disc), or communications channel.
Control Character	<ol style="list-style-type: none">1. A character whose occurrence in a particular context initiates, modifies, or stops a control function.2. In ASCII, any of the 32 characters in the first 2 columns of the standard code table. Ten of these characters form the basis for character-oriented communications control procedures.
Control Signals	Pulses that control the operation of components: enable components, clock-in data, select multiplexer outputs, and initiate operations.
Control Station	The station on a network which supervises the network control procedures such as polling, selection, or recovery. It is also responsible for establishing order on the line in the event of contention (or any other abnormal situation) arising between stations on the network. See also Tributary Station for comparison.
Controller Unit	The PC board (or boards) that control an I/O device and interface with the main processor.
Core Layout/ Overlay	The manner in which a CADDSS user's core memory is used for program execution.
Coreload	A program, series of programs or data which can be executed and/or accessed directly.
CPS	<u>C</u> haracters <u>P</u> er <u>S</u> econd or <u>C</u> ards <u>P</u> er <u>S</u> econd.
CPU	<u>C</u> entral <u>P</u> rocessing <u>U</u> nit.
Crash	A system or program malfunction that causes the system to stop operation.
Cross Section	Cutting at an angle to the axis. The view formed when a plane is passed through a part and everything on one side of the plane is discarded.
Crosshatching	The process of filling in an outline with a pattern.
Crosstalk	The undesired transfer of energy from one circuit, called the disturbing circuit to another circuit, called the disturbed circuit.

CRT	Cathode Ray Tube: An electronic device in which a well-defined and controllable beam of electrons is produced and directed to a surface to give a visible display.
Cubic	Relating to the third dimension, a cube. A cubic curve or equation. An algebraic expression of one variable which employs that variable, its square, and its cube, summed in any combination, each having any coefficient. $4t^3 + 7t^2 + 8t + 6$ is a cubic equation in t with coefficients 4, 7, 8 and 6.
Cursor	Movable, visible mark used to indicate a position for the next unit of input to a display. On a CRT, the cursor indicates the position controlled by the stylus.
Curve	Path of a moving point.
Cut Plane	The ability to define a plane and to intersect that plane with a three-dimensional object in order to derive a sectional view.
CVNET	Computervision proprietary protocol for file transfer between CV Designer Systems. A bisynchronous ASCII protocol.
CVNET II	Computervision's protocol for use with Computervision's PC board.
Cyclic Redundancy Check (CRC)	An error detection scheme in which the BCC is generated by taking the remainder after dividing all the serialized bits in a block of data by a preset binary number.
Data	Any meaningful pattern of bits. Data can be addresses or operands.
Data Access Arrangement (DAA)	Data communications equipment furnished a common carrier or independent manufacturer, permitting attachment of privately-owned data communications equipment to the common carrier switched network.
Data Circuit Terminating Equipment	See Data Communications Equipment.
Data Collection	The act of moving data from one or more points to a central point.
Data Communications	The interchange of data messages between two points over communications channels.
Data Communications Equipment (DCE)	The equipment which provides the functions required to establish, maintain, and terminate a connection, the signal conversion and coding required for communication between Data Terminal Equipment and data circuit. DCE may or may not be an integral part of a computer, e. g., a modem.
G-10	

Data Concentration	Collection of data at an intermediate point from several low-and medium-speed lines for retransmission across high-speed lines.						
Data Integrity	A performance measure based on the rate of undetected errors.						
Data Link Control	A uniform discipline for the transmission of data, over a single communications link. The three types of DLCs include: <table><tr><td>character controlled protocols</td><td>BCP's</td></tr><tr><td>character count protocols</td><td>CCP's</td></tr><tr><td>bit-oriented protocols</td><td>BOP's</td></tr></table>	character controlled protocols	BCP's	character count protocols	CCP's	bit-oriented protocols	BOP's
character controlled protocols	BCP's						
character count protocols	CCP's						
bit-oriented protocols	BOP's						
Data Phone	As a trademark as well as a service mark of AT&T, it identifies the data sets or modems manufactured and supplied by the Bell system for use in data transmission over the regular telephone network. As a service mark, it identifies the transfer of data over the regular telephone network.						
Data Set	A modem, also a collection of data records, with a logical relation of one to another.						
Data Tablet	Input device which has a writing surface with direct correspondence between positions on the tablet and addressable points on the display surface of a CRT.						
Data Terminal Equipment	<ol style="list-style-type: none">1. The equipment comprising the data source, data sink, or both.2. Equipment usually comprising the following functional units:<ul style="list-style-type: none">• control logic• buffer storage• one or more I/O devices or computers• error control facilities• synchronization capability• station I.D. capability						
Data Transmission	The sending of data from one place for reception elsewhere. See Data Communication for comparison.						
Database	Collection of information organized for rapid search, retrieval, and operation.						
Database Relations	Linkages within the CADDs database which logically bind two or more elements in the database. For example, a nodal line (interconnect) is related to its terminal connection nodes (pins) since they all belong to the same electrical net.						

Dataphone Digital Service (DDS)	A communications service of AT&T in which data is transmitted in digital rather than analog form, thus eliminating requirements for modem devices.
Dataphone 50	A public switched-communications service of the Bell system featuring high-speed data communications at 50KBPS.
DCP	<u>D</u> ata <u>C</u> ommunications <u>P</u> rocessor.
DDCMP	<u>D</u> igital <u>D</u> ata <u>C</u> ommunications <u>M</u> essage <u>P</u> rotocol by Digital Equipment Corporation (DEC). The best example of a CHARACTER COUNT protocol. Method of physical data transfer used may be parallel, serial synchronous, or serial asynchronous.
DDEX	<u>D</u> iagnostic <u>D</u> isc <u>E</u> xecutive: A monitor, same as DTEX, but resident on disc.
Debug	A process used to eliminate errors from a computer program.
Default	The value of a required parameter or argument not specifically supplied by the user.
Default Selection	A process that allows a CADDSS 4 user to select global (default) parameters which are then used each time a command is given. For example, SEL TEXT HEIGHT 0.156 will cause all text subsequently added to the drawing to be 0.156 inches high. The operator can override this default by selecting a different height at intersection time.
Delay Distortion	Distortion resulting from non-uniform transmission speed of the various frequency components of a signal through a transmission medium.
Delimiter	A character that separates and organizes different elements of data.
Demodulation	The process of retrieving an original intelligence signal from a modulated carrier wave. This technique is used in data sets to make communications signals compatible with computer signals.
Design Console	The CV trade name for an interactive terminal.
Device	A piece of I/O equipment (such as a magnetic tape or disc drive) external to the CGP chassis.
Diagnostics	Programs that evaluate, test, and identify the status of computer components.

Dial-Up Line	A communications circuit established by a switched circuit connection.
Digitize	The process of specifying data points on an interactive surface.
Digitizer	Device providing input coordinate data by pointing. Digitizers are used in converting a drawing or image to digital form.
Direct Distance Dialing (DDD)	A telephone exchange service which enables a user to dial telephone numbers outside his local calling area without operator assistance.
Direct Memory Access (DMA)	A logical control facility which permits I/O data transfers between a peripheral device directly into or out of memory without host computer intervention handling or control.
Disc	An auxiliary storage device on which information can be read or written.
Display	Visual presentation of data. See CRT. Basic building symbols that construct display images (i.e., points, line segments, and characters).
Display Menu	An option allowing an operator to select the next action by indicating one or more choices with an input device.
DLE	<u>D</u> ata <u>L</u> ink <u>E</u> scape. A control signal used exclusively to provide supplementary line-control signals. These are two character sequences where the first character is a DLE. The second character depends upon the desired function and the code used.
DMA	<u>D</u> irect <u>M</u> emory <u>A</u> ccess or the interface board used to control specified peripheral devices.
Double Precision	The technique of allocating twice the storage space and increasing the computing time to achieve twice the accuracy.
DPU	<u>D</u> isc <u>P</u> rocessing <u>U</u> nit: A disc-processing controller.
Drawing	A graphic representation of data.
DRC	<u>D</u> esign <u>R</u> ules <u>C</u> hecking: A process used to check a printed circuit board for manufacturing tolerance violations. Rules checked include: pad-to-pad, pad-to-interconnect, and interconnect-to-interconnect spacing.
Drill Symbol	A symbol that indicates a particular size drill to be used in a drill template.
Drill Tape	A magnetic or paper tape which contains information to be fed into an NC drill machine.

DTEX	<u>D</u> iagnostics <u>T</u> ape <u>E</u> xecutive: A comprehensive, tape-resident, diagnostic monitor for loading and testing CV system installations, automatically, off-line.
Dual Entity	A type of geometric design rules check in which 2 different entities (such as, pads vs. lines or lines vs. other lines) are checked for the distance between them (gaps) or overlaps.
Duplex	Simultaneous two-way independent transmission in both directions. Also referred to as Full Duplex or FDX.
Dynamic Edit	With storage tube technology, it is necessary to repaint the display completely when any element of the picture is changed. Dynamic editing allows the user to define a simple picture (symbol) which can be displayed in write-through mode and moved around without storing on the CRT.
EBCDIC (Extended Binary Coded Decimal Interchange Code)	Eight-bit (256 combinations) character code used primarily in IBM equipment.
Echo	A portion of the transmitted signal returned from the distant point to the source with sufficient magnitude and delay so as to cause interference.
Echo-Plex	A procedure whereby the receiving station automatically retransmits each character received, so that the sender may verify the correctness of his transmission.
Echo Suppressor	A device used to attenuate or cancel the effects of an echo on the line.
Edit	To alter, adapt, or redefine to achieve conformity to a standard, or to suit a particular purpose.
Effective Address (EFA)	The address obtained from indexing or indirect addressing operations. The EFA specifies an operand or instruction, not another address.
EIA	An <u>E</u> lectronic <u>I</u> ndustries <u>A</u> ssociation character code commonly used in computer applications.
Element	A symbol used in a schematic diagram to represent a particular logical or physical function, such as an AND gate or a resistor.

Elementary Diagram	An electrical schematic diagram containing components, logic elements, wire nets, bullets, miscellaneous graphic and non-graphic information, and text annotation. It may also be called a "Wiring Elementary."
Electronic Industries Association (EIA)	A standards organization specializing in the electrical and functional specification of interface equipment characteristics.
Electronic Switching System (ESS)	The common carrier communications switching system which uses solid-state devices and other computer-type equipment and principles; in particular, systems provided by the Bell System.
ENQ (Enquiry)	Used as a request (for response) to obtain identification and/or an indication of station status. In BISYNC transmission, ENQ is transmitted as part of an initialization sequence (line bid) in point-to-point operation, as the final character of a selection or polling sequence in multipoint operations, and as a text abort.
Entity	CADDS terminology for a primitive graphics item, i.e., arc, circle, line, text, point, spline, figure, nodal line, etc.
EOT (End of Transmission)	Indicates the end of a transmission which may include one or more messages, and resets all stations on the line to control mode (unless it erroneously occurs within a transmission block).
Equalization	Compensation for the increase of attenuation with frequency. Its purpose is to produce a flat frequency response.
Equivalent Elements	Two equivalent elements or subcomponents which can be used interchangeably and still retain an electrically correct circuit.
Equivalent Pins	When an interconnect for a specific signal may be connected to any one of electrically equivalent pins and still be electrically correct. For example, the input pins of a two input AND gate are electrically equivalent pins.
Erase	To remove from existence.
Error Control	An arrangement which detects the presence of errors. In some systems, error correction or recovery circuits are included; these either perform direct operations on received data, or request retransmission from the source.
ES	<u>E</u> lectrical <u>S</u> chematic.

ETX (End of Text)	Indicates the end of message. If multiple transmission blocks are contained in a message in BSC systems, ETX terminates the last block of the message. (ETB is used to terminate preceding blocks.) The block check character is sent immediately following ETX. ETX requires a reply indicating the receiving station's status.
Exchange	A defined area, served by a communications common carrier, within which the carrier furnishes service at the exchange rate and under the regulations applicable in that area as prescribed in the carrier's filed tariffs.
Execute Cycle	The microcycle (DECODE 1, RAD 2A) that begins the execution of an instruction by decoding it.
Extents	The limits to which something extends; the amount of space or surface that something occupies or the distance over which it extends.
Facsimile (FAX)	Transmission of pictures, maps, diagrams, etc. The image is scanned at the transmitter, reconstructed at the receiving station, and duplicated on some form of paper.
Fetch Cycle	The cycle during which an instruction is read out of memory and sent to the CPU.
FIFO	First-In-First-Out memory buffer.
Figure	An alternate terminology for a symbol or a part, and may contain primitive entities, other figures, non-graphic properties, and associations. Figures may be stored together in one library called a figure library, a parts library, or a symbol library.
File	A logical collection of data treated as a unit, which occupies space on a storage device such as a disc or magnetic tape and has an associated filename and file type.
Fillet	The arc of concave junction formed where two entities meet a curve that blends two curves or two lines.
Fillet Surfaces	The name given to the transition surface which blends two other surfaces together. An example of a fillet surface is the surface which blends the wings of an airplane to the plane's body.
Finite Element/Mesh Generation	Finite element analysis is an engineering method for determining the structural integrity of a mechanical part. Mesh generation is a means of creating the data necessary in order to apply finite element analysis programs.

Firmware	A blend of hardware and software characteristics.
Flag	A variable or register used to record the status of a program or device; the noting of errors by a translating program.
Floating Point	A number system in which the position of the radix point is indicated by the exponent part and another part represents the significant digits or fractional part.
Font	An assortment of type all of one size and style. A text font is a complete character set of one size and style. A line font is repetitive pattern used to give meaning to a line.
Format	A general plan of organization or arrangement. It is also the specific arrangement of data.
FORTTRAN-S	The CV version of FORTRAN IV. FORTRAN is an acronym for FORMula TRANslation and is a high-order programming language used primarily for scientific or algebraic applications.
Forward Channel	A data transmission channel in which the direction of transmission coincides with that in which information is being transferred. Compare with Reverse Channel.
FPLA	<u>F</u> ield- <u>P</u> rogrammable <u>L</u> ogic <u>A</u> rray.
Frame	See Block
Frame Check Sequency (FCS)	CRC remainder transmitted at the end of a frame.
Frequency Division Multiplexing (FDM)	Dividing the available transmission frequency range into narrower bands, each of which is used for a separate channel.
Frequency Modulation (FM)	A method of transmission whereby the frequency of the carrier wave is changed to correspond to changes in the information signal wave.
Frequency Shift Keying (FSK)	Also called frequency shift signalling. A method of frequency modulation in which frequency is made to vary at significant instants by smooth as well as abrupt transitions. Typically, a data "1" bit is represented as one frequency and a data "0" as another frequency.

Front End Processor	A communications computer associated with a host computer. It may perform line control, message handling, code conversion, error control, and applications functions such as control and operation of special-purpose terminals.
Full Duplex	In communication, this term pertains to a simultaneous, two-way independent transmission.
Full-Duplex (FDX)	See Duplex.
Function Key	A button or switch which enters commands or other keyboard input, i.e., each choice of a display menu.
Gap	The length of the shortest line segment which can be drawn from the boundary between two entities.
GAPS	<u>G</u> raphics <u>A</u> pplication <u>P</u> rogramming <u>S</u> ubroutines.
Generation	A type or a class of objects developed from an earlier type; an aged version within a family.
Geometric Design Rules	Rules relating to the geometry of a PC board. A text file is used to specify rules for the CHK PRT command and the items checked include gap, overlay, and width.
Geometry	The collection of lines, circles, points, etc., and their special relationship.
Getdata	The interface through which all CADD3 commands receive data from the operator and issue prompts if appropriate. Input to Getdata may include digitized points, explicitly typed X, Y, and Z coordinates, or references to other CADD3 graphic entities.
GIS	<u>G</u> raphics <u>I</u> nformation <u>S</u> ystem.
GPU	<u>G</u> raphics <u>P</u> rocessor <u>U</u> nit.
Graphics I/O	Graphics Input/Output provides general interface to all graphic devices supported by CADD3. It can allow new graphic devices to be added to the system easily, and permits multiple graphic devices to function together. For example, while digitizing, resulting graphics are echoed on the display.
Grid	A network of uniformly spaced points which may appear on an output device, and are used to locate positions.

Grid Size	The spacing of grid points.
Half-Duplex (HDX)	A circuit designed for transmission in either direction but not both directions simultaneously.
Hard Copy	A copy on paper of an image displayed on a CRT display.
Hard Core	That portion of an equipment that must work in order for a diagnostic routine to be effective.
Hardware	The physical equipment components of a computer system, e.g., mechanical, magnetic, electrical, or electronic devices. Hardware is in contrast to software.
Header	The control information prefixed in a message text, e.g., source or destination code, priority, or message type. Also called heading and leader.
Hertz	A unit of frequency equal to one cycle per second. Cycles are referred to as Hertz in honor of the experimenter, Heinrich Hertz. Abbreviated Hz.
Hexadecimal	The number system with a radix of sixteen in which the numbers are represented as 0-9 and A-F. For example, 11 decimal is B hexadecimal.
Hidden Lines	Line segments that would be obscured from view in a orthographic projection of a three-dimensional object.
High Level Data Link Control (HDLC)	ISO version of bit-oriented data link control. Functionally identical to ADC-CP.
High Order Bits	The most significant bits in a data word.
Homogeneous	Of uniform structure or composition throughout.
Horizontal Layer	The layer of the PC board drawing which contains the connections that are predominately horizontal.
Host Computer	A computer attached to a network providing primary services such as computation, database access, special programs, or programming languages.
IC	<u>I</u> ntegrated <u>C</u> ircuit: A tiny complex of electronic components and their connections produced on a small slice of material such as silicon.

ICP	<u>I</u> ntelligent <u>C</u> ontrol <u>P</u> anel.
Incremental Coordinates	A new set of coordinates measured from a previously derived set of coordinates rather than from the origin of X0, Y0, Z0.
Indirect Address	Specifies a storage location containing either a direct or effective address or another indirect address.
Information	A pattern of bits that contains, or is decoded into, data, addresses or operands.
Initialize	To set counters, switches, or addresses to starting values at prescribed points in the execution of a program, particularly for re-execution of a sequency of code.
Input	The data to be processed; the process of putting data into a system.
Input/Output Device	A device attached to a computer that makes it possible to enter information into the computer or to get information out of the computer
Insert	The action of placing entities, figures, or information into a part.
Instaview	A television-type graphics terminal.
Instruction	A coded command that tells the computer what to do and where to find the values it is to work with. A symbolic instruction looks more like ordinary language and is easier to deal with. Symbolic instructions, however, must be changed into machine instructions, usually by another program, before they can be executed by the computer.
Interact IV (IAIV)	The CV name for an automated drafting table used to plot and/or digitize drawings.
Interactive Node and Element Definition (INED)	The capability which gives the CADDs user the ability to interactively create a finite element mesh. Post-processors can convert the CADDs database into formatted input for finite element programs. The acronym INED is used and is pronounced as INEED.
Interconnection	Anything that connects one item to another. On a PC board, interconnections consist of copper runs connecting pads. On schematic drawings, interconnections consist of lines connecting elements. In CADDs drawings, all interconnections are made with nodal lines.

Interface	<ol style="list-style-type: none">1. A shared boundary defined by common physical interconnection characteristics, signal characteristics, and meanings of interchanged signals.2. A device or equipment making possible interoperation between two systems, e.g., a hardware component or a common storage register.3. A shared logical boundary between two software components.
Interface Unit	The PC board (or boards) that allow I/O devices to communicate with the main processor. Interface units hold and transfer data as directed by I/O instructions.
Interrupt	A signal that, when activated, causes a transfer of control to a specific location in memory, thereby breaking the normal flow of execution.
Intrinsic	Belonging to the essential nature or constitution of a thing.
I/O	<u>I</u> nput/ <u>O</u> utput.
IOS	<u>I</u> nput/ <u>O</u> utput <u>S</u> ystem; the board used to interface several types of peripheral devices.
IPC	<u>I</u> nstitute of <u>P</u> rinted <u>C</u> ircuits.
IPS	<u>I</u> nches <u>P</u> er <u>S</u> econd.
ISO (International Standards Organization)	ANSI reports to ISO.
ITB (Intermediate Text Block)	In binary synchronous communications, a control character used to terminate an intermediate block of characters. The block check character is sent immediately following ITB, but no line turnaround occurs.
Justification	The exact placement of an item. Text may be left-, center-, or right-justified depending upon whether the digitized point is to appear to the left, in the center or to the right of the text. If a string is left-justified, the digitized point will lie on the left edge of the string at a width when facing in the same direction as the string.
Keep-out	Nodal lines or strings that define the boundaries of a PC board and the area inside of the board not to be used for routing. Currently used only by Autoroute.

Language	A set of representations, conventions, and rules used to convey information.
Layer	A logical concept used to discriminate or separate group(s) of data within a given drawing. Layering enables an operator to specify derived display elements to be visible. A layer may be thought of as a series of transparencies arranged in any order, yet having no depth. Layering allows a more efficient use of the database.
Leased Line	A line reserved for the exclusive use of a leasing customer without inter-exchange switching arrangements. Also called a private line.
Least Significant Bit (LSB)	The last value bit in a data word. See most significant bit.
Library	A collection of files, such as the CD3PRTS library which contains all the CD3PRTS files.
Limited Distance Modem	A lower cost modem intended for limited distance operation. Also called short-haul modem.
Line	<ol style="list-style-type: none">1. The portion of a circuit external to a device consisting of the conductors connecting a telegraph or telephone set to the exchange or connecting two exchanges.2. The group of conductors in a cable.
Line Font	A line font is a special pattern used to represent a line. Line font as a view is the ability to define specific graphic representations for CADDs entities which are view-independent. For example, a line may be solid when drawn in the top view of an object but becomes dotted in the side view where it is not normally visible. Thus the line's font is view-dependent.
Link	<ol style="list-style-type: none">1. Any specific relationship between two nodes in a network.2. A communication path between two nodes.3. A data link. <p>Unites two or more separately written and compiled subroutines into a single unified operational unit.</p>
Link/Unlink	A command that allows the user to link NC machine toolpaths together and to subdivide toolpaths by unlinking.

LIS	Large Interactive Surface: An automated drafting table used to plot and/or digitize drawings.
LMOS	Large Memory Operating System.
Load Module	A load module is a program in a format suitable for loading into main storage for execution of system commands.
Loader	A program used to link object modules into a form suitable for loading into memory and for execution.
Location	An address in memory where a unit of data or an instruction can be stored.
Logic Element	A symbol which has logical meaning. It may also be called a logic symbol. Logic elements in CADDs are represented by nodal subfigures. Examples of logic elements include AND gates, OR gates, flip-flops, etc.
Logical Address	The address specified by the CPU.
Longitudinal Redundancy Check (LRC)	An error checking technique based on an accumulated exclusive OR of transmitted characters. An LRC character is accumulated at both the sending and receiving stations during the transmission of a block. This accumulation is called the Block Check Character (BCC), and is transmitted as the last character in the block. The transmitted BCC is compared with the Accumulated BCC character at the receiving station for an equal condition. An equal comparison indicates a good transmission of the previous block.
Loop	A sequence of instructions which are executed repeatedly, with or without modifications during each iteration, until a terminating condition is satisfied.
Loops and Macros	Provide the capability to create a set of NC toolpath cuts based on the same geometry, but differing in thickness offset. The user needs only to create the basic toolpath definition. The system then uses this macro to subsequently create a set of cuts by varying the offset parameter.
Low Order Bits	The least significant bits in a data word.
LSI (Large Scale Integrated Circuit)	See UART, USART, USRT.

MABS Associativity	The ability to recall the steps used in deriving an absolute machining (MABS) toolpath such that a revised toolpath can be automatically regenerated after changes occur to the part's geometry or to the tool's descriptions. Thus, the MABS toolpath is associated with the part's geometry.
Machine Instruction	An instruction that a machine can recognize and execute. A code that directs a computer to perform a particular operation.
Machine Language	The actual language used by the computer when it performs operations.
Macros	A prewritten set of statements which acts as an internal subroutine and which processes data passed to it in a specified fashion.
Magnify	Enlarge in appearance.
Main Processor	The two units that function together to execute instructions: the CPU and memory units.
Maintenance Control Panel	The inner control panel of the CGP used for maintenance and diagnostics.
Make File	A text file containing commands to the system loader which controls the way the load module is created. In this sense, the load module is the same as a coreload.
Map	The configuration of physical addresses. To convert logical addresses into physical addresses.
MARK	Presence of a signal. In telegraphy, MARK represents the closed condition or current flowing. Equivalent to a binary one.
Mask	A combination of bits used to select specific portions of any word, character, byte, or register for further processing.
Mass Properties	The generic term used for the calculation of physical engineering information about a part. Examples of mass properties include perimeter, area, volume, weight, moments of inertia, etc.
Mass Storage	Pertains to a device that can store large amounts of data readily accessible to the computer, i.e., a disc or magnetic tape.
Master Station	See Primary Station.

MCP	<u>M</u> aintenance <u>C</u> ontrol <u>P</u> anel.
MD	<u>M</u> echanical <u>D</u> rafting
MDB Board	A multiple I/O board in the CGP main-frame used to interface several types of peripheral devices.
MD/NC	<u>M</u> echanical <u>D</u> rafting/ <u>N</u> umerical <u>C</u> ontrol.
Memory	Any form of data storage, including MOS memory and mass storage, where data can be read and written. Usually, however, memory refers to MOS memory.
Memory Cycle	The amount of time required to read out of or write into a memory location (usually 400 ns).
Memory Unit	The PC board(s) that store data for the CPU.
Menu	The graphics used to guide the operator to the correct function key.
Mesh	A network of lines used to represent or display a surface. A mesh appears as two sets of parallel curves, each set parallel to the surface boundaries, one set intersecting the other.
Message	A communication from the system, e.g., an error message.
Message Switching	A method of handling messages over communications networks. The entire message is transmitted to an intermediate point (e.g., a switching computer), stored for a period of time, perhaps very short, and then transmitted again towards its destination. The destination of each message is indicated by an address integral to the message. Compare with Circuit Switching.
Microdiagnostics	Microprograms residing in the control store that test the operation of the CPU.
Microinstruction	An instruction that controls an elementary CPU operation. A series of microinstructions, called a microroutine, execute each instruction. Each microinstruction defines a machine state (microcycle).
Microprogramming	The use of microinstructions to execute instructions.
Minus Figure	Any CADDs part that contains a minus sign (-) as the first character of its name. Minus figures are treated as connection points but are not normally listed in a net list and are not considered components or elements.

MIPTR	<u>M</u>aster <u>I</u>ndex <u>P</u>ointer: The MIPTR provides a means of obtaining information rapidly from a specific entry in the parts database.
Mirroring	A graphic action which causes a construction to be represented in a reversed arrangement in comparison to the original with reference to an intervening axis.
MMPU (Mapper)	<u>M</u>emory <u>M</u>apping and <u>P</u>rotection <u>U</u>nit or mapper module in the CGP used to access memory above the first 32K.
Mnemonic	An alphabetic representation of a function or a machine instruction.
Model Space	Frame of coordinate reference for the graphics database.
Modem	A device that modulates signals transmitted over communications circuits.
Monitor	A device (hardware or software) that observes and verifies the operations of a data-processing system and indicates any significant departure from the norm.
MOS Memory	<u>M</u>etal <u>O</u>xide <u>S</u>emiconductor memory, the main type of memory used in the CGP-100 as well as in many other computers.
Most Significant Bit (MSB)	The first value bit in a data word. The MSB defines the order for the rest of the word. For example, if bit 0 is the MSB, then the word 1 011 011 000 111 000 is read from left to right as 133070. If bit 15 is the MSB, then the word is read from right to left as 016155.
Move	An action causing a graphics construction to change position relative to the remainder of the drawing or part.
Modem (Modulator-Demodulator)	A device that modulates and demodulates signals transmitted over communications circuits. Also called data set.
Multi-Private Line Service (MPL)	A wideband service of 48 kHz bandwidth.
Multi-User Controller (MUC)	The obsolete name for the Memory Management and Protection Unit (MMPU).
Multiplexer	A device used for multiplexing. It may or may not be a stored program computer. Also a device for connecting a number of communications lines to a computer.

Multiplexing	A division of a transmission facility into two or more channels. See also Frequency Division Multiplexing and Time Division Multiplexing.
Multipoint Line	A single communications line to which more than one terminal is attached. Use of this type of line normally required some kind of polling mechanism, addressing each terminal with a unique ID. Also called multi-drop.
Narrowband Channels	Sub-voice grade channels characterized by a speed range of 100 to 200 bits per second.
NASTRAN	<u>NASA STR</u> uctural <u>A</u> nalysis: a structural analysis program developed to run on large computers.
NC	<u>N</u> umerical <u>C</u> ontrol: Automatic control of machine tools, drafting machines, and other operations by punched paper or magnetic tapes suitably formatted with directive information.
NC Drilling	Automatic control of drilling machines by punched paper or magnetic tape, suitably formatted for drill operation.
NC Insertion	Automatic control of machines which place physical components on a PC board or those machines which direct the placement.
NC Pep	The addition of NC toolpaths and other programming capabilities to the CV PEP processor. This allows CV users to develop special NC capabilities and libraries of simple NC programs to support various NC tools.
NC Toolpath Edit	The ability to react to design changes by modifying selected portions of an NC toolpath without recreating the entire toolpath.
Negative Acknowledgement (NAK)	Indicates that the previous transmission block was in error and that the receiver is ready to accept a retransmission of the erroneous block. NAK also indicates the "not ready" reply to a station selection (multipoint) or to an initialization sequency (line bid) in point-to-point operation.
Net	A set of symbols which are logically connected. A net may also contain bullets. In CADD5 4, a net is represented by nodal lines attached to connect nodes associated with nodal subfigures. It may also be called a Logical Net.
Net List	A list of names, symbols, and their connection points which are logically connected to a net. Bullets are not listed.

Net List Verify	Manual layouts of printed circuit board interconnects are prone to error in their electrical equivalence to the logical schematic. Net List Verify compares the net list of the schematic to the net list of PC board and reports any errors.
Net Name	Alphanumeric designation of a net. In CADD5 4, a net name is nodal text, or properties, associated with a nodal line.
Network	Two or more processors connected via communication lines for the exchange of information.
Nibble	Four bits of a data word. (See Byte.)
Nodal Entity	A class of entities required for wiring diagrams which contain associative relationships between the entities, i.e., nodal line, nodal text, nodal subfigure, connect node, and text node.
Nodal Line (NLIN)	A string which must begin and end on a connect node. Nodal text, usually a signal name, may be associated with a nodal line.
Nodal Subfigure (NFIG)	A figure inserted into an active figure as a "nodal" subfigure. Nodal information is copied from the original figure into the active part but continues to be associated with the subfigure.
Nodal Text (NTXT)	Text associated with a text node or nodal line. Any number of text entities may be associated with a single text node or nodal line.
Noise	Undesirable disturbances in a communications system. Noise can generate errors in transmission.
Non-Return to Zero Inverted (NRZI)	A coding scheme that inverts the binary signal state on a ZERO and leaves it unchanged on a ONE.
Non-Switched Line	A communications link permanently installed between two points. Also called leased line or private line.
Non-Transparent Mode (Normal Mode)	Transmission of characters in a defined character format, e.g., ASCII or EBCDIC, in which all defined control characters and control character sequences are recognized and treated as such.
Normalize	See scale.
ns	nanosecond.

Object Module	An organized, programmed, sequence of machine instructions generated by a compilation of a source file.
Octal	The number system based on a radix of eight, for example, octal 8 is decimal 10.
Off-line	Equipment or devices in a system which are not currently under the direct control of the system.
Offset Origin	The distance from the origin of a part to the point referenced by the N/C inserter.
On-line	Equipment or devices in a system which are currently under the direct control of the system.
One-Way Only Operation	A mode of data link operation in which data are transmitted in a preassigned direction over one channel. Also called simplex operation.
One's Complement	A number formed by interchanging the bit polarities in a binary number, e.g., 1 becomes 0 and 0 becomes 1.
Operation	The action specified by a single computer instruction; a program step undertaken or executed by a computer, e.g., multiplication, comparison, addition, etc. The operation is usually specified by the operator part of an instruction.
Order	To place into a sequence according to some rules or standards.
Origin	The X0, Y0, Z0 point from which all coordinates are measured.
O/S	<u>O</u> perating <u>S</u> ystem.
Output	The result of a process; the transferring of data from internal storage to external storage.
Overflow	A condition that occurs when a mathematical operation yields a result whose magnitude is larger than the program is capable of handling.
Overlap	One of the types of checks performed by the CHECK PART graphics command. An overlap can also refer to the shortest line segment which can be drawn from a boundary of one figure inside a second figure across overlapping space to the nearest boundary of the second figure.

Packet Switching	A data transmission process, utilizing addressed packets, whereby a channel is occupied only for the duration of the packet transmission. NOTE: In certain data communication networks the data may be formatted into a packet or divided and then formatted into a number of packets (either by the data terminal equipment or by equipment within the network) for transmission and multiplexing purposes. See also Circuit Switching and Message Switching.
Pad	An area of plated copper on a PC board to which leads of components are soldered. Plus figures are used to represent pads in CADD5.
Parallel Transfer	The transfer of data one word or byte at a time.
Parallel Transmission	Method of data transfer in which all bits of character or byte are transmitted simultaneously either over separate communication lines or on different carrier frequencies on the same communication line.
Parity	A binary digit appended to an array of binary digits to make the sum of all the bits always odd or always even.
Parity Check	Addition of non-information bits to data, making the number in each grouping of bits either always odd for odd parity or always even for even parity. This permits single error detection in each group.
Part	Another word for drawing.
Part Code	A name that definitely identifies a part (such as 7227).
Partitioning and Placement	In the creation of a PC board from an electrical schematic, partitioning refers to the logical grouping of electrical functions within a given set of hardware components. Placement refers to the physical location of the hardware components on the PC board. CADD5 4 provides tools to automate this process.
PC	<u>P</u> rinted <u>C</u> ircuit: A circuit for electronic apparatus made by depositing conductive material in continuous paths from terminal to terminal on an insulating surface. (Also Program Counter.)
PC/ES	<u>P</u> rinted <u>C</u> ircuit/ <u>E</u> lectrical <u>S</u> chematic.
PCU	<u>P</u> rogrammable <u>C</u> ommunications <u>U</u> nit.
PCU Debug Terminal	A display terminal connected to a debug port on the PCU board.

Pen	A drawing implement. Sometimes called a stylus.
PEP	<u>P</u> arametric <u>E</u> lement <u>P</u> rocessor: a language for defining a graphics database.
Peripheral Device	Any device distinct from the computer which can provide input to and/or accept output from the computer.
PFK	<u>P</u> rogram <u>F</u> unction <u>K</u> eyboard.
Phase Modulation (PM)	A method of transmission whereby the phase angle of the carrier wave is varied in accordance with the signal.
Photoplot	A photograph of printed circuit board graphics used for a particular process. For example, separate photoplots are used for etching each side of a circuit board.
Photoplotter	A device used to perform photoplot functions.
Photoplotter Wheel	A wheel in a photoplotter containing apertures of various sizes and shapes through which light must pass to reach the film. It is also referred to as an aperture wheel.
Physical Device	An I/O or peripheral storage device connected to or associated with a computer.
Pin	A connection point for components and logical elements. In CADDs, a pin is represented by a connect node associated with a nodal subfigure and may also be referred to as a connector on a component.
Pin Name	An alphanumeric designation assigned to a pin. In CADDs, the pin name is nodal text attached to a text node associated to the pin connect node. It may also be called pin number when it is just a numeric designation.
Placement	The assignment of something to a suitable place or location.
Plane	A surface of such nature that a straight line joining any two of its points lies wholly in the surface.
Plus Figure	A CADDs part with a name beginning with a plus (+) sign. Plus figures are used by the photoplotter processor. Each figure refers to a particular aperture on the photoplotter wheel.
Point	A narrowly localized place having a precisely indicated position.

Point-to-Point Connection	<ol style="list-style-type: none">1. A network configuration in which a connection is established between two terminal installations. The connection may include switching facilities.2. A circuit connecting two points without the use of any intermediate terminal or computer. Compare Multipoint Connection.
Polling	The process of inviting another station or node to transmit data. Compare with Selecting.
Polygon	A closed plane figure bounded by straight line segments.
Pop Operation	Reading a word out of the top location of the next address logic stack, thereby popping each word up to the next location.
Port	A port enables graphic information to be transferred in or out of the database. Each port is associated with only one command device.
Postprocessor	A postprocessor is that program or procedure which processes NC data and formats it into data readable by a specified machine.
Pre-placed Lines	Runs or lines that are placed on a PVC board before using Autoroute. Lines may be inserted using specified graphics commands and, in CADD5, they are represented as nodal lines.
Preprocessor	A preprocessor is that program or procedure which process a toolpath to generate a numeric record.
Primary Station	<ol style="list-style-type: none">1. The station which at any given instant has the right to select and to transmit information to a secondary station, and the responsibility to insure information transfer. There should be only one primary station on a data link at one time.2. A station which has control of a data link at a given instant. The assignment of primary status to a given station is temporary and is governed by standardized control procedures. Primary status is normally conferred upon a station so that it may transmit a message, but a station need not have a message to be nominated primary station.
Primitive	Not derived assumed as a basis at the lowest stage of complexity.
Priority	A ranking associated with a task or machine operation defining the preference of its requests for service received from the operating system relative to other tasks or operations requesting service.

Process	A series of actions or operations performing a function that is leading or leads to an end result.
Processor	In hardware, it is the CPU. In software, it is a computer program that includes the compiling, assembling, translating, and related functions for a specific programming language or application.
Program	A set of machine instructions or symbolic statements combined to perform some task.
Program Counter (PC)	A register used by the CPU to record the locations in memory (the addresses), of the instructions to be executed. The PC always contains the address of the next instruction to be executed.
PROM	<u>P</u> rogrammable <u>R</u> ead- <u>O</u> nly <u>M</u> emory.
Prompt	Any message or symbol from the computer system informing the user of possible actions or operations.
Properties	Non-graphic data which may be associated with database entities used to associate various characteristics and values with any subfigure or part. Properties may include such items as color, wire size, pin numbers, lug type, signal values, etc. A drill property is attached to each connect node of a PC component to indicate the size of the drill to be used by an NC drilling machine when drilling holes for specified leads.
Protocol	A formal set of convention or rules governing the format, timing, and error control to facilitate message exchange between two communicating processes. Also included are the electrical, mechanical and functional characteristics of the communications link.
Pseudo-Instructions	The data read into the instruction register from the maintenance control panel.
PTP	<u>P</u> aper <u>T</u> ape <u>P</u> unch.
PTR	<u>P</u> aper <u>T</u> ape <u>R</u> ead <u>e</u> r.
PTT (Post, Telephone and Telegraph Authority)	The governmental agency that functions as the communications common carrier in most areas of the world except North America.
Puck	A manually operated directional control on a large interactive surface.

Pulse Code Modulation (PCM)	Modulation of a pulse train in accordance with an 8-bit code.
Push Operation	Writing a word into the top location of the next address logic stack, thereby pushing each word in the stack down.
Quadratic	A branch of algebra dealing with equations involving terms of no more than the second degree.
Radix	The base of a number system; the number of digit symbols required by a number system.
RAM	<u>R</u> andom <u>A</u> ccess <u>M</u> emory: access to data in which the next location from which data is to be obtained is not dependent on the location of the previously obtained data. This is in contrast to sequential access.
Range	The limits of a series; the distance or extent between possible extremes.
Raster	The horizontal or vertical distance between two adjacent addressable points on a display surface. A system of intersecting lines covering a complete area. A unit of a coordinate system without reference to scale.
Read-Only Memory (ROM)	Memory whose contents are not alterable by computer instructions.
Real	A floating point number used within FORTRAN program.
Real Time Processing	Computation performed while a related or controlled physical activity is occurring so that the results of the computation can be used in guiding the process.
Redundancy	In a protocol, that portion of the total characters or bits that can be eliminated without any loss of information.
Reference Designator	Text (often called component name) used to uniquely identify a component and to associate the component with a particular schematic element.
Refresh	CRT technique requiring periodic retransmission of the display image.
Regen File	File of display vectors necessary to paint the display of the drawing on a CRT.
Register	A special 16-bit data storage area.

Relation	An aspect or quality that connects two or more like things or parts as being, belonging, or working together or as being of the same kind.
Relative Layer	A layer relative to that of the subfigure. If the RLAY5 modifier is used for a text node and the subfigure containing the text node is on layer 10, then the text will be placed on layer 15.
Remote Station	(Multipoint) synonymous with tributary station. (Point-to-point switched network) a station that can be called by the central station, or can call the central station if it has a message to send.
Repaint	Redraw a display image on an output device. In CADD5, a repaint is done from a REGEN file.
Reset (or Clear)	The state of a flip-flop when its Q output = 0 and its \bar{Q} output = 1.
Resource	Any means available to users, such as computational power, programs, data files, storage capacity, or a combination of these.
Restart	To resume execution of a program.
Restore	To renew, rebuild or to bring back to or put back into a former or original state.
Reverse Channel	A channel used for transmission of supervisory or error-control signals. The directional flow of these signal is opposite the direction in which information is being transferred. The bandwidth of this channel is usually less than that of the forward (information) channel. Used on two wire pairs.
Reverse Interrupt (RVI)	In binary synchronous communications, a control character sequence (DLE sequence) sent by a receiving station instead of ACK1 or ACK0 to request premature termination of the transmission in progress.
Ring Network	A computer network in which each computer is connected to adjacent computers.
ROM	<u>Read-Only Memory</u> .
Rotation	The turning of a construction about an axis as if on a pivot.
Router	A program which automatically determines the routing path for the conductive interconnects between components on a printed circuit board.
Routine	A set of instructions arranged in proper sequence to cause a computer to perform a desired operation.

Routing	To place interconnections on a printed circuit board.
RTC	<u>Real-Time-Clock</u> .
Run	A single, continuous execution of a program.
Scale	To change the magnitude of a variable(s) in a uniform way; the ratio of a real thing's magnitude to the magnitude of the model.
Scissor	To remove parts of display elements which lie outside defined bounds, synonymous with clip.
SDLC (Synchronous Data Link Control)	IBM's version of a bit-oriented data link control. Imbedded in SNA.
Secondary Station	A station selected to receive a transmission from the primary station. The assignment of secondary status is temporary, under control of the primary station, and continues for the duration of a transmission. Compare with Primary Station.
Section	A division.
Sector	A physical portion of a mass storage device.
Selecting	A process of inviting another station or node to receive data. Compare with Polling.
Sequential Access	Access is dependent on a previous access.
Serial Transfer	The transfer of data one bit at a time.
Serial Transmission	A method of transmission in which each bit of information is sent sequentially on a single channel rather than simultaneously as in parallel transmission.
Set	A collection of similar items forming a unit; a group of elements having at least one property in common.
Shape Fill	When creating a ground plane of any other area of a PC board which is to be filled with copper, the user can define the boundary of the shape and the area will automatically be painted in, (filled) by the proper apertures when the area is photoplotted.
Signal	The name associated with common nodes of an electrical path.

Signal Element	Each of the parts of a digital signal, distinguished from others by its duration, position, and sense or by some of these features only. In start/stop operation, a signal element has a minimum duration of one-unit interval. If several unit intervals of the same sense run together, a signal element of duration of more than one-unit element may be formed. Signal elements may be start elements, information elements, or stop elements.
Signal Highlighting	The operation that identifies the connection points of a net in a PC board. In CADDs the command required is IDENT NET. The board must have been merged with the net list, using MERGE NET, before highlighting.
Signal Net	See Net List.
Signal To Noise Ratio (SNR)	Relative power of the signal to the noise within a channel, usually measured in decibels.
Silk Screen Diagram	Shows the outline of the PC component. It may be used to obtain a pattern on the PC board by using the silk screen process.
Simplex Mode	Operation of a channel in one direction only with no reversal capability.
Single Entity	A type of geometric design rules check in which each individual entity is checked.
SLU	A Data General produced communications PC board replaced by CV's PCU.
SNA (Systems Network Architecture)	IBM's software protocol for data communications among IBM computers and terminals.
Software	A set of programs, procedures, rules and associated documentation concerned with the operation of a data processing system. Contrast to hardware.
Source	A text file of commands written in computer language. Source must be compiled to generate machine recognizable instructions. Source can be understood by people but not by a computer.
Specialized Common Carrier	A company that provides private line communications services, e.g., voice, teleprinter, data, facsimile transmissions, etc. See also Common Carrier and Value Added Service.
Start Bit	In start/stop transmission, the first element in each character, which serves to prepare the receiving equipment for the reception and registration of a character.

Start of Header (SOH)	A communication control character used at the beginning of a character sequence which constitutes a machine-sensible address or routine information. Such a sequence is referred to as the heading.
Start of Text (STX)	A communication control character which precedes a character sequence that is to be treated as an entity and entirely transmitted through to the ultimate destination. Such a sequence is referred to as text. STX may be used to terminate a character (heading) started by SOH.
Start/Stop Transmission	Asynchronous transmission in which a group of code elements corresponding to a character signal is preceded by a start element and is followed by a stop element. EIA RS 404.
Station	The data terminal equipment from or to which messages are transmitted on a data link. It includes those elements which serve as sources or links for the messages, as well as those elements which control the message flow on the link, by means of data communications control procedures.
Stop Bit(s)	In start/stop transmission, the last element in each character, to which is assigned a minimum duration, during which the receiving equipment is returned to its rest condition in preparation for the reception of the next character.
Storage	Pertaining to a device into which data can be entered, in which it can be held, and from which it can be retrieved at a later time.
Stretch	To expand or shorten, to alter; to extend beyond original limits.
Stretch Part	The ability to stretch or shrink a part and have the values of the appropriate dimensions automatically updated to new values.
String	A series of continuous straight line segments.
Stylus	An instrument used for writing, marking, or incising.
Subfigure	The placement of one drawing into another as a reference without duplicating the display elements. The instance refers to the figure in the parts library.
Subprogram	A program or a sequence of instructions that can be called to perform the same task, though perhaps on different data, at different points in a program, or even in different programs. It may be a function.
Subroutine	Subroutine is another term for subprogram.

Surface	A plane or two-dimensional locus of points.
Surface Machining	The ability to output 3-, 4-, and 5-axis NC toolpaths using the present three-dimensional surface definition capabilities of CADDs, i.e., ruled surfaces, tabulated cylinders, surfaces of revolution etc.
Switched Line	A communications link for which the physical path may vary with each usage, e.g., the dial-up telephone network.
Symbols	A representation of something by reason of relationship, association, or convention; an arbitrary or conventional sign used in writing or printing relating to a particular field to represent operations quantities, elements, or relationships.
Synchronous	Pertaining to related events where all changes occur simultaneously over indefinite timed intervals.
Synchronous Idle (SYN)	Character used as a time fill in the absence of any data or control character to maintain synchronization (character phase) following each line turnaround in Bisync and DDCMP. DLE-SYN is the time fill in BISYNC transparent mode.
Synchronous Transmission	Transmission in which the data characters and bits are transmitted at a fixed rate with the transmitter and receiver synchronized. This eliminates the need for start/stop elements, thus providing greater efficiency. Compare with Asynchronous Transmission.
Syntax	The structure of expressions in a language and the rules governing the structure of a language.
Sysgen	A software system; the process of grouping object modules together to form a software system.
Tag	To attach as an addition. To supply with an identifying number.
Tariff	<ol style="list-style-type: none">1. A published rate for services provided by a common or specialized carrier.2. The means by which regulatory agencies approve such services. The tariff is a part of a contract between customer and carrier.
Task	A specific portion of memory, assigned to the user, which is capable of executing software programs.

Teletype	Trademark of Teletype Corporation. Usually refers to one of their series of teleprinters.
Teletypewriter Exchange Service (TWX)	A public teletypewriter exchange (switched) service in the United States and Canada formerly belonging to AT&T Company which is now owned by the Western Union Telegraph Company. Both Baudot and ASCII-coded machines are used.
Teletypewriter (TTY)	An input/output device with a keyboard that uses ASCII character data (such as the Telewriter or the interactive display terminal).
Telewriter	Used to enter commands or to print out system messages. It has a typewriter-style keyboard, it can print out a hard copy, and may be used as a command device.
Telex Service	A western Union world-wide teletype-writer exchange service that uses the public telegraph network Baudot equipment is used.
Telpak	The name given to the pricing arrangement by AT&T in which many voice-grade telephone lines are leased as a group between two points.
Template	A gauge, pattern, or mold used as a guide to the form of a piece being made.
Temporary Text Delay (TTD)	In binary synchronous communications, a control character sequence (STX ...ENQ) sent by a transmitting station to either indicate a delay in transmission or to initiate an abort of the transmission in progress.
Tentative	Preliminary, not fully worked out or developed.
Terminal	An I/O device, such as a Telewriter, that includes a keyboard and a display mechanism. A terminal is used as the main communication device between the processor and the operator.
Text	In ASCII, as well as in general communications usage, a character sequence is treated as an entity if preceded by a SOT and followed by an EOT control character.
Text File	A file containing text. A text file may be created by the user with the EDIT commands or it may be created automatically by a CADDS command such as LIST NET.

Text Node (TNOD)	A location shown graphically as a triangle (Δ) which contains default parameters for subsequent placement of nodal text. A text node may be associated with a connect node, several connect nodes, or a nodal subfigure or may stand alone.
Thickness	As applied to text, thickness is the line width and is controlled by the aperture on the photo-plotter wheel.
Three-Dimensional (3D)	A form consisting of length, width, and depth. A cube is three-dimensional.
Time-Division	A system of multiplexing in which channels are established by connecting terminals one at a time at regular intervals by means of an automatic distribution.
Toggle	The use of switches located on an operator's console to enter data into the computer memory.
Toolpath	The center line of an NC cutting or drilling tool in motion for a specific cutting operation.
Touch Tone	AT&T registered trademark for pushbutton dialing. The signaling form is multiple tones.
Transformation	The operation of changing, as by rotation or mapping, one configuration into another in accordance with a mathematical rule. See move.
Transform Space	Display image with a coordinate frame of reference other than the part database. Contrast with Model Space.
Translate	To move or change from one place to another.
Transparent	Having the property of invisibility.
Transparent Mode	Transmission of binary data with the recognition of most control characters suppressed. In binary synchronous communications, entry to and exit from the transparent mode is indicated by the sequences Data Link Escape (DLE)-STX and DLE-EXT, ETB, ITB, ENQ.
Trap	An automatic transfer of control to a known location; to catch or take in as if in a trap; an imaginary square about a digitized location.
Trap Size	One-half the size of the imaginary square forming the trap.

Trial Table	A table that stores tentative paths as the router performs its iterations.
Tributary Station	A station, other than the control station, on a centralized multipoint data communications system which can communicate only with the control station when polled or selected by the control station.
Truncation	The reduction of precision by ignoring one or more of the least significant digits, e.g., 3.14159 truncated to four decimal digits is 3.141.
Trunk	A single circuit between two points, both of which are switching centers or individual distribution points.
Turnkey	Pertaining to a computer system sold in a ready-to-use state.
Two's Complement	A number used to represent the negative of a given value in many computers, formed from the given binary value by changing all 1's to 0's and all 0's to 1's and then adding 1.
Two-Dimensional (2D)	A form consisting of length and width. A plane is two-dimensional.
Two Way Alternate	A mode of data link operation in which data may be transmitted in both directions, one way at a time. Also called half-duplex operation.
Two-Way Simultaneous Operation	A mode of data link operation in which data may be transmitted simultaneously in both directions over two channels. <i>NOTE:</i> One of the channels is equipped for transmission in one direction while the other is equipped for transmission in the opposite direction. The channels may be two two-wire pairs or one frequency divided two-wire pair. Also called full-duplex and duplex.
TWX	See <u>T</u> eletype <u>w</u> riter <u>E</u> xchange Service.
UART	<u>U</u> niversal <u>A</u> synchronous <u>R</u> eceiver/ <u>T</u> ransmitter: LSI circuit for start/stop serial data transfer.
Unit	A single quantity regarded as a whole in calculations; a determinate quantity adopted as a standard of measurement.
Unlink	To detach.
USART	<u>U</u> niversal <u>S</u> ynchronous- <u>A</u> synchronous <u>R</u> eceiver/ <u>T</u> ransmitter.
USASCII	See ASCII.

User	One who operates the system.
User Mode	The state of the MMAPU when it maps memory addresses. The mapper RAM cannot be loaded when the MMAPU is in user mode (cf supervisor mode)
USRT	<u>U</u> niversal <u>S</u> ynchronous <u>R</u> eceiver <u>T</u> ransmitter.
Value Added Service	A communication service utilizing communication common carrier networks for transmission and providing added data services with separate additional equipment. Such added service features may be store and forward message switching, terminal interfacing, and host interfacing.
Vector	A quantity that has magnitude and direction and is commonly represented by a directed line segment whose length represents the magnitude and whose orientation in space represents the direction.
Vertical Circuit	A connection between a source and a sink in a network that may be realized by different circuit configurations during transmission of a message. Also called a logical circuit.
Vertical Layer	The layer of the PC board drawing which contains the connections that are predominately vertical.
Vertical Redundancy Check	A check or parity bit added to each character in a message such that the number of bits in each character, including the parity bit, is odd (odd parity or even (even parity).
VGU	<u>V</u> ideo <u>G</u> enerator <u>U</u> nit.
Via Prohibition	A Via is a means of passing from one layer or side of a printed circuit board to the other. A prohibition prevents automatic routing through the area of a Via.
Video	Being, relating to, or used in the transmission or reception of an image on a Cathode Ray Tube (CRT).
View	A pictorial representation.
View Ports	This feature gives a CADDSS user the ability to logically assign several different windows or views of a part's geometry to one physical device, i.e., a drawing may be divided up into many views and each assigned a different location on the LIS surface.
View Space	View space is analagous to transform space.

Visible	Capable of being seen; exposed to view.
Voice Grade Channel	A channel used for speech transmission usually with an audio frequency range of 300-3400 Hertz. It is also used for transmission of analog and digital data. Up to 10,000 bits per second can be transmitted on a voice-grade channel.
Volume	Space occupied as measured in cubic units; the amount of a substance occupying a particular volume.
WACK (Wait Before Transmitting Positive Acknowledgement)	In binary synchronous communications, this DLE sequence is sent by a receiving station to indicate that it is temporarily not ready to receive.
Warning	Something that alerts or serves to alert; to call to one's attention a possible danger.
WATS (Wide Area Telephone Service)	A service provided by telephone companies in the United States that permits a customer to make calls to or from telephones in specific zones for a flat monthly charge. The monthly charges are based on size of the zone instead of number of calls. WATS may be used on a measured-time or full-time basis.
Wideband	Communications channel having a bandwidth greater than a voice grade channel.
Width	Measurement taken at right angles to the length and depth.
Window	A bounded area, within a display image, that contains a scissored subset of the displayable data. It is a framework that resembles or suggests a window.
Wire	A wire run with only two connections.
Wire List	A wire run list containing only two connections in each wire run (Wire). It may also be called a To-From list.
Wire Name	Alphanumeric designation of wire net. In CADDSS, a wirename is represented like a net name.
Wire Net	Subset of electrical connections in a logical net having the same characteristics and common identifiers. No physical order of connection is implied. A wire net may contain bullets.

Wire Net List	Subset of net list which lists the electrical connections of a wire net. The order listed does not imply physical ordering. Bullets are not listed.
Wire Number	Alphanumeric designation of a wire or wire run. In CADDs, a Wire number is represented a wire name.
Wire Run	A wire net implying physical order. Bullets cannot exist in a wire run.
Wire Run List	A wire net list which implies physical order. The order of the list is the connection order of the wire run.
Wiring Diagram	A diagram containing components, wire runs, wires, miscellaneous graphic and non-graphic information and text annotation.
Word	Sixteen binary digits, treated as a single unit in the Computervision CGP-200 and in many other computers.
Write-enable	The condition of a storage device that allows data to be written on it.
Write-protect	The condition of a storage device that prevents data being written on it.
X	A CCITT recommendation designation.
X Lockout	No horizontal movement.
XY Lockout	Movement restricted to either vertical or horizontal direction may not be changed until a full stop is reached in the original direction.
Y-Lockout	No vertical movement.
Z-80 Code	A CV coding compatible with Zilog Model Z-80 microprocessor (chips); used on the PCU card.
Z Clipping	The ability to specify a three-dimensional window, cube, for a drawing such that all elements which are outside the cube become invisible. This feature only affects visibility, no change is made to the database of the part or drawing. It is useful in editing cluttered or complex part geometry.
Zoom	To proportionately enlarge or decrease the size of the display entities by rescaling.

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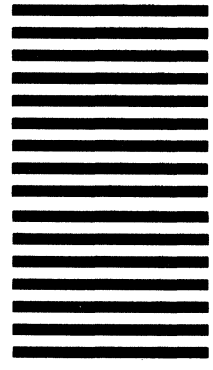
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