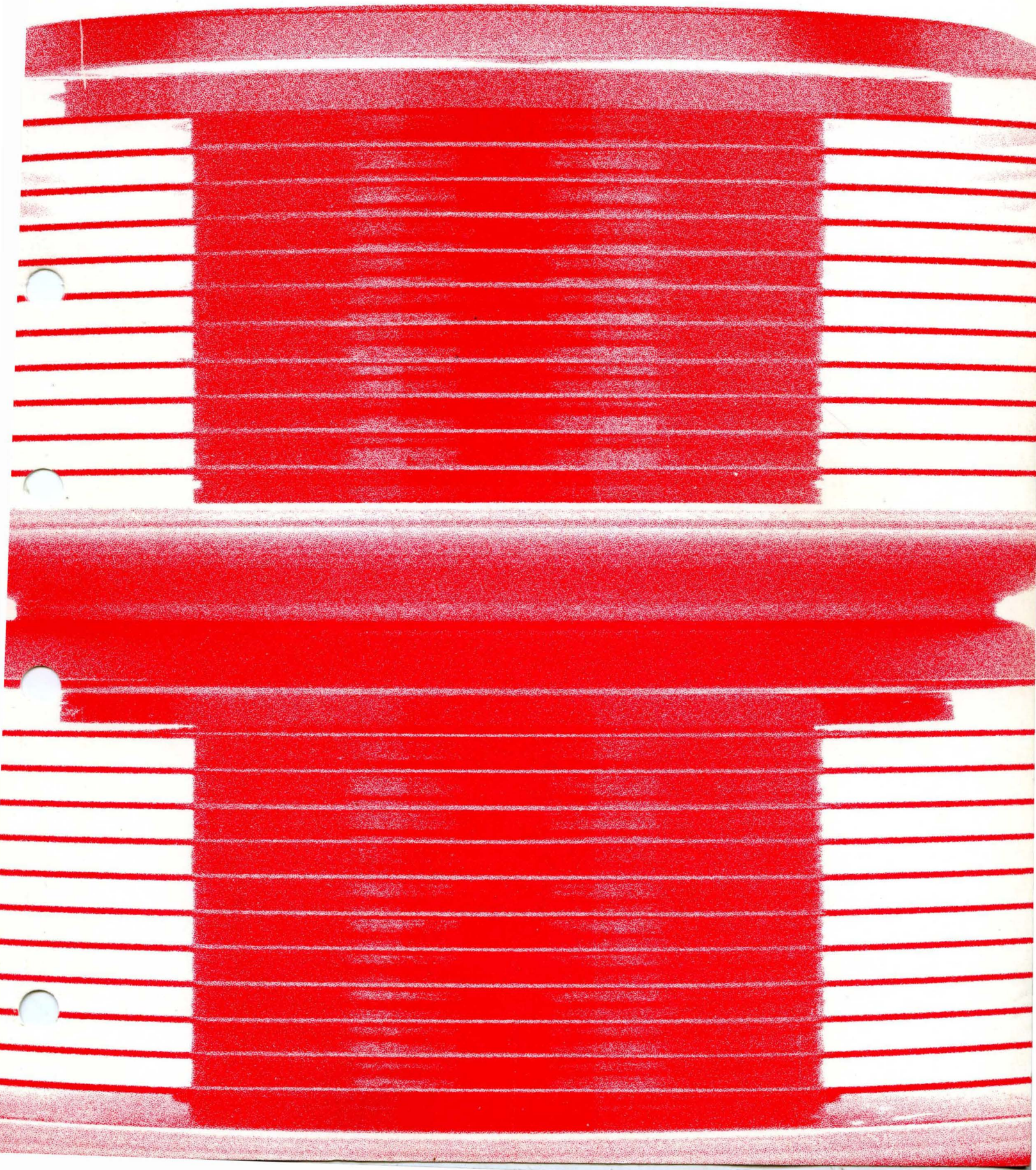
COMPUTERVISION

CGOS

CGOS 200 GNA
Systems Manager Guide



CGOS 200 GNA
Systems Manager Guide

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Section One
INTRODUCTION

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Section 1
INTRODUCTION

INTRODUCTION

Computervision's *CGOS 200 GNA System Manager Guide* is an introduction and summary of key aspects of site management. This release of the Computervision Graphics Operating System (CGOS 200) features Graphics Network Architecture (GNA) that supports up to 10 simultaneous tasks.

Providing step-by-step procedures, this publication guides the System Manager through system building and day-to-day operation. It also defines system configurations, the protection facility, and GNA. The final section alphabetically references the most-commonly used System Manager commands.

The Table of Contents and Index provide quick reference to material throughout the manual. This publication is divided into eight sections:

Section	*Title*	*Contents*
1	Introduction	Highlights the Designer V and CV environment.
2	CGOS Operating System	Introduces the O/S and Graphics environment.
3	Building a System (Overview)	Procedures for: Loading O/S software (COLDSTART), initializing file management (FMINIT), system re-start (Boot-Up), FMCLEAR, LOGIN, and LOGOUT.
4	System Failures/Recovery Procedures	
5	Day-to-Day Operating Procedures	Lists Start-up/Power-down procedures, error message changes, etc.

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INTRODUCTION (Continued)

Section	*Title*	*Contents*
6	Specialized System Procedures	Supplies special system configuration information.
7	Graphics Network Architecture	Explains networking between CV systems.
8	System Commands	References all commands and presents, in detail, the most commonly used System Manager commands.

Due to on-going hardware and software enhancements, some information in this manual may be superseded.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 described in Section 8.

Notation

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

	Exact	*Variable*
USER INPUT	ALL CAPS	Uppercase and Lowercase
SYSTEM OUTPUT	ALL CAPS, SMALL TYPE FACE	Uppercase and Lowercase Small Type Face

	Symbol	*Meaning*
OTHER CONVENTIONS	↵	Carriage return.
	n>	Operating System (O/S) level prompt for input.
	[ ]	Optional material.
	( )	Choose between two or more items.

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.

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Training and Productivity Services

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. 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; Massachusetts users should call 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.

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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.

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.

Installation of Communications Packages

CV supports a variety of communications packages. Installation generally requires:

- Appropriate hardware (PCU or SLU board usually required).
- Adding the hardware components to the system configuration. (See Section 6 for configuration details.)
- Installing the package via SYSCMTB command. (e.g., n>SYSCMTB CMTB.CV2780 installs CV2780 command.)

Section Two
THE OPERATING SYSTEM

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Section 2
THE OPERATING SYSTEM

CGOS 200 GNA OPERATING SYSTEM

CGOS 200 GNA is a graphics-oriented, multi-user, multi-programming operating system developed by Computervision (CV). Supporting all CADDS 3 and 4 interactive graphics CAD/CAM applications, it uses CV's Graphics Processor, the CGP-200.

CGOS 200 GNA is characterized by:

- 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 Network Architecture (GNA).

PROGRAMMING SUPPORT

Text Editors

CGOS supports three text editors for creating and modifying source files. (See EDIT, LONGEDIT, and CVTECO commands, Section 8.)

EDIT	—	A simple, line-oriented editor for inputting text.
CVTECO	—	A character-oriented text editor.
LONGEDIT	—	A line-oriented editor that handles up to 256-character line lengths.

Programming Languages

FORTRAN-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 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.

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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 8.

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 CADDS 4 commands. There are over 100 standard system commands that an operator trained on CADDS systems 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 8 for brief descriptions of system commands.)

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Task Interrupt

To interrupt task execution, the operator enters an ESCAPE or CTRL-B from his/her command device (COMDEV). Printing on the COMDEV or hardcopy device (HARDEV) is temporarily halted, and the task is now in a *wait state*. The wait state is either exited or continued by typing one of the characters below. Each character triggers a specific action:

Interrupt Wait State Actions
(Following an ESCAPE or CTRL-B)

Character	*Action*
P	Toggles HARDEV on/off; continues to wait.
U	Toggles the COMDEV on/off; continues to wait.
B	Ignores; continues to wait.
ESCAPE	Ignores; continues to wait.
Q	Aborts command.
N	Aborts command, terminates execute file, escapes to system level.
K	Aborts command, 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.

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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 system level. CGOS supports *no-wait I/O*, which lets operator input commands from his/her task while the I/O affecting that task is in progress. The system supports certain standard naming conventions for accessing I/O devices.

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., INF0, 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 may be used. The ATTACH command assigns a Taskunitname to the user device.

Example

ATTACH CR,IOSB	Attaches IOSB (name CR).
ATTACH TT,TTYS	Attaches Teletype™ (name TT).

When the device is attached, the Taskunitname is used to access the device from a system command.

Example

SELECT HARDEV = TT	Makes devices 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.
SD	The terminal the user logs in on is named SD by the LOGIN process.

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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 another name is supplied.

Example

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

Special Function Characters

Note

See the *CGOS 200 GNA Operator Guide* for a full description of the ASCII character set, location of the keyboard characters, and special function characters.

Execution of system commands is globally affected by a set of special characters. Users interacting with the system, via a keyboard device, will send characters to the computer using the ASCII character set. Character positioning varies with different keyboards. Specific character positions are described on 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 occur both on the command device (COMDEV) and the hard-copy device (HARDEV).

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

CTRL-P and CTRL-U are operable only for the duration of a single command.

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CARD READER AND EIA CHARACTER SETS

All card reader characters are listed in the *CGOS 200 GNA Operator Guide*.

Special character sets are handled exclusively by the FUTIL CONVERT command. The following set descriptions can be used for reading from paper tape to a text file and punching a paper tape from a text file:

- EI for EIA
- EA for an even parity ASCII

For details and an explanation of how to generate and read these EIA tapes, please refer to the FUTIL and CONVERT commands described in the *CGOS 200 GNA Operator Guide*.

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.

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

File Types

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

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.)

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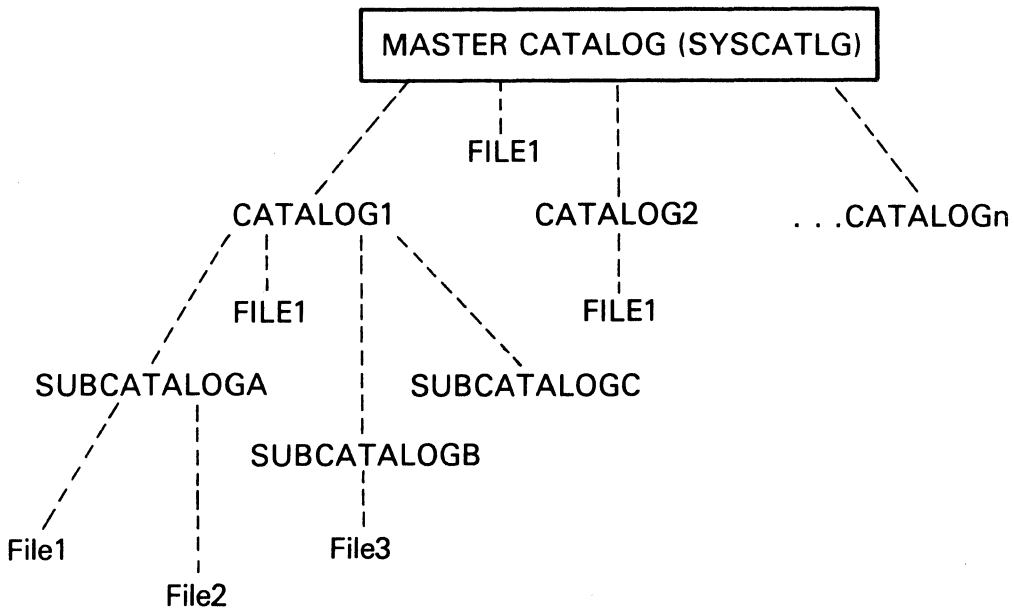
COMMANDS

In referring to a text file, the &BCD level of the filename is sometimes omitted. Certain system 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.



Sample Filenames

SAMPLE FILENAMES

(Based on the preceding diagram):

File1
CATALOG1.SUBCATALOGA.File1
CATALOG1.SUBCATALOGB.File3

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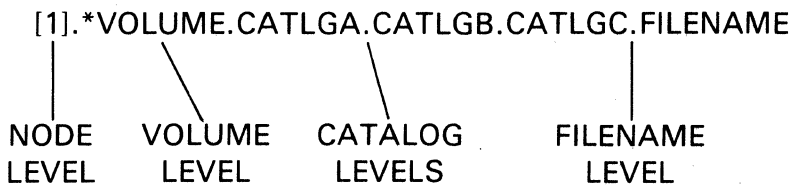
File Naming Conventions

To accomodate Graphics Network Architecture (GNA), an additional level has been added to the filename. This level designates the node where the file is located. (Default = node being worked.) 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 levels in a filename:

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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File Naming Conventions (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 LEVELS

- 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 80 characters. When Working Directories are enabled, any filename entered by a user is joined with the directory entry. The joined name, usually not listed, is still restricted to 80 characters.

- Levels between delimiters are limited to 20 characters.

- These 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

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. These 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. You assign Protection Groups to control user-access to specific commands and files. The File Protection Facility is described in Section 6.

Section Three
BUILDING A SYSTEM

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Section 3
BUILDING A SYSTEM

The following special procedures prepare the Designer IV and V Systems for operation and receiving new software.

FORMATTING THE DISC PACK

This procedure defines the disc's data format and executes hardware error diagnostics. When new or previously used disc packs are successfully formatted via FM Formatter or Magload tape, the O/S can be loaded from tape onto disc.

LOADING O/S SOFTWARE

The O/S maintains and supervises computer system operation. O/S commands enable direct user-control of system operation.

O/S loading involves configuring the system by: selecting hardware components, tasks, and software features, allocating memory space for system functions/tasks, and loading configured O/S software onto the primary system volume via the COLDSTART tape.

O/S AND FILE MANAGER INITIALIZATION

Initialization establishes: the disc pack name, volume number and protection group, a file system, accounting and/or authorized LOGIN capabilities, the authorize file and access tables, and the disc area reserved for application, temporary, and scratch files.

(Option) FMINIT, executed on auxiliary volumes, enables multi-disc volume usage. See FMINIT, Sections 3, 6, and 8.

LOADING AND INITIALIZING APPLICATION SOFTWARE

CV application software performs specialized processes. CADDS, PEP, POST, DOC, and other customer-ordered software (henceforth called application software) is stored on separate tape(s). These files are restorable when the O/S is initialized with the FUTIL file transfer utility.

The SYSCMTB command (see Section 8) enables certain features and specially activated commands. When CADDS 3 software is completely loaded, the command CADDSCLR must be performed on each task to initialize task areas and set default parameters. (CADDSCLR is not done on CADDS 4 Systems.)

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LOADING AND INITIALIZING APPLICATION SOFTWARE (Continued)

Note

Boot-Up, Login, and LOGOUT instructions (after the system has been initialized) are contained in Section 3, Restarting System Procedures. When appropriate software exists in the system, you will want to skip the procedures Formatting the Storage Module through FMINIT and begin initializing the application software.

The system is now ready for use. Detailed instructions follow.

FORMATTING THE STORAGE MODULE DISC PACK

Discs must be formatted before being loaded with software. (Format new or faulty disc packs first.) IF DISCS ARE FORMATTED WITH EXISTING SOFTWARE, ALL DATA IS LOST. SAVE ALL SOFTWARE (ON TAPE OR ANOTHER DISC PACK) BEFORE FORMATTING.

MSC-1300 Controller Dialogue

(The left column defines the procedure; the right column clarifies the action.)

• Install the FM Formatter magnetic tape on the tape drive and put it on-line.	The disc should be powered-up and READY.
• Press APL switch to APL2 for magnetic tape load	The tape advances, rewinds, and dialogue begins:
• CV FM FORMATTER RIGHT (C) COMPUTERVISION, ALL RIGHTS RESERVED.	Do not type ↵ here.
• Type HELP ↵ if assistance needed. (Date Tape Released).	
• * ↵	Formatter Prompt.
• Type SELECT DPUTEST ↵	DPUTEST is loaded into memory, and rewinds. Tape can be removed.

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MSC-1300 Controller Dialogue (Continued)

• DRIVES TO TEST: 0	Up to four drives may be tested; input additional drive numbers in the form 1,2,3.
• FORMAT THE PACKS? (1 = yes,0 = no):1 DRIVE TYPE: 80 MB ↵	Either 80 MB or 300 MB is listed, depending on module size. Verify. Module formatting begins; consult field engineer should error occur.
• FORMATED DRIVE: 000000 ↵	Module formatting is complete. Diagnostics begin.
• FUNCTIONAL TESTS COMPLETED FOR DRIVE 000000 ↵	This message indicates successful completion.

Note

Errors below sector 0900x affect system operation; errors above 0900x may affect data storage and recovery (CHKDISC should be executed during FMINIT.) A CV field engineer should be consulted when discs show severe errors during formatting.

Assuming there are no errors, the storage module is formatted. Proceed to COLDSTART.

Telefile Controller Dialogue

CGOS 200 GNA supports an 80 and a 300 megabyte storage module. *(If the module is new or suspected bad, execute Test A; otherwise, Tests I, F, and Y are sufficient.)

(The left column defines the procedure; the right column clarifies the action.)

- Load magnetic tape labeled MAGLOAD on tape drive and put it ON-LINE.

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Telefile Controller Dialogue (Continued)

- Press APL switch to APL2 for magnetic tape load.

  Tape advances, rewinds, and dialogue begins.

- Enter tape file # (0-9) containing desired program 1

  Do not type ↓ here.

- Type filename (or type N to list filename & function) ↓

  Tape advances and rewinds. When tape stops, type backslash (\ ) to start TELEDIAG16.

  TELEDIG16
  REV.3.0 PATCHED 5-26-81

- Change two TELEDIAG 16 program instructions for the 300 megabyte storage module.

  Stop, Examine location 136, Deposit 23, Examine Location 746, Deposit 23, Examine location 40, Stop/Reset/Start.

- Depress / key on TTY to start:

  TELEDIAG16:

  Drive Type Codes are:

  A = T677
  B = TT50
  C = TT80
  D = T9760
  E = T9762

- ENTER CODE:
  E ↓

  Standard DC-16 with: 32 records.

- 256 WORDS?
  Y ↓

  Highest Core Address Below Loader = 077640 I/O buffer size = 032430

- IS THIS OK?
  Y ↓

- ENTER DC-16 DEVICE ADDRESS
  36 ↓

  ('33-'76)

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Telefile Controller Dialogue (Continued)

- ENTER MASK BIT:
  9 ↵

- ENTER DRIVE
  0 ↵

  TWO OR MORE DRIVES IN USE?
  N ↵

  (0-3)
  (Assumed that system has only one storage module drive. If more, and you wish to format a disc on a drive other than drive 0, enter number of that drive.

- RESET READ-ONLY SWITCH FOR DRIVE 0 ↵
  READY? Y ↵

  Make sure the drive is not WRITE protected.

- PATTERN #
  10 ↵

  (0-9 or >10)
  During formatting, data is written on disc in a pattern selected at this point.

- YOU HAVE SELECTED
  WORST ↵

- MOUNT SCRATCH PACK(S)?
  READY? Y ↵

- PACK 'DIAG' FORMATTED? N ↵

- REST OF PACK ZERO TRACK ID?
  Y ↵

- RESET CONSOLE SWITCHES
  READY? ↵

  Make sure all switches on data switch register are down, in 0 position.

- ENTER TEST:
  I ↵

  Test I initializes drive, insuring that the drive controller is on-line.

  DTEX tape may be removed. COLDSTART Tape may be mounted in anticipation of loading CGOS.

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Telefile Controller Dialogue (Continued)

- END TEST
- ENTER TEST:
  F ↵

PACK DIAG FORMATTED
END TEST.F

Test F verifies Leader locations. Any errors encountered in formatting are printed between here and next message.

- ENTER TEST:
  Y ↵

Test Y writes and reads blocks of data to verify correct operation. (Take a long coffee break.)

- READ/HEAD ANALYSIS
  NO ERRORS
- ENTER TEST:
- PRESS STOP/RESET SWITCH
  TO STOP, THEN RESET.

Assuming there are no errors, the storage module is formatted. Proceed to to *COLDSTART*.

LOADING THE O/S (COLD-START)

When the disc is successfully formatted, the O/S is initialized. The COLDSTART process builds the system configuration and loads the O/S software from the COLDSTART tape onto disc.

The new CV COLDSTART tape contains configurations and CGOS software. Configurations (pre-defined) reside in slots 0-11; the customer-tailored configuration contained in slot 0. Modifications are possible under special circumstances (see Section 6).

COLDSTART

Mount and power-up disc, mount COLDSTART tape on tape drive. Set console switches 4 and 5 (located behind CGP-200 maintenance control panel) to select system device.

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LOADING THE O/S (COLD-START)
(Continued)

User-interactive devices and location of boot-up message are selected by these switch settings (UP = 1 and DOWN = 0):

Switch 4	*Switch 5*	*Device Code*	*Device Type*	
UP	DOWN	08-09	TTY	
DOWN	DOWN	28-29	INFO	
DOWN	UP	20-21	IOS	
UP	UP	0F	LPT	(output only: not for interactive use)

Press APL2 switch.

CGOS (date)
COMPUTERVISION CORP.
CGOS 200/10 CS#58
VERSION DATE 4-7-81

(See "Boot-up", this section.) CS# and version date varies.

TYPE OK ↵ TO CONTINUE

ENTER CONFIGURATION # ↵

Refer to COLDSTART tape label for correct configuration #.

0010 0780 RESTORED

Output to indicate the system has been brought in from tape to disc.

TYPE OK TO INDICATE
FILE MANAGER IS ON DISC

↵ if no File Manager exists on the disc (i.e., when building or rebuilding a pack).

TYPE OK ↵ TO
SUPPRESS PRINT

Suppress optional BLDSYS print-out; not needed by general user. (See Section 8.)

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LOADING THE O/S (COLD-START) (Continued)

The following information varies, depending on configuration used:

```
WORDS AVAILABLE:
SHARED OS>C0F     0016   FROM   0C10   TO   0C26
KERNAL            051A   FROM   5400   TO   59A1
BOOT CODE         001B   FROM   0020   TO   003B
SHARED OS>C0F     03CA   FRP,   0786   TP   0B50
DATA CHAN PAGE    796    FROM   7000   TO   7796
UNINIT DATA       0043   FROM   50ED   TO   5130

****CGOS 200/10****
```

System boot-up message.

The system is now configured and the CGOS loaded onto disc. Duplicating the COLDSTART tape is recommended, especially if the Protection Facility is desired (see GENSLTAP, Section 8). When an existing configuration must be changed, refer to Section 6.

O/S AND FILE MANAGER INITIALIZATION

CGOS software has been loaded on the disc (the system is booted-up). CGOS initialization begins with the following Login dialogue.

Login

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.)

CTRL-L (or CTRL-Rn)

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 if there is one available.

- 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.

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Login
(Continued)

FMCLEAR	If you are the first person to Login after the system is booted up, this message appears. See FMCLEAR command for response to FMCLEAR output
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-YY(,HH:MM)	Under FMINIT, you are asked to set the system clock. (Based on 24-hour clock, e.g., 1:00PM = 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.
INVALID ENTRY	This message is output if the password is not valid for the given name and number. You must begin again by typing CTRL-L or CTRL-Rn.
TASK n INITIATED	Output when Login is complete and the task is ready to use the system (n = task number assigned to you).

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Login
(Continued)

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 boot-up.)
2. USERNAME.LOGINEXEC (USERNAME = your LOGIN name.) The text file USER-NAME.LOGINEXEC is executed.
3. SYSEXEC.LOGINnn (nn = two-digit hexadecimal task number.) Task-specific files are only executed for the task numbered nn.
4. SYSEXEC.LOGIN
5. SYSNEWS.&BCD.LCLNEWS

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**.

Login is complete; proceed with O/S and file manager initialization.

Exception

When disc pack contains a CGOS 200 GNA file manager which is to be retained, skip to *Loading and Initializing Software*. However, should a Login error message appear, skip instead to *Crash Recovery Procedure*.

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Accounting Operation/ Authorized Login Option

During Login, an operator supplies an account number in addition to his/her job name and corresponding password. You, as System Manager, retain detailed user accounting information (on-system time, etc.).

With CGOS 200/10, accounting logs are kept as file manager files in the catalog SYSTEM.LOG. You can save these files on tape, or copy them into other files for archival purposes. The charge rate (COST/MIN) is set during the FMINIT procedure. (See FMINIT, Section 8).

To access accounting log maintenance operations, the operator logs in while you invoke the OPLOG command. (See OPLOG, Section 8.)

USER LOGIN MODES

Mode	*Description*	*Action*
*CONTROLLED	Login restricted to user specified in authorized file; selected user access of certain files/commands.	1. See FMINIT. 2. See Protection Facility, Section 6. 3. See Loading and Initializing Application Software.
*USAGE LOGS	System records user's time.	1. See FMINIT. 2. See Login Accounting Procedure. 3. See Loading and Initializing Application Software.
UNCONTROLLED USER ACCESS	Any person may Login and access any file; system doesn't record time.	1. See FMINIT. 2. See Loading and Initializing Application Software.

*CONTROLLED USER ACCESS and USAGE LOGS mode procedures may be followed in conjunction.

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FMINIT

FMINIT should now be done to initialize the file manager and the O/S. FMINIT, executable on auxiliary volumes, is an option to enable multi-disc volume usage.

Note

FMINIT command documentation, is contained in Section 8.

LOADING AND INITIALIZING APPLICATION SOFTWARE

When the O/S and file manager are initialized, application software is loaded and initialized (if required). If previously saved application software is to be used instead, the System Manager can LOGOUT and the system is ready for general operation. (See System Boot-Up Procedures.)

The following commands, in sequence, load the application software. (It is assumed that you are still logged in.)

To Load Application Software

n> ATTACH MT, TAPE ↵	Mount the application tape marked CADDS.OVLY on the tape drive.
TAP0 OF TYPE OF TAPE ATTACHED AS MT	Message indicates that tape is sucessfully attached.
n> COPY:MT//NLEV [,LIST=NO] ↵	For no printout, use LIST=NO option; it suppresses all output except error messages.
n> SYSCMTB CMTB.XXX ↵	Additional user applications must be initialized with this command. (XXX = Command Table name. See current Command Tables.)

The system is now fully initialized and ready for users to Login.

SYSTEM RE-START (BOOT-UP) PROCEDURES (TAPE, DISC)

During the re-start (Boot-Up) process, load the O/S into the CGP-200 to initialize/COLDSTART the O/S. The CGP-200's Automatic Program Load (APL) automatically loads the O/S (from primary disc or tape devices) into the CGP memory.

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Selecting Boot-Up Device

Boot-up device information is presented in the table that follows.

Typical APL Assignments	*Device Switches*
Disc - APL1 (left block) Tape - APL2 (right block)	Each APL switch block contains seven miniature rocker switches (right side of control panel).

Switch	*Function*
1	Controls whether the device is a DMA device (ON for all Boot-Up devices).
2-7	Contains device code for desired device.

Typical Device Configuration

APL1	126	MSC 1300 Storage Module Controller (DPU).
	136	Telefile Storage Module Controller.
APL2	122	Magnetic Tape.

CGP 200 Boot-Up

Two large black switches, STOP/RESET and APL1/APL2 located in the middle of the CGP control panel, initiate the Boot-Up. APL1 switch is normally set for the primary disc's device code; APL2 is normally set for the tape drive's device code.

- Press STOP/RESET switch — Make sure primary disc is powered up and on-line.
- Press APL1/APL2 switch to APL1 for a boot from primary disc.

```
**CGOS 200/10 REV. 0.0**
```

This message is displayed on system console.

The system is now ready for operation. Other users can Login. If a hardware error occurs, type PC and ACCUMULATORS in this format:

PC	AC0	AC1	AC2	AC3
XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

Save this information and notify appropriate CV field service personnel.

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SAVCOR

SAVCOR is used during system debugging to examine a *snapshot* picture of core. SAVCOR saves all of the core, transfers it onto the disc, and reboots the system into core. The system is again ready for Login.

- Press STOP.
- Press RESET.
- Examine location 2.
- Select System Console. — Set switch 14 down; reset switch 4 and 5 to previous settings.
- Continue

The file manager determines the disc location of the SAVCOR buffer (where the last SAVCOR taken resides on the disc).

DDEX Boot-Up

Diagnostic Disc Executive (DDEX) is a mutually exclusive disc resident on the CGOS 200 GNA, i.e., both CGOS 200 and DDEX may simultaneously reside on the system primary volume.

- Set console switch 0 — Follow CGP boot-up procedure outlined above.

```
**CGOS 200/ Rev 0.0**
NO DDEX BOOTSTRAP ON DISC.
```

Message appears if DDEX is not on disc. When DDEX is on disc, this message is followed by DDEX Boot-Up message.

You are now running under DDEX. You may return to CGOS 200 GNA by rebooting the system with console switch 0 off.

Note

DDEX is also invoked by typing the BOOTDEX command at system level. See BOOTDDEX command documentation, Section 8.

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LOGOUT

n> LOGOUT ↵	Enter command.
MINS. ELASPED: COST:	When authorized Login or accounting Login is enabled, the system responds with the time elapsed since Login and the cost for time used.
TASKn TERMINATED	This is the final system response in all configurations. All units attached to the task are released and the task is terminated.

AUTOLOGOUT

The System Manager can, optionally, set the Autologout feature at BLDSYS time. If set to off, user tasks are only logged out when the LOGOUT command is entered. If set to on, the system logs out tasks permitted to remain idle for 15 minutes at system level.

Section Four
SYSTEM FAILURES/RECOVERY PROCEDURES

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Section 4
SYSTEM FAILURES/RECOVERY PROCEDURES

This section describes hardware errors, software errors, and crash recovery procedures.

HARDWARE FAILURES

Disc hardware failures may be:

- Reported by the CHKDISC command.
- Implied when sectors on the disc pack become physically unreadable.
- Indicated by the DUMPERR command's F006 errors showing AC0 = 124x.

Portions of data may be saved on tape, directly from the failed disc (depending upon the occurrence of unreadable sectors). If no software failures have occurred, this data should be valid. To ensure its future reliability, saved data should be verified before/after saving, and before attempting to use it in the production mode.

SOFTWARE FAILURES

Disc software failures are indicated by:

- Unexplainable file manager errors, etc.
- Hardware errors; i.e., F006 errors where AC0 = 1nn, hexadecimal (1 = disc; nn = value other than 24, where 24 = disc offline or hardware disc error).
  - — F006 is a general device hardware and device software error code.
  - — AC0 points out the device where the error occurred. AC0's left byte indicates the device the error is concerned with; AC0's right byte tells the type of error (either hardware or software).

Rather than particular sectors being unreadable, the sector's data content has become invalid. Failures result when the software attempts to make use of this invalid data.

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SOFTWARE FAILURES (Continued)

When the software fails, no data should be saved from the failed pack (data problems are usually subtle and widespread when symptoms appear at the user level.) If a pack must be saved on tape, data should be carefully validated before saving for future use. CV can make no assurances of the data's reliability.

Note

To report software failures refer to BUG REPORTING in Section 1.

REBUILDING THE STORAGE MODULE

When recovery options are complete, the storage module must be reformatted and rebuilt (see Section 2). Following FMINIT, CHKDISC verifies the storage module's usability. Data from back-up tapes may now be restored.

Caution

Storage modules that have experienced head crashes are IRRECOVERABLE; They should NOT be remounted in any drive until repaired and inspected.

Memory Parity Errors

CGOS 200 GNA constantly monitors system memory modules for hardware failure. Should any part of the system memory fail, the system automatically shuts down and this message is output to the System Boot-Up Console.

MEMORY INTERRUPT[, PRESS CONTINUE]

- Set console switch 8

  With switch set (normal mode of operation is to have have switch 8 off), the optional portion of the message "PRESS CONTINUE" appears.

  Switch 8: Halts the system during memory diagnostics, and allows CV field personnel to examine memory boards for memory parity error indicator lights.

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Memory Parity Errors
(Continued)

- Press CONT on CGP Console

Resumes diagnostic procedure. If switch 8 is off, the system executes diagnostic procedure without halting; when completed, one of these messages is emitted:

1. TRANSIENT

   Transient Error. System received a memory parity interrupt but was unable to repeat the error.

2. RECOVERABLE AT XXXX YYYY

   Recoverable Error. System received repeatable parity interrupt and was able to clear the error by writing to the bad location.

   (XXXX = 2K module hex value where error detected.) (YYYY 2K module hex value offset within 2K module.)

3. NON-RECOVERABLE AT XXXX YYYY WWWW RRRR

   Non-Recoverable. System received repeatable parity interrupt but was unable to clear error by writing to the bad location.

   XXXX and YYYY values same as above.

   WWWW = pattern written to cause error.

   RRRR = pattern read back.

When memory parity errors occur, system integrity is no longer assured. Save all information output to the system console and notify the CV Regional Office immediately. When the hardware problem is corrected, or another system is available, the pack may be recovered. (See Crash Recovery Procedure that follows.)

CRASH RECOVERY PROCEDURE

This message, during Login, means that the system has crashed:

```
SYSTEM ERROR FM ERROR IN ACCT OR ACT FILES: FILE MANAGEMENT
DISABLED. DEFAULT SYSTEM MANAGER MUST LOGIN (DO NOT REBOOT)
AND RUN FMRCVR AND FMCLEAR.
```

To Login After System Crash

```
# (CTRL)-L
TYPE NAME, NUMBER
CGOS 200,10 ↵
```

Use name, number and the password included on COLDSTART tape.

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TYPE PASSWORD ↵	CGOS 200/10 with ↵ as password = CV default on all COLDSTART tapes (unless a COLDSTART tape has been created via GENSLTAP command, and default Login entry is changed). See GENSLTAP (Section 8).
n> FMRCVR ↵	Check user LOGIN MODES (Section 3), then proceed with FMRCVR (Section 8).
n> FMCLEAR ↵	See FMCLEAR (Section 8).

If the above fails, the disc must be totally rebuilt; the file manager has been destroyed.

SYSTEM ERROR CODES/ MESSAGES

Current error codes and messages are listed in the *CGOS 200 GNA Operator Guide*. The following table lists on-line filenames, the hexadecimal range of the error codes, and the particular type of error. (*NOTE:* This information can be accessed by HELP.ERROR.) The last part of this section explains how the user can change the content of error messages.

On-Line Filenames and Error Message File Ranges

Error	*File/Error Range*	*Error Lines*
System Error	SYSNEWS.ERROR.SYS (0301-FF07)	System error codes/ meanings.
Device Errors for F006x	AC0	Left byte specifies device where error occurred.
	SYSNEWS.ERROR.F006DEV (0000-0011 — Devices)	Left byte error code descriptions.
	SYSNEWS.ERROR.F006TYP (0001-0035 — Errors)	Right byte descriptions.
File Management Errors	SYSNEWS.ERROR.FM (C0001-CFFF)	File Management error descriptions.

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ON-LINE FILENAMES AND ERROR MESSAGE FILE RANGES (Continued)

Error	*File/Error Range*
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)
	SYSNEWS.ERROR.FUTIL.SCANERRS
	SYSNEWS.ERROR.FILESCAN (A100-A114 — Utility) (A180-A1B2 — FUTIL Scanner)
COMMANDS	SYSNEWS.ERROR.EDIT (8001-8014)
	SYSNEWS.ERROR.LOADER.MAJOR (8001-8052)
	SYSNEWS.ERROR.LOADER.MINOR (8080-9092)
	SYSNEWS.ERROR.LOADER.DIAGNOSTICS (80D1-80D5)
	SYSNEWS.ERROR.SRCHBCD (8001-800B)
	SYSNEWS.ERROR.TECO (8001-8FFF)
UTILITIES	SYSNEWS.ERROR.UTIL (9801-980A)

Commands (EDIT, LOADER, TECO, etc.) have their own versions of error files. 8001 for Editor means one thing; 8001 for SRCHBCD means another. Each system command may have an error range of 8001 to 8FFF.

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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
    5-6-80  0:32:59
```

Instruct the system to find the error message for C007.

```
#L, C007 ↵
SYSNEWS.ERROR.&BCD.FM
    5-6-80  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!= =
39!= =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.

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Describing Errors

The amount of information output to the user when an error occurs can be modified to suit particular needs. The SELECT command is used to specify one of three possible information levels, as shown.

- Error number only:

  SELECT ERRLEVEL = SHORT

- Error number and a brief description:

  SELECT ERRLEVEL = NORMAL

- The error number, descriptive title, and detailed description:

  SELECT ERRLEVEL = LONG

Section Five
DAY-TO-DAY OPERATING PROCEDURES

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Section 5
DAY-TO-DAY OPERATING PROCEDURES

This section consists of selected day-to-day operating procedures and computer printouts to illustrate examples. Users will be sent either revisions and/or change pages to future procedures.

BACK-UP TAPE MANAGEMENT

It is critical system back-up procedure immediately. From the first day of operation, start a system back-up procedure to save all (selected groups) of system files. File systems can then be quickly and easily restored with minimal losses, should a mishap occur.

Saving Files

Have the operator run the FUTIL command or execute files (using FUTIL) to save files on magnetic tape. A full back-up is used to save all files; groups of files may be saved separately. Files that have changed since the last full back-up, are saved with what is called a *save-since*.

To Label Tapes

Start a library of magnetic tapes from these back-up operations. Save each operation on a separate tape, identifying each tape by:

- System name
- System number
- Revision date
- Type of save (full back-up, save-since)
- Tape density
- Tape number.

On recycled save-since tapes, note (on an extra label) the date the last save-since was dumped.

Examples

SYSTEM GEORGE	SYSTEM#3
CADDS 4 rev 2.00	CADDS 4 rev 2.00
6-June-79	Save-since 1600 BPI
Full back-up 800 BPI	Daily
Tape File #3003	3-Jan-80
(#3 of 6)	10-Jan-80
	17-Jan-80
	24-Jan-80

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Tape Libraries

For easy reference, keep a hardcopy list of tape filenames and a hardcopy listing of each full back-up. Requests to restore files can then be dealt with as follows:

- Reference the binder containing the full back-up listing.
- Record tape date; number(s); and file record number(s) of the files to be restored.
- Have the operator restore the files using the FUTIL command.

System back-up procedure depends on system use. A system with few catalogs that seldom change would be backed-up differently than a system that has many catalogs changing often.

DAILY/WEEKLY/ MONTHLY PROCEDURES

Procedure 1

Daily

Dump save-since tape. Daily save-since tapes can be recycled on a weekly basis (4 to 8 tapes rotating).

Weekly

Dump save-since tape (previous weekly save-since dumped). The weekly tapes are rotated on a monthly basis (16 to 32 tapes rotating).

Monthly

Perform a full back-up of system. Save all files on system; store indefinitely (4 to 10 tapes per month).

Approximate tape usage for one year, 68 to 160.

Procedure 2

Daily

Dump save-since tape of day's work. Recycle these tapes on a weekly basis (4 to 8 tapes rotating).

Weekly

Dump a full back-up of system. Rotate tapes on a monthly basis (16 to 40 tapes rotating).

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DAILY/WEEKLY/ MONTHLY PROCEDURES (Continued)

Monthly

Save last full back-up. Rotate these monthly tapes on a six-month basis (24 to 84 tapes rotating every 6 months).

At Six Month Intervals

Save last monthly back-up for an indefinite period (8 to 16 tapes per year).

Approximate tape usage for one year, 52 to 112.

Procedure 3

If all development or production work is performed in selected catalogs, it may be advantageous to perform the back-up procedure on only those catalogs.

First

Dump full back-up to create a baseline.

Second

Create an execute file to perform a daily full back-up on the selected groups of changing catalogs (5 to 10 tapes per week rotating).

Weekly

Save last daily full back-up. (4 to 8 tapes per month rotating).

Monthly

Dump a full back-up of entire system (24 to 48 tapes rotated every 6 months).

At Six Month Intervals

Save last full back-up indefinitely (8 to 16 tapes per year).

SYSTEM REBUILDING PROCEDURES

Procedures 1 and 2

To COLDSTART and initialize the system, follow instructions in Section 3.

Restore the latest version of a full back-up using FUTIL command (COPY[/LIST=NO] :MT : //REPLACE=YES).

In sequence, from earliest to latest, restore any weekly save-sinces and then daily save-sinces until all tapes are restored. Use the FUTIL command: (COPY[/LIST=NO] :MT : //REPLACE=YES).

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SYSTEM REBUILDING PROCEDURES (Continued)

Procedure 3

Restore the latest full back-up, followed by the latest of the selected catalog tapes using the FUTIL command: (COPY[/LIST=NO] :MT : //REPLACE=YES).

TAPE USAGE

Tape usage is dependent upon system usage. Any figures given represent approximations of standard usages with tape density set to 1600 BPI and a 300 MB disc pack 75 percent full.

SYSTEM BACK-UP PROCEDURES

Given below are examples of commands used in system back-ups. Full back-up, daily save-since, and daily selected back-up are all described. In all cases, the FUTIL command is used (see FUTIL, Section ÷, *CGOS 200 GNA Operator Guide*).

Full Back-Up

```
n>ATTACH MT, TAPE ⏎
n>FUTIL ⏎
  #COPY[/LIST=NO] : :MT//LABEL=/XXXXXX/
  # ⏎
n>DETACH MT ⏎
```

Daily Save-since

On a daily basis, enter the following commands. (This can be done by using an EXECUTE file.) Where SINCE=6-3-80:00:00:00 is specified, substitute the date (and optionally, the time) of the last daily or full back-up.

```
n>ATTACH MT, TAPE ⏎
n>FUTIL
  #COPY[/LIST=NO]//SINCE=6-3-80:00:00:00 : :MT//LABEL=/XXXXXXX/
  #
  n>DETACH MT ⏎
```

Selected Back-up

To back-up selected catalogs, use this sequence of commands:

```
n>ATTACH MT, TAPE ⏎
n>FUTIL ⏎
  #COPY[/LIST=NO] catalog1 :MT
  #ADD[/LIST=NO] catalog2
  #ADD[/LIST=NO] catalog3
        .       .       .
        .       .       .
        .       .       .
  #ADD[/LIST=NO] catalogn
n>REWIND ⏎
n>DETACH MT ⏎
```

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SYSTEM START-UP AND SHUTDOWN

Start-up and shutdown procedures for various conditons are described in detail.

- Ensure that the main AC circuit breaker on the wall is in the OFF position.
- Ensure that all devices (CGP, Disc, magnetic tape units, etc.) are turned off.
- Turn on wall-mounted main AC circuit breaker.
- Power-up CGP (switches are located behind front and rear panels).
- Power-up disc, magnetic tape units, all terminals, and any other peripheral devices.

System Shutdown (End of Work Period)

- Press RESET on CGP.
- Press START/STOP on disc drive.
- Remove disc from drive and put in dust cover. (Never place disc on top of disc drive.)
- Do not remove AC power from CGP. The AC power switches and circuit breakers are located behind the front and rear panels of the CGP and on the wall.

System Shutdown (Before Long Weekend or Plant Shutdown)

- Log-out all tasks.
- Press RESET on CGP.
- Power down all terminals.
- Press START/STOP on disc drive.
- Remove disc pack and store properly.
- Power down disc. (Front and rear panels must be removed.)
- Remove any magnetic tapes from mag tape unit and store properly.
- Power down magnetic tape unit and computer.
- Remove front panel from CGP and shut switch off.
- Turn main AC circuit breaker on wall to OFF.

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System Shutdown (After Power Failure)

- Turn main AC circuit breaker on wall to OFF.
- Power down each piece of equipment: CGP, magnetic tape unit, disc, etc.
- Power down each terminal.

Section Six
SPECIALIZED SYSTEM BUILDING PROCEDURES

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Section 6
SPECIALIZED SYSTEM BUILDING PROCEDURES

This section defines system building procedures, multi-volume procedures, and the Protection Facility.

DEFINING SYSTEM CONFIGURATIONS

The customer-tailored configuration (slot 0) is rarely changed. New configurations are defined by selecting hardware components for system and software features after System Initialization.

1. Execute appropriate command:

   - NEWCFG — Generates new configuration; dialogue lists all definition tables.
   - EDITCFG — Modifies configuration; select definition table via EDITCFG.
   - FUTIL — Restores previously-saved configuration (tape).

2. (For NEWCFG and EDITCFG only.) Dialogue Response heading defines configuration.

3. Execute BLDSYS command.

Configuration Dialogue Responses

When new configurations are defined, with either procedure (see Defining System Configurations), their definition tables are output in dialogue format.

Configuration Dialogue

⏎	Indicates no selection or modification; procedure advances to next step.
	When selection required, ⏎ repeats question.

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Configuration Dialogue Responses (Continued)

TYPE PARAMETER NUMBER, COMMA, NEW PARAMETER VALUE.	Modifies selection parameter. Parameter Input/Output Values (DEC) - decimal number. (HEX) - hexadecimal number. (BCD) - two BCD characters. (NC) - no change; parameter cannot be modified.
TYPE COMMA N AFTER SELECTION.	N (no list), suppresses parameter listing which is otherwise automatically listed once per option selection.
TYPE L IN PLACE OF OPTION SELECTION RESPONSE.	Prints option list if not automatically done.
TYPE L IN PLACE OF PARAMETER MODIFICATION RESPONSE.	Modified parameter lists are not automatically printed. Type L here to verify completed parameter list. "BAD PARMS: n1,n2,...nk" is output, when invalid parameters are found. Re-input selection and parameters.

System Options

CGP Parameters

1. TIS SIZE (HEX) = 0080
2. #IOFLAGS (DEC) = 5
3. #TAPE REQ (DEC) = 2
4. #DISC REQ (DEC) = 5
5. TASKS (DEC) = 1
6. SWAP INDEX (DEC) = 103
7. BMS INDEX I = 4
8. BMS INDEX B = 1
9. AUTOLOGOUT (ON=1/OFF=0) (DEC) = 1
10. SITE-ID FOR THIS NODE (DEC) = −1
11. CONNECTION CONFIGURATION (HEX) = 0000

CGP without FPU Parameters

1. TIS SIZE (HEX) = 0080
2. #IOFLAGS (DEC) = 5
3. #TAPE REQ (DEC) = 2
4. #DISC REQ (DEC) = 5

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System Options (Continued)

5. TASKS (DEC) = 1
6. SWAP INDEX (DEC) = 103
7. BMS INDEX I = 4
8. BMS INDEX B = 1
9. AUTOLOGOUT (ON=1/OFF=0) (DEC) = 1
10. SITE-ID FOR THIS NODE (DEC) = −1
11. CONNECTION CONFIGURATION (HEX) = 0000

Centaur Parameters

1. TIS SIZE (HEX) = 0080
2. #IOFLAGS (DEC) = 5
3. #TAPE REQ (DEC) = 2
4. #DISC REQ (DEC) = 5
5. TASKS (DEC) = 1
6. SWAP INDEX (DEC) = 0
7. BMS INDEX I = 1
8. BMS INDEX B = 1
9. AUTOLOGOUT (ON=1/OFF=0) (DEC) = 1
10. SITE-ID FOR THIS NODE (DEC) = −1
11. CONNECTION CONFIGURATION (HEX) = 0000

Configuration Definition Table

Various definition tables are provided with guidelines for choosing parameters.

General System Parameter Values			*System Function Allocated Space*
TIS SIZE (HEX)	=	N	(Task Input Stream SIZE) Characters typed or digitized ahead without any data loss ('8'× ≤N ≤'100'×).
# IOFLAGS (DEC)	=	N	IOFLAGS per task: (1≤N ≤10).
# TAPE REQ(DEC)	=	N	Tape I/O requests pending per tape unit. Controller per task: (1≤N ≤5).
# DISC REQ(DEC)	=	N	Disc I/O requests pending per disc. Controller per task: (1≤N ≤5).
SWAPPING INDEX BMS INDEX I BMS INDEX B			Buffer management and swapper parameters.
TASKS (DEC)	=	N	Number of tasks.

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Configuration Definition Table (Continued)

General System Parameter Values	*System Function Allocated Space*
AUTOLOGOUT = N	1 = AUTOLOGOUT feature is enabled. A task idle at system level for more than 15 minutes is automatically logged out. 0 = AUTOLOGOUT disabled.
SITE ID FOR THIS NODE CONNECTION CONFIGURATION	GNA configuration parameters See *Selecting GNA configurations*.

SELECTING THE PRIMARY AND ADDITIONAL DISCS

You chose the primary disc that controls where system software resides. It becomes controller 0 in the system.

Although disc parameters are not usually changed, you may reduce them in size when there is limited space in the system. To modify parameters, use the command, "ENTER PARM MOD:".

To Select the Primary Disc

DISC 0 OPTIONS:

(1) DPU
(2) TELEFILE

- Enter Option
- 1 ↵

Option DPU selected

- Enter PARM MOD ↵

PRIMARY DISC PARAMETERS:

(1) # DRIVES (DEC)	=	1
(2) DEVNO (HEX)	=	0016
(3) # SECT/TRACK (DEC)	=	32
(4) # SURFACES (DEC)	=	19
(5) # CYLINDERS (DEC)	=	810

Multiple disc unit configurations (on the dual storage module) normally reside on the same controller. In this case, change parameter 1 to reflect the number of drives.

Standard Parameter Values

Drive Tape	*1*	*2*	*3*	*4*	*5*
DPU 80 megabyte	1=4	16x	32	5	810
DPU 300 megabyte	1=4	16x	32	19	810
TELEFILE 80 megabyte	1=4	1Ex	32	5	810
TELEFILE 300 megabyte	1=4	1Ex	32	19	810

You may add additional disc controllers (with one or more units per controller) to the system. Number them consecutively, starting with one.

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To Select Additional Discs

DISC 1 OPTION:

- Enter option
  1,N ↓ — Indicates Storage module is selected.
- Enter PARM MOD
  1,2 ↓ — Reflects 2 drives.

SELECTING THE TAPE UNIT

A single unit tape controller resides in the system; additional tape units must be selected. These parameters may be set for the tape unit:

NAME 1:	1st two characters of unique tape unit name.
NAME 2:	2nd two characters of unique tape unit name.
UNIT:	The hardware unit number used by the controller to access this unit.
UNCHWRDI,2,3:	Unit characteristic words; values set at boot-up time.

Note

These parameters are currently not used by the system; only one type of tape unit exists (STANDARD).

Standard Tape 0 Options

- Enter option
  1 ↓ — 1st tape unit selected.
- Enter PARM MOD ↓ — TAPE UNIT PARAMETERS:

NAME 1 (BCD)	=	TA	TA
NAME 2 (BCD)	=	P0	P1
UNIT (DEC)	=	0	1
UNCHWRD 1 (HEX)	=	0000	0000
UNCHWRD 2 (HEX)	=	0000	0000
UNCHWRD 3 (HEX)	=	0000	0000

- ↓ — Parameters unchanged.
- Tape 1:
  1,N ↓ — 2nd tape unit selected; parameter listing suppressed.
- Enter PARM MOD
  2,P1 ↓ — Parameter 2 = P1.
  3,1 ↓ — Parameter 3 = 1.
- L ↓ — Ask for parameter listing.

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SELECTING AUXILIARY UNIT OPTIONS

Auxiliary device units (terminals, plotters, etc.) are added to the system by selecting the appropriate option when defining a configuration. There are 22 possible auxiliary unit selections:

Auxiliary Unit 0 Options

(1)	TELETYPE	(12)	VARIAN 216
(2)	INFOTON	(13)	TBIO
(3)	LINE PRINTER	(14)	GOULD 5100
(4)	TERMINET	(15)	GOULD 4800
(5)	IOS	(16)	INSTAVIEW
(6)	NUMERIDEX	(17)	GPU
(7)	VERSATEC	(18)	VARIAN 208
(8)	CARD READER	(19)	PCUC
(9)	XYNETICS C65	(20)	PCUG
(10)	PAPER TAPE READER	(21)	CALCOMP 960
(11)	PAPER TAPE PUNCH	(22)	XYNETICS C84

When an auxiliary unit option is selected, the default parameters for that option are typed. Parameters will include one or more of the following:

Auxiliary Unit Parameter Selections

NAME 1:	1st two characters of unique name.
NAME 2:	2nd two characters of unique name.
DEVNO:	Device code.
DEVNO IN:	Input device code.
DEVNO OUT:	Output device code.
DEVNO n:	Nth device code ($0 < n < 5$).
BS PAD:	Pad characters required for backspace.
LF PAD:	Pad characters required for line feed.
FF PAD:	Pad characters required for form feed.
CR PAD:	Pad characters required for ↓.
LC SWITCH:	Indicates if the device has lower case alphabetic capability. Should be 20 (HEX) if device does not have lower case, 0 if it does.
TOP MARGIN:	Skip n lines from top of page.
BOTTOM MARGIN:	Skip n lines at bottom of page.
PAGE LENGTH:	Text lines per page.
PAGE WIDTH:	Columns per page.
UNCHWRDn:	Nth Unit Characteristics Word ($0 < n < 4$).

Note

TOP MARGIN, BOTTOM MARGIN, plus PAGE LENGTH gives the total lines per page (see Section 2).

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SELECTING AUXILIARY UNIT OPTIONS (Continued)

Default parameters may now be modified (see *Defining System Configurations*). When parameter modification is complete, and no default HARDEV is configured, this message is output:

- TYPE OK IF DEFAULT HARDEV — Causes unit being configured to be assigned as default HARDEV. (One default HARDEV allowed per configuration.)

To configure devices, refer to auxiliary parameter rules and guidelines. Specific auxiliary unit configurations are outlined in the following sections.

BISYNC

In order to run the BISYNC Communications Package (IBM 2780), the system must contain a synchronous line unit (SLU) board for communications-based version of the IBM 2780 remote job entry terminal. (For additional information, refer to table that follows.) The SLU must be connected to a CV-supplied front-end Data Communications Processor (DCP). (A PCU-based version is described under CV2780.)

BISYNC Configuration (for SLU Board)

Device Type	Task-based I/O (TBIO)
Device Name	DCP0
UNCHWRDs	Override default system parameters for error recovery, line handling, etc.

Word 1

Digit 1 (left):	Maximum line bids per try. (range 3-F).
Digit 2:	Maximum error retries per message. (range 3-F).
Digit 3:	Maximum logical records per physical message. (range 1-4).

Word 3

Bit 0 (right):	1 = disable WAK message transmission.
Bit 1:	disable optional STX.
Bit 2:	enable full duplex modem control.
Bit 3:	disable abort on too many NAKs or ENQs when receiving.

Any values outside the acceptable range are ignored.

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NOTES ON BISYNC BITS

- WAK/ENQ — The DCP transmits WAK when it has received data and is not ready for the next data message within two seconds. When WAK transmission is disabled, the host detects the missing reply and sends an ENQ. The DCP replies when the next buffer is available. If no buffer becomes available within 20 seconds, the DCP assumes the system has died, and sends an EOT to the host to abort the reception. (Some host systems do not accept WAKs gracefully.)

- STX — (Optional, normally enabled.) STX refers only to multiple record text. When enabled, all records in a message begin with STX. When disabled, only the first record begins with STX.

- RTS — (Request-to-Send Line) Full-duplex modem control refers to the RTS line from SLU to modem. When full-duplex control is enabled, RTS is always up. When disabled, RTS is up only when transmitting. Half-duplex modems run with this feature off; full-duplex modems use this feature. The default is half-duplex.

- NAK-ENQ Abort — This results from an over-transmission of NAKs or overreception of ENQs while receiving data from the host. Some hosts do not abort reception; the protocol specifies the transmitting station responsible for errors, and the DCP aborts.

- EBCDIC — Host sites consider: the remote line declared, the EBCDIC Transparency feature enabled, and use of the Multiple Record feature optional.

- The following table lists default characters.

BISYNC Default Characteristics

	3310	*0000*	*0000*
Maximum line bids	=	3	
Maximum retries	=	3	
Records per block	=	1	
WAK transmission	=	enabled	
Optional STX	=	enabled	
Full-duplex modem control	=	disabled	
NAK-ENQ abort	=	enabled	

Example

A system using a full-duplex modem, needing up to 8 line bids, 14 retries, and maximum records/block would use:

8E40 0000 0004

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HASP, CV2780, and CVNET

The full-version HASP emulates an IBM HASP Workstation. Its two-way, interleaved communication with a host computer supports the HASP protocol. CV's HASP uses the PCU as a front-end processor. The HASP's PCU is configured identically to the CV2780 PCU, except that HASP ignores the unit characteristic words.

Computervision's CV2780 package is a PCU-based emulation of the IBM 2780 remote job entry (RJE) terminal. Two of the three device code pairs (data channel ports) on the PCU must be enabled at installation and configured as shown.

CVNET is a communications method allowing transmission of files and operator messages from one Computervision system to another. CVNET may be either SLU or PCU-based. If a PCU is used, two of the three PCU device-code pairs (data channel ports) must be configured. See table that follows.

CV2780, CVNET Configurations

	CV2780 SLU	*CV2780 PCU*	*CVNET PCU*
Device Type	TBIO	PCUC	PCUG
Device Name	User-selectable CVNX = default X = ordinal CVNET SLU: CVN0,CVN1,CVN2...	PCx0 x = PCU board ordinal. 1st PCU = PC00, PC01; 2nd PCU = PC10, PC11...	PCx1
UNCHWRD's	Ignored	Ignored	Ignored

Instaview, Instaview-C Instaview-D, and CVD-4

All of these devices are configured by selecting auxiliary unit option 16. The default parameters for that option are:

1. NAME1 (BCD) = VG
2. NAME2 (BCD) = U0
3. DEVNO 1 (HEX) = 0030
4. DEVNO 1 (HEX) = 0031
5. DEVNO 1 (HEX) = 0032

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Instaview, Instaview-C, Instaview-D, and CVD-4 (Continued)

6. DEVNO 1 (HEX) = 0033
7. UNCHWRD1 (HEX) = 0000
8. UNCHWRD2 (HEX) = 0000
9. UNCHWRD3 (HEX) = 0001

The device unique names must be assigned sequentially (VGU0, VGU1, VGU2,...)

The first Unit Characteristic Word is used to distinguish among these devices. When bit 15 is set, it indicates that graphics are disabled. Only the CVD-4 should have that bit set. When bit 14 is set, it indicates that an Instaview-D surface is being used in place of the standard Instaview tablet. Thus, both the Instaview-D and the CVD-4 should have that bit set. To summarize:

Device	*UNCHWRD1*
Instaview	0000
Instaview-C	0000
Instaview-D	0002
CVD-4	0003

The third Unit Characteristic Word is used to indicate the number of physical VGU boards configured with the device. For example, an Instaview-C, which is configured with 3 VGU boards, would have a 3 in the third UNCHWRD.

Compucircuit, Calcomp 7000 and Gerber Plotters

The Calcomp 7000 on-line plotter system consists of a Calcomp 748 plotter with a Calcomp 925 controller. Compucircuit is a photoplotter Device manufactured by Computervision. Gerber is another compatible on-line plotter system.

Calcomp, Compucircuit, and Gerber Configurations

	Calcomp 7000	*Compucircuit*	*Gerber*
Device Type	C925	INFO	TBIO
Device Name	C925	User-selected	GP
UNCHWRD's	Ignored	Only 1st UNCHWRD used	Ignored

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Compucircuit, Calcomp 7000 and Gerber Plotters (Continued)

Compucircuit UNCHWRD 1 Values

UNCHWRD Value	*Device*	*Resolution (acc = accurate)*
0404	150 Compucircuit	1 mil
0604	150 Compucircuit	1/4 mil
0504	150 Compucircuit	1 mil, acc origin
0704	150 Compucircuit	1/4 mil, acc origin
0804	100 Compucircuit	1 mil
0A04	100 Compucircuit	1/4 mil
0904	100 Compucircuit	1 mil, acc origin
0B04	100 Compucircuit	1/4 mil, acc origin

These values are computed as combinations of the various bit values presented in the following table.

Compucircuit Bit Code for UNCHWRD1

Bit	*Hex Value*	*Use*
0	0001	Reserved
1	0002	Reserved
2	0004	Unit = Compucircuit
3	0008	Reserved
4	0010	Reserved
5	0020	Reserved
6	0040	Reserved
7	0080	Reserved
8	0100	Compucircuit acc origin
9	0200	Compucircuit resolution (0 = 1 mil, 1/4 = mil)
10	0400	Compucircuit 150 (24" × 24")
11	0800	Compucircuit 100 (15" x 15")
12	1000	Reserved
13	2000	Reserved
14	4000	Reserved
15	8000	Reserved

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Varian and Versatec Dot Matrix Printer/Plotters

Selecting auxiliary unit options 7 (Versatec), 12 (Varian 216), or 18 (Varian 208), will cause the default parameters shown in table that follows to be typed.

Varian and Versatec Default Parameters

Parameter	*Versatec*	*Varian 216*	*Varian 208*
1. NAME1	VS	VR	VR
2. NAME2	TO	60	80
3. DEVNO	001F	001F	001F
4. UNCHWRD1	0370	00C7	00C7
5. UNCHWRD2	00C8	00C8	00C8
6. UNCHRRD3	1B80	10B0	1080

If a specific option is selected more than once, unique names should be assigned sequentially (e.g., VST0, VST1, VST2). The device code for the unit is hardware configuration dependent. Unit Characteristic Words (see tables that follow) are used to indicate this model-specific information.

Changing Printer/Plotter UNCHWRDS

Format	*Specified By*
Characters/line	1st UNCHWRD
Rasters/inch	2nd UNCHWRD
Rasters/line	3rd UNCHWRD

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Varian and Versatec Dot Matrix Printer/Plotters (Continued)

	Printer/Plotter UNCHWRDS		
Printer Plotter	*UNCHWRD 1*	*UNCHWRD 2*	*UNCHWRD 3*
Varian			
4108	0050	0064	0320
4208	0050	00C8	0640
4111	0084	0064	0420
4211	0084	00C8	0840
4115	008D	0064	0580
4215	008D	00C8	0B00
4122	00C8	0064	0840
4222	00C7	00C8	1080
Versatec			
1200	0084	00C8	0840
8122	0108	0064	0840
8222	0210	00C8	1080
8124	0120	0064	0900
8224	0240	00C8	1200
8136	01B8	0064	0DC0
8236	0370	00C8	1B80
8142	0200	0064	1000
8242	0400	00C8	2000
8172	0380	0064	1C00

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Gould Dot Matrix Printer/Plotter

Refer to tables that follow for model specific information.

Gould Configurations

	Gould 5100 Plotter	*Gould 5100 Printer*	*Gould 4800 Printer*
Device Type	TBIO	G51P	G48P
Device Names	Assigned consecutively: DMX0, DMX1, DMX2.		
UNCHWRDs	1st left digit of 1st UNCHWRD = 2.		No input necessary.

Gould Printer/Plottter UNCHWRDS

Printer/Plotter	*UNCHWRD 1*	*UNCHWRD 2*	*UNCHWRD 3*
Gould 5100 (22' plotter only)	2108	0064	0840

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Honeywell GRTS and ISBD GRTS

The Honeywell communication package (GRTS) allows intercommunication with Honeywell 6000 series computers. The ISBD GRTS, a varient of the Honeywell GRTS, is configured identically to the Honeywell SLU as shown in table that follows.

	Honeywell GRTS PCU		*Honeywell SLU*	*ISBD GRTS SLU*
	Port 0	*Port 1*		
Device Type	PCUC	TBIO	TBIO	TBIO
Device Name	PC00	SYN0	SYN0	SYN0
UNCHWRDs	Ignored	Ignored	Ignored	Ignored

Univac 1004 Synchronous and UT200

The 1004 communication package allows synchronous communication with the Univac 1108 computers.

The UT200 emulates a Control Data Corporation User Terminal 200 RJE workstation. Univac and UT200 communication via SLU and PCU, respectively, are configured as follows:

Univac 1004 and UT200 Configurations

	Univac 1104		*UT200*	
	PCU	*SLU*	*PCU*	*SLU*
Device Type	PCUC	TBIO	PCUC	TBIO
Device Name	PC00	SYNC	PC00	SYNC
UNCHWRDS	Ignored	Ignored	Ignored	Ignored

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IOSB

Only the first word is used; it is bit encoded. These tables show bit encoding and commonly-used UNCHWRDs, respectively. IOSB devices should be defined (for configurations) before any other devices.

IOSB Bit Code

Bit	*Hex Value*	*Device*
0	0001	Display
1	0002	Plotter
2	0004	LTD 1
3	0008	CVD
4	0010	Display telewriter
5	0020	Plotter telewriter
6	0040	LTD 1 telewriter
7	0080	CVD telewriter
8	0100	Reserved
9	0200	Reserved
10 & 11	0000	1 Pen
	0400	2 Pens
	0800	3 Pens
	0C00	4 Pens
12	0000	Interact II
	1000	Interact IV
13	0000	2 mil plotter resolution
	2000	1 mil plotter resolution
14	4000	Display is 10 inches
15	8000	Display is 19 inches

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IOSB
(Continued)

The following table lists IOSB UNCHWRDs.

IOSB Unit Characteristic Words (UNCHWRDS)

UNCHWRD	*Device*		
IOS DISPLAYS			
4011	10" display and telewriter		
8011	19" display and telewriter		
IOS PLOTTERS			Pens Resolution
0022	Interact II, telewriter		2 mil
1022	Interact IV, telewriter	1	2 mil
1422	Interact IV, telewriter	2	2 mil
1822	Interact IV, telewriter	3	2 mil
1C22	Interact IV, telewriter	4	2 mil
3022	Interact IV, telewriter	1	1 mil
3422	Interact IV, telewriter	2	1 mil
3822	Interact IV, telewriter		
3C22	Interact IV, telewriter	4	1 mil
IOS DIGITIZERS			
0004	LTD only		
0044	LTD and telewriter		
0008	CVD only		
0088	CVD and telewriter		

DCMN
Card Reader

If FUTIL or CONVERT is used, the values are:

UNCHWRD = 0 — IBM029 punch codes
UNCHWRD = 1 — IBM026 punch codes
UNCHWRD = 2 — Special Livermore Tabs Card punch code

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DUPLICATING THE O/S AND CONFIGURATIONS

With the GENSLTAP command, you may duplicate the complete operating the configuration and CGOS software) on another tape. This should be done if the protection facility was enabled for added security. (See Section 3.)

To Duplicate the O/S:

```
n> ATTACH MT,TAPE ↓
n> GENSLTAP ↓

TYPE OK TO CHANGE DEFAULT LOGIN ENTRY
OK ↓

TYPE NAME, NUMBER
Name, Number ↓

TYPE PASSWORD
Password ↓
```

The tape may later be loaded as if it were the original COLDSTART tape.

When the configuration is defined, you may save it from disc onto tape for later use. (The configuration, not the O/S software will be saved.) It should be saved in a file-the filename identifying the configuration; it is less likely other users will overwrite it.

To Save Configurations:

```
n> COPYCFG Slotn, Filename ↓

n> COPY Filename :MT ↓
```

To Re-define Existing Configurations:

You can use a previously-saved configuration to re-define an existing configuration when the O/S is already initialized. After mounting tape and attaching the tape drive:

```
n> COPY :MT filename ↓
n> BLDSYS Filename ↓
```

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DUPLICATING THE O/S AND CONFIGURATIONS (Continued)

TYPE OK TO SUPPRESS PRINT
OK ↵

TYPE OK TO USE NEW SYSTEM
OK ↵

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BLDSYS Printout

A ↵ in response to TYPE OK TO SUPPRESS PRINT message (during the BLDSYS procedure) prints out the information given below. The bulk of this information is not of use to the general user, and can be suppressed at BLDSYS time. The printout lists options and space used for generating the system configuration.

TYPE OK ↵ TO SUPPRESS PRINT

```
ALLOCATE GLOBALS OF VARIABLE SIZE

TAPEQ       0026, 6A79  (K1)
CPUQ0       000D, 0E42  (S0)
CPUQ1       000D, 0E35  (S0)
CPUQ2       000D, 0E28  (S0)
CPUQ3       000D, 0E1B  (S0)
CPUQ4       000D, 0E0E  (S0)
DMANO       000D, 0E01  (S0)
DRWBQ       000D, 0DF4  (S0)
DISCQ       00F5, 6984  (K1)
PTSKLIST    0009, 0DEB  (S0)
DRSOURCE    0009, 697B  (K1)
DISCUNS     0001, 0DEA  (S0)
RESTRDSC    0001, 0DE9  (S0)
DTWTCT      0008, 0DE1  (S0)
DMPTSPT2    004F, 692C  (K1)

CREATE CFG. DEPENDENT DATA STRUCTURES
& LOAD CFG.DEPENDENT CODE

SYS OPT 1/TASK 0:
TIS                     0080, 68AC  (K1)
IOFLAGS                 0008, 68A4  (K1)
DATA        0690, 0100, 0041, 6863  (K1)
DATA        068F, 0100, 003F, 0DA2  (S0)

TASK 1:
TIS                     0080, 67E3  (K1)
IOFLAGS                 0008, 67DB  (K1)
DATA        0690, 0100, 0041  679A  (K1)
DATA        068F, 0100, 003F, 0D63  (S0)

TASK 2:
TIS                     0080, 671A  (K1)
IOFLAGS                 0008, 6712  (K1)
DATA        0690, 0100, 0041, 66D1  (K1)
DATA        068F, 0100, 003F, 0D24  (S0)

TASK 3:
TIS                     0080, 6651  (K1)
IOFLAGS                 0008, 6649  (K1)
DATA        0690, 0100, 0041, 6608  (K1)
DATA        068F, 0100, 003F, 0CE5  (S0)
```

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BLDSYS
Printout
(Continued)

```
TASK 4:
TIS                          0080, 6588  (K1)
IOFLAGS                      0008, 6580  (K1)
DATA      0690, 0100,  0041, 653F  (K1)
DATA      068F, 0100,  003F, 0CA6  (S0)

TASK 5:
TIS                          0080, 64BF  (K1)
IOFLAGS                      0008, 64B7  (K1)
DATA      0690, 0100,  0041, 6476  (K1)
DATA      068F, 0100,  003F, 0C67  (S0)

TASK 6:
TIS                          0080, 63F6  (K1)
IOFLAGS                      0008, 63EE  (K1)
DATA      0690, 0100,  0041, 63AD  (K1)
DATA      068F, 0100,  003F, 0C28  (S0)

TASK 7:
TIS                          0080, 632D  (K1)
IOFLAGS                      0008, 6325  (K1)
DATA      0690, 0100,  0041, 62E4  (K1)
DATA      068F, 0100,  003F, 0BD0  (S3)

DISC 0 OPT 2:
CODE      0639, 0200,  00C8, 621C  (K1)
CODE      0633, 0100,  0021, 003F  (B2)
CODE      0634, 0200,  00EC, 6130  (K1)
DATA      0640, 0100,  000C, 77F4  (D4)
DATA      063F, 0100,  003C, 0B94  (S3)

TAPE 0 OPT 1:
DATA      06DA, 0100,  0048, 60E8  (K1)

AUX0 OPT 2:
CODE      064C, 0100,  0008, 0C20  (S0)
CODE      0648, 0100,  0016, 60D2  (K1)
DATA      0672, 0100,  0006, 60CC  (K1)
DATA      0670, 0100,  0022, 60AA  (K1)
DATA      0671, 0100,  0033, 6077  (K1)

AUX 1 OPT 2:
DATA      0672, 0100,  0006, 6071  (K1)
DATA      0670, 0100,  0022, 604F  (K1)
DATA      0671, 0100,  0033, 601C  (K1)

AUX 2 OPT 2:
DATA      0672, 0100,  0006, 6016  (K1)
DATA      0670, 0100,  0022, 5FF4  (K1)
DATA      0671, 0100,  0033, 5FC1  (K1)

AUX3 OPT 2:
DATA      0672, 0100,  0006, 5FBB  (K1)
DATA      0670, 0100,  0022, 5F99  (K1)
DATA      0671, 0100,  0033, 5F66  (K1)

AUX 4 OPT 2:
DATA      0672, 0100,  0006, 5F60  (K1)
DATA      0670, 0100,  0022, 5F3E  (K1)
DATA      0671, 0100,  0033, 5F0B  (K1)
```

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BLDSYS Printout (Continued)

```
AUX 5 OPT 3:
DATA      067D, 0100, 0006, 5F05  (K1)
DATA      0673, 0100, 0049, 5EBC  (K1)

AUX 6 OPT 2:
DATA      0672, 0100, 0006, 5EB6  (K1)
DATA      0670, 0100, 0022, 5E94  (K1)
DATA      0671, 0100, 0033, 5E61  (K1)

AUX 7 OPT 2:
DATA      0672, 0100, 0006, 5E5B  (K1)
DATA      0670, 0100, 0022, 5E39  (K1)
DATA      0671, 0100, 0033, 5E06  (K1)

WORDS AVAILABLE:
    0010   FROM 0C10   TO    0C20
    0606   FROM 5800   TO    5E06
    001F   FROM 0020   TO    003F
    0500   FROM 0694   TO    0B94
    07F4   FROM 7000   TO    77F4

**** CGOS 200 REV 0.0 ****
```

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THE PROTECTION FACILITY (CONTROLLED USER ACCESS)

The Protection Facility prevents unauthorized logins. It also protects files and commands by establishing the type of access permitted for each individual or group. (System level files refer to catalogs, parts, or text files.) This section covers the components, operation theory, and implementation of the Protection Facility.

A three-part control exists within the Protection Facility: (see figure that follows).

1. To Login, the user inputs a name, number, and unique password that matches an entry contained in the Authorize File. The Authorize File, created with EDIT and AUTHRIZ commands, associates an access table and Default Protection Group (DPG) with each user.

   You may include an optional field, LOGIN TASK DIRECTORY FILENAME, after access table name and before the DPG. Up to 20 characters, enclosed by single quotes ('), this name forms the last level of a filename which is found in the catalog SYSTEM.DIRECTORY. (See AUTHRIZ documentation.)

   Note

   In order to take advantage of GNA directory search rules, this feature must not be used.

2. Any time a particular file or command is accessed, the file or command's protection group (PG) and attempted type of access is compared to the PG and attributes listed in the user's access table. An error message results if the PG's listed attributes do not allow desired type of access.

3. Users can create, modify, or restore files in any PG to which they have WRITE access. These files become a part of the user's DPG. The existing file's PG is not changed when the file is modified.

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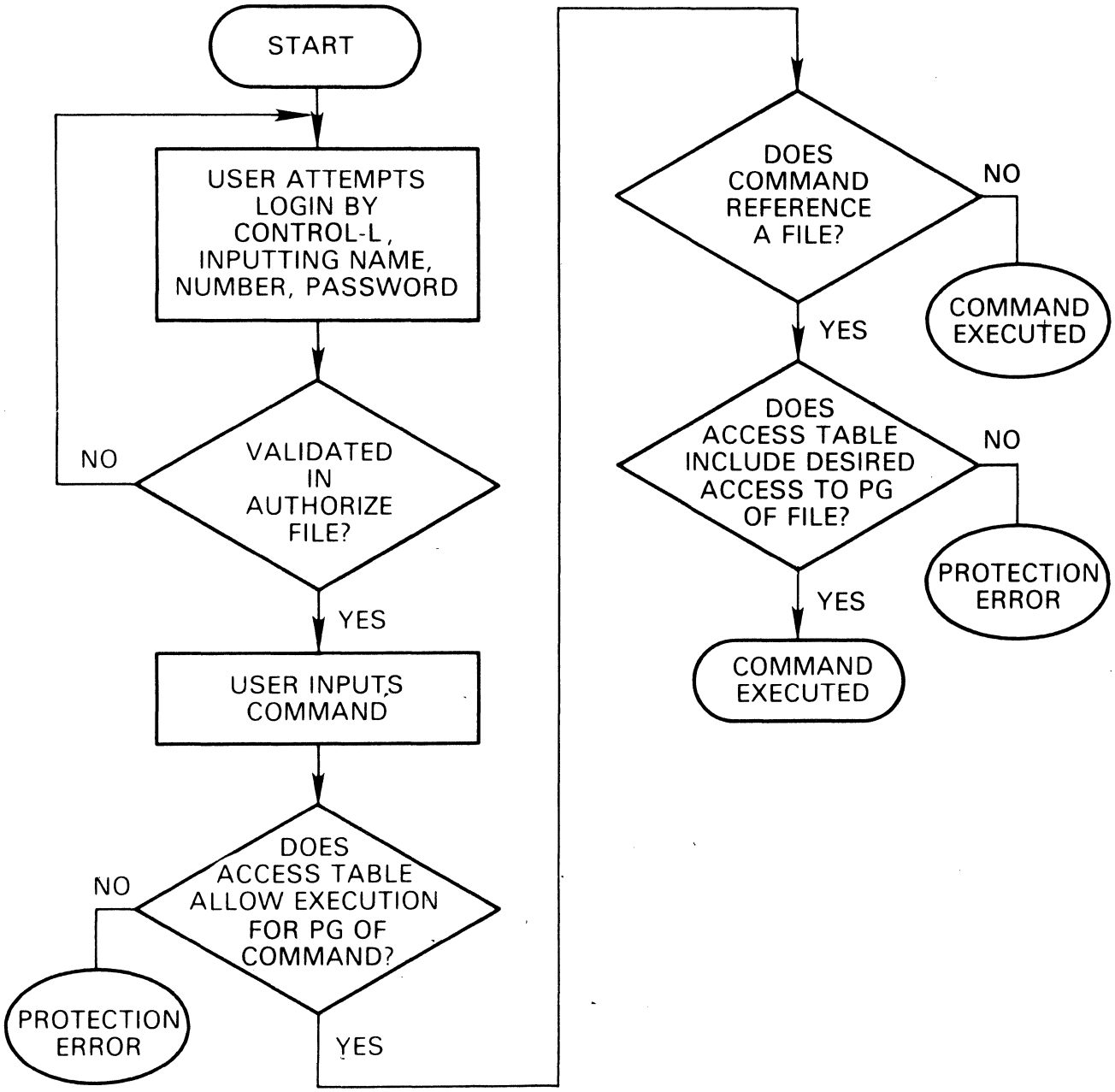
Protection Facility Flowchart

As System Manager, you design the protection facility with the FMINIT command. The protection facility is initialized after the authorized Login is enabled by the FMINIT process.

HOW THE PROTECTION FACILITY FUNCTIONS



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Protection Facility Access

PROTECTION ACCESS

The means of access, READ; DELETE; WRITE; MODEL (CADDS 4 only); OR EXECUTE. represented by a letter. With this letter, the user may access files and/or commands and [CHANGE] them to another protection group.

PROTECTION GROUP (PG)

The PG number is the number you give to a unique set of files/commands. It determines which users may access the files/commands. Files/commands with the same number are said to be members of the same protection group. Access types are attributes of the protection group, i.e., 2500/R implies that the user has READ access for all files/commands in PG 2500 only.

ACCESS TABLE

An Access Table lists protection groups and their attributes (types of access). Each user is assigned to one access table which determines which files/commands the user may access. By adding full or part of the BASIC or ADMIN access table (template) to a user's access table, you control his/her ability to execute specific commands and access specific files. (See the following tables.)

To Select Controlled Access:

Access Table Types

Access	*Used When*	*Action*
BASIC (Default access tables BASIC and ADMIN automatically created by system)	Login restricted to users listed in Authorize File.	Step 1: See Authorize File.
	Users have complete access to most files/commands.	Step 2: See "Loading/ Initialization of Applica- Software". (Section 3)
See Default Access Tables	Critical system commands/ files restricted to a certain group of users.*	
EXTENDED (Tables created w/EDITACT)	All of the above rquired.	Step 1: See "Access Table Design".
	Restricted file/command access by selected user.	Step 2: See "Authorize File".
		Step 3: See "Loading/ Initializing of Application Software". (Section 3)

*Critical commands: AUTHRIZ, BLDSYS, COPYDISC, FMINIT, FMRCVR, GENSLTAP, PACHDISC, PACHFIL, SET, SYSCMTB. Critical Files: Accounting and Protection files.

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Default Protection Facility Access - Default Protection Group (DPG)

As System Manager, you permanently assign the DPG in the authorize file to a user. When a user writes a file/command, his/her DPG is automatically assigned as the protection group of the file/command. You can temporarily change the DPG number with the SETPROT command. Each time the user logs in, his/her original number assigned becomes the DPG. Types of access are M = Model (CADDS 4 only), R = Read, W = Write, E = Execute command, C = Change PG of file/command, D = Delete.

Default Access Tables

Access Table Name	*Protection Group Range*	*Attributes*
ADMIN		
1	0000 - 0000	/ MRWECD
2	0001 - 0001	/ R
3	0002 - 0002	/ RWECD
4	0003 - 0003	/ RWECD
5	0004 - 0010	/ RWECD
6	0011 - 009F	/ E
7	00A0 - 00A0	/ RE
8	00A1 - 1FFF	/ RWECD
9	2000 - 2000	/ MRWECD
BASIC		
1	0000 - 0000	/ MRWECD
2	0010 - 0010	/ RWD
3	0020 - 009F	/ E
4	00A0 - 00A0	/ RE
5	00A1 - 1FFF	/ RE
5	2000 - 2000	/ MRWECD

DEFAULT DESIGNATORS (S,G,P)

The default designator (S-system, G-group, or P-private) plus the desired PG's attributes are placed in an access table. When you specify the default designator and its accompanying attributes (with the SETPROT or CHGPROT command), the user may choose the associated PG without knowing the actual number.

Example

Access table	SETPROT SRWD changes DPG to 2000.
2000-2000/RW	

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Protection Groups 0-0100

The following tables list system commands and associated protection groups. Template refers to the default access table with which the user may access file/commands.

System Files

Protection Group	*File/Catalog*	*Template*
0	DATA — Computervision Supplied Data Files	ADMIN/ BASIC
2	SYSTEM.FAT — Access Tables SYSTEM.&BCD.AUTHORIZE	ADMIN
3	SYSTEM.LOG — Accounting Tables	ADMIN
10	SYSTEM — Basic system files	ADMIN/ BASIC
A0	SYSCATLG — Primary System	ADMIN/ BASIC

Restriction

All users must have SYSCATLG access to operate system, and RWD access to PG 10 to access basic system files. No user should have more than R access to PG 1.

Restoring User-Created Files

These special system files, used by the system protection facility, must have a protection group (PG) of 2:

- Access tables (SYSTEM.FAT.name).
- System.&BCD.Authorize.
- Authorized Login/Accounting Log Files (SYSTEM.LOG catalog).

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Restoring User-Created Files (Continued)

The initial access tables and authorize file (created during FMINIT) have the correct PG. New access tables (created with the EDITACT command) always have the correct PG. However, any files restored from tape or copied from another file into the SYSTEM.FAT or SYSTEM.LOG catalog, may have the default protection group (DPG) of the user restoring the copy. These access tables are not usable by the system.

To restore the correct PG, use the CHGPROT command after restoring new files into the catalog:

- CHGPROT SYSTEM.FAT, 2
- CHGPROT SYSTEM.LOG, 3

In general, when a user wants to change access to a file, he/she must have: access to the old file, some access to the new file, and access to the CHGPROT command.

Protection Facility Commands

System level commands are both CV-supplied and user-developed. The following commands, used in connection with the protection facility, are explained in detail in the *CGOS 200 GNA Operator Guide*.

PG/System Commands

Protection Group	*Commands*		*Template*
10	AUTHRIZ COPYDISC EDITACT	FMINIT FMRCVR PACHDISC GENSLTAP OPLOG	ADMIN
1F	BLDSYS* PACHFIL* SET		ADMIN
20	CHGPROT CHKDISC COMPILE	DUMPKERN LISTCFG* LISTCMTB*	ADMIN/ BASIC

*Indicates required user access to the file on which the command is performed.

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Protection Facility Commands (Continued)

Protection Group	*Commands*		*Template*
	COPYCFG*	LISTLOAD	
	CVTECO*	LISTPROT	
	DELCFG*	LOAD*	
	DUMP	NEWCFG*	
		RENAMDEV	
		RENAM	
	EDIT*	SETPROT	
	EDITCFG*	SETTAPE	
	EDITCMTB*	SORTCAT*	
	CONVERT	TAPETYPE	
	CONVERTB		
	FMCLEAR		
	GENCOM*		
30	ATTACH	LOGOUT	ADMIN/
	CHGDEVNO		BASIC
	COMPARE*		
	CROSSREF		
	DATE		
	DETACH	PRINTLP	
	DOFORM	PRINT*	
	DSABDEV		
	DUMPERR	REWIND	
	DUMPTAPE		
	ENABDEV	SELECT	
		SETDEV	
	FILCOM	SETPUNCH	
	FPHEX	SORTFILE*	
	GENINDX		
	GETPUNCH		
	HARDEV	STATUS	
		SYSNEWS*	
	HEXCALC		
	HEXFP	TEST	
	LCLNEWS*	UP	
	LISTCOM		

*Indicates required user access to the file on which the command is performed.

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Protection Facility Commands (Continued)

Protection Group	*Commands*		*Template*
100	ATCHVOL	FMCHECK*	ADMIN/
	COPYTEXT	LIST*	BASIC
	COPY*	FUTIL*	
	DSABVOL	COPYTEXT*	
	DTCHVOL	SYSCMTB*	
	EDITACT*		
	ENABVOL	USERCMTB*	
	EXECUTE*		

Note

Protection group is 0 when the uncontrolled Login mode isselected for all of the above.

BRIEF DESCRIPTION OF FACILITY COMMANDS

AUTHRIZ — Checks entries, encodes passwords of edited authorize file w/EDIT command.

CHGPROT — Changes a file's PG.

EDITACT — Commands editor to create, modify, or delete access tables.

LIST — Lists file's PG when FULL option used.

LISTPROT — Lists current user's access table and DPG.

SETPROT — Changes current user's DPG, allowing files to be be accessed by selective classes of operators. (WRITE access must exist for the desired DPG.)

Note

See also System Commands in Section 8.

*Indicates required user access to the file on which the command is performed.

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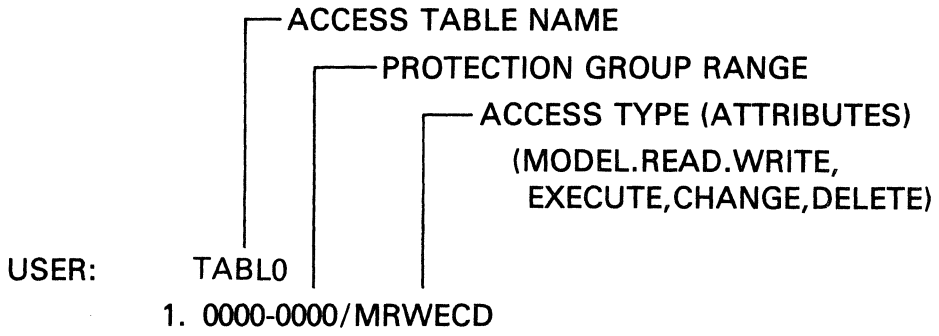
ACCESS TABLES

Access tables are set up as follows:



Sample Access Tables

USER: TABL0

1. 0000-0000/RWECD
2. 0020-0009/E
3. 0010-0010/RWD
4. 00A0-2000/RE
5. 2001-2001/RE
6. 2002-2003/RWD
7. 200A-200A/E
8. 2010-201F/RWECD

USER: TABL1

1. 0000-0000/RWECD
2. 0020-0009/E
3. 0010-0010/RWD
4. 00A1-2000/RE
5. 2003-2004/RWD
6. 2005-2005/RE
7. 2020-202F/RWECD

USER: TABL1

1. 0000-000/RWECD
2. 0001-0001/R
3. 0002-0002/RWECD
4. 0003-0003/RWECD
5. 0004-0010/RWECD
6. 0011-009F/E
7. 00A0-1FFF/RWECD
8. 2000-2000/MRWECD
9. 2001-2001/MRWECDS
10. 2002-2004/MRWECD
11. 2005-2006/MRWECDG
12. 2010-202E/MRWECD
13. 201F-2020/MRWECDP
14. 2021-202F/MRWECD

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Designing the Access Table

You attain extended protection by structuring access tables to permit varied access for file/command protection groups. Simplicity is important when designing a comprehensive protection facility. An example follows this procedure.

ENTERING ACCESS TABLES (PREPARATION)

1. Categorize present and prospective user files/commands by function, purpose, or project. (e.g., general usage execute files, keyfiles, etc.) assign the same PG to files/commands of each category. Assign contiguous PGs to categories likely to be accessed by the same groups of people.

2. Group operators into classes or teams, according to the common types of files/commands they will use. Class size may be one or greater. Each class will be assigned its own access table.

3. Determine categories of files/commands each class will be able to access. List PGs of those files/commands in the class's access table. Associate allowed access for each PG (Model — CADDS 4 only, Write, Read, Delete, Execute, or Change).

4. Combine PGs with same attributes into a range (e.g., 2001/RE becomes 2001-2002/RE, etc.).

5. Assign each user to a Default Protection Group (DPG); enter the DPG number into the Authorize file. The DPG number must also appear as a PG number in the access table with a write attribute. Because it will be assigned as the user's file/command PG number, it should represent the PG most likely to be used. (The DPG can, however, be changed by SETPROT; the file/command's PG can be changed by CHGPROT.)

6. To eliminate memorization of actual PG numbers (for users frequently switching between DPGs), use default designators as the argument of SETPROT, (S, G, or P) with the attributes of the PG containing "W" access which is to be an alternate DPG. If the default designator is placed within a range, the first PG is chosen.

Note

CHGPROT reguires Change access to be an attribute of the original and changed PG.

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ENTERING ACCESS TABLES (PREPARATION) (Continued)

S, G, or P each identifies a unique PG only when placed with a unique combination of attributes:

Example

2000-2000/RWDS	PG 2000 identified
3000-3000/RWDG	PG 3000 identified
3500-3500/RWDG	Never 3500

7. To allow access to system files/commands, the PGs of the ADMIN or BASIC standard access table must be added. This is done during EDITACT. The ADMIN table is usually reserved for System Managers; the BASIC table is sufficient for general Operators.

8. Use EDITACT command.

9. Creation of the access tables is complete.

Example

The following samples are designed to illustrate the process of developing the access rights of a group of users. In this particular example, the group of users are:

1. The Project Leader (PRJLDR) who has access to all files.

2. Three users who make up a sub-group:

   - User 1 & 2 — Each has a private PG and share access to a set of PG's.
   - User 3 — He/she has a separate set of PG's and, therefore, a separate set of files to access.

Authorize File

User	*No.*	*Access Table*	*DPG*	*Pass-Word*
PROJLDR,	1,	TABL2,	0000,	PL
USER1,	2,	TABL0,	2010,	A
USER2,	2,	TABL0,	2011,	B
USER3,	10,	TABLE1	2020,	C

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ENTERING ACCESS TABLES (PREPARATION) (Continued)

The following table illustrates a typical scenario dealing with user access assignments. Each line in the table is numbered and explained in the paragraphs that follow the table.

Sample User Actions and Related Access Types

Line	User	Action Performed	User DPG	File PG	Type of File/Command Available			
					PROJLDR	USER1	USER2	USER3
1.	PROJLDR	Creates new file A	0000	0000	RWECD	RWECD	RWECD	RWECD
2.	PROJLDR	CHGPROT file A	0000	2004	RWECD	None	None	RWD
3.	USER3	Edits file A	2020	2004	RWECD	None	None	RWD
4.	PROJLDR	SETPROT S RWECD	2001	—	—	—	—	—
5.	USER1	Edits file B	2010	2001	RWECD	Error RE	RE	None
6.	USER3	Reads file B	2020	2001	RWECD	RE	RE	Protection error
7.	PROJLDR	CHGPROT file B GRWECD	0000	2005	RWECD	None	None	RE
8.	USER3	CHGPROT file B 2020	2002	2005 Protection Error	RWECD	None	None	RE
9.	USER2	SETPROT 2004	2010 Protection Error	—	—	—	—	—

Types of Access

R = Read
W = Write
E = Execute command
C = Change PG of file/command
D = Delete

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ENTERING ACCESS TABLES (PREPARATION) (Continued)

1. A new file, "A" is created by PROJDR. PG for PROJDR is assigned as file A's PG.
2. File A's PG changed to 2004. PROJDR has required "C" access to 0000 and some access to 2004.
3. A modified and refiled file/command retains the same PG, regardless of the DPG of the user who last modified the file.
4. DPG 2001 is chosen by inputting the default designator "S" and appropriate attributes.
5. Error: No "W" access for PG 2001 in the user's access table.
6. Protection error: File B's PG is not listed in user 3's access table.
7. PG 2005 referenced by inputting default designator "G" and access attributtes. First group in range chosen.
8. To change protection "C", user must have access to both original and desired PGs.
9. To change DPG, user must have "W" access for desired group.

Creating the Authorize File

The Authorize file is required, regardless of whether Basic or Extended access protection is desired. The Authorize file contains entries that establish each user's:

LOGIN name and password.
Project designation.
Access table.
Default protection group (DPG).

Authorize file entries are input via the EDIT command:

```
EDIT SYSTEM.AUTHORIZE
```

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Creating the Authorize File (Continued)

To Develop Authorize File

Command	*Description*
#I	Input the following entries, one line per user to be listed in the authorize file. Separate each entry with a comma and each line by a § . Two consecutive § complete the input; the prompt ("#") appears.
	• User's Name — (Up to 20 alphanumeric characters.)
	• Project Designation — (Up to 13 alphanumeric characters.) Name and project designation may be empty entries if no accounting entries are being kept. (Four commas still required.)
	• Access Table Name — (Up to 20 alphanumeric characters.) When BASIC access protection is desired, there is a choice of two access tables: ADMIN - Assigned to users performing some function related to the System Manager, or users needing to access restricted files and commands outlined in Appendix A. BASIC - Assigned to users performing general system operations. (For EXTENDED access protection, any access table created with EDITACT may be named.)
	• Login Task Directory Filename — (Up to 20 alphanumeric characters; delimited by single quotes.) This field is optional.

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Creating the Authorize File (Continued)

Command		*Description*
	• Default Protection Group (DPG)	(Up to 4 numeric characters.) 0000 for BASIC access protection. Up to 8000x for EXTENDED access protection (if user has WRITE access for that PG).
	• Password	(A string of up to 6 characters of any type.)

Caution

Do not lose the password, it is irrecoverable.

#T	Types out entire file. (Checks for accuracy.)
#En	Allows you to edit specified line number (n = line number).
#F	Files Authorize file.
AUTHRIZ	File checked for errors; password is encoded.
LOGOUT	(Also subsequent LOGIN) required to enable changes made above.

Sample Authorize Files

SYSTEMADMIN,0,ADMIN,0000,ADMIN	User logs in with the name SYSTEMADMIN and the number 0. SYSTEMADMIN has ADMIN for a password and access table with a DPG of 0000.
PROJLDR,1,ADMIN,0030,ABC	The Project leader, logging in with * (* meaning that no account number is needed), is allowed to use any number. He/she uses the access table ADMIN with ABC as a password and a DPG of 0030.

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Creating the Authorize File (Continued)

U1,2,BASIC,0000,EFG	User U1 uses the access table BASIC with EFG as a password and a DPG of 0000. He/she must log in with number 2.
U2,*,BASIC,0000	User U2 requires no number or password to LOGIN. U2's access table is BASIC. The DPG is 0000.

MULTI-VOLUME PROCEDURES

CGOS 200 GNA is capable of supporting a number of auxiliary disc volumes. The volumes may be removed and transferred to another disc drive during system operation.

Initializing Volumes

FMINIT must be used to initialize the File Manager on each volume. When initialization is complete, however, the volume may be transferred without initializing it a second time. If volumes were initialized with the SINGLE option they must always be mounted on the same drives. Volumes may be initialized independently by inputing the volume's drive number.

The Primary Volume

The O/S (primary volume) is always indicated by drive number 0. Authorized LOGIN and accounting procedures may only be enabled on the primary volume, which must not be removed from the drive during system operation.

Configurations/ Naming

Each volume, unless initialized with the SINGLE option, may have its own unique configuration, O/S (See COLDSTART), and file manager structure (FMINIT). The auxiliary disc volume is named in the usual catalog representation, except that an asterisk (*) must precede the name (e.g., *VOLNAME.CAT1.CAT2.FILE).

Each volume will be assigned the PG input during FMINIT. Files cannot span independent volumes.

Accessing Volumes

Five commands are necessary to access a volume (see *Selecting the Primary and Additional Discs*). A volume must be enabled and associated to the system with the ENABVOL command. Only then may the user attach to the volume with ATCHVOL.

When no longer required, the volume should be detached using the DTCHVOL command. Only when volumes are detached from all tasks and then disabled by a DSABVOL command can a volume be physically removed.

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AUXILIARY DISC VOLUME ASSOCIATED COMMANDS	LIST	Lists volumes as if they were catalogs.
	STATUS	Lists disc status information, including system configuration, system version, and file manager status.
	LOGOUT	Automatically detaches volumes from task.

WORKING DIRECTORIES

The file management system supports user-defined search lists, called directories. A directory consists of a hierarchy of catalogs, called directory entries. Once a directory is enabled by a task, the File Manager uses the search list defined in the directory to resolve all user file references.

A directory restricts the scope of the File Manager's search for existing files; when the user references an existing file, the File Manager searches only those catalogs specified in the directory. Search order corresponds to the order of the files on the list.

New files referenced by the user are always created in the catalog designated as the CREATE directory in the user's current directory. A directory is automatically enabled at LOGIN time when a user's directory command filename is specified in the SYSTEM.AUTHORIZE file. (See AUTHRIZ on-line documentation.)

Example

Entry is SYSTEMADMIN,0,ADMIN,'MYDIR',PSW

ENABDIR SYSTEM.DIRECTORY.MYDIR is done at LOGIN time.

User logs in under "CADDS 3"; there is a file called
"SYSTEM.DIRECTORY.&BCD.CADDS3OPER"
which contains the text:

```
SYSCATLG = L     (Typical GNA
[0] = G           directory.)
```

This line exists in the "SYSTEM.AUTHORIZE" file:
CADDS3,*,BASIC,'CADDS3OPER', Password

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Directory Enable, Override, Disable, List

DIRECTORY ENABLE

A user may create a directory by using the ENABDIR command (see Command Section in the *CGOS GNA 200 Operator Guide*). Once enabled, all file references are made within the user's directory.

Example

n> ENABDIR CATALGA,CATALGB=C ↵	Searchlist CATALGA CATALGB is created/enabled (where CATALGB = user's create directory). =L Local Create; =G Global Create; =C Local & Global Create.
n> EDIT FILEB ↵	The system searches CATALGA for the file CATALGA.&BCD.FILEB. If file does not exist in CATALGA, CATALGB is searched. If file does not exist in CATALGB, the system responds:
TYPE OK TO CREATE NEW FILE OK ↵	System creates the file CATALGB.&BCD.FILEA.
#TV	Typing file header within editor invokes filename without directory entry.
&BCD.FILEA 03-21-81 21:00	

Note

In both examples, directory is transparent to the user.

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DIRECTORY OVERRIDE

Prefixing a "=" to any file reference will override the working directory for a single command.

Example:

User's directory = CATALGA CATALGB=C. (Files CATALGA.FILE and FILE exist in the system when directory is enabled.)

n> PRINT FILE ↵ Outputs the file CATALGA.FILE to the COMDEV.

n> PRINT =FILE ↵ Outputs the file named &FILE.

DIRECTORY DISABLE

A user directory may be explicitly disabled by using the DSABDIR command (see *CGOS GNA 200 Operator Guide*). A user's directory is implicitly disabled at LOGOUT.

DIRECTORY LIST

A user may list the current directory with the LISTDIR command (see *CGOS GNA 200 Operator Guide*).

Section Seven
GRAPHICS NETWORKING ARCHITECTURE (GNA)

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Section 7
GRAPHICS NETWORKING ARCHITECTURE (GNA)

GRAPHICS NETWORKING ARCHITECTURE (GNA)

Graphics Networking Architecture (GNA) is a CV communications protocol that links several Designer Systems in a single, more powerful unit. When CADDS 3 or CADDS 4 systems are networked with GNA, users have the advantage of sharing pooled system resources, without complications in command syntax. GNA has little or no impact on performance.

System Management

For the System Manager, GNA offers several advantages:

- Support for up to 48 on-line interactive graphics users, as if all 48 users worked on a single system.
- Support from one system to another during partial failure conditions.
- Centralized data management, with a master library of CADDS parts and subfigure files, and new features such as data archiving.
- Centralized user accounting.

Operation

GNA integrates the activities of distinct CADDS 3 or CADDS 4 systems into a single, unified system. From the operator's perspective, each system no longer has a distinct identity. In its place is a large multi-processor configuration with the following characteristics:

- A single, centrally located CADDS database accessible to every operator.
- Transparent access to data, including files stored in the central CADDS database.

PHYSICAL CONFIGURATIONS

The CGOS 200 GNA network connects two to seven CV Designer Systems in an integrated unit. These systems are tied together in a network configuration that includes a central *host* node which is linked to each of the other *satellite* nodes. This type of network is called a *star* configuration. The maximum star configuration consists of a host node with six satellites.

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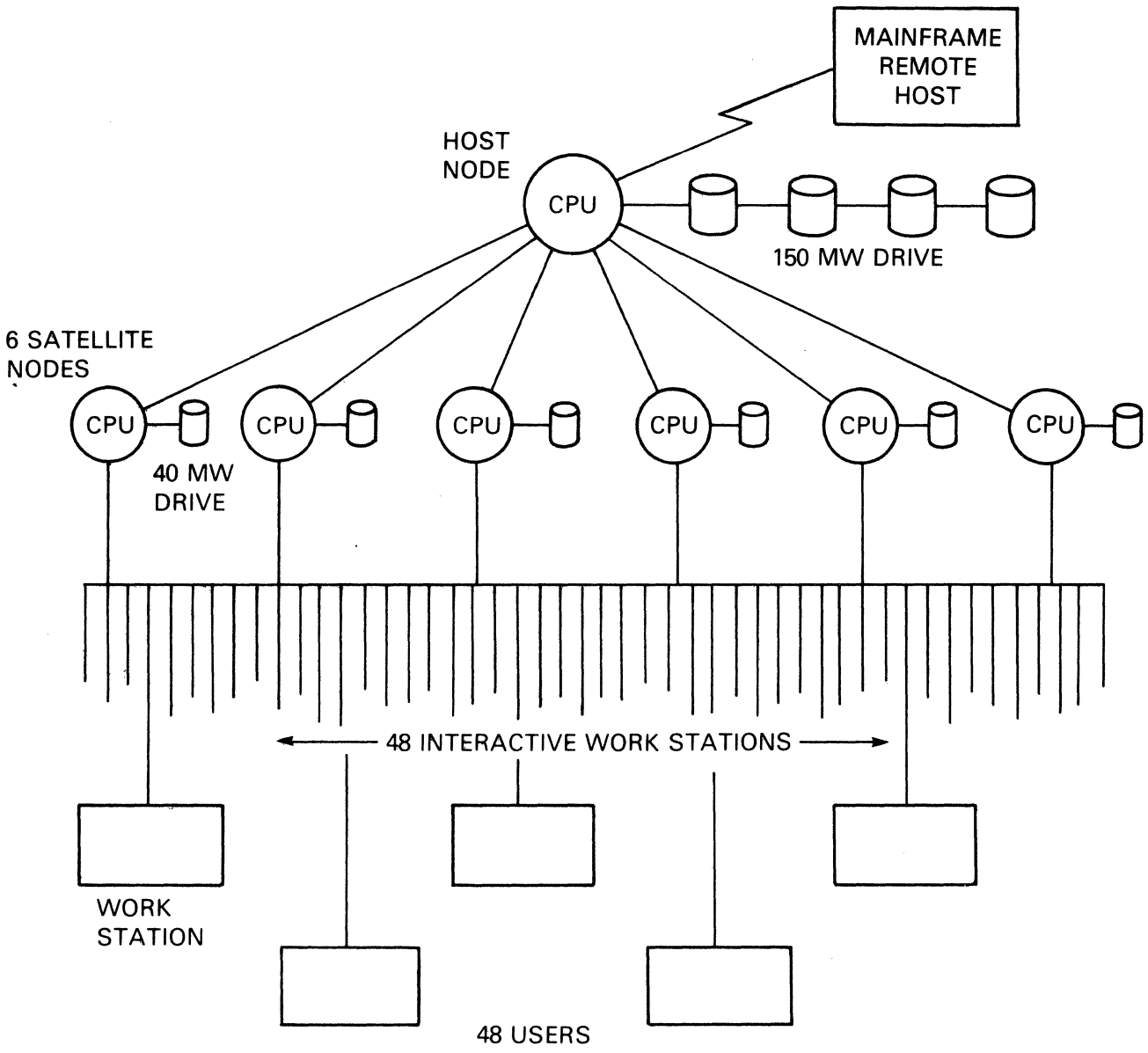
In the star configuration, satellite nodes communicate with the host node, but not with each other. Shared data resides at the host node; on command, the host node distributes this data to satellite nodes via communication links. Every node supports user-interactive graphic activities.



STAR CONFIGURATION

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Host Node

The host node consists of a CGP with floating point unit, memory management units, and main memory. The host node supports:

- Up to four storage module disc drives (to support a shared database).
- Two magnetic tape drives (for system generation, archiving, and back-up purposes).
- Non-interactive peripherals (printers and plotters).
- Up to ten user tasks.

In a non-networking environment, one system supports eight interactive graphics tasks. The same system, functioning as the host node in a network configuration, supports one less interactive graphics task for each link to a satellite node. For example, if the host is linked to four satellites, then it can only support four interactive graphics tasks.

Satellite Nodes

A satellite node consists of a CGP with memory management units, main memory, and a floating point unit. Each satellite node supports:

- Up to four disc drives (for accessing temporary and non-shared files).
- A magnetic tape drive (for system generation and local back-up).
- Interactive graphic devices (Instaviews, IOS terminals, and digitizers).
- Non-interactive peripherals (dot matrix plotters, printers, etc.).
- Up to nine user tasks. Eight of these can be interactive graphics tasks.

Memory Requirements

Each network node has the following requirements:

NETWORK CONFIGURATION

Designer IV or Designer IV-R CGP-100 (CADDS 3):

- 56K words for operating system.
- 26K words for network connection.
- 26K words for user task.

Designer IV or Designer IV-R CGP-200 (CADDS 4):

- 208K words (minimum) for operating system.
- 26K words for network connection.
- 34K words for user task.

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SYSTEM BUILDING

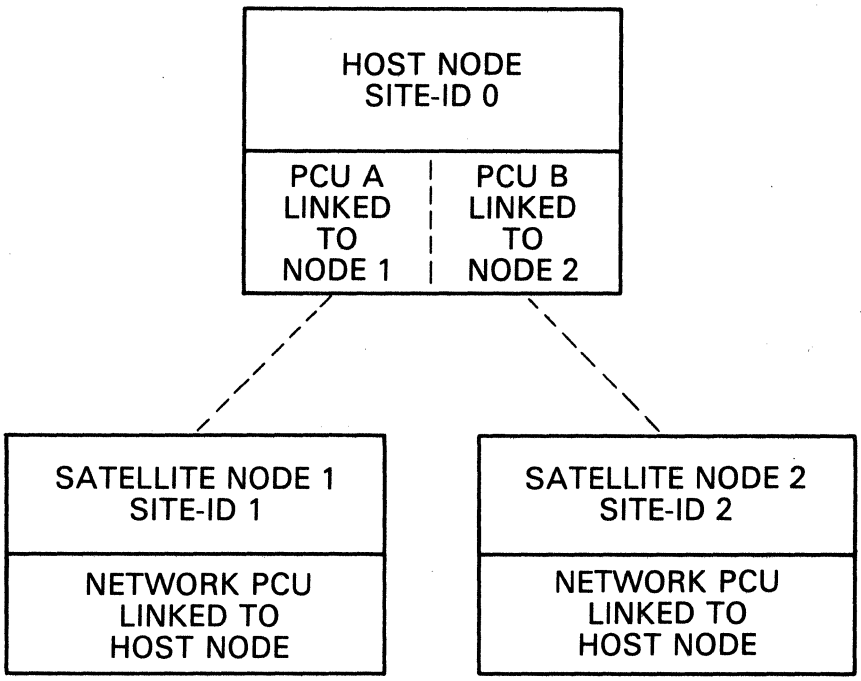
The system building procedure (BLDSYS) has been modified to accommodate GNA. The appropriate BLDSYS configuration must be configured at each node. To do this, the physical configuration of the network must be known.

Each network node is identified by a unique integer, called a *Site-ID*. A function of the software, Site-IDs are user-assigned as integers (range 0-6) during system generation at each node. Conventions dictate that the host have a Site-ID of 0, and that satellite nodes be assigned values from 1 to 6. Before configuring each node, a physical configuration map of the network is generated, and Site-IDs assigned to each node.

Communications Links

Node-to-node connections (point-to-point links) are supported at each end by a Programmable Communications Unit (PCU). The host node must have one PCU for each link to a satellite; satellite nodes must also have a PCU at their end of the link.

Sample Map of a Network with Three Nodes



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Establishing a Configuration

BLDSYS Parameters

System parameters in the BLDSYS procedure have been expanded to accommodate GNA. Two new parameters, numbers 10 and 11, have been added.

CGP System Parameters
(Default values, no network configured)

1.	TIS SIZE (HEX)	= 0080
2.	# IOFLAGS (DEC)	= 5
3.	# TAPE REQ (DEC)	= 2
4.	# DISC REQ (DEC)	= 5
5.	# TASKS (DEC)	= 7
6.	SWAP INDEX (DEC)	= 103
7.	BMS INDEX I	= 4
8.	BMS INDEX B	= 1
9.	AUTOLOGOUT (ON=1/OFF=0) (DEC)	= 1
10.	SITE-ID FOR THIS NODE (DEC)	= -1
11.	CONNECTION CONFIGURATION (HEX)	= 0000

GNA Parameters

Parameters 10 and 11 define the network configuration.

- Parameter 10 is the site-ID for the node. If no network is configured, the value is -1. Otherwise, the value is as follows:

Naming Conventions for Systems

System Name	*Site-ID*
Host Node	0
Satellite Node 1	1
Satellite Node 2	2
Satellite Node 3	3
Satellite Node 4	4
Satellite Node 5	5
Satellite Node 6	6

- Parameter 11

  A hexidecimal word that defines the connection configuration and indicates network connections for the node. The default value (0000) indicates no network is configured. Parameter 11 is a bit-oriented map

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with one bit per possible network connection. Bits are numbered from 0; bit 0 is the left-most bit. If the node is connected to node N, bit N of the word is set. A network may have 7 nodes maximum; only bits 0-6 are used, bits 7-15 are ignored. The appropriate values are:

PCU(s) Connected To Node(s) #:	*Bit Number(s) Set:*	*Value of Parameter 11:*
0	0	8000
1	1	4000
1-2	1-2	6000
1-2-3	1-2-3	7000
1-2-3-4	1-2-3-4	7800
1-2-3-4-5	1-2-3-4-5	7C00
1-2-3-4-5-6	1-2-3-4-5-6	7E00

Note

For a satellite node, Parameter 11 will always have the value of '8000'x.

Example

Shows standard system parameters for a network with two satellites.

	CGP System Parameters		
	NODE 0	*NODE 1*	*NODE 2*
1. TIS SIZE (HEX)	0080	0080	0080
2. # IOFLAGS (DEC)	5	5	5
3. # TAPE REQ (DEC)	2	2	2
4. # DISC REQ (DEC)	5	5	5
5. # TASKS (DEC)	7	9	9
6. SWAP INDEX (DEC)	103		
7. BMS INDEX I	4		
8. BMS INDEX B	1		
9. AUTOLOGOUT (ON=1 /OFF=0) (DEC)	1	1	1
10. SITE-ID FOR THIS NODE (DEC)	0	1	2
11. CONNECTION CONFIGURATION (HEX)	6000	8000	8000

Note that the above examples highlight GNA parameters only. Other system parameters are set as described in preceding sections.

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PCU Parameters

In addition to system parameters, users must also configure appropriate PCU Auxiliary Units for the network connections. There must be a Rev. B PCU at each end of a GNA link between host and satellite. The Rev. B PCU consists of two Auxiliary Units: A PCUC and a PCUG device.

PCUC

There are seven PCUC Auxiliary Unit parameters. The first two parameters contain the device code, which is defined in the physical configuration. The third and fourth parameters specify the device number. Each of the final three parameters is a Unit Characteristic Word (UNCHWRD):

- UNCHWRD1

  Contains the speed code in the right byte and the clock switch in the left byte, as follows:

  Clock Switch = 0 Modem.
  1 PCU connected without Modem.

  Speed code corresponds to the Baud Rate at which the data is transmitted. This is shown in the table below.

Speed Code	*Baud Rate*
1	4.8 kps
2	9.6 kps
3	54.2 kps
4	70.9 kps
5	76.8 kps
6	83.8 kps
7	92.2 kps
8	102.4 kps
9	115.2 kps
A	131.7 kps
B	153.6 kps
C	184.3 kps
D	203.4 kps
E	307.2 kps
F	460.8 kps

- UNCHWRD2

  Assigned the value: Site-ID + 1

- UNCHWRD3

  Not used; value should be zero.

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PCUG

Parameters one through four are the same as for the PCUC. Parameters five and six contain READ and WRITE buffer sizes. Eight is the recommended value for parameters five and six. Parameters seven through nine contain the following Unit Characteristic Word values:

- UNCHWRD1

  Not used; value should be zero.

- UNCHWRD2

  Assigned the value: Site-ID + 1.

- UNCHWRD3

  Not used; value should be zero.

Host Node Configuration Parameters

GNA System	*Host Node Site ID*	*CGP Configuration System Parameters: System ID for This Node (#10)*	*CGP Configuration System Parameters: Connection Configuration (#11)*	*PCUC/PCUG UNCHWRD2 Values — Sat. #s 1-6*
One Satellite	0	0	4000	2----------
Two Satellites	0	0	6000	2-3--------
Three Satellites	0	0	7000	2-3-4------
Four Satellites	0	0	7800	2-3-4-5----
Five Satellites	0	0	7C00	2-3-4-5-6--
Six Satellites	0	0	7E00	2-3-4-5-6-7

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Satellite Node Configuration Parameters

System Name	Node Site ID	CGP Configuration System Parameters: System ID for This Node (#10)	CGP Configuration System Parameters: Connection Configuration (#11)	CGP Configuration System Parameters: PCUC/PCUG UCHWRD2 Values
Satellite No. 1	1	1	8000	1
Satellite No. 2	2	2	8000	1
Satellite No. 3	3	3	8000	1
Satellite No. 4	4	4	8000	1
Satellite No. 5	5	5	8000	1
Satellite No. 6	6	6	8000	1

Example

PCU Auxiliary Unit parameters for a network with two satellites and a host.

Host (Site-ID = 0)

Aux Unit 5 PCUC Parameters

1. NAME 1 (BCD)	PC
2. NAME 2 (BCD)	10
3. DEVNO IN (HEX)	0030
4. DEVNO OUT (HEX)	0031
5. UNCHWRD1 (HEX)	0E01
6. UNCHWRD2 (HEX)	0002
7. UNCHWRD3 (HEX)	0000

Aux Unit 6 PCUG Parameters

1. NAME 1 (BCD)	PC
2. NAME 2 (BCD)	11
3. DEVNO IN (HEX)	0032
4. DEVNO OUT (HEX)	0033
5. READ BUFFER SIZE (HEX)	8
6. WRITE BUFFER SIZE (HEX)	8
7. UNCHWRD1 (HEX)	0000
8. UNCHWRD2 (HEX)	0002
9. UNCHWRD3 (HEX)	0000

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Host (Site-ID = 0) (Continued)

Aux Unit 7 PCUC Parameters		*Aux Unit 8 PCUG Parameters*	
1. NAME 1 (BCD)	PC	1. NAME 1 (BCD)	PC
2. NAME 2 (BCD)	21	2. NAME 2 (BCD)	21
3. DEVNO IN (HEX)	0034	3. DEVNO IN (HEX)	0035
4. DEVNO OUT (HEX)	0035	4. DEVNO OUT (HEX)	0036
5. UNCHWRD1 (HEX)	0E01	5. READ BUFFER SIZE (HEX)	8
6. UNCHWRD2 (HEX)	0003	6. WRITE BUFFER SIZE (HEX)	8
7. UNCHWRD3 (HEX)	0000	7. UNCHWRD 1 (HEX)	0000
		8. UNCHWRD2 (HEX)	0003
		9. UNCHWRD3 (HEX)	0000

NODE 1 (Site-ID = 1)

Aux Unit 5 PCUC Parameters		*Aux Unit 6 PCUG Parameters*	
1. NAME1 (BCD)	PC	1. NAME1 (BCD)	PC
2. NAME2 (BCD)	00	2. NAME2 (BCD)	01
3. DEVNO IN (HEX)	0030	3. DEVNO IN (HEX)	0032
4. DEVNO OUT (HEX)	0031	4. DEVNO OUT (HEX)	0033
5. UNCHWRD1 (HEX)	0E01	5. READ BUFFER SIZE (HEX)	8
6. UNCHWRD2 (HEX)	0001	6. WRITE BUFFER SIZE (HEX)	8
7. UNCHWRD3 (HEX)	0000	7. UNCHWRD1 (HEX)	0000
		8. UNCHWRD2 (HEX)	0001
		9. UNCHWRD3 (HEX)	0000

NODE 2 (Site-ID = 2)

Aux Unit 5 PCUC Parameters		*Aux Unit 6 PCUG Parameters*	
1. NAME1 (BCD)	PC	1. NAME1 (BCD)	PC
2. NAME2 (BCD)	00	2. NAME2 (BCD)	01
3. DEVNO IN (HEX)	0030	3. DEVNO IN (HEX)	0032
4. DEVNO OUT (HEX)	0031	4. DEVNO OUT (HEX)	0033
5. UNCHWRD1 (HEX)	0E01	5. READ BUFFER SIZE (HEX)	8
6. UNCHWRD2 (HEX)	0001	6. WRITE BUFFER SIZE (HEX)	8
7. UNCHWRD3 (HEX)	0000	7. UNCHWRD1 (HEX)	0000
		8. UNCHWRD2 (HEX)	0001
		9. UNCHWRD3 (HEX)	0000

Note that the above units are in addition to the devices that would be normally configured for a given node.

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Start-up Errors

When the network is configured and the system booted up, the first user on the host node receives one message (on his/her COMDEV) for each network link between host and satellite. The first user on each satellite will get one message concerning the network link to the host. The following message indicates a successfully initialized link:

```
NETWORK LINK TO NODE XXXX INITIALIZED
```

XXXX = Site-ID of node at the other end of the link.

The following message indicates an error in the configuration, or the PCU device:

```
NETWORK LINK TO NODE XXXX NOT INITIALIZED
```

POSSIBLE ERROR MESSAGES

```
**ERROR CALL D012
--Unable to attach PCUC device.--
```

This means that there is no PCUC unit in the configuration or that the PCUC has invalid network parameters.

```
**ERROR CALL D013
--Unable to attach PCUG device.--
```

This means that there is no PCUG unit in the configuration or that the PCUG has invalid network parameters.

```
**ERROR CALL D014
--Unable to access PCU device.--
```

This means that either the PCU device codes in the configuration are incorrect or that the PCU itself is down.

```
**ERROR CALL D303
--NETWORKING ISNOT INITIALIZED--
--FILE 'OVLY.PCU.LNO' IS NOT FOUND--
```

The file OVLY.PCU.LN0 containing PCU network overlay is not on the system. Networking has not been initialized.

NOTE

No other users may Login until each link is successfully or unsuccessfully initialized.

Example

(Boot-up on host. Configuration = 4 Satellites)

****CGOS 200/10****

<CTRL L> ↓

*** FMCLEAR ***

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```
TYPE DATE AND TIME: MM-DD-YY [,HH:MM]
1-1-81,8:00 ↵

NETWORK INITIALIZATION IN PROGRESS

NETWORK LINK TO NODE 0001 INITIALIZED
NETWORK LINK TO NODE 0002 INITIALIZED
NETWORK LINK TO NODE 0003 INITIALIZED
NETWORK LINK TO NODE 0004 NOT INITIALIZED

**ERROR CALL D014**
--UNABLE TO ACCESS PCU DEVICE--

**TASK 0 INITIATED**
```

There is no PCU board in the system for the fourth link; hence, the error message.

Building Packs

Procedures for building disc packs have not changed under GNA. As System Manager, you load the basic software, overlays, component libraries, and subfigures on the host and satellite system packs. Major part files should be retained on the host; by using Working directories, updated major part files are retained only on the host system.

FILE MANAGEMENT

GNA allows flexibility in locating and accessing data. A user working on a satellite node can access data located at the host, as well as at his/her own node. From the host, a user can access data stored at any node in the configuration. Under GNA, access to files on remote nodes can be explicit or transparent, depending on System Manager and user needs. Under certain circumstances, it is useful to control data access and make the location of data transparent to the user. As System Manager, you can implement this control by establishing Working Directories for each user.

Note

See Section 2, File Naming Conventions/Restrictions.

File Searching

The default file searching operation is to search only the local SYSCATLG. This means that unless a Working Directory is enabled, files located at remote nodes will only be found when the node level is explicitly included in the filename. A user may frequently wish to access files on a node other than the one he/she is working on. This is particularly true for a user working at a satellite node. For such a user, a Working Directory should be set up. This will automate the search for files in commonly accessed remote locations.

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CONVENTIONS FOR CADDS

In a networking environment, it is standard to locate CADDS files as follows:

- The host node contains the network's Master Parts Library on one or more discs.
- Each satellite node contains CADDS scratch files, overlay files, and subfigure libraries relevant to work done at that node.

Working Directories

Working Directories are particularly important in the GNA environment since they define the relationship between file management at the satellite and file management at the host. With a Working Directory enabled, a user who works at a satellite can create files on either the host or the satellite, as is appropriate, and access remote data without knowing its location. A Working Directory sets two criteria for the File Manager:

- The *Search List* tells the File Manager to search particular nodes, volumes, and/or catalogs to locate an existing file.
- The *Create Directory* tells the File Manager that new files will reside on a specific node, volume, and/or catalog.

SEARCH LIST

The Working Directory provides a search list for file references. This list includes node locations. With an appropriate Working Directory enabled, the operator can find a part or subfigure file without knowing whether it is located on the host or the satellite. A typical Working Directory search list for a satellite node is set up in this order:

(1) Local part/subfigure library

(2) Central part/subfigure library

(3) Local SYSCATLG

(4) Central SYSCATLG

The local parts library is searched, then the remote parts library is searched, then the local SYSCATLG is searched, and finally, the remote SYSCATLG is searched. Generally, this order is the best compromise between performance and convenience. With the local parts library listed first, the File Manager should generally be able to locate a parts file on the satellite, so that there is no need to transfer the file from the host.

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CREATE DIRECTORIES

A user can have a Local and a Global create directory. Files are created in either directory, depending on the option selected when the file is opened. The default is to create new files in the Global directory. GNA conventions are as follows:

- Local (temporary) files are created in the Local Create Directory so that they remain on the local satellite node. CADDS scratch files should be created in this directory.
- Global (permanent) files are created in the Global Create Directory so that they will be filed to the host for access by users on other satellites. In CADDS, new parts should be are created in this directory.

STANDARD DIRECTORIES

ENABDIR is the command that enables a Working Directory. The SYSEX EC. BOOTUP and SYSEXEC.LOGIN files enable the following standard Working Directory:

```
ENABDIR LOCAL, SYSCATLG = L, [0] = G
```

This directory is a general guideline for use on a satellite node. The elements of this particular command have the following meaning:

- LOCAL

  When the File Manager searches for an existing file, the local SYSCATLG will be searched first.

- SYSCATLG = L

  Informs the File Manager that all temporary files (i.e., the active part and its regen) will reside on this satellite. When the File Manager searches for an existing file, the local SYSCATLG will be searched second.

- [0] = G

  Informs the File Manager that all newly created permanent files will be stored on the host. Therefore, during part filing, the part and its associated regen file will be filled to the host. If an existing file is referenced, but not found at the satellite, the host SYSCATLG will be searched.

When the Working Directory is enabled, parts that are created or modified reside on the host during their first filing. If later requested, the filed part is activated and presented at the appropriate satellite.

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Note

To view a Working Directory, use the command LISTDIR.

Example

An Electrical Schematic (ES) group, a Printed Circuit (PC) group, and a Mechanical Design (MD) group all use the same GNA system. Each group works on a different satellite node. To facilitate the different types of work each group performs, and to facilitate access to remote data, the System Manager sets up the following Working Directories in separate files. Each file is located in the SYSNEWS.DIRECTORY catalog and referenced from the file SYSTEM.&BCD.AUTHORIZE.

- PC Group

  ENABDIR PC = L, [0].PC = G, SYSCATLG, [0].SYSCATLG

  The PC group creates Global files in the PC catalog on the host. Local files are stored at the PC catalog on the satellite. The Working Directory search list is set up so that the satellite PC catalog is searched first, followed by the host PC catalog, followed by the local SYSCATLG, and finally, the host SYSCATLG.If a PC group user typed the command:

EDIT SAM.X

The File Manager will open the first of these files that it finds:

- PC.SAM.X
- [0].PC.SAM.X
- SAM.X
- [0].SAM.X

If none of these files exists, EDIT prints the message: TYPE OK TO CREATE NEW FILE. If the user enters *OK*, the file [0].PC.SAM.X will be opened at the host, and a temporary file will be opened at the local node.

- MD Group

  ENABDIR MD = L, [0.MD = G, SYSCATLG, [0].SYSCATLG

  The MD group creates Global files in the MD catalog on the host. Local files are stored at the MD catalog on the satellite. The Working

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Directory search list is set up so that the satellite MD catalog is searched first, followed by the host MD catalog, followed by the local SYSCATLG, and finally, the host SYSCATLG.

- ES Group

  ENABDIR ES, SYSCATLG

  The ES group normally works only at the local node. ES users do not usually access data stored at the host, nor do they file data to the host. They can still access the host, however, by specifying = [0] as the first level of any filename.

Note

An equal sign (=) appended to the first level of the filename will override the Working Directory. Local and Global create directories are not specified. By default, the first entry on the search list (ES) becomes the Local and Global Create catalog.

CADDS OPERATION

In normal CADDS operation, the user has no indication that he or she is working in a networking environment. The operator can enter CADDS commands and access CADDS databases just as if no network was configured. Although the Master Parts Library resides at the host, Working Directories make it unnecessary for the operator to know the actual location of most data.

Data Transfer

For CADDS to operate efficiently on a GNA system, several objectives must be met: The user should be able to access files without knowing their location. Therefore, syntax for accessing a part on the host should be identical to syntax for accessing a part locally. Part transmission from host to satellite or satellite to host should be minimized and timed so as not to interfere with regular system use. The System Manager plays an important part in meeting these objectives.

GNA will have minimal impact on system performance, provided that the system manager controls the timing of file transfers. Satellite node users must have access to files in the Master Parts Library, located on the host. Copies of appropriate parts, subfigures, and other files from this library should be transferred from host to satellite during start-up. Once this transfer has taken place, host and satellite nodes need only interact during part filing.

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START-UP

As each satellite is brought on-line, GETSLIB (See Section 8) is invoked from the satellite boot-up execute file SYSEXEC.BOOTUP. GETSLIB distributes copies of host node master files to each satellite node. To determine which files will be transferred, GETSLIB processes a file called the Subfigure Library Directory (SFLD).

The SFLD is a text file containing a list of catalogs and files to be included in the subfigure library of the satellite node. The System Manager controls the contents of the SFLD. Different information, or a uniform data set, can be sent to various satellites, depending on the contents of the SFLD. The SFLD is uniquely associated with a particular satellite under the following naming convention:

SYSTEM.SUBFIG.&BCD.DIRn

where n is the satellite node Site-ID.

PART ACTIVATION/ FILING

Part activation and filing will impact system performance if they involve part transfer from host to satellite, or from satellite to host. To avoid the impact of part activation, GETSLIB should be invoked from the satellite boot-up execute file, SYSEXEC.BOOTUP, as described above. To avoid the impact of part filing between satellite and host, local part filing has been developed.

Generally, the operator who has completed work on a new or modified part or subfigure will file that part back to the Master Parts Library. In the GNA environment, the Master Parts Library is located on the host; therefore, this type of part filing involves transferring the part from satellite to host. Local part filing avoids this transfer by temporarily storing the part on the satellite.

CADDS Commands

CADDS 4 command language is identical in networking and non-networking environments. To accommodate local part filing, one new command has been added to CADDS 3.

CADDS 3

Generally, the CADDS 3 user types FILE to file a new or updated part to the Master Parts Library. In the GNA environment, FILE files the part in the user's Global Create catalog, located on the host. Filing the part to the host is time-consuming. As an alternative, LFILE may be used.

LFILE, which is equivalent to CADDS 4 EXIT PART F or FILE PART, files the new or updated part to the Local Create directory, located on the satellite. The part is then located in the catalog named *LOCAL*; a CADDS 3 part would have the full name:

LOCAL.CD3PRTS...

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When the same part is filed to the host, the local version will be deleted. Typing FILE, will file the part to the host and automatically delete the local version of the part located on the satellite.

Recovery Procedure

If the network fails, the satellite will be unable to interact with the host. This makes it temporarily impossible to file a CADDS part back to the host. When the part filing procedure tries to file the part to the host, a File Manager error will be returned. The part filing procedure detects this type of an error return and prompts the user to file the part locally. If the user types *OK*, the part will be filed as if he or she had typed LFILE instead of FILE.

Example

CADDS 3 systems are networked under GNA, but the host node goes down.

```
n> CADDS ↵

.  .  .
.  .  .
.  .  .

#FILE ↵

**ERROR CALL D100**
-- NETWORK TASK DOWN
TYPE OK TO FILE LOCALLY
#OK ↵
#EXIT ↵
```

This files the part to the LOCAL.CD3PRTS catalog. When the host is back up, FILE may be re-typed to transfer the part to the host.

Data Archiving

SAVING FILES

Back-up procedures allow centralized management of systems networked under GNA. When an operator backs up the file structure of any node in the configuration, important information about saved files is automatically preserved and passed to a central location. The FUTIL (archive) option generates information about files backed-up on magnetic tape or otherwise saved. When ARCHIVE is typed as part of the FUTIL command line, the following message is output:

```
ENTER NAME OF AN ARCHIVE FILE, OR ↵ TO STOP ARCHIVE
```

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Typing the name of a valid archive index file, passes file information to ARCHINDX, which is the command used to create and maintain the archive index.

ARCHINDX

ARCHINDX is installed by creating an Archive Index to all data stored off-line. The System Manager must ensure that there is only one Archive Index. The Archive Index must be located on the host node. In conjunction with the FUTIL (archive) option, ARCHINDX keeps a record of each file that is removed from the system. These files can be stored on magnetic tape, a removeable auxiliary disc volume, or a node.

Once records are written to the archive index file, they can be retrieved with ARCHINDX or ARCHSRCH. The following information about each file can be stored and retrieved using ARCHINDX and ARCHSRCH:

ARCHIVE INDEX

FILENAME

Full filename in standard filename format (can include node level).

DATE

Date, and optionally, time of the archiving. To locate file information in the archive, the options BEFORE and SINCE are available.

TYPE File

Manager file type — hex number between 0 and FF.

LOCATION

Storage location of archived file: disc pack, node name, or tape label.

COMMENT

Up to 80 characters supplied when the file was archived.

Section Eight
SYSTEM COMMANDS

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Section 8
SYSTEM COMMANDS

INTRODUCTION

The CGOS 200 GNA command syntax is very similar to CADDS 4 graphics commands. An operator trained on CADDS 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:

*	Command is described in this manual
**	Indicates Programmer Reference
***	Indicates CGOS 200 GNA Operator 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 ↵), 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.
	DUMPFILE***	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.

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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.

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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**	Renumbers 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.
	SYSSIZE***	Checks whether sufficient memory is available for a network task.
Protection Facility Commands	AUTHRIZ*	Verifies entries and encodes passwords for Login authorization file.
	CHGPROT***	Changes a file's protection group.
	EDITACT***	Creates, modifies, or deletes access tables.
	LISTPROT***	Lists your access table and default protection group (DPG).
	SETPROT***	Changes your DPG.
Memory Processing Commands	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.

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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).

DETAILED COMMAND DESCRIPTIONS

The command descriptions that follow are arranged in alphabetical order. All commands listed in the preceding pages and identified by one star (*) are included.

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ARCHINDX

PURPOSE

Indexes and references files stored on disc or tape. In conjunction with FUTIL, it provides an automatic procedure for indexing files as they are backed up.

SYNTAX

ARCHINDX [filename] ⏎

Command ⏎

filename — Name of the archive index.

Command — LOCATE or QUIT, or if you are maintaining the archive index, ADD, DELETE, PURGE, or FILE.

COMMENTS

ARCHINDX uses two types of files to store and retrieve information on files in the archive:

- The primary archive index file, *filename*, all information is stored. This 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 index is set up.

DAY-TO-DAY USE

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 one or more common catalog levels, use the MATCH option.

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DAY-TO-DAY USE (Continued)

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=02-28-81 or DATE=02-28-81:14:00:00). To find a record the date, and time if given, must be an exact match. For less precise match of dates, use BEFORE or SINCE.

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 1 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=TAPE01, LOCATION=*PACK033).

COMMENT

Matches a comment of up to 80 characters supplied when the record was added to the Data File.

MATCH

Wildcard specification substituting for 0-n characters after the first catalog level of the filename.

OPTIONS can be entered in any order.

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DAY-TO-DAY USE (Continued)

Note

Each KEY field entered as a LOCATE option will speed record lookup. To execute a search with only non-Key fields, each record must be searched in sequence. In general, this is a time-consuming procedure. LOCATE) lists the entire contents of the archive index.

ADDING RECORDS

Files are generally added to the archive index using the FUTIL archive option. Use ADD to add files manually. ADD options DATE, FILETYPE, LOCATION, and COMMENT can be listed in any order.

SYNTAX

ADD Filename/DATE,TYPE [,LOCATION,COMMENT].

Filename

Full filename in standard filename format.

DATE

Date, and optionally, time of the archiving (e.g., DATE=02-28-81 or DATE=02-28-81:14:00:00).

TYPE

File manager file type hex number between 1 and FF (e.g., Type=3 (Text), Type=1 (Catalog)).

LOCATION

Storage location of archived file: Disc pack, Node name, or Tape label.

COMMENT

User-supplied comment up to 80 characters long.

ARCHSRCH will prompt for arguments omitted from the ADD command line.

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ADDING RECORDS (Continued)

Example

```
n> ARCHINDX ↵
ENTER NAME OF ARCHIVE INDEX:
* INDEX.ARCHINDX ↵
# ADD TEST.RUN/D=01-5-68,T=4 ↵
ENTER COMMENT FIELD:
* ↵
ENTER STORAGE LOCATION FIELD:
* NODE3[ ↵
# F ↵
n> ↵
```

Adds the record TEST.RUN to Data File INDEX.ARCHINDX. Date and file type are input on command line. Prompt for Comment (blank) and Storage Location F files changes and exits to O/S level.

COMMENTS

There are two steps in each ARCHINDX session:

- Enter one or more of the above commands. PURGE and LOCATE are processed immediately. Other commands will not be processed until the end of the session.
- At the end of the session, type FILE to save the changes, or QUIT to quit without saving the changes.

  ARCHINDX uses two characters to prompt for input:

  # is the general prompt.

  * prompts for a specific response to a question.

Any command or keyword, except DELETE and PURGE, may be issued in abbreviated form. ARCHINDX needs only enough of the command name to make it unique (e.g., A,AD, or ADD are all acceptable input for the ADD command).

When ARCHINDX asks for an OK response, Y, YE, YES, or OK are all 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.

SYNTAX

ADD

Arguments to ADD can be entered in either of two ways:

Enter ADD ↵ and let ARCHINDX prompt you for each field of the record. In response to the prompt, type only the contents of the field.

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SYNTAX
(Continued)

Example

```
ENTER FILE TYPE:
* 2 ⏎
```

You can enter the filename and OPTIONS on the ADD command line. This is the only way to enter options for other commands. Break up multi-line commands using a semicolon (;) between syntax elements.

Example

```
ADD TEST.FILE/TYPE=2,D=02-5-81:14:30:00; ⏎
>  ,LOC=TAPE1
```

OTHER COMMANDS

This form of ARCHINDX syntax is optional with ADD, but necessary with the LOCATE and DELETE commands. Enter the name of the option, an equal sign, and the actual key field:

Option = Contents of key field

When entering more than one OPTION, use commas as separators. Option names (with applicable commands) are:

ASK	(DELETE)
BEFORE	(LOCATE,DELETE)
COMMENT	(ADD,LOCATE,DELETE)
DATE	(ADD,LOCATE,DELETE)
LOCATION	(ADD,LOCATE,DELETE)
SINCE	(LOCATE,DELETE)
TYPE	(ADD,LOCATE,DELETE)

When ARCHINDX detects a syntax error caused by a typing mistake, it retypes the segment of the line 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 ⏎
***ERROR CALL 0000 NO SUCH RECORD IN THE INDEX***
>LOC TEST.FILE/TYPE=2,B=02-5-81
```

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System Manager Duties

As System Manager, you install ARCHINDX by creating the Data and Key Files. Normally, there is one Data File per operating system. The Data File is created with the command:

ARCHINDX [Datafilename] ↵

If Datafilename is omitted, and no Datafile exists, ARCHINDX prompts the user to enter one:

```
FILE NOT FOUND, OK TO CREATE NEW ONE?
```

After typing *YES*, enter the names of Key Files, beginning with the Date Key File. There are five possible Key Files, but only the Date Key File is mandatory. ARCHINDX types this monologue:

```
FOR EACH OF THE FOLLOWING FIELDS, ENTER A FILENAME FOR THE KEYFILE TO BE CREATED FOR
THAT FILE, OR JUST ENTER A CARRIAGE RETURN IF THAT FIELD IS NOT TO BE USED AS A KEY.

NOTE — DATE FIELD IS REQUIRED

ENTER FILENAME FOR THE DATE FIELD:
*
```

After prompting for a date field key file, ARCHINDX successively prompts for these additional key files:

- User-supplied comments.
- Filename
- File type
- Storage location (disc, tape, and/or node)

Data and Key fields are created immediately as typed. After entering a filename or carriage return in response to each prompt, you are returned to the standard ARCHINDX prompt (#).

Although only the date field key file is required, additional key files will speed record lookup. ARCHINDX uses a binary search of key files to find records stored in the Data File. A field without a Key File may still be used as the basis of a search, but such a search will be very time-consuming, since each record must be searched for in sequence.

Once you've created these files, the FUTIL *archive* option will provide automatic additions to the File Archive, and indexing will be automatic.

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DELETING RECORDS

Records are deleted with a two-step process. First, the records are flagged for deletion. Then, with a separate command, any flagged records may be physically deleted. Flagged records cannot be listed with the LOCATE command. To flag the records:

DELETE [filename] [/OPTIONS]

Arguments (filename and OPTIONS) are the same as for LOCATE, with the addition of an ASK option to prompt for user approval regarding deletion of individual records.

When a significant number of records are flagged, you may want to free disc space by physically deleting flagged records. Do this with the PURGE command:

```
# PURGE <CR>
*** PURGE ***
DO YOU REALLY WANT TO PURGE NOW? Y ↓
#
```

PURGE should generally be run as a background job.

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AUTHRIZ

PURPOSE

Verifies entries/encodes passwords for LOGIN authorization file (SYSTEM.&BCD.AUTHORIZE). Run this command each time the authorization file is edited.

SYNTAX

AUTHRIZ

COMMENTS

The LOGIN authorization file lists authorized users by name, number, and password. It also identifies users access table and default protection group. The EDIT command creates the authorization file. Each line in the file must have five comma-separated entries:

Entry	*Character Limit*	*Field*
Name*	20	ALPHANUMERIC
Project designation	13	ALPHANUMERIC
Access table name	20	ALPHANUMERIC HEX, ASSIGNED TO USER
Task LOGIN Directory File (Optional)	20	USER FILENAME CHARACTERS
Default protection group	4	NUMERIC, ASSIGNED TO USER
Password*	6	NO LIMITATION

MESSAGES

Errors in the authorization file are flagged. Character limits, fields, and commas are checked. If a line has errors, all messages appropriate to that line are printed, followed by the line itself. Passwords are not encoded for lines with errors. When errors are detected, edit and correct the file and rerun AUTHRIZ.

After editing the authorization file, type AUTHRIZ. If no error occurs, system returns to command level.

Note

See AUTHORIZ On-line documentation.

* Empty Entries when accounting entries need not be retained. (Four commas required.)

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BLDSYS

PURPOSE

BLDSYS is used to build a new version of the CGOS 200 GNA resident O/S from a configuration slot or configuration file created by EDITCFG or NEWCFG. You may build the configuration either for test purposes or for executing CGOS 200 GNA.

SYNTAX

BLDSYS Arg

INPUT/OUTPUT

(The left column defines the procedure; the right column clarifies the action.)

n> BLDSYS ↵	Input command with argument. Dialogue begins
TYPE OK TO SUPPRESS PRINT	Supresses BLDSYS procedure output which is not usually of interest to the user. If OK not typed, BLDSYS will build requested system, and output BLDSYS data.
TYPE OK TO USE NEW SYSTEM	Output after new system is built. If you don't type OK, BLDSYS procedure terminates; system just built is lost. (Useful for testing configuration validity.) If you type OK ↵ and no other task is logged in, BLDSYS: (1) Makes new system the executing version of the O/S. (2) Restarts the new system (equivalent to rebooting from disc).
OTHER TASK LOGGED IN	This message is printed at the COMDEV when any other task is logged in. (BLDSYS will not proceed.)
TYPE OK TO USE NEW SYSTEM	This response repeated. Make sure other tasks are off system, then type OK or ↵ to quit BLDSYS procedure.

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BOOTDDEX

PURPOSE — Bootstraps DDEX (Disk Diagnostic Executive).

SYNTAX — BOOTDDEX

COMMENTS — Only this task may be logged-in.

INPUT/OUTPUT — (The left column defines the procedure; the right column clarifies the action.)

n> BOOTDDEX ↵	Input command. Dialogue begins.
OTHER TASKS LOGGED IN	Output when more than one task is logged in. Control is returned to system level.
BOOTDDEX COMMAND ABORTED	
SET CONSOLE SWITCH ZERO	Implies that only one task is logged-in.
TYPE OK WHEN SET	Ensure that console switch is set and Type *OK*. The system will boot-strap DDEX. Any other response aborts command and returns control to system.
NO DDEX BOOTSTRAP ON DISK	Unless DDEX is resident on the system primary volume, the CGOS 200 GNA boot-up message appears, followed by this message. You may log back into CGOS 200 GNA. If DDEX is resident on system primary volume, CGOS 200 GNA boot-up message is followed by DDEX boot-up message. DDEX is now in control of the system.

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CHKDISC

PURPOSE

Verifies disc pack for use. Checks that every sector can be read, so bad sectors may be removed from the file manager disc area.

CHKDISC may be directly invoked or entered indirectly through FMINIT. If logical drive number is omitted, 0 is assumed. *ESC* followed by Q aborts the command.

SYNTAX

CHKDISC [logical drive number]

MESSAGES

These messages are output at the COMDEV:

DISC READ ERROR =XXXX AT SECTOR YYYY

Indicates disc READ error YYYY of type XXXX at sector YYYY.

If disc READ error occurs in O/S sectors, this message is output:

CRITICAL SECTOR
NON-RECOVERABLE ERROR
THIS DISC NOT USABLE
PROGRAM ABORTED

Output if disc READ error occurs in O/S sectors.

CHKDISC returns control to the O/S. Otherwise this next message is printed:

XXXXXXX SECTORS CHECKED

Indicates CHKDISC has checked the number of sectors indicated.

Note

CHKDISC will only run if no other tasks are logged in.

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COPYCFG

PURPOSE

Copies configuration from/to a configuration slot or file. When configuration is copied, control returns to the system.

SYNTAX

COPYCFG Sourcecfg, Destcfg

Sourcecfg = Configuration slot number or filename for configuration to be copied.

Destcfg = Configuration slot number or filename destination.

Example

```
n>COPYCFG 1,SYS.CFG ↵
```

Copies a configuration from config. slot 1 file to SYS.CFG.

```
CONFIGURATION:1
COPIED TO SYS.CFG
```

System response.

COPYDISC

PURPOSE

Copies sectors from one part of a disc to another.

SYNTAX

COPYDISC Source, Destination, Sector-count

Both *source and destination* are of the format: logical drive number/absolute disc location (DLOC). If the logical drive number is unspecified, logical drive 0 is assumed and the format is simply: absolute-dloc.

COMMENTS

DLOCS = 6 hex digits; Sector Count = 8 hex digits; (leading zeros need not be entered).

MESSAGES

Any error messages are typed at the COMDEV. System regains control after command completion.

Caution

This command can destroy irrecoverable system or disc data. Use only for extraordinary system debugging.

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DELCFG

PURPOSE

Clears a configuration definition from a configuration slot or configuration file.

SYNTAX

DELCFG Arg

Where Arg is a configuration slot number or filename.

Example

To delete configuration file SYS.CFG, enter:

n> DELCFG SYS.CFG ↵ System responds: SYS.CFG DELETED

DSABDEV

PURPOSE

Disables detached unit so that it may not be used.

SYNTAX

DSABDEV device name

Where device name is 4 character unique device name assigned to the device to be disabled.

MESSAGES

These messages are output at the COMDEV:

ILLEGAL SYNTAX	Command string input could not be interpreted.
INVALID UNIQUE DEVICE NAME	Device name input does not exist on the system.
DEVICE ALREADY DISABLED	Device specified is already disabled.
ERROR ON DEVICE DISABLE	Device specified cannot be disabled.
DEVICE xxxx DISABLED	Device successfully disabled.

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EDITACT

PURPOSE

Access table editor which creates, modifies,or deletes access tables for the purpose of controlling user access to files/commands.

SYNTAX

EDITACT [Username[,N]] [,C]

Where username = name of an access table.

OPTIONS

All options must be separated by commas:

Username	Allows entry to an existing access table of the given name (equivalent to EU command).
N	Allows entry to a new access table of the given name; must be used with username (equivalent to the CU command).
C	Automatically updates the bitmap (see Automatic Category of Commands; equivalent to CM command).

COMMENTS

- EDITACT, an editor, contains numerous subcommands that enable you to create, examine, modify, and delete access tables.
- An access table, an essential component of file/command protections, defines the protection ranges and access types available to a user. (See *The Protection Facility*, Section 6.)
- Once EDITACT is invoked, unlimited Access tables may be edited, but, only one table may be edited at a time. To build an access table, input protection group (PG) ranges and corresponding access types. A PG range = one or more consecutive PG numbers of the same access type.

COMMAND CATEGORIES

ENTRY

Enables user to evoke a new or existing access table. Only one table may be currently entered at a time.

EDIT

Used to add, modify or delete PGs and access types in the currently entered access table only.

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COMMAND CATEGORIES (Continued)

UTILITY

Lists pertinent information relating to access tables and PGs.

AUTOMATIC

Enables adding to an access table, a specified range of PGs to be associated together with their access types, without concern for the actual PG numbers. A bitmap, an internal index transparent to the user, keeps account of PGs in use.

Thus, the system can automatically allocate available contiguous PGs from a previously reserved block of PGs, or other unallocated PGs to accommodate the range and access types required by the user.

EXIT

Enables user to exit from one access table and go on to the next without leaving EDITACT.

TERMINATION

Exits the user from the ACCESS table editor EDITACT) and returns to system level.

PROTECTION GROUP RANGE

0000-1FFFx

PG's within this range are generally reserved for system files and commands. It is strongly recommended that these PG's be added to an access table only by use of the AT or AMT commands.

Caution

Certain protection groups within this range must be included in each ACCESS table to enable user to operate system (see Section 6).

2000-7FFFx

All PG's within this range may be assigned and modified in any manner. A PG from this range is assigned for user's files/commands.

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ACCESS TYPES

A user's access to files/commands in a PG is specified by the Access type. User access to files/commands is divided into four categories. Any combination of access types may be used.

File Access

W — user may write (create or modify) files as well as read and delete.
R — user may read files.
D — user may delete files.

Command Access

E — execution of system level command allowed (does not pertain to execute files).

Protection Group Access

C — provides ability to change a file's PG to another PG using the CHGPROT command.C must be present in current PG of the file and user must have at least READ access to the new PG.

Part Access

M — user has model access to file (CADDS 4).

COMMANDS

You may input these commands after EDITACT has been entered and the prompt (#) is present:

PG = protection group (AT = acccess types).
[argument] = argument is optional.
USERNAME = access table name (up to 20 alphanumeric characters).

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EDITACT COMMANDS

Command Name/ Category Syntax	*Description*
ENTRY	
CREATE USERNAME [CU Username]	Creates/enters a new access table, labelled Username. Use edit or automatic commands to add PG's to the access table.
EDIT USERNAME [EU Username]	Enters existing access table. Username to be edited, using edit or automatic commands.
DELETE USERNAME DU Username	Deletes the existing access table.
REPLACE USERNAME RU Username	Equivalent to DU followed by CU of the original username.
EDIT	
ADD RANGE Ar pg a [-pb b]/at	Adds an explicit range of PGs and PG access types to the access table currently entered.
ADD and MERGE RANGE AMR pg a [-pg b]/at	Adds an explicit range of PGs. If overlap exists, ranges with common attributes are combined into a single range; non-overlapping ranges are listed individually. Thus, each PG is listed only once. Example: Current access table 1. 2100-2150/RWEG listed 2. 2200-2210/RWECDP

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EDITACT COMMANDS

Command Name/ Category Syntax	*Description*
	Command AMR 2120-2205/CDS Resulting access table 1. 2100-211F/RWEDG 2. 2120-2150/RWECDG 3. 2151-21FF/CDS 4. 2200-2210/RWECDP
ADD TEMPLATE	Adds a list of protection group ranges and access types from the access table user-name to the currently access table.
AT Username	This is the recommended method for the addition of groups below 2000x by copying either of the predefined acess tables, Basic or Admin. (See Section 6).
ADD and MERGE TEMPLATE AMT Username [/line a [-line b]]	Merges a list of ranges from access table USERNAME to current table (see AT and AMR).
DELETE LINE DL line a [-line b] DELETE RANGE DR pg a -pg b	Deletes an entry from currently entered access table. Single or multiple entries are deleted by specifying line number(s) or protection range(s). If using DR, the protection group range must be listed exactly as it appears in the table.

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EDITACT COMMANDS

Command Name/ Category Syntax	*Description*
MODIFY RANGE MR pg a [-pg b] MODIFY LINE ML line	Modifies an entry in the currently entered table by identifying its PG ranges exactly as listed in the access table or by line number. When range is identified, a prompt (=) signals to input modification in the form: [pg c] [-pg d][/attributes] After each modification, the line is reprinted. Line may be remodified. Terminate modify command with an extra). Errors aren't checked until modification process is terminated.
UTILITY PRINT P[line a [-line b]]	Prints out latest version of entries in currently entered access table, or any range of line numbers is given. Output format = USER: USERNAME line #. Start at range-end of range/at.
PRINT USERNAME [*] PU [USERNAME] line [a [-line b]]	Prints contents of indicated table username. If * used, all existing tables are printed. The tables created line during current EDITACT will not be printed; original table will be printed for recently modified tables.
LIST USERNAME LU	Lists name, creation, date, time of all access tables.
LIST FREE PGS LPU [pg a [-pg b]]	Scans bitmap, lists PG ranges not assigned as of last CM command. This list is as accurate as last CM command. Start—end of range.

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EDITACT COMMANDS

Command Name/ Category Syntax	*Description*
LIST IN USE PG LPU [-g a [-pg b]]	Scans bitmap, lists PG ranges that are assigned to access tables. PGs in the reserved block are considered in use. Bitmap automatically updated as each group used. Output format = start of range—end of range.
CREATE BITMAP CM	Creates bitmap (internal user-transparent map of all available PGs) by reading existing access tables. Use command: 1. Prior to reserving new block of PGs. 2. After deleting PGs, for accurate LPF or LPU. **Caution:** Any currently reserved block (See CB) is automatically deleted following CM.
AUTOMATIC CREATE BLOCK CB size	Creates reserved block of contiguous PGs of length *size* for AB commands. Only one reserved block may exist at a time. Use CM command prior to CB to insure a current bitmap. Bitmap is automatically updated after CB.
ADD BLOCK AB size/attributes	Adds (to access table) next available specified range ofcontinguous PGs (from reserved block created by CB command) and assigns indicated access types. Reserved block is reduced by *size.*
REPLACE BLOCK RB [size]	Deletes currently reserved block, replacing PGs to available pool, and automatically updates bitmap. RB size replaces (returns) part of reserved block to available pool of PGs. A CB *size* is automatically performed so remaining groups of original block are reserved in a new block.

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EDITACT COMMANDS

Command Name/ Category Syntax	*Description*
ADD NEXT AN size/attributes	Adds 1st available contiguous PG range (noted by bitmap)size/ attributes of specified size with access types to currently entered access table.
EXIT QUIT USERNAME QU	Exit from current table without saving modifications. If this table is later entered without leaving EDITACT, the QU table will be intact; otherwise, all will be lost.
SAVE USERNAME SU	Saves the currently entered access table on disc.
TERMINATION QUIT Q	Performs a QU command; clears any reserved block; files the bitmap if no modifications occurred since last CM commands and returns to operating systems.
FILE F	Performs a Q in addition to saving currently entered access table.

CREATING A NEW ACCESS TABLE

```
# CU username
# AT BASIC or ADMIN
```

See Section 6 to choose proper access table.

A combination of edit, automatic, and utility commands may be used to add PGs and their attributes to the access table.

```
# SU
# F
```

For last table edited.

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Example

A variety of techniques may be used to create and edit access tables. Access tables created below are from the example depicted in *The Protection Facility*, Section 6.

Numbers associated with access tables are always hexadecimal. Assume there is a ↵ after each line of user input.

n >EDITACT TABL0, N,C ↵

The access table editor is enabled. Inputting N automatically enters the newly created table TABL0. C Initializes the bitmap so it will be continually updated as protection groups are added.

```
# AT BASIC
0000-0000/RWECD
0020-009F/E
00A0-00A0/RE
00A1-1FFF/RE
```

Uses the default access table as a template to add required PGS and their attributes under 2000. This permits system operation for general operators.

```
# AN 1/RE
2001-2001/RE
# AN 2/RWD
2002-2003/RWD
```

The first unassigned PG's are automatically determined and allocated. Consecutive blocks of PG's may be allocated when they are not elsewhere assigned.

```
# AR 200A-200F/RWD
200A-200F/RWD
```

A specific protection group range and their attributes are assigned.

```
# LPF
2010-7FFF
```

All unassigned PG's are listed.

```
# CB 100
BLOCK = 2010-210F
```

Reserves a contiguous block of the first 100 unassigned PG's for use by the AB command. These PG's may still be accessed by AR command without reserved-blocks status.

```
# AB 10/RWECD
2010-201F/RWECD
```

A range of the first 10 consecutive PG's are transferred from the reserved block to TABL0.

```
# P
```

Prints the entire current access table.

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```
USER TABL0

1.0000-0000/RWECD
2.0020-009F/E
3.00A0-00A0/RE
4.00A1-1FFF/RE
5.2001-2001/RE
6.2002-2003/RWD
7.200A-200F/E
8.2010-201F/RWECD

# SU
```

Files the access table with the name TABL0 and exits TABL0. EDITACT is 200A-200F/E.

Note

The editing of access table TABL1, similarly performed as TABL0, is left as an exercise to the reader. The continuing example assumes that TABL1 exists.

```
# CU TABL2
```

Enters newly created table, TABL2.

```
# AT ADMIN
USER: ADMIN
1.  0000-0000/RWECD
2.  0001-00001/R
3.  0002-0002/RWECD
4.  0003-0003/RWECD
5.  0004-000F/RWECD
6.  0010-009F/E
7.  00A0-00A0/RE
8.  00A1-1FFF/RWECD
9.  2000-2000/RWECD
```

Uses the default access table as a template to add required PGs under 2000. This permits operator-access to restricted files/commands as well as general system operations.

```
# AT TABL0/5
2001-2001/RE
2002-2003/RWD
200A-200F/E
2010-201F/RWECD

#AMT TABL1/5
2001-2001/RE
2002-2004/RWD
2005-2005/RE
200A-200F/E
2010-202F/RWECD
```

Since TABL2 will generally be a combination of the PG's of, TABL0 and TABL1, the PG's beginning with line 5 are added and merged into Use PU Username to print the contents of access tables not currently entered.

```
# MR 200l
11.2001-2001/RE
= /RWECDS
11.2001-2001/RWECDS
=
#ML 11
```

Any PG above 7FFF may be modified by input of PG range or line #. Line may be continually remodified until a ↵ with no entry is entered. The P command may be used to display ranges and line numbers.

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```
11.2002-2004/RWD
= /RWECD
11.2002-2003/RWECD
=
# ML 12
12.2005-2005/RE
= /RWECDG
12.2005-2005/RWECDG
= -2006
12.2005-2005/RWECDG
=
# DR 200A-200F
#AMR 201F-2020/RWECDP
2010-201E/RWECD
201F-2020/RWECDP
2021-202F/RWECD
```

Entry deleted. Bitmap is not updated. The overlapping (and nonoverlapping, if any) portions of existing and added ranges are split into separate entries or combined according to the attributes.

```
# F
n>
```

TABL2 is filed and EDITACT is terminated.

EDITACT ERROR MESSAGES

BAD REQUEST — Bad input, character or command.

NO CHAN AVAILABLE — No file manager channnels are available — an internal file manager error. Perform FMCLEAR.

FILE OPEN — An access table is currently entered for modification. Table must be completed (SU or QU) to proceed.

NO FILE OPEN — No access table is open for edit when an edit, print or exit command was typed. (Use CU, EU, or RU to proceed)

NO BITMAP — A command requiring a bitmap was typed when no bitmap has been created yet. (Use CM.)

BAD RANGE — Illegal range was specified: no range, range below 0, range with end less than start.

BAD ATTRIBUTES — Illegal characters were entered for attributes.

NOT FOUND — Range or line number specified cannot be found in current access table.

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EDITACT ERROR MESSAGES (Continued)

RANGE xxxx-yyyy OVERLAPS	Attempted to add a range which overlaps with an existing range.
LINE NOT ADDED: ACT FULL	Open access table is full. No room for more entries.
NO BLOCK AVAILABLE OF REQUESTED SIZE	Command AN cannot find large enough block to meet request.
NO BLOCK AVAILABLE OF REQUESTED SIZE LARGEST BLOCK = xxxx	Attempted to create a reserved block but no available block large enough.
NO BLOCK	No reserved block created when requested by AB or RB.
BLOCK ALREADY EXISTS: xxxx-yyyy	Reserved block already created; only one may exist. Use CM followed by CB to reserve a new block if desired.
BLOCK TOO SMALL	Attempt to add a range from a reserved block that is greater than its size.

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EDITCFG

PURPOSE

Configuration editor.

SYNTAX

EDITCFG (ARG)

Where ARG is an existing configuration slot number or an existing configuration filename. If ARG is not present, the configuration being edited is initialized with these defaults:

CGP SYSTEM PARAMETERS

1. TIS SIZE (HEX) = 0800
2. IOFLAGS (DEC) = 5
3. TAPE REQ (DEC) = 2
4. DISC REQ (DEC) = 5
5. TASKS (DEC) = 1
6. SWAP INDEX (DEC) = 103
7. BMS INDEX I (DEC) = 4
8. BMS INDEX B (DEC) = 1
9. AUTOLOGOUT(ON=1/OFF=0) (DEC) = 1
10. SITE-ID FOR THIS NODE (DEC) = -1
11. CONNECTION CONFIGURATION (HEX) = 0000

(See *Defining System Configurations*, Section 6.)

COMMANDS

EDITCFG responds with a prompt (#). You may then input any of the following EDITCFG commands:

ADD SELTYPE — Add a selection of type *seltype* where seltype is one of the following:

DISC: DISC UNIT
TAPE: TAPE UNIT
AUX: AUXILIARY UNIT

DEL SELTYPE,N — Deletes the nth selection of type *seltype* where n ≥ 0 and seltype is as for ADD. If the unit deleted is the configuration's default HARDEV, the configuration's default HARDEV is set to none.

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COMMANDS (Continued)

DFHD (N)	Changes the default HARDEV to auxiliary unit n if n is present, or to none if n is not present (n $\geq$0).
FILE (cfg)	Checks current configuration for validity and files it under cfg which is a configuration slot or filename (may not exist yet). If cfg is not present, it is taken to be the ARG in the original command. Note that EDITCFG does not terminate after the FILE command so that a user may create several configurations while in EDITCFG.
LIST (seltype) or (CTRL)	Lists current configuration or a portion thereof. When no argument given, entire configuration is listed. If seltype is present (where seltype is as for ADD), that portion of configuration is listed. If CTRL is present, system parameters are listed.
MODC	Replaces existing portion of configuration (given by LIST CTRL) with system default parameters. The default parameters may then be changed. Respond to ENTER OPTION request with CR to maintain old selection.
MODP (seltype,n) or (CTRL)	Allows modification of the parameters for a selection. Use seltype,n (where seltype is as for ADD and n $\geq$0), to modify parameters for the nth selection of type seltype. Use CTRL to modify system parameters.
QUIT or Q	Terminates EDITCFG.

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ENABDEV

PURPOSE Enables a unit which has been disabled.

PURPOSE ENABDEV device name

Where the device name is the 4 character unique device name for the device to be enabled.

MESSAGES

ILLEGAL SYNTAX	Command string input could not be interpreted.
INVALID UNIQUE DEVICE NAME	Unique device name does not exist on the system.
DEVICE NOT DISABLED	Devices cannot be enabled unless they are disabled.
ERROR ON DEVICE ENABLE	Device specified cannot be enabled.
DEVICE xx ENABLED	Specified device was successfully enabled.

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ERRLOG

PURPOSE

Produces a formatted dump of system error log.

SYNTAX

ERRLOG [OPTIONS]

OPTIONS

SINCE

Lists only those errors logged after the since date supplied by user. SINCE option must be first option in option list. Supply the since date in the form:

mm-dd-yy:bhh:mmb:ss

mm	=	two digit month
dd	=	two digit day
yy	=	two digit year
bhh	=	two digit hour preceded by a space
mmb	=	two digit minute followed by a space
ss	=	two digit second

TYPE

Lists only specified errors. The actual syntax of this option is:

DSK0
TAPE
INTX
MAPI
VGUB

The TYPE option list depends on the specific errors that ERRLOG is set up to log for your system.

Example

```
ERRLOG SINCE=01-30-80-[:17:42:00],DSK0,MAPI,TAPE

Type SINCE date:          Format mm-dd-yy:bhh:mmb:ss
01-30-80:17:42:00

Type OK to reinitialize   Typing OK clears out ERRLOG buffer after DUMP.
ERRLOG buffer
OK
```

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MESSAGES

- A full explanation of errors logged by this command can be found in the format file for the specific device. The last four characters that make up the last level in SYSTEM.LOG.FORMAT Catalog also make up the options used by the TYPE option.

- SYSTEM.LOG.FORMAT.XXXX (Where XXXX is replaced by the 4 char representation of the device (i.e., DSK0, TAPE.).

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FMCLEAR

PURPOSE

Clears any file management (FM) files currently marked in use in the 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.

OPTION

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.

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 boot-up 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 HARDFILE.

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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).

  FMCLEAR with a FM Name list searches the specified calalog 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; file manager checks are performed to determine 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.

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.
Error message, followed by prompt	The new filename is not unique. Provide a different filename, or delete the new, temporary file:

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RENAMING (Continued)

TEMPORARY FILE RENAMED TO: Catalog.Newname	The new (or newly revised) filename is unique; the new, temporary file is given same file type as the original.
ENTER NEW LAST LEVEL NAME FOR TEMPORARY FILE	This is repeated after the error message if the file is not unique.
TEMPORARY FILE DELETED	Output when) 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.Catalogorfilename FILE CLEARED or CATALOG CLEARED	Output for every cleared file or catalog. May be suppressed; see NOLIST.
Catalog.File ORIG FILE CLEARED	Results when original version of a file is opened for create for supersede. Maybe suppressed; see NOLIST.
Catalog.File WORKFILE DELETED	File of type 'FF' hexadecimal also known as a WORKFILE) is unconditionally deleted. May be suppressed; see NOLIST.
FILE MARKED FOR DELETION: FILE DELETED	If a file is sumultaneously open for read and for supersede, and supersede finishes before read, FM marks the original file to be deleted when the original file is not in use (i.e., when open for read is finished). Files of this status, when found by FMCLEAR, are always unconditionally deleted with this message. May be suppressed by NOLIST.

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FMINIT

PURPOSE

Threefold:

- Initializes a primary volume (disc pack) for file management (FM).
- Initializes an auxiliary volume for file management, enabling multi-disc volume usage.
- Changes volume information for a given disc pack.

SYNTAX

FMINIT

COMMENTS

Only one task may be logged in when FMINIT is executed. In a dialogue with the user, parameters are chosen to initialize the file manager and CGOS 200 GNA, if this is drive number 0.

`n>` FMINIT

Input command. Dialogue begins.

GIVE LOGICAL DRIVE NUMBERS (0-7)
n [,SINGLE]

Respond with logical drive number of volume (disc pack) being initialized, or, if SINGLE option is selected, with the logical controller number of the drives being initialized. Responding with 0, indicating either logical drive or logical controller, initializes the system's primary volume.

Choose the SINGLE option only if multiple volumes will be mounted concurrently on multiple drives of a single controller, and will be used as if the various volumes constitute a single volume. Therefore, volumes on all drives of the controller must always be mounted together and always on the same drives. The SINGLE option initializes all drives configured on a given contoller as a single logical drive. Once the logical drive number is input, a list of disc areas available to the file manager on the requested volume or controller is output.

OTHER TASKS LOGGED IN
FILE AREA NOT INITIALIZED

Output when more than one task is logged in. FMINIT returns to system level. Otherwise, FMINIT begins the initialization process:

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COMMENTS (Continued)

TYPE OK IF AN EXISTING FILE AREA IS TO BE PRESERVED

Type OK to preserve current FM catalog structure on this volume. In this case, the pack ID; volume name; protection group; current disc partition (expressed as the number of sectors reserved, per task, for temporary files); and disc areas currently used by file manager are displayed. This message follows:

TYPE OK TO CHANGE PACK VOLUME NAME AND/OR VOLUME PROTECTION GROUP

INPUT PACK ID (NOT GREATER THAN 20 CHARACTERS)

If you choose not to retain the current volume information or preserve existing file areas on the volume, you are asked to input a pack ID. The pack ID must be no more than 20 characters and may contain blanks. If the current file areas are being preserved, a ⟩ will retain the current pack ID. Otherwise, you must input a volume name.

INPUT VOLNAME (=20 CHAR) OR ⟩

The volume name must begin with an asterisk * and be less than or equal to 20 characters, including the *. It cannot contain any blanks. If the current file areas are being preserved, a ⟩ will retain the current volume name. Otherwise, you must input a Protection Group:

INPUT VOLUME PROTECTION GROUP OR ⟩

The volume name and OR ⟩ protection group are only used for accessing auxiliary volumes in a multi-volume environment, but are required for all volumes. If the current file areas are being preserved, you are then allowed to change or maintain the disc partition:

ENTER NUMBER OF DISC SECTORS (HEX) PER TASK TO BE RESERVED FOR TEMPORARY FILES OR ⟩ FOR NO CHANGE:

You're repeatedly prompted until correct response is typed; (a correct response =a non-negative hex nmber such that the response multiplied by the number of user tasks must not exceed the number of disc sectors available to FM (see above for this latter figure). Increasing the size of the temporary file space has no practical effect since the permanent (FM) file space is previously established; decreasing this size changes only the temporary file space. If you are initializing the primary volume, additional information is requested regarding authorized log-in and system accounting.

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COMMENTS (Continued)

If you are not preserving existing file areas, this is output:

TYPE OK TO ENABLE AUTHORIZED LOGIN

Type OK if the system will require user names and passwords to log in or to use the file protection features of the system.

TYPE OK TO ENABLE ACCOUNTING LOGS

Type OK if the system accounting logs are desired. Following a positive response, you are asked to specify the charge rate:

TYPE COST/MIN

If you are preserving existing file areas, the current status (enabled/disabled) of authorized LOGIN and accounting logs is displayed. You can type OK to change the current status:

AUTHORIZED LOGIN CURRENTLY ENABLED/DISABLED TYPE OK TO DISABLE/ENABLE AUTHORIZED LOGIN ACCOUNTING LOG CURRENTLY ENABLED/DISABLED TYPE OK TO DISABLE/ENABLE ACCOUNTING LOGS

TYPE COST/MIN

If your response enables accounting logs, you are asked to specify the charge rate.

TYPE OK TO ENABLE AUTHORIZED BOOTUP

Type OK if system requires a boot password for the first task logging in directly after boot-up.

ENTER BOOT-UP PASSWORD (6 CHAR)

If you typed OK above, designate a 6-character password.

AUTHORIZED BOOT-UP CURRENTLY ENABLED/DISABLED. TYPE OK TO DISABLE/ENABLE AUTHORIZED BOOTUP

If you are preserving the existing file areas, the current status of boot-up is displayed. You can type OK to change the current status.

If you are not preserving existing file areas, FMINIT outputs the following prompts:

GIVE NUMBER OF DISC SECTORS PER CLUSTER

The cluster size must be apositive HEX integer that is a power of two. The value of the disc cluster size represents the number of physical contiguous sectors which cannot be broken up further for allocation purposes, i.e., all files are allocated as multiples of this number.

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COMMENTS (Continued)

DO YOU WANT DDEX ON DISC (YES OR NO)?

This prompt asks if space should be reserved on disc for the Disc Diagnostic Executive (DDEX) operating system (see Section 3).

If you type YES, and there's no DDEX area on disc, an area for DDEX is reserved. If a DDEX area was already on disc, it will be preserved. If you type NO, and there was no DDEX on disc, no space is allocated for it. However, if there was a DDEX area, it will be lost.

You are then asked to partition the disc:

ENTER NUMBER OF DISC SECTORS (HEX) PER TASK TO BE RESERVED FOR TEMPORARY FILES OR ⟩ FOR DEFAULT:

You will be repeatedly prompted until a correct reponse is typed.

TYPE OK TO INITIALIZE FILE AREA (ANY EXISTING FILES ON THIS DRIVE WILL BE LOST)

If you wish to avoid initialization at this point, type a ⟩. FMINIT prints the following message and returns to system level.

FILE AREA NOT INITIALIZED

FILE AREA INITIALIZED

Output when file area is initialized, along with the pack ID, volume name, protection group, creation date and time, and sectors per task for temporary files (disc partition).

If you are initializing the system primary volume, a basic set of access tables, a default authorization file, and accounting files are created for the file manager, and the CHKDISC and CD3INIT commands are automatically executed, eventually returning you to system level.

If an auxiliary volume is being initialized, FMINIT gives you the option to run the CHKDISC command:

TYPE OK TO RUN CHKDISC

If you type OK, the CHKDISC command is executed and control returns to the system level. Otherwise control returns directly to system level.

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MESSAGES

If the file area is not successfully initialized by FMINIT, a message is output to that effect, and the disc is not changed in any way. Other error messages may be output during FMINIT. Generally, if there is an error in a numerical value input, the appropriate system error number is printed followed by the message:

```
***INPUT ERROR RETRY***
```

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FMRCVR

PURPOSE

Recovers the system primary (logical drive 0) file management areas when required by Login procedures.

SYNTAX

FMRCVR

COMMENTS

Only one task may be logged in (task must be logged in with system default entry). FMRCVR assumes that an FM structure already exists on disc.

INPUT/OUTPUT

(The left column defines the procedure; the right column clarifies the action.)

n > FMRCVR	Input FMRCVR command. The pack ID, volume name, and volume protection of current FM structure is printed.
TYPE OK TO CHANGE PACK ID, VOLUME NAME, AND/OR VOLUME PROTECTION GROUP	OK changes any or all of these parameters (formats described in the FMINIT command).) leaves them unchanged.
AUTHORIZED LOGIN CURRENTLY (ENABLED, DISABLED) TYPE OK TO (DISABLE,ENABLE) AUTHORIZED LOGIN	OK reverses the state of authorized LOGIN.) leaves it unchanged.
ACCOUNTING LOGS CURRENTLY (ENABLED, DISABLED) TYPE OK TO (DISABLE,ENABLE) ACCOUNTING LOGS.	OK reverses the state of accounting logs.) leaves status unchanged. If account logs are still enabled after response, you're asked to specify rate:
TYPE COST/MIN	Ends dialogue. FMRCVR sets CGOS flag in the DDEX area of the disc; re-enables file management areas; returns to system level.

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GENSLTAP

PURPOSE

Generates a self-loading system tape (also known as a COLDSTART tape) containing all O/S overlays, data on disc, and data not stored in the file structure.

SYNTAX

GENSLTAP Tapename [,Filename]

Where Tapename = task name for tape unit to be used.

COMMENTS

- A self-loading tape is generated; messages listing system disc areas are saved or output. Control automatically returns to the system.
- The 12 configurations currently resident in configuration slots are saved as part of the GENSLTAP.
- If Filename exists, it must be the name of a configuration slot or configuration file which will be placed in configuration slot 0 on the self-loading tape. When Filename is not present, configuration currently in slot 0 is used.

Note

The system version number on the self-loading tape will be the current system version number.

INPUT/OUTPUT

(The left column defines the procedure; the right column clarifies the action.)

n> GENSLTAP	Input command (see above SYNTAX).
TYPE OK TO CHANGE DEFAULT LOGIN ENTRY	A default name, number, and password is associated with each COLDSTART tape that must be used for LOGIN when there is no file manager. If the protection facility is to be enabled, the default LOGIN name should be changed for added security. The original COLDSTART tape should be secured.

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INPUT/OUTPUT (Continued)

TYPE NAME,NUMBER

This signifies that the LOGIN entry for the CGOS 200 GNA being saved is used (unless you typed OK to the above question). The name and number you respond with will be stored on the tape.

TYPE PASSWORD

Respond with desired password. Either of these messages may be answered with a) (i.e., a null entry). The tape then proceeds.

When the tape is finished, the original default entry for the O/S residing on the pack is restored.

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GETSLIB

PURPOSE

Maintains current subfigure library at a GNA satellite node.

SYNTAX

GETSLIB

COMMENTS

- SUBFIGURE LIBRARY MANAGEMENT

  In the GNA environment, part/subfigure disc files reside at each satellite node. These files are copies of host node masters, transferred by GETSLIB. A satellite subfigure library minimizes Host-to-Satellite file transfers.

  Each satellite node should have a unique Subfigure Library Directory (SFLD). You maintain the SFLD that resides at the host node. Invoke GETSLIB from the satellite boot-up execute file SYSEXEC.BOOTUP. During satellite node boot-up, the SFLD is transferred from host to satellite. The satellite node uses the SFLD to establish its subfigure library.

- SUBFIGURE LIBRARY DIRECTORY FORMAT

  The SFLD is a text file containing a list of catalogs and files in the satellite node's subfigure library. It is uniquely associated with a satellite node under the following naming convention:

  SYSTEM.SUBFIG.&BCD.DIRn

  n = Satellite node site-ID (one digit).

Non-blank lines in the SFLD specify files for the satellite subfigure library in the form:

CATALOG-NAME-[/FILE-NAME-LIST][/OPTIONS]

If FILE-NAME-LIST contains two or more names, each name must be preceded or followed by a comma. Options include:

Option	*Meaning*
REPLACE=YES	Replace previous versions of preceding files.
REPLACE=NO	Do not replace previous versions.
EXCEPT	Include all files in CATALOG-NAME, except files named in FILE-NAME-LIST.

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COMMENTS

- REPLACE = NO

  SFLD lines are processed faster under REPLACE = NO, since date/time comparisons are unnecessary unless the file(s) exist at the satellite site.

- REPLACE = YES

  Files are transferred only if the host file is more recent than the satellite version. At boot-up, differing host and satellite versions of the SFLD implies a change in the satellite subfigure library contents. If the host and satellite versions of a file differ, the more recent file is selected for the subfigure library. A warning message greets the first user to LOGIN to the satellite, unless the host file is the more recent version. At either node, files specified in the SFLD are always included in the satellite subfigure library.

- Subfigure Library Files.

  If FILE-NAME-LIST is omitted, every file in CATALOG-NAME is included in the subfigure library.

  A part/subfigure file not specified in an SFLD may still be accessed by the satellite. This tool is intended to enhance interactive terminal sessions rather than to restrict file access.

  Files of other types need not be excluded from an SFLD (you may find it useful to transfer files such as COMMAND TABLES, AUTHORIZE FILES, EXECUTE FILES, etc.

ERRORS

If the option is misspelled or there are more than two options on the line, an error message is typed and the faulty SFLD line is echoed at the satellite COMDEV.

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HELP

PURPOSE

Prints documentation on your COMDEV.

SYNTAX

HELP

To Access HELP

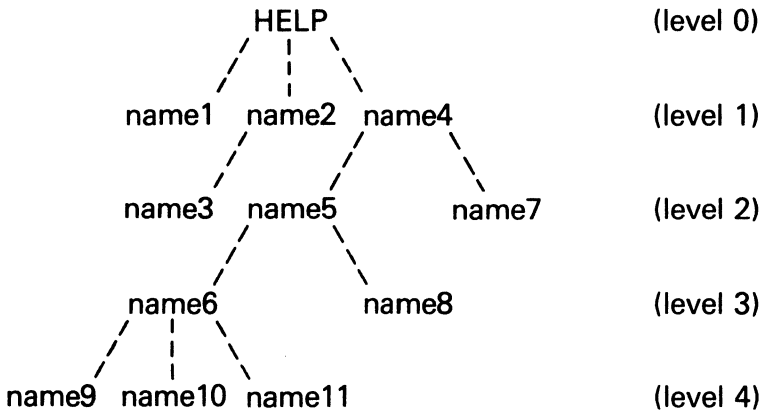
n>HELP ↓ — Type HELP ↓ in response to a prompt at the Operating System (O/S) level (n>). Documentation is printed on your COMDEV.

?] — 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.

Command	*Description*
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.

Command	*Description*
?] 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.

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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.

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LISTALL

PURPOSE

Lists all exisiting 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.

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 ">".

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.

COMMAND STRING

The entered command string must be valid relative to the FUTIL LIST command.

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
```

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LISTCFG

PURPOSE

Lists a configuration slot or file.

SYNTAX

LISTCFG NAME

COMMENTS

- Name can be a number between 0 and 11; this represents a configuration slot (part of the resident O/S).
- Name can also be the full name of a file under file management. This file must be a type 4 (configuration) file. (See Section 6, *Defining System Configurations*.)

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NETDIAG

PURPOSE — Exercises a point-to-point network link for diagnosis.

SYNTAX — NETDIAG

COMMENT — NETDIAG generates a network request to send a buffer to the remote network task. The remote network task then copies the input buffer into an output buffer and returns it to the caller.

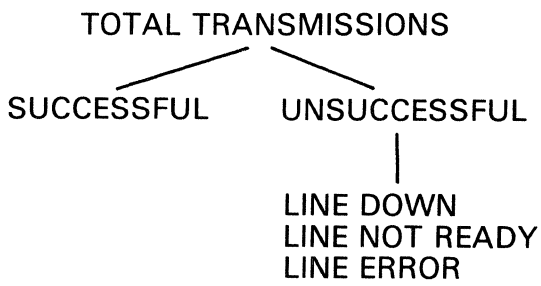
INPUT/OUTPUT — (The left column defines the procedure; the right column clarifies the action.)

n >NETDIAG	Input command. Dialogue ensues.
ENTER LOOP COUNT	(DEC) Enter number of transmissions.
ENTER SITE-ID (HEX)	Enter remote site ID.
ENTER BUFFER SIZE	Enter buffer size; must not exceed XXXX (HEX).

MESSAGES — NETDIAG outputs one of two responses after each transmission:

SUCCESS	The transmission is complete and the buffers match.
TRANSMISSION	The transmission is incomplete owing to error (see below).

These statistics are output in response to ESC and on completion of all transmissions:



ERRORS

- Following each transmission, appropriate networking error messages are output.
- In the event of a configuration error, the system provides host and linked node site ID's (as perceived by each):

```
HOST NODE     XXXX  XXXX
LINKED NODE   XXXX  XXXX
```

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NETSTATS

PURPOSE

Retrieves and displays timing statistics for a point-to-point link in a Graphics Network Architecture (GNA) configuration.

SYNTAX

NETSTATS

INPUT/OUTPUT

n > ENTER SITE-ID (HEX)

Enter a remote site ID. If you are on a terminal connected to the host, you can type any configured satellite; if you are on a satellite, type only 0 to indicate host.

TYPE OK TO RESET STATISTICS

For valid timing results, reset statistics before running a test.

OK ↓

Statistics are output in the format:

```
SATISTICS FOR SITE-ID          XXXX
TOTAL NETWORK ACTIVE TIME   XXXXXX  SEC
WAITING FOR PCU             XXXXXX  %
WAITING FOR SYSTEM CALL     XXXXXX  %
TOTAL WORDS TRANSMITTED     XXXXXX  K
TOTAL # OF TRANSACTIONS     XXXXXX
```

STATISTICS RESET

Message output if OK was typed in response to reset statistics prompt.

Caution

NETSTATS is only effective for one-direction testing in a single-user environment.

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NETTEST

PURPOSE

Exercises all network links in a configuration.

SYNTAX

NETTEST

COMMENTS

- For each link in the configuration, NETTEST generates 10 network requests to send a buffer to the remote network task. The remote network task copies the input buffer into an output buffer and returns it to the caller.

- NETTEST is a general tool to get a *yes* or *no* answer in a given configuration.

OUTPUT

As each link is exercised, NETTEST outputs:

SITE-ID XXXX — SUCCESS *or*
SITE-ID XXXX — FAILURE.EXECUTE NETDIAG

To pinpoint problems indicated by a failure message, execute NETDIAG for the link.

NEWCFG

PURPOSE

Generates a new system configuration to be placed in a configuration file.

SYNTAX

NEWCFG

COMMENT

The NEWCFG command initiates a dialogue for configuration definition which is identical to that described under *Defining System Configurations*, Section 6.

MESSAGES

When the configuration definition dialogue is completed, this message is output:

n > TYPE SLOT OR FILE FOR CNFG	Type either configuration slot or configuration file name where you want to store newly-defined configuration. ↓ if you do not want to store configuration. NEWCFG terminates.

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OPLOG

PURPOSE — Processes operation's log tables.

SYNTAX — OPLOG

COMMANDS

INITLOG	Initializes (zeroes) the accounting files.
DUMPLOG	Produces a formatted dump of the log table. (Included in dump: NAME, NUMBER, DATE, TIME, DURATION, TASK, AND COST.)
CLEARLOG	Executes a DUMPLOG followed by an INITLOG.
COMPLOG	Completes uncompleted entries in the log table.
SUMCHARG	Calculates total cost per user.

Note

OPLOG does work when other tasks are logged in. All logged tables are access-protected.

INPUT/OUTPUT — (The left column defines the procedure; the right column clarifies the action.)

n> OPLOG	Enter command to process log tables. (See *Accounting Operation/Authorized Login Option*, Section 3.)
OTHER TASKS LOGGED IN	This message is output if other tasks are logged in.
n> TYPE COMMAND	This message appears if no other tasks are logged in.
	Type any command described above. ↓ to terminate session.

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PACHDISC

PURPOSE

Physically examines and modifies disc data.

Caution

This command can destroy irrecoverable system or disc data. Use only for extraordinary system debugging.

SYNTAX

PACHDISC DISC ADDR, WORD COUNT [,BASE ADDRESS]

Where *DISC ADDR* is relative to the start of the disc. *WORD COUNT* is the count of words to be read in. BASE ADDRESS is the base location to be assigned to the first word. The default base address location is 0.

COMMENTS

After system prompt (#), type DISC ADDR (8 hex digits of the form UDSSSSSS), where:

U = Unit Number
D = Drive Number
SSSSSS = Absolute Sector Address

Leftmost digits are 0-filled if unspecified.

COMMANDS

In the following commands, all occurrences of the word *LOCN* (N = decimal digit) represents buffer addresses in the range: BASE ADDRESS < LOCN < BASE ADDRESS + WORD COUNT -1

- DUMP [DUMP] [D] [LOC1 [LOC2]], [LOC1 -LOC2]],...

  Prints all values between LOC1 and LOC2 (in HEX) in the format:

```
LOC1 XXXX XXXX XXXX XXXX XXXX XXXX XXXX XXXX LOC1  +0
XXXX XXXX XXXX XXXX XXXX XXXX XXXX XXXX LOC1 +8 XXXX
XXXX XXXX XXXX XXXX XXXX XXXX XXXX LOC1 +10 XXXX
XXXX XXXX XXXX XXXX XXXX XXXX XXXX LOC1 +18 XXXX
XXXX XXXX XXXX XXXX XXXX XXXX XXXX
```

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COMMANDS (Continued)

- SEARCH

  SEARCH SR [LOC1 [-LOC2]], [LOC1 [-LOC2]], ... = VALUE

  Prints all buffer locations falling into specified ranges whose contents equal value. If ranges are not specified, the entire buffer is searched. Output format is:

  LOC1 VALUE
  LOC2 VALUE

- SET
  [SET]
  [SE] LOC = VALUE1,VALUE2,...,VALUEN

  Sets contents of buffer locations LOC to LOC + N-1 to VALUE1, VALUE2,...,VALUEN.

  SET]
  [SE] [LOC1 [-LOC2]], [LOC1 [-LOC2]], ... = VALUE

- SET [LOC] [LOC]
  SE [LOC1-LOC2] [LOC1-LOC2],... = VALUE

  Sets contents of buffer locations (within specified ranges) to VALUE.

- MOVE
  [MOVE]
  [M] COUNT,LOC1,LOC2

  Moves contents of the buffer. COUNT words are moved from LOC1 TO LOC2. If LOC2 < LOC1, then the move is made in the order LOC2-> LOC1, LOC2 + 1-> LOC1 + 1, etc. If LOC1 < LOC2, then the move is made in the order LOC1 + CNT-1-> LOC2 + CNT-1, LOC1 + CNT-2-> LOC2 + CNT-2, etc.

- QUIT [QUIT] [Q]

  Causes an immediate exit to O/S level. All disc is left unchanged from its value at PACHDISC initiation.

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COMMANDS (Continued)

- FILE FILE

  Writes back buffer contents to original disc location. Any changes will be reflected by disc data. When buffer is written, control is returned to O/S level.

MESSAGES

These error messages are output at the COMDEV:

WORD COUNT TOO BIG	Word count is too large to fit into available buffer space for PACHDISC. Words modified = [(WORD COUNT + 255)/256]*256
BAD REQUEST	PACHDISC improperly entered or system error on disc READ or WRITE.
BAD COMMAND	Command typed to PACHDISC not recognized.
BAD LOC	Buffer address specified for examination or modification is outside the permitted address range. For commands allowing ranges to be specified, if either end of a range is beyond the limits, command will not be performed for that range. If multiple ranges are specified, the command will be performed for all those ranges which satisfy the boundary check.
DISC CHANGED	File command successfully performed.

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RESETPCU

PURPOSE

Resets a user-specified programmable communications unit (PCU). This action clears any previously *downloaded* PCU code and prepares the PCU for a new *download.*

SYNTAX

RESETPCU <TASKUNITNAME>
<TASKUNITNAME> = PCU's task name.

Example

n>ATTACH PC,PC00 ↵	Attach PCU to be reset.
n>RESETPCU PC ↵	Reset it.

MESSAGES

SUCCESSFUL	Reset is successful.
UNSUCCESSFUL	Reset unsuccessful. RESETPCU instructs you to manually reset the PCU (with switch on PCU board). If the PCU reset switch is not accessible, the CGP must be rebooted to reset the PCU.

SETDEV

PURPOSE

Sets unit characteristic word values for an attached unit.

SYNTAX

SETDEV Taskunitname, Chr1,Chr2,Chr3

Where Taskunitname = two-character user assigned task name for unit (see ATTACH), and Chr1,2,3 = hexadecimal values assigned to the unit characteristic words for this unit.

MESSAGES

See below. Control is automatically returned to the system.

UNIT CHARACTERISTIC WORDS FOR Taskunitname SET TO Chr1,Chr2,Chr3	The assignment was successful.
ILLEGAL COMMAND SYNTAX	Command string input could not be interpreted.
INVALID DEVICE NAME	Device name specified does not exist.

See description of unit characteristic words under *Defining System Configurations*, Section 6.

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SYSCMTB

PURPOSE — Adds a command table to SYSCMTB, the system command table. SYSCMTB is a file manager command table that is searched by user commands.

SYNTAX — SYSCMTB Filename

Where *Filename* names an existing command table file.

COMMENT — The file becomes an appendix to SYSCMTB. Its commands are available to all users.

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.

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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.

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