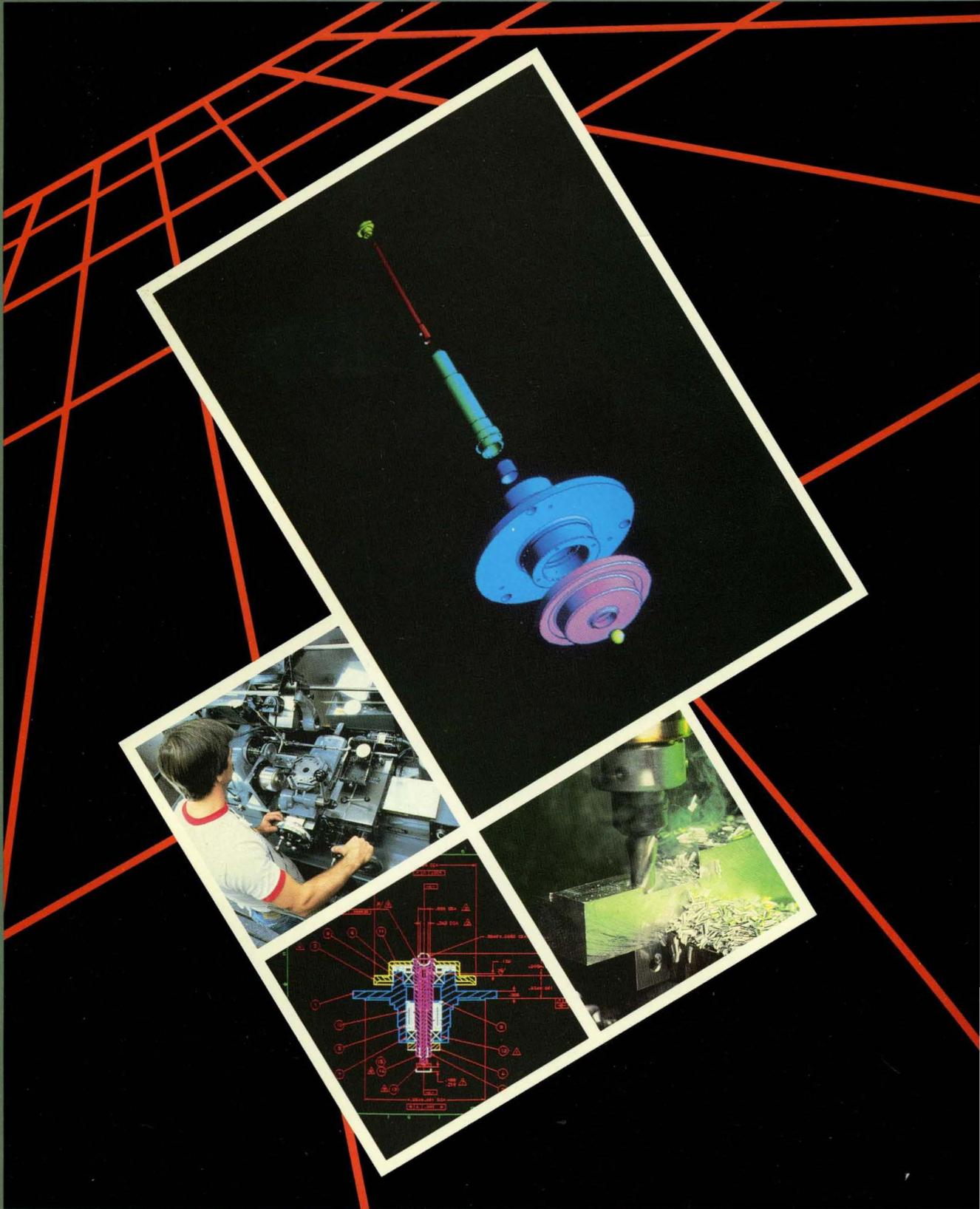


ICEM Design/Drafting

Introduction and System Controls


CONTROL
DATA



ICEM Design/Drafting
Introduction and System Controls
for NOS

Reference

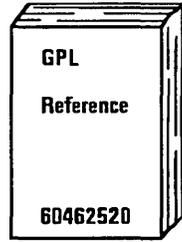
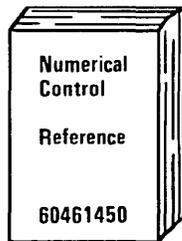
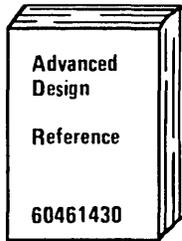
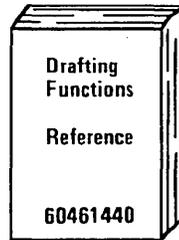
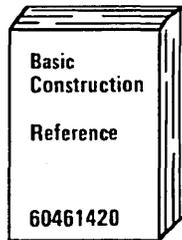
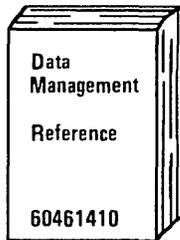
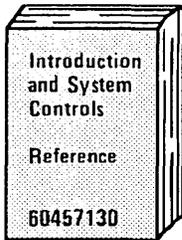
This product is intended for use only as described in this document. Control Data cannot be responsible for the proper functioning of undescribed features and parameters.

Related Manuals

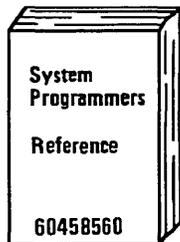
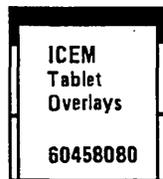
Background:



Manual Set:



Additional:



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Manual History

Revision K documents ICEM DDN Version 1.6, printed in December 1985. The following major features have been added or changed in this release version: terminal characteristics, feet/inches measurement units, entity selection enhancements, coordinate systems, menu display modals, construction modals, system decimal places modals, entity selection control modals, restore terminal parameters, local display file modals, activate user page/change tablet file, trace files, blank/unblank, delete, file current part/exit ICEM DDN.

Previous Revision	System Version	Date
A	1.0	August 1979
B	1.1	June 1980
C	1.2	January 1981
D	1.3	June 1981
E	1.3	August 1981
F	1.4	September 1982
G	1.5	December 1983
H	1.53	November 1984
J	1.57	May 1985

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About This Manual

This manual describes the CONTROL DATA® Integrated Computer-aided Engineering and Manufacturing Design/Drafting/Numerical Control (ICEM DDN) software system. It contains an introduction to system operation and reference information on the first four menus.

ICEM DDN is a computer-aided design/computer-aided manufacturing (CAD/CAM) software package. With this package, you can create engineering drawings of your design by using the geometric construction, mechanical analysis, and mechanical drafting functions. A full range of drafting procedures is available, such as automatic dimensioning, manually entered dimensioning, and material identification. GPL, a powerful graphics programming language, is available for calculating and programming graphic parameter values.

If you have ICEM Advanced Design, you can produce three-dimensional geometric entities. If you have ICEM Numerical Control, you can generate a toolpath to machine a design.

Tektronix models 4014, 4105, 4107, 4109, 4113, 4114, 4115, and 4125, as well as Control Data's Viking 721 and IEW 790 with TEKEM graphics terminals and an optional graphics tablet (refer to appendix B) are the primary input/output (I/O) devices used with ICEM DDN. You interact with ICEM DDN by entering input using the graphics terminal keyboard or graphics tablet; you receive output in the form of graphics displays on the terminal screen. In addition, a hardcopy device may form part of the graphics terminal configuration.

Many users access ICEM DDN through the ICEM Engineering Data Library (EDL). Other users access ICEM DDN directly through NOS. Both methods are available on CYBERNET® Services and ICEM Services. These manuals provide additional assistance on methods to access ICEM DDN:

- If you are accessing ICEM DDN through ICEM EDL, refer to the ICEM EDL Version 1.2 Reference Manual.
- If you are accessing ICEM DDN through NOS Version 1 or 2, refer to the Network Products Interactive Facility Version 1 Reference Manual or the NOS 2 Reference Set, Volume 1, Introduction to Interactive Usage, respectively.
- If you are accessing ICEM DDN through CYBERNET/ICEM Services, refer to appendix E in this manual.

Audience

This manual is a reference source for design engineers and drafting personnel who have already had initial training in the use of the ICEM DDN system. It is not intended to be a tutorial guide to ICEM DDN. New users should refer to the ICEM Design/Drafting User's Guide for a step-by-step introduction to the ICEM DDN system.

Organization

This manual is organized in two parts. Part I contains information on accessing and using ICEM DDN. Part II provides reference information on the first four ICEM DDN menus: 1 MODALS AND FONTS, 2 BLANK/UNBLANK, 3 DELETE, and 4 FILE/EXIT.

This manual is part of the ICEM DDN manual set.

The ICEM Design/Drafting Data Management manual describes menus 5 through 8 of the main menu: special functions, data base management operations, input/output operations, and display control.

The ICEM Design/Drafting Basic Construction manual describes menus 9 through 14 of the main menu: point construction, line construction, arc construction, special curve construction, entity manipulation, and data verification.

The ICEM Design/Drafting Drafting Functions manual describes menus 16, 18, and 19: drafting functions, analysis, and SI/US resize.

The ICEM Advanced Design manual describes menu 15 ADVANCED DESIGN, which covers three-dimensional curves and surfaces.

The ICEM Numerical Control manual describes menu 17 NUMERICAL CONTROL, the numerical control programming part of ICEM DDN.

The ICEM GPL manual describes menu 5.13 GPL and the GPL programming language.

Conventions

In this manual, headings contain a series of numbers separated by periods. These numbers represent the selections available within the ICEM DDN menu hierarchy. The first number in the heading is the main menu choice, the second number is from the second-level menu, and so on. For example, menu choice 12.7.3 HEXAGON is from the third level of the menu hierarchy.

When the word 'system' is used, it refers to the ICEM DDN software system. When the Network Operating System is referred to, it is called either NOS or the operating system.

All text that the system displays is shown in uppercase letters and highlighted with a special typeface, as shown below:

```
PEN THICKNESS
  1.ON
  2.OFF
  3.SET PEN/THICKNESS
```

Additional Related Publications

You can find related information in the following publications:

Manual Title	Publication Number
Automatically Programmed Tooling System (APT IV)	17326900
Graphics Terminal Assist Version 1 User's Guide/Reference Manual	60476100
ICEM Design/Drafting GRAPL Programming Language	60461460
ICEM Engineering Data Library Version 1 Reference Manual	60459740
ICEM Schematics Reference Manual	60456540
ICEM Schematics User's Guide	60462490
ICEM User-Defined Tablet Overlay	60457650
Network Products Interactive Facility Version 1 Reference Manual	60455250
Network Products Interactive Facility Version 1 User's Guide	60455260
NOS 2 Reference Set, Volume 1, Introduction to Interactive Usage	60459660
NOS 2 Reference Set, Volume 2, Guide to System Usage	60459670
NOS 2 Reference Set, Volume 3, System Commands	60459680
NOS Version 1 Reference Manual, Volume 1	60435400
UNILOT Version 3 User's Guide/Reference Manual	60454730
XEDIT Version 3 Reference Manual	60455730

Ordering Manuals

Control Data manuals are available through Control Data sales offices or through Control Data Corporation Literature Distribution Services (308 North Dale Street, St. Paul, Minnesota 55103).

Submitting Comments

The last page of this manual is a comment sheet. Please use it to give us your opinion of the manual's usability, to suggest specific improvements, and to report technical or typographical errors. If the comment sheet has already been used, you can mail your comments to:

Control Data Corporation
 Publications and Graphics Division ARH219
 4201 Lexington Avenue North
 St. Paul, Minnesota 55126-6198

Please indicate whether you would like a written response.

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You access ICEM DDN through IAF. For this reason, you must be familiar with elementary interactive usage procedures before using ICEM DDN. Any time the ICEM DDN applications software program is not executing, the graphics terminal behaves as an interactive terminal, responding to IAF commands. To use ICEM DDN, you must be familiar with the following interactive tasks:

- Logging in. (Consult your local site analyst for the specific login commands that are required at your workstation.)
- Attaching and running ICEM DDN.
- Basic file manipulation for the ICEM DDN data base.

If you are using NOS Version 1, a complete discussion of these tasks is contained in the Network Products Interactive Facility Version 1 Reference Manual and the Network Products Interactive Facility Version 1 User's Guide. If you are using NOS Version 2, refer to the NOS 2 Reference Set, Volumes 1 and 2. The ICEM Design/Drafting User's Guide contains a step-by-step procedure for completing tasks related to ICEM DDN.

Attaching the ICEM DDN File

ICEM DDN is contained in a direct access file named ICEMDDN in the application library file. To access the file, enter:

```
ATTACH, ICEMDDN/UN=APLLIB
```

Creating a Permanent Part File

ICEM DDN provides a sophisticated, updatable data base in which drawings can be stored, retrieved, and worked on from session to session. However, it is your responsibility to create a permanent file that will contain the data base and to attach the data base file before executing ICEM DDN. ICEM DDN uses a local file named TAPE3 for the data base. To create a permanent file for the data base, enter:

```
DEFINE, TAPE3=filename
```

Filename is any valid NOS file name (seven or fewer alphanumeric characters). This creates a permanent file, given a name assigned by you, that contains the data base when the session is over.

Accessing a Permanent Part File

Once you have created a permanent file for storing parts, you must make this file available. To do so, enter:

```
ATTACH,TAPE3=filename/M=W
```

If you do not want a permanent data base, NOS creates a scratch TAPE3, which is lost at the end of the IAF session.

If the local TAPE3 file is not an ICEM DDN data base, ICEM DDN aborts. The system displays:

```
BAD TAPE3 - ABORT
```

If TAPE3 is not attached in write mode, ICEM DDN aborts. The system displays:

```
WRITE ON READ - ONLY FILE TAPE3 AT address
```

These actions are meant to protect files that are not TAPE3.

The ICEM Design/Drafting User's Guide contains more information about the data base file.

Executing ICEM DDN

To execute ICEM DDN after attaching the ICEMDDN file and, optionally, after defining or attaching the data base file, enter the following statement:

```
ICEMDDN
```

Setting the Baud Rate

The speed at which the computer and terminal communicate is the baud rate. If you specify more than one baud rate in the ICEMDDN command statement, only the last one is used. Enter the first digit of one baud rate to set the baud rate.

The system prompts:

```
ENTER BAUD RATE
```

Use the following list to determine which digit to enter:

If Baud Rate is	Enter
300	3
1200	1
2400	2
4800	4
9600	9

It is possible to preselect the baud rate by adding parameter settings after the ICEMDDN command, as in this example:

```
ICEMDDN,9
```

Parameter settings may be entered following the ICEMDDN command. Available parameters and their use are explained later in this chapter.

Specifying Your Terminal Type

There are two ways to specify the desired terminal types and characteristics. The first method is to enter ICEM DDN and allow the system to prompt you with menus for needed information. The second method is to specify types and characteristics in advance by adding parameter settings to the ICEMDDN command.

Once you have entered ICEM DDN, you are asked to identify the hardware configuration of your terminal.

Terminal Characteristics

ICEM DDN operates on a wide range of terminal types including Tektronix 4014, 4105, 4107, 4109, 4113, 4114, 4115, and 4125, as well as Control Data's 721 and IEW 790 with TEKEM. Each terminal type has specific display options which you choose after making the appropriate selection from the Terminal Type menu. First, the system prompts for identification of your terminal type:

```
GRAPHICS TERMINAL TYPE
 1.TEKTRONIX 4014
 2.TEKTRONIX 4105
 3.TEKTRONIX 4107
 4.TEKTRONIX 4109
 5.TEKTRONIX 4113
 6.TEKTRONIX 4114
 7.TEKTRONIX 4115
 8.TEKTRONIX 4125
 9.CDC VIKING 721
10.CDC IEW 790 WITH TEKEM
```

Once you have identified the terminal type you are using, the system requests more specific information concerning your choice of menu area selection, local display files, and local character sets. The system displays one or more of the prompts described below.

Menu Area Selection

Operates on Tektronix terminal types 4113, 4114, 4115, and 4125. This menu is responsible for directing the menu text (also known as dialog area text) to the appropriate place. This menu does not appear for Tektronix 4014, 4105, 4107, 4109, CDC 721, and CDC IEW 790 with TEKEM terminals, which display all menus in the dialog area. You can direct the menu area to be displayed either on the graphics terminal or on a CDC 722 terminal.

Local Display Files

This prompt is displayed on Tektronix terminal types 4107, 4109, 4113, 4114, 4115, 4125, and CDC IEW 790 with TEKEM terminals.

The local display file (LDF) is memory internal to the terminal in which entities are stored for rapid repainting, blanking, and deleting. To repaint from the LDF, press the PAGE key on the Tektronix terminals. Lists that are not in the LDF, such as those listing the parts in TAPE3, color spectrum display, and temporary entity colors, will not be redrawn after entering PAGE. The screen clears and nothing is repainted if the LDF is turned off on Tektronix 4107, 4109, 4113, 4114, 4115, 4125, and CDC IEW 790 with TEKEM terminals. The PAGE repaint is faster than the R function control key for the Tektronix 4107, 4109, 4113, 4114, 4115, 4125, and CDC IEW 790 with TEKEM terminals and displays on the screen any updates to the local copy. It is a local command only, and does not affect the system.

Entering the ICEM DDN function control key R (repaint) does not repaint from the LDF, but rather regenerates the entire part from the data base, a more time-consuming process by comparison. In the event that a part becomes so large that it fills the LDF, you must turn off the LDF. You can check the amount of memory remaining in the LDF by putting the terminal into SETUP mode (function key on the

upper right of the keyboard) and entering STATUS, MEM. If the amount of memory remaining is nearing zero, turn off the LDF. If the memory is filled, you will have entities missing from the part.

Local Character Set

Operates on Tektronix terminal types 4107, 4109, 4113, 4114, 4115, 4125, and CDC IEW 790 with TEKEM terminals.

If on, a character set that is stored in local memory is used for speeding the generation of text (notes, dimensions, and so forth) in a part.

Specific Terminal Characteristics Menus

The following menus are used to select specific display characteristics for graphics terminals. The system prompts you can use to select the characteristics for your specific terminal are summarized below.

Tektronix 4014

For this terminal, the text is written on top of the graphics. The system prompts whether or not you want to use the tablet:

TABLET	Select whether you wish to use tablet input.
1.OFF	
2.TEKTRONIX 4953	
3.TEKTRONIX 4954	

If] or [is entered at any menu, the system returns to the Graphics Terminal menu.

Tektronix 4105

There are no prompts after you select this terminal type. The system automatically initializes and takes you to the ENTER PART NAME prompt.

Tektronix 4107/4109

For these terminals, you are prompted to select from several display options:

TABLET	Select whether you wish to use tablet input.
1.ON	
2.OFF	

LOCAL DISPLAY FILE	Select whether you wish to use the local display file.
1.ON	
2.OFF	

LOCAL CHARACTER SET	Select whether you wish to use the local character set.
1.ON	
2.OFF	

If] is entered at any menu, the system returns to the Graphics Terminal menu. If [is entered, the system returns to the previous menu.

Tektronix 4113/4114

For these terminals, you are prompted to select from several display options:

MENU AREA
1. GRAPHICS TERMINAL
2. 722

Enter:

- 1 To direct the menu text to the graphics terminal scrolling dialog area.
- 2 To direct the menu text to a CDC 722 terminal.

TABLET
1. OFF
2. TEKTRONIX OPTION 13
3. TEKTRONIX OPTION 14
4. TEKTRONIX 4957

Select the tablet type you wish to use or turn off tablet input.

LOCAL DISPLAY FILE
1. ON
2. OFF

Select whether you wish to use the local display file.

LOCAL CHARACTER SET
1. ON
2. OFF

Select whether you wish to use the local character set.

If] is entered at any menu, the system returns to the Graphics Terminal menu. If [is entered, the system returns to the previous menu.

Tektronix 4115/4125

For these terminals, you are prompted to select from several display options:

MENU AREA
1. GRAPHICS TERMINAL
2. 722

Enter:

- 1 To direct the menu text to the graphics terminal scrolling dialog area.
- 2 To direct the menu text to a CDC 722 terminal.

TABLET
1. OFF
2. TEKTRONIX OPTION 13
3. TEKTRONIX OPTION 14
4. TEKTRONIX 4957

Select the tablet type you wish to use or turn off tablet input.

LOCAL DISPLAY FILE
 1.ON
 2.OFF

Select whether you wish to use the local display file.

LOCAL CHARACTER SET
 1.ON
 2.OFF

Select whether you wish to use the local character set.

NUMBER OF BIT PLANES
 1.FOUR
 2.SIX
 3.EIGHT

Enter the appropriate number of bit planes for your particular terminal type. For more information, consult your analyst or a CDC sales representative.

If] is entered at any menu, the system returns to the Graphics Terminal menu. If [is entered, the system returns to the previous menu.

CDC 721

The system prompts you to select whether or not you wish to use a tablet.

TABLET
 1.ON
 2.OFF

Select the tablet type you wish to use or turn off tablet input.

If] or [is entered at any menu, the system returns to the Graphics Terminal menu.

CDC IEW 790 with TEKEM

For this terminal, you are prompted to select from several display options:

TABLET
 1.ON
 2.OFF

Select whether you wish to use tablet input.

LOCAL DISPLAY FILE
 1.ON
 2.OFF

Select whether you wish to use the local display file.

LOCAL CHARACTER SET
 1.ON
 2.OFF

Select whether you wish to use the local character set.

NUMBER OF BIT PLANES
 1.FOUR
 2.SIX
 3.EIGHT

Enter the appropriate number of bit planes for your particular terminal type. For more information, consult your analyst or a CDC sales representative.

If] is entered at any menu, the system returns to the Graphics Terminal menu. If [is entered, the system returns to the previous menu.

Specifying by Parameter Settings

You can specify the terminal configuration by adding parameter settings to the ICEMDDN command. The following parameters are currently available for preselecting terminal type, terminal characteristics, and menu area:

Parameter	Description
TT	Terminal type
MA	Menu area
TB	Tablet
LD	Local display file
LA	Local character set and grid
BP	Number of bit planes

Many other parameter settings are available. Refer to Preselecting Parameter Settings in this chapter for a complete list.

Tektronix 4105, 4107, 4109, 4113, 4114, 4115, and 4125 Terminal Status Settings

If you have a Tektronix 4105, 4107, 4109, 4113, 4114, 4115, or 4125 terminal, you can set the terminal status settings shown in table 1-1 by pressing the SETUP key.

Table 1-1. Tektronix Terminal Status Settings

Status Settings	4105, 4107, 4109 Terminals	4113, 4114, 4115, 4125 Terminals
TBSTATUS	Not Applicable	Out ¹
TBHEADER CHARS	Not Applicable	Control ¹
RLINE LENGTH	140	140
ECHO	Yes	Yes
LOCK KEYBOARD	No	No
SNOOPY	No	No
BAUDRATE	Applicable Baud Rate	Applicable Baud Rate
FLAGGING		
Pre-NOS Version 2	DTR/CTS (with DCSL) IN/OUT (without DCSL)	DTR/CTS (with DCSL) IN/OUT (without DCSL)
NOS Version 2	INPUT	INPUT
EOLSTRING		
Pre-NOS Version 2	CR (with DCSL) CRLF (without DCSL)	CR (with DCSL) CRLF (without DCSL)
NOS Version 2	Not Applicable	Not Applicable
BLOCKMODE	No	No
BREAKTIME	100	100
QUEUESIZE	8100	8100
DUPLEX	Not Applicable	Full
XMTDELAY	0	0
XMTLIMIT	Applicable Baud Rate	Applicable Baud Rate
BYPASSCANCEL		
With Echoplex	LF	LF
Without Echoplex	NL	NL

1. For emulation of a Tektronix 4014 terminal.

You should add these parameter settings before entering ICEM DDN. Other terminal status settings are set by ICEM DDN or have no bearing on its operation.

Preselecting Parameter Settings

You may preselect certain ICEM DDN parameter settings automatically. These settings eliminate the need to select various parameters each time you enter ICEM DDN. The following command is an example of preselected parameter settings:

```
ICEMDDN,9,CT=T,DS=A73,TT=T4115,TB=Y,UM=E
```

In this example, the following parameters are in effect each time ICEM DDN is called up:

- The baud rate is set at 9600.
- The trace file is activated.
- 1973 ANSI drafting standards are in effect for all new parts.
- The Tektronix 4115 terminal configuration is in operation.
- The tablet is turned on automatically.
- English units of measurement are in effect.

If your design and drafting work involves repeated use of the same parameters, these settings are a time-saving feature. The following list describes parameters and their use.

NOTE

The terminal must have the specific hardware to support the terminal configuration selected or you will experience unpredictable results.

Parameter	Description
A ¹	ASCII input mode. Default: Not selected. Instructs the system to input in ASCII input mode using the 0005 control byte. Used only with NOS. Recommended for use with CDC TELEX. (Your site analyst will know if you are using TELEX.)
B ¹	Binary input mode. Default: Not selected. Instructs the system to input in BINARY input mode using the 0006 control byte. Used only with NOS. Can be used with TELEX. (Your site analyst will know if you are using TELEX.)

1. If you specify more than one of the A, B, or C parameters in the system CALL statement, only the last one specified is used.

Parameter	Description
BP	Number of color bit planes on the graphics terminal.
BP=4	Specifies that the terminal has 4 color bit planes. This setting allows display of 16 simultaneous colors on the screen.
BP=6	Specifies that the terminal has 6 color bit planes. This setting allows display of 64 simultaneous colors on the screen.
BP=8	Specifies that the terminal has 8 color bit planes. This setting allows display of 256 simultaneous colors on the screen.
	This parameter has no effect on terminals with no bit plane options.
C ¹	Coded input mode. Default: Not selected. Instructs the system to not suppress question marks on input requests. Used with NOS versions that do not support the PROMPT macro.
CT	Overlay and I/O queue trace file name. Default: CT. This file is not produced when tracing is off. Refer to the T parameter description.
	CT Names the file CT.
	CT=lfm Changes the overlay and I/O trace file name to lfm.
	CT=0 Suppresses the overlay trace file.
DS	Drafting standard default. If you do not set this parameter, the system does not set any default drafting standard and asks the DRAFTING STANDARD? prompt for each new part created.
	DS=A82 Sets the default drafting standard to ANSI 1982. Any new parts you create are made to ANSI standards and the DRAFTING STANDARD? prompt is omitted.
	DS=A73 Sets the default drafting standard to ANSI 1973. Any new parts you create are made to ANSI 1973 standards and the DRAFTING STANDARD? prompt is omitted.

1. If you specify more than one of the A, B, or C parameters in the system CALL statement, only the last one specified is used.

Parameter	Description
DS=D	Sets the default drafting standard to DIN. Any new parts you create are made to DIN standards and the DRAFTING STANDARD? prompt is omitted. You can use this parameter only if the DIN standards library is attached.
DS=F	Sets the default drafting standard to FRENCH. Any new parts you create are made to FRENCH standards and the DRAFTING STANDARD? prompt is omitted. You can use this parameter only if the FRENCH standards library is attached.
DS=B	Sets the default drafting standard to BRITISH. Any new parts you create are made to BRITISH standards and the DRAFTING STANDARD? prompt is omitted. You can use this parameter only if the BRITISH standards library is attached.
DS=S	Sets the default drafting standard to SWEDISH. Any new parts you create are made to SWEDISH standards and the DRAFTING STANDARD? prompt is omitted. You can use this parameter only if the SWEDISH standards library is attached.
DS=J	Sets the default drafting standard to JAPANESE. Any new parts you create are made to JAPANESE standards and the DRAFTING STANDARD? prompt is omitted. You can use this parameter only if the JAPANESE standards library is attached.
DS=C	Sets the default drafting standard to CHINESE. Any new parts you create are made to CHINESE standards and the DRAFTING STANDARD? prompt is omitted. You can use this parameter only if the CHINESE standards library is attached.

NOTE

If you call an existing part from TAPE3, the system uses the drafting standard with which the part was originally created, regardless of the DS parameter setting. (The DRAFTING STANDARD? prompt is described in chapter 2.)

If you wish to attach DIN, FRENCH, BRITISH, SWEDISH, JAPANESE, or CHINESE drafting standards libraries, consult the installation instructions for your ICEM DDN tape. The instructions include a list of Control Data international representatives who can supply the libraries.

Parameter	Description
E	Execute only mode. Default: Not selected. Simulates ICEM DDN running in execute only mode.
FL	TAPE3 file length limit. Refer to File Length Limit in chapter 2 of this manual for more information.
FS	Sets the select target size area to full screen. Default: Not selected. Refer to 1.11.6 SET SELECT TARGET in chapter 3 of this manual for more information.
GL	Global parts file length limit. Refer to File Length Limit in chapter 2 of this manual for more information.
GP	Global pattern file length limit. Refer to File Length Limit in chapter 2 of this manual for more information.
I	Input file name. Default: I=INPUT. Uses the file INPUT as input. I=lfn Uses the alternate local input file lfn as input. When end-of-information (EOI) is encountered, the input file is changed to INPUT.
IT	Input trace file name. Default: IT. This file is not produced when tracing is in the off position. Refer to the T parameter description. IT Names the trace file IT. IT=lfn Changes the input trace file name to lfn. IT=0 Suppresses the input trace file.
L	List output. Default: L=OUTPUT. L Uses the file OUTPUT as output. L=lfn Uses the alternate local output file lfn as output.
LA	Sets the local assist. Default: Depends on the terminal type. LA=N Sets the local assist to the off position. LA=Y Sets the local assist to the on position.

Parameter	Description
LD	Sets the LDF to the on position if the selected terminal supports a local display file. If not, no action is taken.
	LD=N Sets the LDF to the off position regardless of terminal type.
	LD=Y Turns on LDF if terminal type supports local display file.
M	System call control. Default: M=400000 (accounting off).
	M=nnnnnn Controls system calls. nnnnnn is an octal number with each bit controlling whether a system call is made. Setting a bit inhibits the corresponding system call. Refer to appendix C for a description of each bit.
MA	Sends menu text to the graphics terminal.
	MA=GRAF Menu text set according to terminal specifications.
	MA=A722 Selects the CDC 722 as the alphanumeric terminal device for Tektronix 4107, 4109, 4113, 4114, 4115, and 4125 terminals.
MT	Menu input trace file name. Default: MT.
	This file is not produced when tracing is off. Refer to the T parameter description.
	MT Names the trace file MT.
	MT=lfn Changes the menu input trace file name to lfn.
	MT=0 Suppresses the menu input trace file.
NR	Deactivate reprieve. Default: Not selected.
	Deactivates reprieve processing.
OT	Output list output. Default: OT.
	OT Names the trace file OT.
	OT=lfn Changes the output trace file name to lfn.
	OT=0 Suppresses the record of output trace file.

Parameter	Description
P	Pseudo paper tape mode. Default: Not selected. Enables pseudo paper tape mode. Used with microprocessor-assisted stations for systems that do not allow paper tape mode operation.
T	Trace mode. Default: Not selected. Turns on trace mode. This produces data on default files IT, OT, CT, and MT. Refer to 1.17 CHANGE TRACE FILE STATUS in chapter 3 of this manual for a description of these files.
TB	Tablet control. Sets tablet on. Default: Not set. TB=N Sets tablet off. TB=Y Sets tablet on. TB=OPT13 Sets Tektronix Option 13 tablet on for Tektronix 4113, 4114, 4115, and 4125 terminals. TB=OPT14 Sets Tektronix Option 14 tablet on for Tektronix 4113, 4114, 4115, and 4125 terminals. TB=T4953 Sets Tektronix 4953 tablet on for Tektronix 4014 terminal. TB=T4954 Sets Tektronix 4954 tablet on for Tektronix 4014 terminal. TB=T4957 Sets Tektronix 4957 tablet on for Tektronix 4107, 4109, 4113, 4114, 4115, and 4125 terminals.
TT	Terminal type. Default: Not selected. TT=T4014 Selects the Tektronix 4014 with alpha assist on graphics terminal. TT=T4105 Selects the Tektronix 4105 with alpha assist on graphics terminal. TT=T4107 Selects the Tektronix 4107 with alpha assist on graphics terminal. TT=T4109 Selects the Tektronix 4109 with alpha assist on graphics terminal. TT=T4113 Selects the Tektronix 4113 with alpha assist, local assist, and LDF all set to the on position. TT=T4114 Selects the Tektronix 4114 with alpha assist, local assist, and LDF all set to the on position.

Parameter	Description
TT=T4115	Selects the Tektronix 4115 with alpha assist, local assist, and LDF all set to the on position. Bit planes are set to 4.
TT=T4125	Selects the Tektronix 4125 with alpha assist, local assist, and LDF all set to the on position. Bit planes are set to 4.
TT=C721	Selects the CDC 721 terminal with alpha assist on.
TT=C790T	Selects the CDC IEW 790 emulating a Tektronix 4115 with menu text on the separate alphanumeric screen, local assist, and LDF all set to the on position.
UM	Units of measure. Default: Not set. You are prompted to enter the units of measure unless you specify one of the following parameters: UM=E Selects the U.S. customary units (inches). UM=FI Selects U.S. units (feet, inches). When the unit of measure selected is feet/inches, the DRAFTING STANDARD prompt will have only two choices, ANSI 1973 and ANSI 1982. If UM=FI is specified and the DS is not A73 or A82, the system displays: ONLY ANSI STD. ALLOWED WITH FT/IN The drafting standard menu is then displayed with only two choices, ANSI 1982 and ANSI 1973. UM=M Selects metric units (millimeter).
*AX	Optim utility. Default: x-axis primary. (Refer to appendix B, ICEM Design/Drafting Data Management manual.) *AX = X x-axis is primary. *AX = Y y-axis is primary.

Error Processing

If illegal entries are made on the LD, TB, or LA parameters, the system displays:

CONTROL CARD ERROR

An invalid entry made using the TT or MA parameters issues the following messages and displays the default menu choice. This is applicable to all current terminal types.

(TT) ILLEGAL TERMINAL TYPE, INPUT IGNORED

(MA) ILLEGAL MENU TYPE, INPUT IGNORED

Trace Files

DDN tracing capability creates local files that record the steps taken during a system session. The trace file feature allows you to report problems so that ICEM DDN can be debugged by an analyst. Four files may be created, each of which records a different aspect of the system session:

- **Input Trace (IT)**
This file records all menu selections as tablet position data for character, graphics cursor, and tablet input.
- **Menu Trace (MT)**
This file records all menu selections as actual menu strings for character, graphics cursor, and tablet input.
- **Output Trace (OT)**
This file records every character sent to the terminal by the computer.
- **Overlay and Data Access Trace (CT)**
This file records the binary numbers of the called overlays and records the binary disk read/write information in chronological order.

NOTE

IT and MT files are text files written in alphanumeric characters; OT and CT files are expressed in binary format.

The following example shows the procedure for recording and executing trace files:

1. Enter a T parameter setting in the ICEMDDN call statement:

```
ICEMDDN,9,T.
```

2. Execute the ICEM DDN program.

3. After ICEM DDN termination, perform these operations:

A. Enter PACK and the desired file name:

PACK,IT.

B. Enter REWIND,IT.

REWIND,IT.

C. Execute the ICEM DDN call statement with the file name request:

ICEMDDN,9,I=IT.

4. IT runs with input from the file (I=Ifn). All data you input (when you request the IT file) during the previous ICEM DDN session will be displayed from start to finish.

NOTE

Each of these files is explained in more detail in the Preselecting Parameter Settings section of this chapter and in 1.17 TRACE FILE STATUS in chapter 3.

Patterns Update When Entering ICEM DDN

In ICEM DDN releases prior to release version 1.6, parts, patterns, and the UTF were stored on TAPE3. Beginning with ICEM DDN release version 1.6, patterns are no longer stored on TAPE3. When you enter V1.6, the system automatically updates all patterns created prior to V1.6 and stored on TAPE3. All existing local patterns must be updated to a new pattern library before they can be used.

The two possible update situations are discussed below.

- If you enter ICEM DDN with a current TAPE3 or an old TAPE3 that does not have any local patterns, no update is required and you proceed to the ENTER PART NAME prompt.
- If you enter ICEM DDN with an old TAPE3 that has local patterns, the system displays the following message:

```

ICEM DDN 1.6 AUTOMATIC PATTERN UPDATE
-----
TO PROVIDE INCREASED PATTERN FLEXIBILITY
OLD 'LOCAL' PATTERNS WILL NO LONGER BE
STORED ON TAPE3.  THEY MUST BE COPIED TO
A NEW PATTERN LIBRARY (FILE) BEFORE THEY
CAN BE USED.  YOU WILL BE ASKED TO NAME
THIS NEW LIBRARY.
THE FOLLOWING MENU WILL CONTINUE TO
APPEAR WHENEVER YOU ENTER ICEM DDN UNTIL
YOU REMOVE THE OLD PATTERNS ON TAPE3.

```

The system then prompts you to update old local patterns to a new pattern library:

```

UPDATE PATTERNS TO NEW LIBRARY
1.UPDATE - REMOVE OLD PATTERNS
→ 2.      - DO NOT REMOVE OLD PATTERNS
⇒ 3.NO UPDATE - REMOVE OLD PATTERNS
4.        - DO NOT REMOVE OLD PATTERNS

```

Select the desired operation.

Enter:

- 1 To update all patterns on TAPE3 to a new pattern library and remove the old local patterns from TAPE3. If you enter 1, the system will request more information concerning the new pattern library. The system displays:

```
ENTER NAME FOR NEW PATTERN LIBRARY
```

If a file with this name does not already exist, the system displays:

```
THE PATTERN LIBRARY IS BEING CREATED.
THIS WILL BE THE PRIMARY LIBRARY.
```

If a file with this name already exists, the system displays:

```
A FILE WITH THIS NAME ALREADY EXISTS
```

The system then prompts you for an alternative pattern library name:

```
ENTER NAME FOR NEW PATTERN LIBRARY
```

If there is a pattern library attached called 'PATTERN', the system displays:

```
SINCE A NEW PATTERN LIBRARY MUST BE  
CREATED FOR THE PATTERNS WHICH YOU ARE  
UPDATING, THE ATTACHED LIBRARY 'PATTERN'  
WILL BECOME THE SECONDARY LIBRARY.
```

The system provides pattern transfer progress reports, displaying this message after each 25 patterns have been transferred:

```
THERE ARE nnnn PATTERNS TO UPDATE  
nn PATTERNS UPDATED  
:  
ALL PATTERNS UPDATED
```

- 2 To update all patterns on TAPE3 to a new pattern library and leave the old local patterns on TAPE3. This will cause the UPDATE PATTERN TO NEW LIBRARY prompt to be displayed each time ICEM DDN is entered with this TAPE3. This prompt displays until all old local patterns are removed from TAPE3.

If you enter 2, the system will request more information concerning the new pattern library. The system displays:

```
ENTER NAME FOR NEW PATTERN LIBRARY
```

If a file with this name does not already exist, the system displays:

```
THE PATTERN LIBRARY IS BEING CREATED.  
THIS WILL BE THE PRIMARY LIBRARY.
```

If a file with this name already exists, the system displays:

```
A FILE WITH THIS NAME ALREADY EXISTS
```

The system then prompts you for an alternative pattern library name:

```
ENTER NAME FOR NEW PATTERN LIBRARY
```

If there is a pattern library attached called 'PATTERN', the system displays:

```
SINCE A NEW PATTERN LIBRARY MUST BE  
CREATED FOR THE PATTERNS WHICH YOU ARE  
UPDATING, THE ATTACHED LIBRARY 'PATTERN'  
WILL BECOME THE SECONDARY LIBRARY.
```

The system provides pattern transfer progress reports, displaying this message after each 25 patterns have been transferred:

```
THERE ARE nnnn PATTERNS TO UPDATE  
nn PATTERNS UPDATED  
:  
ALL PATTERNS UPDATED
```

- 3 To remove all patterns on TAPE3 without updating them to a new library. This is the same as deleting all patterns on TAPE3. You will then proceed to the ENTER PART NAME prompt.

DRAFTING STANDARD

1. ANSI 1982
2. ANSI 1973
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

Enter the desired drafting standard.

Standards 1. ANSI 1982, and 2. ANSI 1973 are attached by default.

For selections 3. DIN, 4. FRENCH, 5. BRITISH, 6. SWEDISH, 7. JAPANESE, and 9. CHINESE, the appropriate standards library must be attached. Consult your site analyst or your local Control Data representative if libraries for DIN, FRENCH, BRITISH, SWEDISH, JAPANESE, or CHINESE standards are required.

Retrieving a Part

If you call up a part name and sheet number that already exist, you are not prompted for measurement unit and drafting standard settings. The system uses the settings that were specified when the part was created and the two preceding menus are not displayed. In creating a part, part names may have up to 70 characters and sheet numbers may have up to four digits.

If you are retrieving a part created previously, the system provides three retrieval options:

1. If the name and sheet number you enter are the full name and exact sheet number of an existing part and the name is not a subset of any other name, the part is retrieved immediately.
2. If the name and sheet number you enter are the full name and exact sheet number of an existing part and the name is a subset of any other name(s), the system displays:

ENTERED NAME MATCHES EXISTING PART

For example: you enter part name TORUS and parts named TORUSA and TORUSB already exist.

3. If the name you entered is a subset of only one part name and the sheet number is identical, the system displays:

ENTERED NAME IS A SUBSET MATCH OF

For example: you enter DRAFT C and one part (and only one) named DRAFT CURVE already exists.

Following either of these last two cases, the system displays the matched part name and sheet number:

part name
SHEET number
RETRIEVE?

Enter:

Y To retrieve the part.

N To return to the ENTER PART NAME prompt.

If you enter an N or [to the preceding prompt, the system displays:

DO YOU WANT TO DEFINE A PART NAMED-part name

The system then prompts:

part name
SHEET number

Enter:

Y To continue to the UNITS OF MEASURE prompt.

N To return to the ENTER PART NAME prompt.

Reading the Main Menu Heading

If the name you entered is a subset match of more than one existing part, the system displays:

ENTERED SUBSET MATCHES MANY NAMES.

You return to this prompt:

DO YOU WANT TO DEFINE A PART NAMED-part name

Reading the Main Menu Heading

After your part has been specified, the main ICEM DDN menu heading displays a listing of current values for standard system parameters:

ICEMDDN L=x V=x D=xxx P=x C=x

Parameter	Description
L	Current level number.
V	Current work view.
D	Current depth.
P	Current pen number.
C	Current color number.

Each time the main menu is called, the system displays the current values for level, view, depth, pen number, and color number.

Using ICEM DDN

2

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Using ICEM DDN Menus

All of the functions and operations of ICEM DDN are organized into sets of hierarchically arranged menus. The main menu contains 19 menu choices as illustrated in the following display:

- 1.MODALS & FONTS
- 2.BLANK/UNBLANK
- 3.DELETE
- 4.FILE/EXIT
- 5.SPECIAL FUNCTIONS
- 6.DATA BASE MANAGEMENT
- 7.INPUT/OUTPUT/REGENERATION
- 8.DISPLAY CONTROL
- 9.POINT
- 10.LINE
- 11.ARC/CIRCLE/FILLET
- 12.OTHER CURVES
- 13.ENTITY MANIPULATION
- 14.DATA VERIFY
- 15.ADVANCED DESIGN
- 16.DRAFTING
- 17.NUMERICAL CONTROL
- 18.ANALYSIS
- 19.SI/US/RESIZE

NOTE

Some menu headings listed may be blank on your system. These headings are either for future use or are features that have not been purchased by the user organization. Menus 15 ADVANCED DESIGN and 17 NUMERICAL CONTROL are two optional features.

The main menu is an umbrella category for many menu choices. For example, if you select 9 POINT from the main menu, the screen displays:

- 1.SCREEN POSITION
- 2.KEY-IN
- 3.POLAR
- 4.DELTA
- 5.VECTORED
- 6.CIRCLE CENTER
- 7.ON A CIRCLE
- 8.CURVE END
- 9.INTERSECT 2 CURVES
- 10.SPLINE POINTS
- 11.ON A LINE
- 12.CURVE NORMAL
- 13.BEARING/DISTANCE
- 14.ON A CURVE
- 15.SURFACE POINTS

- 16.SPHERICAL
- 17.FAN POINTS
- 18.INCREMENTAL POINTS
- 19.MODIFY/REPLACE

If you select 1.SCREEN POSITION, the screen displays the prompt INDICATE POSITION. You then indicate the desired location for the point by means of the graphics cursor. The system reads and stores these coordinates.

Command and Request Format

You execute an operation by selecting that operation from a menu displayed on the terminal screen. The menus are arranged in a top-down manner, that is, entries in higher level menus refer to lower level menus and entries in the lower level menus refer to operations executed by ICEM DDN. You initiate an operation by obtaining the menu that contains it and selecting that operation. When you select one of these operations, ICEM DDN asks for any parameters needed by displaying prompts. You answer these requests by either entering the requested information, or using the graphics cursor to indicate a position or an entity on the screen. The menu that contains the operation you need is obtained by working down from higher level menus. Some menus can be selected directly with function control keys and squares (refer to table 2-1).

An item can be selected only from the menu that is currently active. To select an item in that menu, enter one of the following choices, followed by the RETURN key:

- Keys 1 through 9 and 0 on the keyboard to select items 1 through 9 and 10.
- Keys 1 through 9 while the SHIFT key is pressed to select items 11 through 19.
- Entries 10 through 19 to select menu items 10 through 19.
- Special function control keys, such as CTRL-F, CTRL-P, CTRL-L, and CTRL-A to select the 9 POINT, 10 LINE, and 11 ARC/CIRCLE/FILLET menus, respectively (refer to table 2-1).

After you select a menu choice, the system requests any required parameters and executes the operation. If the parameters entered are not acceptable or are not complete, the system responds by again requesting the required parameters. If you abort the operation by pressing the] key before any parameters are entered (or in response to the graphics cursor), the system does not execute the operation. For example, if you select 9.1 SCREEN POSITION, the system waits for you to position the graphics cursor and press the read C key. If you do so, the system creates a point at that position. If you do not enter the required parameters (in this case, the position at which a point is to be created), but instead press the] key or the [key, the system does not execute the operation but returns to the menu 9 POINT. If you press] again, the system responds by displaying the next higher menu, in this case the main ICEM DDN menu.

In summary, ICEM DDN moves through the menus in the following manner:

- If you select the name of the next lower level menu, that lower level menu is displayed and becomes active.
- If you select an operation from a menu, after that operation is completed or aborted, the menu from which the operation was selected is displayed and is active again.

- If you do not select an item and press], the next higher menu is displayed and is active.
- If you select an operation from a menu, and press [after selecting the operation but before the parameter requests are satisfied, the menu from which the operation was selected is displayed and is active again.
- If you select an invalid item, the system sounds a beep at the terminal. You must enter a valid entry.

Operations that create entities (refer to table 2-2) may function differently, depending on the setting of 1.2 CONSTRUCTION MODALS.

Using the Function Control Keys and Squares

You can control the operation of ICEM DDN through keys on the graphics terminal keyboard or squares on the graphics tablet that have a special and consistent use throughout the system. Whether a key operates as a function control key depends on the context. In some contexts (when the system is waiting for a control input, such as a menu or operation selection), the keyboard is in special function or function control mode. In other contexts (when the system is waiting for alphanumeric information), the keys have their normal alphanumeric values and uses and can be used to enter data and parameter values only. Table 2-1 lists and describes the function control keys and squares.

You may have to press the RETURN key after pressing a function control key or square. Whether or not this is necessary depends on both the terminal configuration and the type of input expected by the system.

Table 2-1. Function Control Key and Square Operations

Key	Square	Title	Description
A		Select arc, circle, or fillet	Captures the arc, circle, or fillet closest to the graphics cursor. All other selectable entity types are temporarily locked out.
C		Read graphics cursor	Tells the system to read the graphics cursor. It is a valid key only when the graphics cursor is active. During entity selection, this is the standard key used to capture the closest entity whose type is valid for the current operation.
CTRL-A		Go to 11 ARC/CIRCLE/FILLET	Takes system control directly to 11 ARC/CIRCLE/FILLET. It is a valid key at any time (not applicable for GTA-2).
CTRL-D		Delete last entity	Deletes the last entity created. It is a valid key at any time (not applicable for GTA-2).

(Continued)

Table 2-1. Function Control Key and Square Operations *(Continued)*

Key	Square	Title	Description
CTRL-L		Go to 10 LINE	Takes system control directly to 10 LINE. It is a valid key at any time (not applicable for GTA-2).
CTRL-P		Go to 9 POINT	Takes system control directly to 9 POINT. It is a valid key at any time (not applicable for GTA-2).
D		Change depth	Causes the prompt 1.DEPTH=xxxx to appear with the current zt value, which can be modified. After entering a value or indicating reject or operation complete, control returns to the menu or prompt active before D was selected. This key is not recognized as a function key when in the enter data mode.
E or CTRL-E		Go to Entity Selection menu	When selecting entities, returns to the Entity Selection menu for choosing other selection methods or setting constraints. If you have already selected some entities, these entities remain selected. This key is valid only during entity selection.
F or CTRL-F		Return to main menu	Returns control to the main menu. These keys are valid at any time but are not applicable for the CDC Graphics Terminal Assist Version 2 (GTA-2).
G		Activate grid	Changes the grid activation status. If the grid is activated (with 1.18 GRID) and G is selected, the system deactivates the grid. If G is selected again, the system reactivates the grid. This key is not recognized as a function key when in the enter data mode.
H		Select section lining	Captures the section lining closest to the graphics cursor. All other selectable entity types are temporarily locked out.
K		Automatic hardcopy	Produces a printout (hardcopy) of the screen display on a hardcopy device. It is valid only from alternative input files (trace script). In normal interactive keyboard or tablet mode, it is not valid.

(Continued)

Table 2-1. Function Control Key and Square Operations (Continued)

Key	Square	Title	Description
L		Select line	Captures the line closest to the graphics cursor. All other selectable entity types are temporarily locked out.
M		Change menu display	Changes the menu display status. If the menus are off and M is selected, all selected menus are displayed. If the menus are on and M is selected, all subsequently selected menus are not displayed. This key is not recognized as the menu control function key when in the enter data mode and does not control the menu headers.
N		Select toolpath	Captures the toolpath with the closest GOTO point. All other entity types are temporarily locked out.
N		No	Signifies no in response to a prompt. This key is not recognized as a no response when in the enter data mode.
O		Select other curves	Captures conics, composite curves, vectors, point set curves, three-dimensional splines, and machining curves closest to the graphics cursor.
P		Select point	Captures the point closest to the graphics cursor. All other selectable entity types are temporarily locked out.
PAGE		Local repaint display	If the LDF is turned on, redraws the local display file. PAGE is a local command only and does not affect the system. See Terminal Characteristics in chapter 1 for more information.
R		Repaint display	Redraws the display. After completion of the repaint, control passes back to the menu or prompt that was active before R was selected. This key is not recognized as a function key when in the enter data mode.

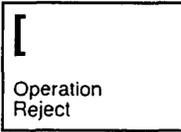
(Continued)

Table 2-1. Function Control Key and Square Operations (Continued)

Key	Square	Title	Description
S		Select spline	Captures two-dimensional spline closest to the graphics cursor. All other selectable entity types are temporarily locked out.
T		Select text	Captures dimensioning entities with text only. These are linear, circular, diameter and angular dimensions as well as labels and notes. The selectable position on these entities is to the lower left of their text.
V or CTRL-V		Other Options	Allows you to set modals associated with a function in process, display a menu bypassed because of a default mode or method modal setting, or unfold additional menu options.
W		Wait	Puts the system on wait status. A carriage return reactivates script. This key is valid only from alternative input files (trace script). In normal interactive keyboard or tablet mode, it is not valid.
Y		Yes	Signifies yes in response to a prompt. This key is not recognized as a yes response when in the enter data mode.
Z		Window (zoom)	Changes the position and size of the part on the screen. Menu 8.6 ZOOM is displayed. After you select from this menu and give the new zoom constraints, the screen is redrawn and control passes back to the menu or prompt active before z was selected. This key is not recognized as a function key when in the enter data mode.

(Continued)

Table 2-1. Function Control Key and Square Operations (Continued)

Key	Square	Title	Description
]		Operation complete	Signifies that you are done with the current operation. If all expected inputs are entered before the operation complete key is pressed or if default values are to be accepted, the operation in progress is performed and control passes to the next logical prompt. If the necessary inputs are not given, control is returned to the next higher menu or prompt, thus aborting the current operation. This is always a valid key.
[		Operation reject	Tells the system to negate the previous operation and, if possible, to return control to a preceding message. This is always a valid key. There are special uses of this key in some applications.
!		Capture and accept data	Captures and saves the value of a parameter that has been displayed by ICEM DDN and associates that value with a variable name. Subsequently, the variable name can be entered in response to a parameter prompt. This has the same effect as entering the value that was captured.
?		Help	Explains the current prompt. The explanation may consist of several paragraphs. You must enter either] or [after each paragraph. Enter] to show the next paragraph, if any, and enter [to terminate the help display. If the HELP key is used during entity selection, additional paragraphs will list the types of entities that are selectable. If no help is available for a prompt, the system rejects the entry of ? by sounding a bell. This key is not recognized as a function key when in the enter data mode.

(Continued)

Table 2-1. Function Control Key and Square Operations (Continued)

Key	Square	Title	Description
|		Enter and exit embedded text mode	Embedded text is non-executable text that is recorded on a script file or within a tablet string. When the script file or tablet string is executed, the embedded text will be written to the terminal.
#		Modify the default value	Allows you to use the default value in an expression during data entry.

Entity Selection Matrix

Each operation in ICEM DDN that requires you to select entities from those in the current part allows only certain types of entities to be selected. For example, if you create a line with 10.3 JOIN 2 POINTS, you can select only points, not lines or arcs. Table 2-2 specifies the entities that you can select for many of the operations in ICEM DDN. An X indicates that the entity in that column can be selected for the operation in that row.

You can determine which entity types are selectable in the entity selection module by using the HELP function (the function control key ?). If a specific tutorial for the current operation exists, it will be displayed first. For example, if you enter 13.3 GROUP and the HELP function, the system first displays an informational message. If you request more help, it displays this menu:

SELECTABLE ENTITIES

- 1.POINT
- 2.LINE
- 3.CIRCLE
- 4.CONIC
- 5.SPLINE
- 6.POINT-SET
- 7.GROUP
- 8.GENERAL LABEL
- 9.GENERAL NOTE
- 10.SECTION LINING

After you enter], the system returns to the preceding message in entity selection. Up to 14 different entity types are listed at once. If more types are selectable, they are displayed in the next tutorial menu after entering].

A list of selectable entities is displayed by entering ?.

Table 2-2. Entity Selection Matrix

Menu	Point	Line	Circle	Spline	Set	String	Conic	Other Entities
9.8		X	X	X	X		X	Machining curve Composite curve Bezier curve
9.9		X	X	X			X	Machining curve
9.12		X	X	X	X		X	Machining curve
9.14		X	X	X	X			Machining curve
9.17		X	X	X	X	X	X	Machining curve Composite curve Bezier curve

(Continued)

Table 2-2. Entity Selection Matrix (Continued)

Menu	Point	Line	Circle	Spline	Set	String	Conic	Other Entities
9.18.1		X	X	X	X	X	X	Machining curve Composite curve Bezier curve
9.18.2		X	X	X	X	X	X	Machining curve Composite curve Bezier curve
9.18.3		X	X	X			X	Machining curve Composite curve Bezier curve
9.18.4	X							
10.4			X	X			X	
10.11			X	X			X	
10.12			X	X			X	
10.14	X	X	X	X	X		X	
10.17		X						
12.2		X	X	X				
12.8		X	X	X			X	Machining curve
13.1	X	X	X					Array, group
13.2	X	X	X					Array, group
13.3	X	X	X	X			X	Group, section lining, note, label
13.4	X	X	X	X	X	X	X	All entities except toolpaths and dimensions
13.5	X	X	X	X	X	X	X	All entities except toolpaths
13.6	X	X	X	X	X	X	X	All entities except toolpaths and dimensions
13.7	X	X	X	X	X	X	X	All entities except toolpaths
13.8	X	X	X	X	X	X	X	All entities except toolpaths and dimensions

(Continued)

Table 2-2. Entity Selection Matrix (Continued)

Menu	Point	Line	Circle	Spline	Set	String	Conic	Other Entities
13.10	X	X	X	X			X	
13.11	X	X	X	X	X	X	X	All entities except toolpaths and dimensions
13.12	X	X	X	X	X	X	X	All entities except toolpaths and dimensions
13.13	X	X	X	X	X	X	X	All entities except toolpaths and dimensions
13.14	X	X	X	X	X	X	X	All entities except toolpaths and dimensions
16.2		X	X	X			X	
16.3		X	X	X			X	
16.4	X	X	X	X	X		X	Centerlines, machining curve
16.5	X	X	X	X	X		X	Centerlines, machining curve
16.6	X	X	X	X	X		X	Centerlines, machining curve
16.12	X		X					
16.18	X	X	X	X			X	

Entity Selection

Some operations require that you select entities. An entity is any object that the system has created and stored, such as a point, line, arc, or other curve. ICEM DDN allows you to identify constraint sets or characteristics that an entity must have in order to be selectable. There are two basic parts of entity selection: identification of applicable entities and specification of constraint sets. Constraint sets allow you to select, for example, all circles or all circles shown in blue and drawn in a particular pen number. You must understand the following concepts in order to successfully use the entity selection feature.

Constraint Sets

You identify those characteristics of entities that the system should use to decide which entities are eligible for selection. You can choose not to have any constraints, in which case the selection method process operates as it did before release version 1.6. In either case, constraint sets do not select any entities; entities are selected by selection methods (see below). A constraint set is only a filter used during the selection method.

Constraint sets have the following characteristics:

- They may be temporary or named and saved.
- They are activated when you define new constraints or when you enter the name of a previously defined constraint set.
- They are active until you clear them with 9. CLEAR CONSTRAINTS in the Entity Selection menu or they are automatically cleared at the end of selection if the modals 1.11.8 CONSTRAINT SET DURATION in the Entity Selection Control menu or 7.2 CONSTRAINT SET DURATION in the Entity Selection menu are set to ONCE.

NOTE

There are two alternative methods for setting modals with the entity selection feature. You may set modals using the 1.11 ENTITY SELECTION CONTROL menu before you have begun the entity selection process. You may also set modals once you have begun the entity selection process by using 7. MODALS in the Entity Selection menu.

Selection Method

In order to select entities, you must choose a selection method. Any active constraints are used to filter the entities selected using a particular selection method.

You may use the 1.11.10 SELECTION METHOD modal to automatically set a selection method. When entity selection is requested by the system, this will be the method automatically chosen. For example, if you set the modal to 1.11.10.3 SEQUENCE NUMBER, the system automatically prompts you, when an entity must be selected, to select entities by their sequence number. The default selection method is SCREEN SELECT.

When entity selection is requested by the system, you may enter E or CTRL-E to return to the Entity Selection menu. When that menu displays, you may choose a different selection method or set constraints.

Using Entity Selection

Use the following steps to perform entity selection:

1. If you do not have a default selection method set (using 1.11.10 SELECTION METHOD), you have, by default, selected SET when used as a selection method. You are first prompted for a selection method by the Entity Selection menu.

NOTE

Any selection methods inappropriate to a particular entity type will be blanked in the Entity Selection menu.

2. The heading for both the Entity Selection and Modify Selection menus displays the current constraint set status:
 - If you have no defined constraints and are not using a named and saved constraint set, the status is NONE.
 - If you have defined constraints but have not named and saved them, the status is NO NAME.
 - If you are using a named and saved constraint set, the constraint set name is displayed.
 - If you are using a named and saved constraint set and have defined constraints with the Define Constraints menu, the constraint set name is displayed followed by a plus sign (+).
3. Once you have selected entities with the Entity Selection procedure, the system displays the Modify Selection menu if 7.3 SELECTION MODIFICATION in the Entity Selection menu is on. Using this menu, you select more entities with the add functions or reject inappropriately selected entities with the remove function. In addition, you can set more properties with which you wish to constrain further selections.

In many cases throughout the system, the following series of prompts is displayed, and the following entity selection procedure is used to select entities:

```

CONSTRAINT SET=csetname           Enter the desired selection method.
ENTITY SELECTION
 1. SCREEN SELECT
 2. CHAIN
 3. REGION IN
 4. ALL DISPLAYED
 5. ENTIRE PART
 6. OTHER SELECTION METHODS
 7. MODALS
 8. USE NAMED CONSTRAINT SET
 9. CLEAR CONSTRAINTS
10. DEFINE CONSTRAINTS

```

Screen Select

If you select 1.SCREEN SELECT from the Entity Selection menu, the system displays:

INDICATE ENTITY

Use the graphics cursor to select entities.
After positioning the graphics cursor, enter an entity select character (C, P, L, N, A, O, S, or T; refer to table 2-1) to indicate an entity.

If multiple views are displayed, you have the option of indicating an entity in any of the displayed views. An entity must be at least partially on screen in the work view to be selected in another view. Rectangular and circular arrays, data graphs, dimensions, notes, toolpaths, labels, section lining, and templates must be selected within the work view. When an entity is selected, the system displays an attention indicator (a small oval) on the entity. If the entity was selected in a view other than the work view, attention indicators appear in both the work view and in the view in which the entity was selected. Selecting entities outside the work view does not change the work view (for example, the view of definition for view dependent entities is always the workspace associated with the work view). To end screen selection of entities, press]. Selected entities can be rejected one at a time by pressing [. The system will not reselect the most recently rejected entity until you select another entity.

There are four cases in screen select mode where the selection procedure is unable to find an eligible entity. These cases are:

- There are no selectable entities displayed on the screen in the work view for the current operation.
- All of the entities selectable for the current operation have already been selected.
- No entities specified by the entity select key or the current constraints are selectable.
- No selectable entities are within the currently set target area (refer to 1.11.6 SET SELECT TARGET).

If any of these cases are encountered after an entity select key has been pressed, the system sounds a bell and displays:

NO ELIGIBLE ENTITIES WITHIN TARGET AREA

You return to the INDICATE ENTITY prompt.

Chain Select

This form of entity selection is useful in selecting an ordered series of contiguous curves. The curves may form an open or closed set.

If you select 2.CHAIN SELECT from the Entity Selection menu, the next menu depends on the 1.11.2.3 DISALLOW PRESELECTED CURVES modal setting.

If this modal is off, you can immediately select a number of connected entities called a chain. The chain is specified by using the graphics cursor to first select an entity and then select one end of that entity, which determines the direction in which to search for the next connected entity. The system selects all the entities that are connected in a series in the direction indicated, either until no line or curve is found with an endpoint within 0.13 mm (0.005 in) of the last entity selected or until an entity selected by the system is connected with the selected entity. The entities to be selected should be uniquely connected lines, arcs, splines, or other curves, with common endpoints; that is, one end connected to one end.

If the Disallow Preselected Curves modal is on prior to selecting the first entity of the chain, the system prompts:

INDICATE DISALLOWED CURVE

Use the graphics cursor to indicate up to 10 curves that are not to be included in the subsequent chain of curves. This ensures that the system does not branch in an undesirable direction where three or more curve ends meet.

Enter] to terminate the indication of disallowed curves and to proceed with the rest of the chain select procedure described above.

Entity/Direction

If the modal 1.11.2.1 is set to SELECT FIRST ENTITY AND DIRECTION, the system displays:

INDICATE ENTITY

Use the graphics cursor to indicate the first of a series of connected entities.

NOTE

You can select this entity from any of the currently displayed views, provided the entity is at least partially on screen in the work view.

INDICATE DIRECTION

Use the graphics cursor to indicate the direction (or path) to be followed in selecting the entities.

NOTE

You must indicate this direction within the work view, regardless of where the first entity was selected. The system marks each of the entities selected with an attention indicator (a small oval).

Entity/Entity

If the modal 1.11.2.1 is set to SELECT FIRST AND SECOND ENTITIES, the system displays:

INDICATE ENTITY	Use the graphics cursor to indicate the first and second entities.
INDICATE SECOND ENTITY	

If you select non-contiguous curves, the system displays:

FIRST AND SECOND ENTITIES DO NOT CONNECT

It then prompts:

INDICATE SECOND ENTITY

The system then returns to the Entity Selection menu. Press] to complete selection.

Region In

If you select 3.REGION IN from the Entity Selection menu, the system displays:

INDICATE A CORNER OF THE REGION	Use the graphics cursor to indicate the location of one corner of a rectangular region.
---------------------------------	---

NOTE

If multiple views are displayed, you can specify the region in any of the displayed views.

INDICATE THE OPPOSITE CORNER	Use the graphics cursor to indicate the location of the diagonal corner of the rectangular region. If multiple views are displayed, this corner is interpreted as if it were in the view of the first corner. All entities that are partially or wholly inside this region are selected. The system marks the entities selected with attention indicators.
------------------------------	--

The system then returns to the Entity Selection menu. Press] to complete selection.

All Displayed

If you select 4.ALL DISPLAYED from the Entity Selection menu, the system selects all eligible, on-screen, unblanked entities in the work view.

Entire Part

If you select 5.ENTIRE PART from the Entity Selection menu, the system selects all eligible entities in the part, that is, all entities which meet the current constraints.

Other Selection Methods

If you select 6.OTHER SELECTION METHODS from the Entity Selection menu, the system displays:

OTHER SELECTION METHODS

Enter the desired selection method.

- 1.NAME
- 2.LAST ENTITY
- 3.ALL NOT DISPLAYED
- 4.REGION OUT
- 5.SEQUENCE NUMBER
- 6.POINTER NUMBER

Enter:

- 1 If you select 1.NAME from the Other Selection Methods menu, the system displays:

ENTER ENTITY NAME

Enter the name of the entity to be selected.

- 2 If you select 2.LAST ENTITY from the Other Selection Methods menu, the system selects the last entity created or modified.

- 3 If you select 3.ALL NOT DISPLAYED from the Other Selection Methods menu, the system selects all eligible, off-screen, or blanked entities.

- 4 If you select 4.REGION OUT from the Other Selection Methods menu, the system selects all eligible, on-screen, unblanked entities outside of a given region.

The system displays:

INDICATE A CORNER OF THE REGION

Use the graphics cursor to indicate the location of one corner of a rectangular region.

NOTE

If multiple views are displayed, you can specify the region in any of the displayed views.

INDICATE THE OPPOSITE CORNER

Use the graphics cursor to indicate the location of the diagonal corner of the rectangular region. If multiple views are displayed, this corner is interpreted as if it were in the view of the first corner. All entities that are partially or wholly outside this region are selected. The system marks the entities selected with attention indicators.

The system then returns you to the Entity Selection menu. Enter] to complete selection.

- 5 If you select 5.SEQUENCE NUMBER from the Other Selection Methods menu, the system displays:

SEQUENCE NUMBER=

Enter the sequence number of the entity to be selected. The sequence numbers of entities in the current part can be determined using 7.4 DISPLAY ENTITY SEQ. NO (refer to the ICEM Design/Drafting Data Management manual).

- 6 If you select 6.POINTER NUMBER from the Other Selection Methods menu, the system displays:

POINTER NUMBER=

Enter the pointer number of the entity to be selected. The pointer number of an entity can be found using 5.1 CANON (refer to the ICEM Design/Drafting Data Management manual).

Modals

If you select 7.MODALS from the Entity Selection menu, the system allows you to set certain modals which govern the operation of constraint sets. This modals menu allows you to reset modals without interrupting the entity selection process. The system displays the modals and their current settings:

MODALS

1.REPEAT INCLUDE/EXCLUDE	ON or OFF
2.CONSTRAINT SET DURATION	ONCE or CONT
3.SELECTION MODIFICATION	ON or OFF
4.SINGLE SELECT FROM GROUP	ON or OFF
5.CHAIN SELECT MODE	E/D or E/E
6.CHAIN SELECT METHOD	SCREEN or NAME or SEQ or POINTER or SET
7.DISALLOW PRESELECTED CURVES	ON or OFF
8.ATTENTION INDICATORS	ON or OFF
9.CONSTRAINT SET LEVEL	CUR or nn or SET

If you wish to change a modal value, enter the desired setting:

- 1 If you select 1.REPEAT INCLUDE/EXCLUDE, you can select to remain at the Define Constraints menu and continue setting constraints or return after setting one constraint. The system displays:

REPEAT INCLUDE/EXCLUDE

- 1.ON
- 2.OFF

Enter:

- 1 To enter more than one include or exclude property at a time. This is the default setting.
- 2 To enter only one include or exclude property at a time.

- 2 If you select 2.CONSTRAINT SET DURATION from the Modals menu, you can specify the length of time a constraint set will be active. The system displays:

CONSTRAINT SET DURATION

- 1.ONCE
- 2.CONTINUOUS

Enter:

- 1 To specify that the constraint set will be active only until this selection is complete or until it is cleared. This is the default setting.
- 2 To specify that the constraint set will be active as long as this part is in use or until it is cleared.

- 3 If you select 3.SELECTION MODIFICATION from the Modals menu, you can indicate whether or not you will later want to modify the entities selected. The system displays:

SELECTION MODIFICATION

- 1.ON
- 2.OFF

Enter:

- 1 To allow modification of selected entities.
- 2 To return from selection without modifications. This is the default setting.

- 4 If you select 4.SINGLE SELECT FROM GROUP from the Modals menu, you can turn on or off the ability to single select entities that are members of a group or composite curve. When this modal is on, you can single select from a group; when this modal is off, you cannot single select from a group.

SINGLE SELECT FROM GROUP

- 1.ON
- 2.OFF

Enter:

- 1 To single select entities from a group.
- 2 To not single select entities from a group. This is the default setting.

- 5 If you select 5.CHAIN SELECT MODE from the Entity Selection menu, you can specify a chain with a first entity and direction or first and second entities. The system displays:

CHAIN SELECT MODE

- 1.SELECT FIRST ENTITY AND DIRECTION
- 2.SELECT FIRST AND SECOND ENTITIES

Enter:

- 1 To select a first (starting) entity and identify a direction to find contiguous entities. This is the default setting.
- 2 To select the first and second entities of the chain.

- 6 If you select 6.CHAIN SELECT METHOD from the Entity Selection menu, you can specify the method for selecting the entities needed for defining a chain. The system displays:

CHAIN SELECT METHOD

- 1.SCREEN SELECT
- 2.NAME
- 3.SEQUENCE NUMBER
- 4.POINTER NUMBER
- 5.SET WHEN USED

Enter:

- 1 To indicate chain entities by screen position. This is the default setting.
- 2 To indicate chain entities by name.
- 3 To indicate chain entities by sequence numbers.
- 4 To indicate chain entities by pointer number.
- 5 To indicate chain select method when needed (no default).

- 7 If you select 7.DISALLOW PRESELECTED CURVES from the Modals menu, you can select curves which should not be included in the chain. The system displays:

DISALLOW PRESELECTED CURVES

- 1.ON
- 2.OFF

Enter:

- 1 To specify a system prompt for disallowed curves prior to any chain selecting.
- 2 For no system prompt for disallowed curves. This is the default setting.

- 8 If you select 8.ATTENTION INDICATORS from the Modals menu, you can put oval attention indicators on selected entities. The system displays:

ATTENTION INDICATORS

- 1.ON
- 2.OFF

Enter:

- 1 To display attention indicators.
- 2 To not display attention indicators.

- 9 If you select 9.CONSTRAINT SET LEVEL from the Modals menu, you can select the level on which to name and save constraint sets. This allows you to merge constraint sets from one part to another by using 6.1.7 MERGE INTO CURRENT PART (refer to ICEM Design/Drafting Data Management manual). The system displays:

CONSTRAINT SET LEVEL
 1.CURRENT LEVEL
 2.SPECIFIC LEVEL
 3.SET WHEN USED

Enter:

- 1 To name and save on the current level.
- 2 To name and save on another level.
- 3 To name and save the set when used.

Use Named Constraint Set

If you select 8.USE NAMED CONSTRAINT SET from the Entity Selection menu, you can use a named and saved constraint set during selection. The system displays:

CONSTRAINT SET=csetname

Enter the name of a constraint set. Use] to accept the current constraint set. Enter LIST for a complete list of constraint sets.

If the name you enter does not exist in the data base, the system displays:

CONSTRAINT SET NOT FOUND

The system then redisplay:

ENTER CONSTRAINT SET NAME TO USE

Clear Constraints

If you enter 9.CLEAR CONSTRAINTS from the Entity Selection menu, the system removes all constraints and displays:

ALL CONSTRAINTS CLEARED

Define Constraints

If you enter 10.DEFINE CONSTRAINTS from the Entity Selection menu, the system allows you to define new constraints and manage old ones. You are able to define the properties which entities must have in order to be included or excluded for selection. These properties form a constraint set, which acts as a filter for defining eligible entities for selection. You may save this constraint set permanently and recall it by name or you can define a set temporarily.

The first ten choices on the Define Constraints menu specify the properties an entity must have to be included in or excluded from selection. An eligible entity must have at least one condition for each included property and must not meet any excluded properties. For example, you would select all lines or arcs drawn in pen 1 on level 2, 3, or 4 which are not drawn in color 1 and not dashed using the following choices:

INCLUDE LEVELS 2-4
INCLUDE PEN 1
INCLUDE LINES AND ARCS
EXCLUDE ENTITIES DRAWN IN COLOR 1
EXCLUDE DASHED ENTITIES

Constraint sets are defined and managed by the following menu:

DEFINE CONSTRAINTS

1. INCLUDE-LEVEL
2. -PEN
3. -COLOR
4. -TYPE
5. -FONT
6. EXCLUDE-LEVEL
7. -PEN
8. -COLOR
9. -TYPE
10. -FONT
11. USE NAMED CONSTRAINT SET
12. CLEAR CONSTRAINTS
13. LIST CONSTRAINT SETS
14. DELETE CONSTRAINT SETS
15. NAME CURRENT CONSTRAINT SET

Enter the desired constraint functions.

Enter:

- 1 If you select 1.INCLUDE-LEVEL from the Define Constraints menu, you are prompted for a level range:

1. FROM LEVEL = 0
2. TO LEVEL = 0
3. BY INCREMENT = 1

Enter the desired level range and increment (rate of increase) factor. Entities on the given level(s) are now eligible for selection.

- 2 If you select 2.INCLUDE-PEN from the Define Constraints menu, the system prompts you for a range of pen numbers:

1. FROM PEN = 0
2. TO PEN = 0

Enter the desired pen numbers. Entities with the selected pen numbers are now eligible for selection.

- 3 If you select 3.INCLUDE-COLOR from the Define Constraints menu, the system prompts you to select a range of color numbers from a color table:

1. FROM COLOR = 0
2. TO COLOR = 0

Enter the desired range of color numbers. Entities with the selected color numbers are now eligible for selection.

- 4 If you select 4.INCLUDE-TYPE from the Define Constraints menu, the system prompts you to select from the Entity Types menu:

ENTITY TYPES

Enter the desired entity types.

- 1.ALL-BASIC GEOMETRY
2. -3-D CURVES
3. -SURFACES
4. -DRAFTING
5. -N/C
6. -GROUP/ARRAY/TEMPLATE
7. -OTHER
- 8.SPECIFY-BASIC GEOMETRY
9. -3-D CURVES
10. -SURFACES
11. -DRAFTING
12. -N/C
13. -GROUP/ARRAY/TEMPLATE

If you choose any of the first seven choices (1 through 7) in the Entity Types menu, all entity types in each of those categories will be selectable.

If you choose 8.SPECIFY-BASIC GEOMETRY in the Entity Types menu, the system displays:

BASIC GEOMETRY

Enter the desired basic geometry entity type(s).

- 1.POINT
- 2.LINE
- 3.ARC/CIRCLE/FILLET
- 4.2-D SPLINE
- 5.CONIC
- 6.STRING
- 7.POINT SET

If you select 9.SPECIFY-3-D CURVES in the Entity Types menu, the system displays:

3-D CURVES

Enter the desired 3-D curves entity type(s).

- 1.3-D SPLINE
- 2.COMPOSITE CURVE
- 3.VECTOR
- 4.BEZIER CURVE
- 5.MACHINING CURVE

If you select 10.SPECIFY-SURFACES in the Entity Types menu, the system displays:

SURFACES

Enter the desired surfaces entity type(s).

- 1.PLANE
- 2.SURFACE OF REVOLUTION
- 3.TABULATED CYLINDER
- 4.RULED/DEVELOPABLE SURFACE
- 5.CURVE MESH SURFACE
- 6.FILLET SURFACE
- 7.OFFSET SURFACE
- 8.COMPOSITE SURFACE
- 9.CURVE DRIVEN SURFACE
- 10.HEXAHEDRON
- 11.DATA POINT SET
- 12.DATA STRUCTURE SET

If you select 11.SPECIFY-DRAFTING in the Entity Types menu, the system displays:

DRAFTING

Enter the desired drafting entity type(s).

- 1.LINEAR DIMENSION
- 2.RADIUS DIMENSION
- 3.DIAMETER DIMENSION
- 4.ANGULAR DIMENSION
- 5.FEATURE FRAME
- 6.NOTE
- 7.LABEL/TAPER DIMENSION
- 8.SECTION LINING
- 9.CENTERLINE

If you select 12.SPECIFY-N/C in the Entity Types menu, the system displays:

N/C

Enter the desired N/C entity type(s).

- 1.TOOL
- 2.TOOLPATH
- 3.COMPOSITE TOOLPATH

If you select 13.SPECIFY-GROUP/ARRAY/TEMPLATE in the Entity Types menu, the system displays:

GROUP/ARRAY/TEMPLATE

Enter the desired group/array/template entity type(s).

- 1.GROUP
- 2.ARRAY
- 3.TEMPLATE

After you have selected entity type(s) from menus for specific categories, the system returns to the main Entity Types menu.

- 5 If you select 5.INCLUDE-FONT from the Define Constraints menu, the system prompts you to select a range of font styles from the following menu:

FONT	Select the desired font style.
1.SOLID	
2.DASHED	
3.PHANTOM	
4.CENTERLINE	

- 6 If you select 6.EXCLUDE-LEVEL from the Define Constraints menu, you are prompted for a level range:

1.FROM LEVEL = 0	Enter the desired level range and
2.TO LEVEL = 0	increment (rate of increase) factor.
3.BY INCREMENT = 1	Entities on the given level(s) are now
	ineligible for selection.

- 7 If you select 7.EXCLUDE-PEN from the Define Constraints menu, the system prompts you for a range of pen numbers:

1.FROM PEN = 0	Enter the desired pen numbers. Entities
2.TO PEN = 0	with the selected pen numbers are now
	ineligible for selection.

- 8 If you select 8.EXCLUDE-COLOR from the Define Constraints menu, the system prompts you to select a range of color numbers from a color table:

1.FROM COLOR = 0	Enter the desired range of color
2.TO COLOR = 0	numbers. Entities with the selected color
	numbers are now ineligible for selection.

- 9 If you select 9.EXCLUDE-TYPE from the Define Constraints menu, the system prompts you to select from the Entity Types menu (refer to the Entity Types menu in 4.INCLUDE-TYPE).

- 10 If you select 10.EXCLUDE-FONT from the Define Constraints menu, the system prompts you to select a range of font styles from the following menu:

FONT	Select the desired font style.
1.SOLID	
2.DASHED	
3.PHANTOM	
4.CENTERLINE	

- 11 If you select 11.USE NAMED CONSTRAINT SET from the Define Constraints menu, the system allows you to name a saved constraint set to use during selection. The system displays:

CONSTRAINT SET=csetname	Enter the name of a constraint set. Use
ENTER CONSTRAINT SET NAME TO USE	] to accept the current constraint set.
	Enter LIST for a complete list of
	constraint sets.

If the name you enter does not exist in the data base, the system displays:

```
CONSTRAINT SET NOT FOUND
```

The system then redisplay:

```
ENTER CONSTRAINT SET NAME TO USE
```

- 12 If you enter 12.CLEAR CONSTRAINTS from the Define Constraints menu, the system removes all constraints and displays:

```
ALL CONSTRAINTS CLEARED
```

- 13 If you enter 13.LIST CONSTRAINT SETS from the Define Constraints menu, the system displays the chosen constraint set and displays:

```
CONSTRAINT SET=csetname          Enter the constraint set name. Use ] to
ENTER CONSTRAINT SET NAME TO LIST accept the current constraint set. Enter
                                  LIST for a complete list of current
                                  constraint sets.
```

If the entered name does not exist, the system displays:

```
CONSTRAINT SET NOT FOUND
```

The following prompt is then redisplayed:

```
ENTER CONSTRAINT SET NAME TO LIST
```

For example, you may have created a constraint set named BOLTS which had these properties:

```
INCLUDE LEVELS 2,3,4,6
INCLUDE PEN 1
INCLUDE LINES, ARCS
EXCLUDE ENTITIES DRAWN IN COLOR 1
EXCLUDE DASHED ENTITIES
```

If you request a list of that constraint set, using 13.LIST CONSTRAINT SETS from the Define Constraints menu, this list would be displayed:

```
LIST OF CONSTRAINT SET BOLTS
INCLUDE
  LEVEL-2-4,6
  PEN-1
  TYPE-LINES,
  -ARCS

EXCLUDE
  COLOR-1
  FONT-DASHED
```

- 14 If you selected 14.DELETE CONSTRAINT SETS from the Define Constraints menu, the system displays:

ENTER CONSTRAINT SET NAME TO DELETE

Enter the constraint set name to be deleted. Enter LIST for a list of all constraint sets in the part.

If the name does not exist, the system displays:

CONSTRAINT SET NOT FOUND

The system then redisplay this prompt:

ENTER CONSTRAINT SET NAME TO BE DELETED

If the constraint set does exist, the system prompts:

DELETE csetname?

Enter:

Y To delete the constraint set.

N To reenter the constraint set name.

After the constraint set has been deleted, the system displays:

csetname DELETED.

- 15 If you select 15.NAME CURRENT CONSTRAINT SET from the Define Constraints menu, the system saves the current constraint set for future use. Constraint set names may have from 1 to 10 alphanumeric characters. The following names cannot be assigned to constraint sets: LIST, NONAME, NONE.

The system displays:

ENTER CONSTRAINT SET NAME

After you have entered it, the system displays:

csetname SAVED.

Entering Data

When in the enter data mode, the system displays a prompt and data value requesting that you enter a value. You can then examine the value displayed, enter a new value, and define displayed values as variables. For example, for 10.2 KEY IN, the system displays the following prompts:

<p>1.XT1 = 2.YT1 = 3.ZT = 0.00</p>	<p>Enter data for any variable appearing on the menu without a default value. Those variables which have default values may be accepted or new values may be entered.</p>
--	---

On some terminals, such as the Tektronix 4014, a greater than (>) symbol points to the current line awaiting input. Once you enter a value and press RETURN, the greater than symbol is overwritten by a less than (<) symbol. The system then advances to the next line, skipping over any lines with default values. When all variables have values associated with them, you may either enter] and press RETURN to accept them or enter the number of any line you wish to alter. If you enter a line number, the system crosses out the existing value and waits for a new value to be entered. This process continues until you enter].

On other terminals, such as the Tektronix 4115, no > or < symbols are displayed, nor are values crossed out when you modify them. Instead, the system displays the entire menu and prompts you to enter input by reissuing each line sequentially. Once you have entered all the values, enter] and RETURN to accept these settings. If you wish to modify any values, enter the appropriate line number and the system will reprompt you.

For any data or text entry, there is a limit to the number of characters that may be entered. To find the limit for a specific function, refer to the specific manual for that menu function.

Data Entry in Feet/Inches

When you enter data with feet/inches unit of measure, the following rules apply:

- A single quote (') denotes feet and a double quote (") denotes inches.

Examples:

5' for 5 feet.

2" for 2 inches.

5'2" for 5 feet and 2 inches.

- Constants and variables that are not followed by a single or a double quote are interpreted as inches, that is, the inch symbol is optional.

Examples:

2" and 2 are interpreted as 2 inches.

A" and A are interpreted as A inches.

- Fractions of an inch are expressed by typing an inch symbol (") between the integer and the fraction. The fractional part is expressed by a numerator, followed by a slash (/), followed by a denominator.

Examples:

2"1/2 is interpreted as 2.5 inches.

1' 3/8 is interpreted as 1 foot and 0.375 inch.

3' 6"7/8 is interpreted as 3 feet and 6.875 inches.

- Blanks are insignificant and may be added to improve readability. Arithmetic expressions are evaluated from left to right; high precedence operations are evaluated first.

Examples:

2" 1/2 and 2"1/2 are identical.

2' 1" 3/8*2 is interpreted as 2 feet and 1.750 inches.

- Parentheses must be used when measurements in feet/inches are used as operands in arithmetic expressions.

Examples:

(1"1/2)*(2"3/4) is equal to (1.5 in) multiplied by (2.75 in).

(3' 4"1/16)*2 is equal to (3 ft and 4.0625 in) multiplied by 2.

- Data entry in feet/inches is valid only when the unit of measure modal is in feet/inches and data entry is for linear (distance) measurement.

Examples:

XT = 3' 2"7/8 is a valid distance measurement.

START ANGLE = 45" is an invalid distance measurement.

RESIZE FACTOR = 9/16' is an invalid distance measurement.

Data Display in Feet/Inches

When the unit of measure is feet/inches, data displayed by the system is expressed in feet/inches. This applies only to linear (distance) measurements. System modals are provided to control the data display format when the unit of measure is feet/inches (refer to 1.4 SYSTEM DECIMAL PLACES in chapter 3 of this manual).

Examples:

RADIUS = 1'2"1/2 is a distance measurement.

YT=3'0"7/8 is a distance measurement.

RESIZE FACTOR=1.0000 is not a distance measurement.

Display of Drafting Dimensions in Feet/Inches

When the unit of measure is feet/inches, dimension drafting entities generated with the automatic dimensioning method are displayed using feet and inches symbols. The single quote (') denotes feet, the double quote (") denotes inches. A dash character (-) separates feet and inches. Drafting modals are provided to control the formatting of dimension text (refer to 16.1.4 DIMENSION TEXT in the ICEM Design/Drafting Drafting Functions manual).

Type-Ahead Feature

The type-ahead facility can speed up the data entry and menu selection process. Instead of entering RETURN after each value, you can type ahead with the TAB key or a period. In the 10.2 KEY IN example shown in the ENTERING DATA example above, you can enter either of the following instructions to define a line between (2,2,0) and (4,4,0):

```
2 TAB 2 TAB 4 TAB 4 ] RETURN
```

```
2.2.4.4. ] RETURN
```

NOTE

When you use the type-ahead feature, intermediate menus and menu headings will not be displayed.

Data Capture

At any time, you can enter variable names in place of numeric values as entered data. These variables may be up to six characters in length. Variables can be defined and assigned values either by using 5.2 GRAPL (refer to the ICEM Design/Drafting Data Management manual) or by assigning displayed values to variables when in the enter data mode. This latter method is called data capture. By entering an exclamation point (!) followed by a 6-character name, the value for the current line is assigned to that variable. For example, when verifying two points, the system may display:

```
1.DXT      = 1.23 !DX
2.DYT      = 2.00
3.DZT      = 0.00
4.2-D DIST = 2.35 !D2
5.3-D DIST = 2.35
```

To capture the dxt value, enter !. For example, you can enter !DX on a line to save the value of that entry in the variable DX. Data in this example is displayed to two decimal places, but the variable DX is assigned the unrounded value, which is 1.233408. To capture the 2-D DIST value in the variable D2, press the RETURN key or square until the cursor appears on line 4 and enter !D2. The value of D2 would be 2.3497425. When you finish capturing values, enter].

Calculating Capability

At any time, you can enter arithmetic operators, expressions, and functions in place of numeric values as in enter data mode. The system calculates, displays, and saves the value for future reference. For example, the following entries are valid (the system displays the calculated values):

1.X1 = A=SQRT(4) =2.0000
2.Y1 = B=3/A =1.50000
3.Z1 = 5/8 =0.625

Arithmetic expressions use arithmetic operators to combine constants, variables, or functions in a sequence that can be reduced to a single arithmetic value.

This arithmetic operators available in ICEM DDN are:

- + Addition
- Subtraction
- ** Exponentiation
- * Multiplication
- / Division

Arithmetic expressions are evaluated from left to right in the following order of preference:

- Exponentiation
- Multiplication and division
- Addition and subtraction

Nested expressions (expressions within parentheses) are evaluated first, proceeding from the innermost expression to the outermost.

Embedded Text

Embedded text is nonexecutable text that is recorded on a script file or within a tablet string. When the script file or tablet string is executed, the embedded text will be written to the terminal. This allows a user to document script files and tablet strings.

Whenever a menu item can be entered, you can enter the | character instead. This puts the system into the embedded text mode, where it stays until you enter another | character. When you enter a | character, a line of 40 periods appears in the menu area of the screen. (Entered text is limited to 40 characters per line.) Any keyboard or tablet entry is translated directly to the screen and to a script file. No further action is taken on embedded text entries. The following example illustrates the embedded text feature. In this example, the user entered a | after 2.MODEL COORDINATES and after 'original scale.'

```

---DEFINITION SPACE
 1.TRANSFORM COORDINATES
 2.MODEL COORDINATES|
.....
Transform coordinates are used here
because the data to be entered is at the
original scale|
.....
 1.XT =
 2.YT =
 3.ZT = 0.0000

```

Later, when the script is run, the embedded text displays as follows:

```

---DEFINITION SPACE
 1.TRANSFORM COORDINATES
 2.MODEL COORDINATES
.....
Transform coordinates are used here
because the data to be entered is at
the original scale
.....
 1.XT =
 2.YT =
 3.ZT = 0.0000

```

Using the Tablet

ICEM DDN supports the Tektronix graphics tablet on all terminals except the Tektronix 4105. The tablet accepts three types of input:

- Text entry, such as notes, labels, and values
- Menu selections
- Graphics input

The tablet transmits all three types of input to the system by means of the tablet pen or other cursor device. When text or menu data are transmitted, this device is referred to as an alphanumeric cursor. When graphics input is transmitted, this device is referred to as a graphics cursor.

ICEM DDN accepts text and menu data when the READY light on the tablet power module is on for the Tektronix terminal type 4014 only. The graphics cursor displays on the screen of other terminal types. Press the pen against the tablet to transmit data. Pressing the pen activates the PEN light on the power module for Tektronix 4014 terminal type only. Remove the pen from the tablet when not in use to prevent sending extraneous data.

The graphics cursor device sends graphics data to the system. For example, you enter graphics data by moving the pen tip on the tablet face. The minimum distance between the pen and tablet for successful transmission is 3.18 mm (0.12 in). The lower left corner of the tablet is recognized by the system as the lower left corner of the screen display.

NOTE

Refer to appendix B for more information on using the tablet.

Menu and Text Selection

You can enter a series of menu selections and text from the tablet by using the pen to indicate an area on the tablet assigned to that input. The tablet sends the pen location on the tablet to the computer, where the system decodes it to determine the area chosen and the action requested.

For any data or text entry, there is a limit to the number of characters you can enter. To find the limit for a specific function, refer to the specific manual for that menu function.

Tablet Error Messages

The following messages may occur after a tablet menu selection has been made.

If a tablet square is selected which has no menu string associated with it, the system displays the following message:

TABLET SQUARE UNDEFINED.

If you select a tablet square from a programmed page that is defined by a string name, and a string with that name is not in the local MSTRING file or there is no local MSTRING file, the system displays the following message:

```
MSTRING msname IS NOT IN msfile
```

If the system finds a line in the MSTRING file with more than 127 characters when it is executing a tablet square defined by a string name, the system displays the following message:

```
A LINE IN MSTRING msname IS TOO LONG.
A MAXIMUM OF 127 CHARACTERS CAN BE
USED IN A SIGLE MSTRING LINE.
```

The system stops any string being processed and waits for input.

If the system finds an error in the menu input format when it is executing a tablet square defined by a string name, the system displays the following message:

```
MSTRING msname CONTAINS A SYNTAX ERROR
```

The system stops processing the string and waits for input.

Graphics Input

You enter graphics input from the tablet using the pen or other graphics cursor device. The cursor on the screen follows the location and movement of the pen on the tablet. The pen is used to select entities, indicate the side or position of an entity, create a line between points, and many other graphics functions.

When using the tablet, enter graphics input to ICEM DDN by pressing the pen on the appropriate function control square. Refer to Using the Function Control Keys and Squares in this chapter for a complete description of all available function control squares. The upper portion of the tablet overlay is reserved for function control square selection. Refer to appendix B for more information on tablet use.

The default function control square for graphics input from the tablet is the C square. You may select other squares at any time during graphics input. For example, to select points on the screen display, you would press the pen on the P square. The system will then display the points you select until you enter another instruction.

Valid function control squares for entity selection include C, P, L, A, N, O, S, E, and T. The control character automatically resets to C after a menu selection. However, the function control square is not reset if you select a square that does not require a menu selection. For example, selecting Z (zoom) during graphics input resets the system to C, whereas selecting delete last entity (which requires no further menu selection) leaves the function control unchanged.

In addition to the function control squares for entity selection, other function control squares include operation reject (I), operation complete (I), change menu display (M), repaint display (R), zoom (Z), change depth (D), return to the main menu (F), and help (?). Also, prompts such as INDICATE POSITION, INDICATE DIRECTION, and INDICATE SIDE all require graphics input that is different from entity selection. Graphics input of this type requires the function control square C and has meaning only with respect to the work view. Therefore, you must provide this input within the work view.

In some cases, you may make selections either by pressing the appropriate squares in the upper portion of the tablet or by pressing squares in another portion of the tablet. For instance, points can be selected either by pressing the P square or by pressing any of the point menu selection squares in the lower left portion of the tablet (refer to figure B-1 in appendix B).

If multiple views are displayed and you indicate a position outside the work view, the system sounds a bell to indicate an error and displays:

INDICATION MUST BE IN WORK VIEW

When you enter view indicators on the work view, the system returns to the INDICATE POSITION, INDICATE DIRECTION, or INDICATE SIDE prompt.

Choosing an invalid square or tablet area causes the system to sound a bell.

Entity Dragging

Entity dragging is a function which allows you to move or drag selected entities about the screen so that you may preview new positions prior to actual placement. The dragging function is turned on or off with modal 1.14.3 ENTITY DRAGGING. Entity dragging can be used in menus 13.5 TRANSLATE and 13.7 DUPLICATE AND TRANSLATE (refer to the ICEM Design/Drafting Basic Construction manual), and 16.13.1 NEW ORIGIN (refer to the ICEM Design/Drafting Functions manual).

Entities Defined Off Screen

If an entity is defined partially or completely off screen while in the single view mode, the system displays:

ENTITIES DEFINED OFF SCREEN

If you define an entity which is partially or completely off screen while in the multiple view mode, the system continues without prompts or actions.

Coordinate Systems

ICEM DDN allows you to construct and modify entities in three-dimensional space on a two-dimensional terminal screen. Certain key terms, concepts, and relationships--such as coordinate systems, coordinate space, views, work views, workspace, and workplane--will assist you in making full use of this three-dimensional feature. Examples and descriptions of these features follow.

Terms, Concepts, and Relationships

Coordinate Space

Coordinate space refers to a reference frame in which every point can be described by a set of three numbers, that is, x, y, and z coordinates. The x, y, and z axes are three mutually perpendicular axes. Each point in space can be referenced by measuring distances given by the coordinate values along the corresponding axes. There are two types of coordinate space: model coordinate space and transform coordinate space, depending on the origin and orientation of the coordinate axes.

Model space is the coordinate space by which every other space is defined. Model space is fixed in orientation and in origin. It is always displayed as the front view, view 1.

Transform space is a coordinate space defined by a transformation from model space. Transform space is any coordinate space generated by rotating the model space axes about the origin ($x=y=z=0$) followed by a translation away from the origin.

Coordinates

Coordinates are the values of a spatial position measured against right-handed, three-dimensional Cartesian coordinate axes that are mutually perpendicular (orthogonal). ICEM DDN offers you two coordinate systems for entity construction and modification: model and transform coordinates.

Model coordinates are the values of a spatial position measured against the x-, y-, and z-axes associated with the front view (model space).

Transform coordinates are the values of a spatial position measured against the xt-, yt-, and zt-axes associated with any other space.

Workspace

Workspace is the space in which entity construction and modification occurs. This space is referred to as the definition transform space. The work plane exists in the workspace parallel to the xt-yt plane of the workspace. Each view can have a workspace associated with it. Geometry is defined and edited in the work view and in the current workspace.

You activate a workspace in one of three ways:

- By assigning values to x-, y-, and z-axes (the model coordinates) when in view 1 (front view);
- By assigning values to xt-, yt-, and zt-axes (the transform coordinates) when in any view other than view 1;
- By using 8.11 CHANGE WORK SPACE to activate any axes position as a workspace.

Definition Space

The definition space is the coordinate space in which the entity was defined.

View of Definition

The definition space was referred to as view of definition in previous ICEM DDN versions.

Space Name

A space name is the identifying name for a coordinate space.

View

A view is a particular way of looking at a three-dimensional space in a two-dimensional medium, the display screen. Associated with a view is a coordinate space where the first two coordinates describe the plane of the screen. The third coordinate is perpendicular out of the screen.

Work View

A work view is the view window on the screen display where construction and modification occurs. This space is referred to as the display transform space. It is possible to select entities outside of the work view.

Standard View

A standard view is a display of any of these spaces: front, back, top, bottom, right, left, isometric, and auxiliary.

View Name

A view name is another term for a space name.

View Number

A view number is another term for a space number.

Work Plane

A plane used for construction and modification of some entities (such as lines, arcs, hexagons, and triangles). This plane is only operational in the current workspace and affects the orientation of those entities.

If the workspace is model coordinate space, the work plane is perpendicular to the z-axis. If the workspace is transform coordinate space, the work plane is perpendicular to the zt-axis of the particular space. In either case, the z or zt value of the plane is the current depth.

Using the Three-Dimensional Coordinate System

Figures 2-1 and 2-2 illustrate the model and transform coordinate system alignments of the eight standard views: top, bottom, front, back, right, left, auxiliary 1, and isometric 1. The figures illustrate the movement of the workplane along the z-axis of the model coordinates.

The arrowhead shows the positive direction of the z-axis vector in each view. Note that the vector of the zt-axis and the z-axis in the front view is never displayed, because it is directed toward the user in each view.

In any of these views if you use transform coordinates, the workplane moves along the zt-axis. Thus, the zt-axis and z-axis are not always aligned. For example, in AUX 1 and ISO 1 views, the workplane front and back are reversed in the respective views.

Figures 2-3 through 2-10 detail the orientation of the model and transform coordinate axes in the eight standard views. These orientations are important for accurate entity construction and modification.

Note the location of the positive and negative vectors of the z-axis indicated in each view. The orientation of these vectors is easily seen in all views except views 1 (front) and 5 (back). In the front view, the positive z-axis is toward the user and the negative z-axis is into the display screen. The back view is the opposite: the positive z-axis is into the screen and the negative z-axis is toward the user. The vector of the zt-axis, as noted above, is usually directed into the screen.

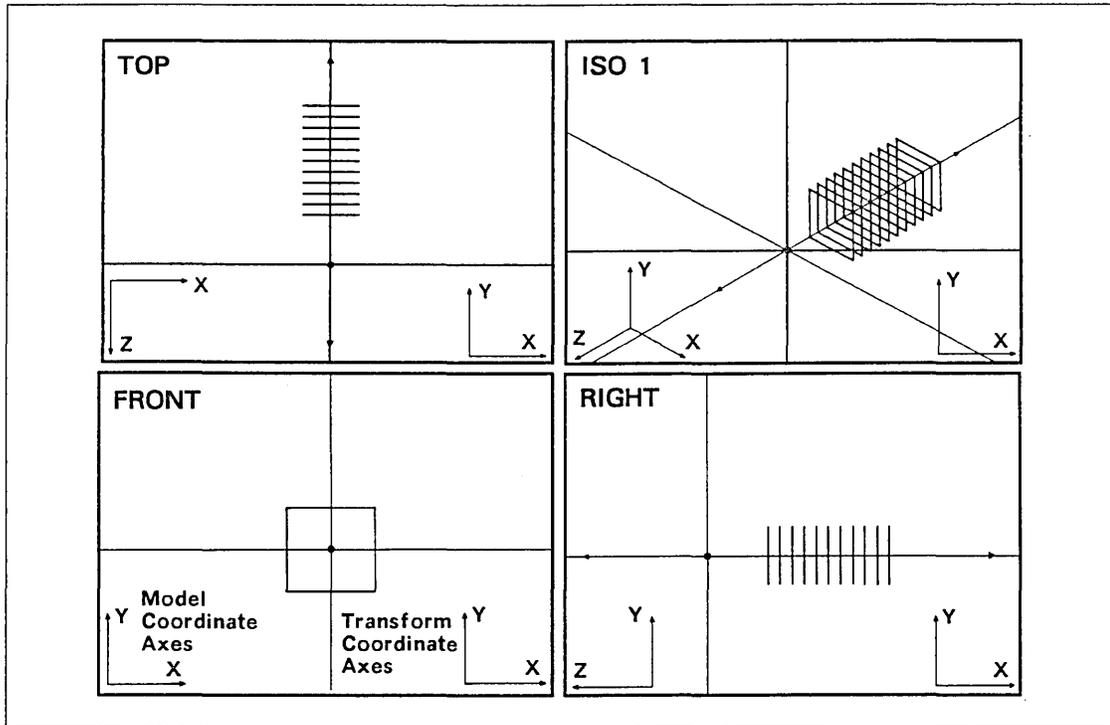


Figure 2-1. Four Display Views (A)

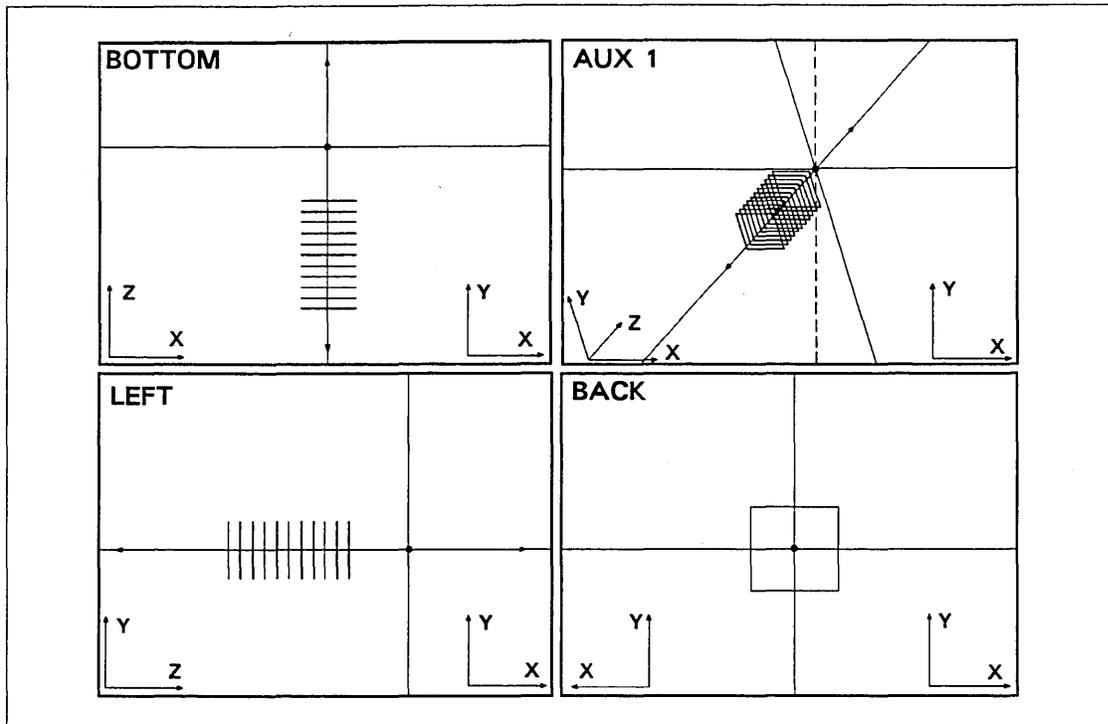


Figure 2-2. Four Display Views (B)

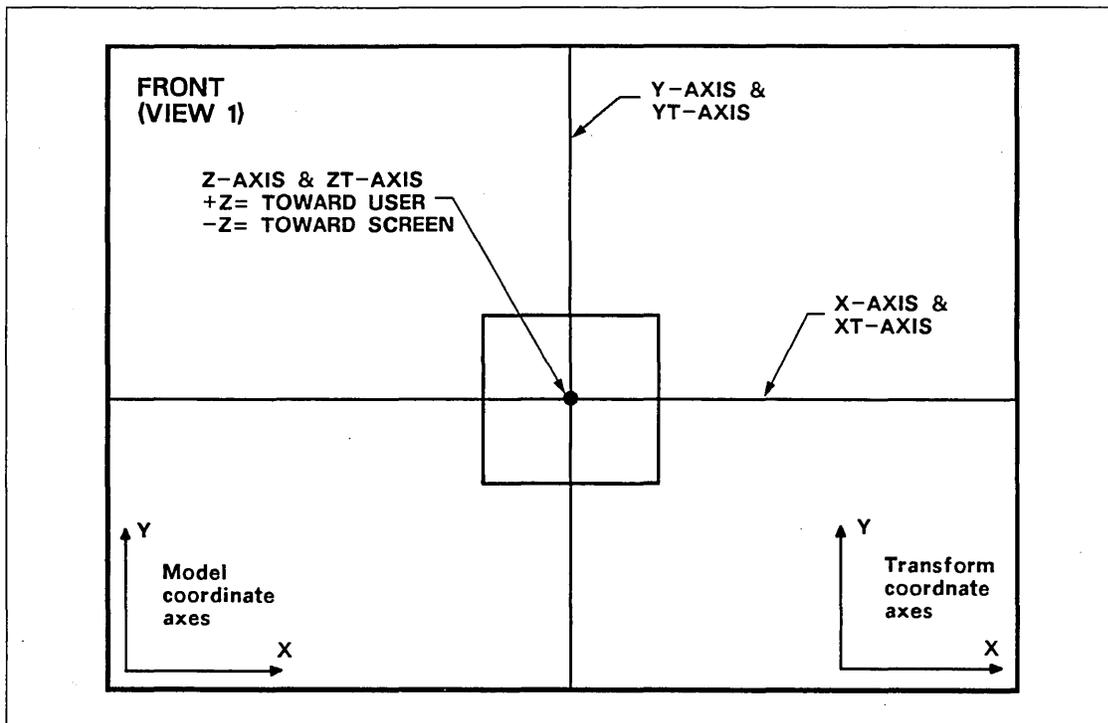


Figure 2-3. Front Display View

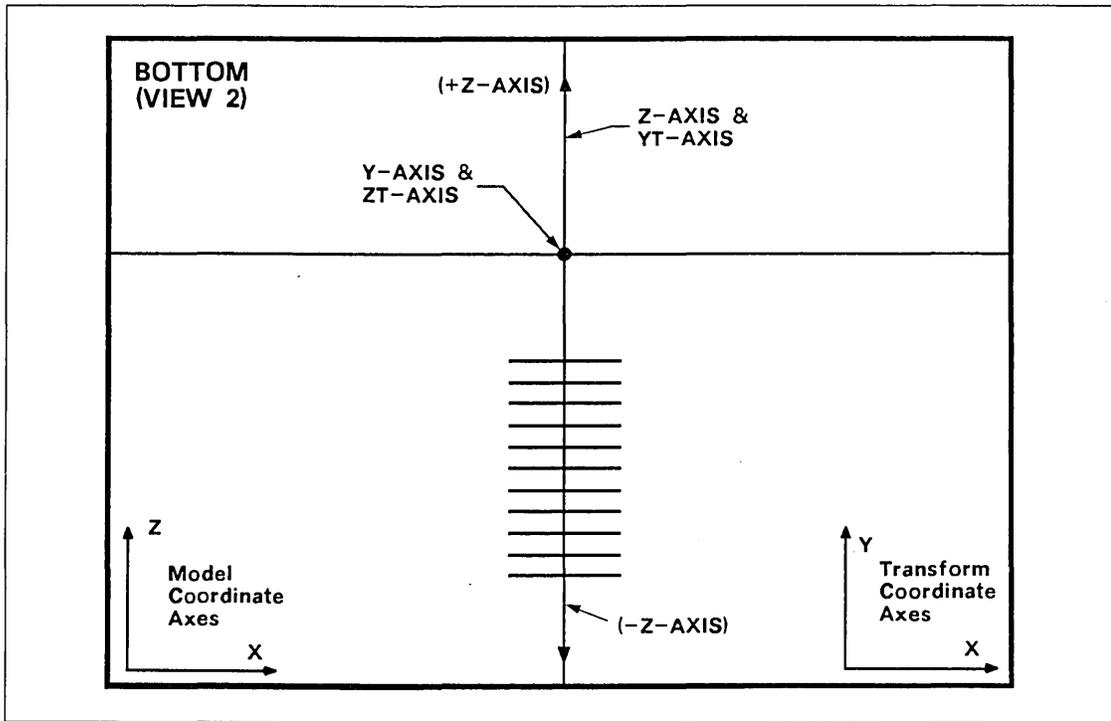


Figure 2-4. Bottom Display View

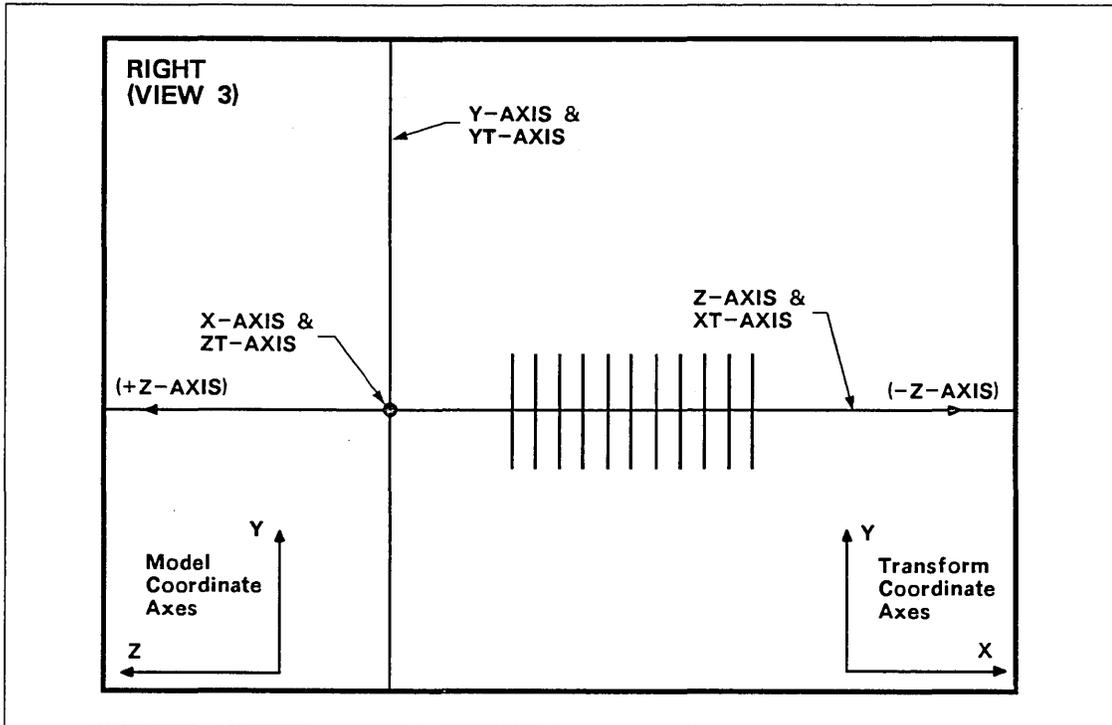


Figure 2-5. Right Display View

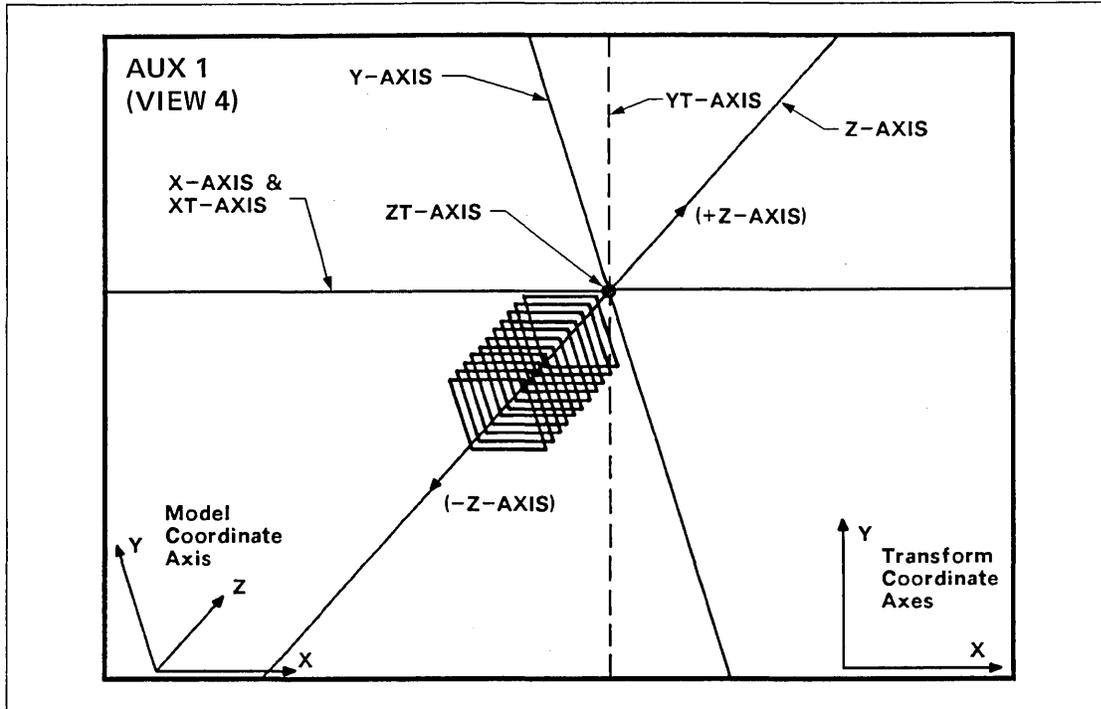


Figure 2-6. Aux 1 Display View

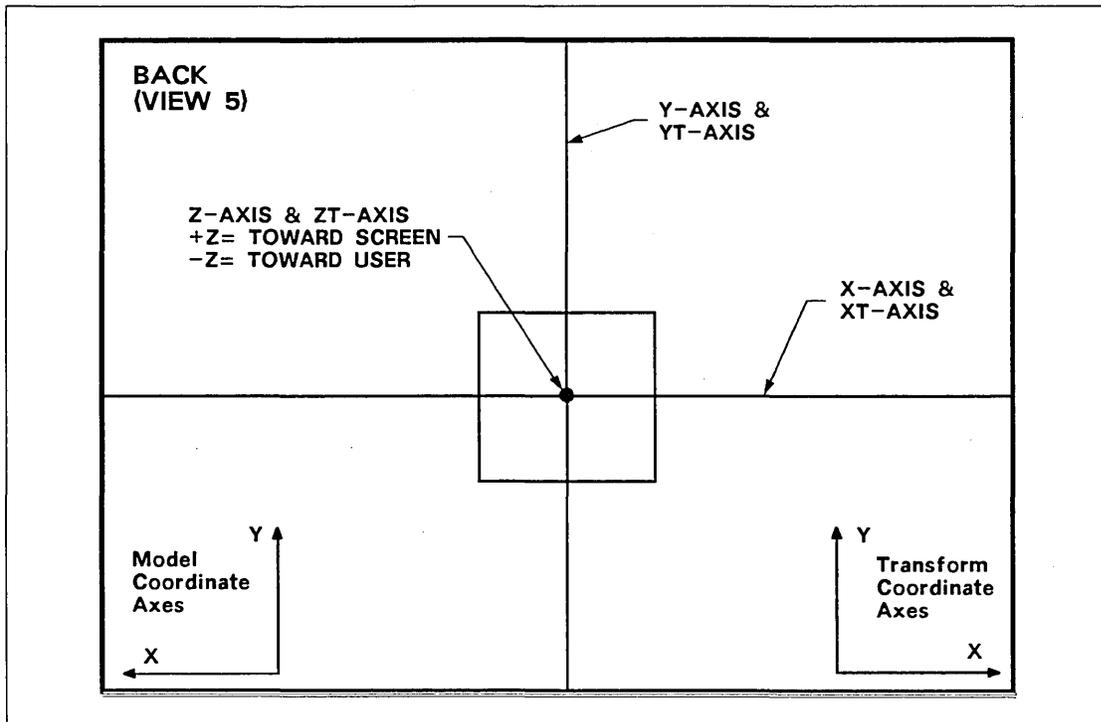


Figure 2-7. Back Display View

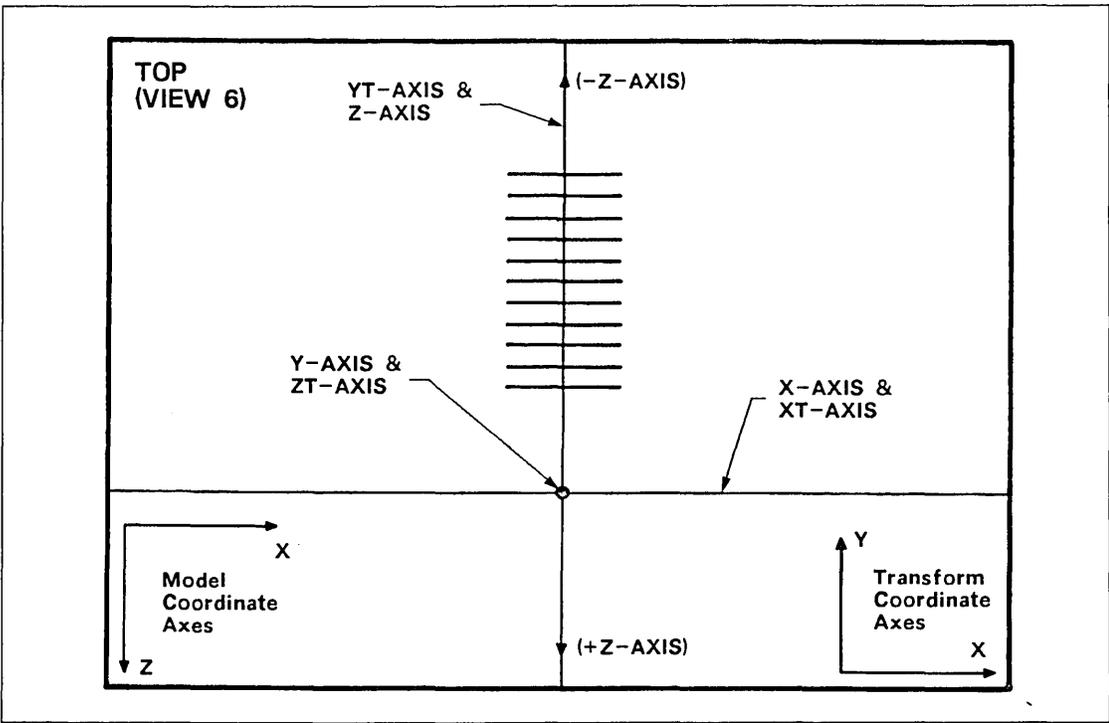


Figure 2-8. Top Display View

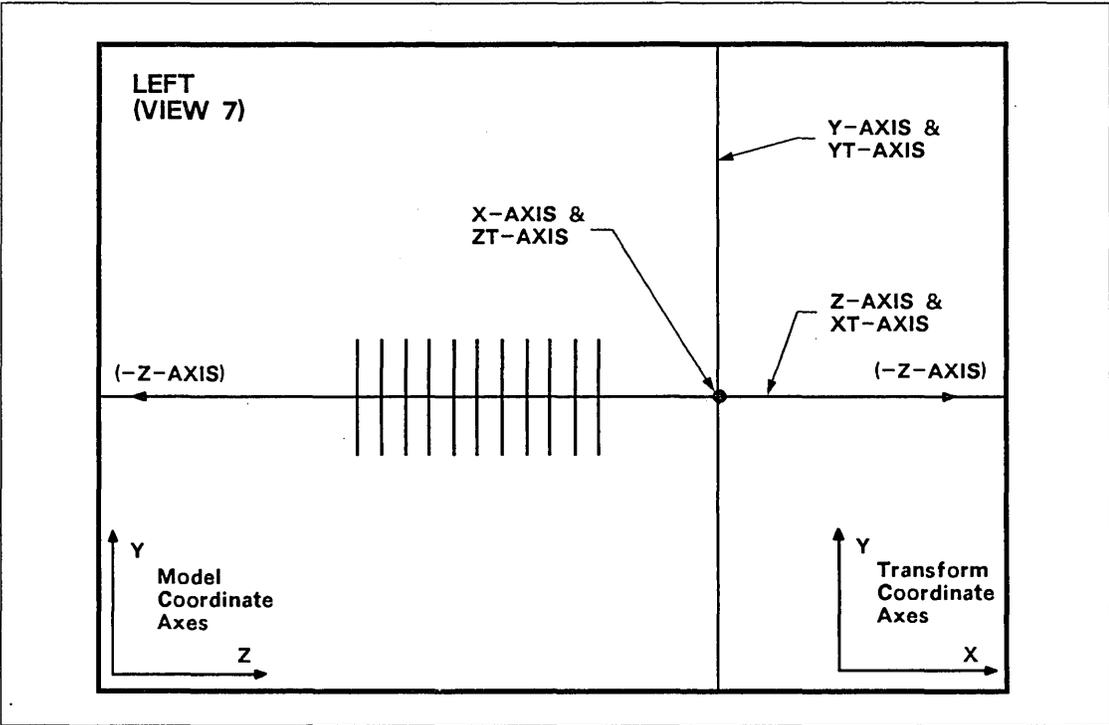


Figure 2-9. Left Display View

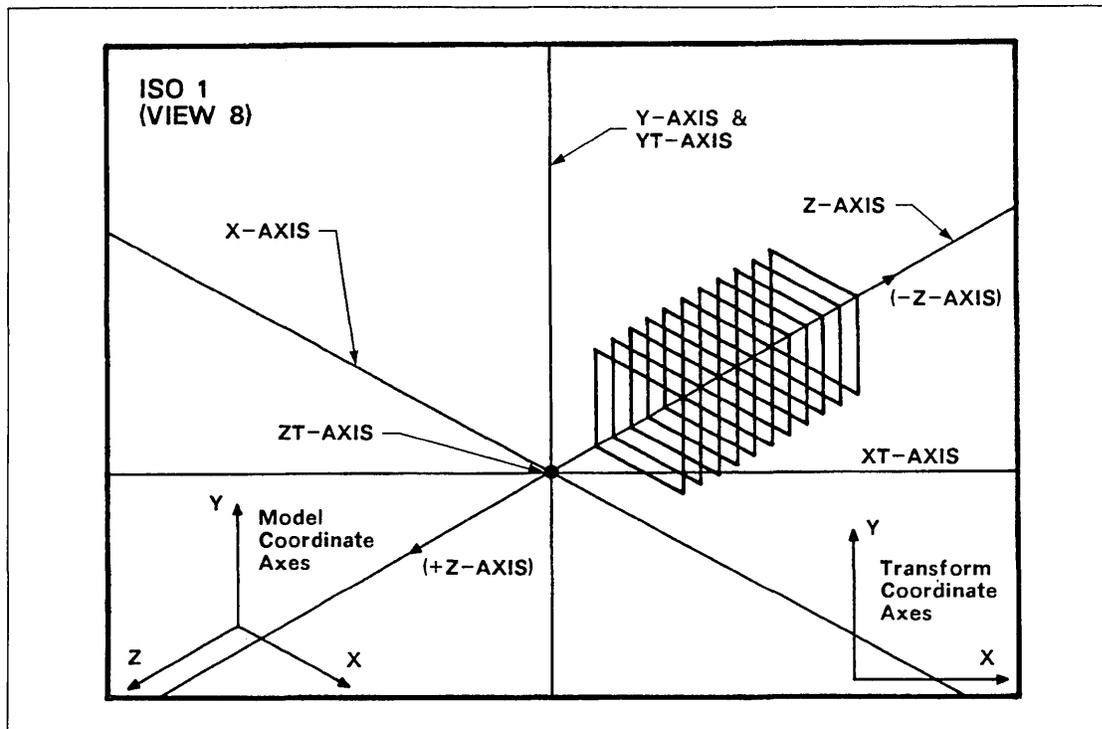


Figure 2-10. ISO 1 Display View

Help, Error, and Informative Messages

ICEM DDN provides help, error, and informative messages that assist you in creating and modifying part drawings.

By pressing the ? key or the HELP square, you can ask ICEM DDN for assistance in understanding a prompt or in deciding what action to take next.

ICEM DDN has two ways of warning you about errors or potential problems. Some operations such as 5.13 GPL (refer to ICEM GPL manual) display number-coded error messages. Error messages explanations are listed in appropriate reference manual chapters or appendixes.

The informational message system displays direct interactive messages on the terminal screen to tell you immediately that a problem has occurred or may occur soon. For example, when using 3.3 DELETE ALL POINTS, the system prompts you to acknowledge that you recognize you have requested deletion of all displayed points.

File Length Limits

File length limits may be established for the filing file (TAPE3), the global parts file (GPARTS), and the global pattern file (PATTERN). Length limits are determined by parameter settings (refer to Preselecting Parameter Settings in Chapter 1 of this manual). The TAPE3 file length limit is set by the FL parameter, the global parts file length limit is set by the GL parameter, and the global patterns file length limit is set by the GP parameter. The file length limit feature is turned on selectively for each file type by the presence of a parameter setting.

Entered values are multiplied by 100 and represent the number of ICEM DDN sectors the file may occupy. An ICEM DDN sector is twice as large as a NOS program resource unit (PRU). For example, a limit of 20 represents 2000 ICEM DDN sectors or 4000 NOS PRUs. The default values for the limit parameters are 10000 ICEM DDN sectors. Defaults are selected by entering the two character parameter without a value on the parameter statement (that is, FL, GL, or GP). For each of the parameters, if a value or default is not entered, the status and limit enforcement is not activated for that particular file.

NOTE

The length of global files is found by FILINFO which is only available on the NOS and KRONOS systems. (Global file length information is not available on NOS/BE and SCOPE systems).

When a file that has limits is added to, the system displays the maximum file size, total number of ICEM DDN sectors used by this file, and the percentage of maximum file space that has been used. The system displays:

```
PARTS FILE STATUS:  xx% OF MAXIMUM SIZE
TOTAL SECTORS USED   xxxxx
MAXIMUM PERMITTED   xxxxx
```

```
GLOBAL PARTS FILE STATUS:  xx% MAX
TOTAL SECTORS USED   xxxxx
MAXIMUM PERMITTED   xxxxx
```

```
GLOBAL PATTERNS FILE STATUS:  xx% MAX
TOTAL SECTORS USED   xxxxx
MAXIMUM PERMITTED   xxxxx
```

NOTE

If none of these parameter settings is used, the system does not display any file length limits messages. Your file length is allowed to grow to any size permitted by your validation.

The size of TAPE3 is checked whenever the file is saved or an addition is made from the global parts file, global pattern file, or from the UTF or local pattern areas of TAPE3. If you are working on a part and input from a pattern, global part restore or UTF would exceed the TAPE3 length limit, the system will not accept new additions from any of these sources except the UTF.

The sizes of the global part and global pattern files are checked whenever parts or patterns have been written to the file.

When you file TAPE3, the system displays the file status warning message if the maximum file length limit has been exceeded:

```
PARTS FILE LENGTH LIMIT EXCEEDED-
YOU CANNOT USE THIS FILE UNTIL
THE LIMIT IS INCREASED
      ACKNOWLEDGE
```

You acknowledge this message (by entering J or Y). When the file length limit has been exceeded, the system terminates (but does not abort). You are then permitted to reenter ICEM DDN to list parts. You can also initialize areas of TAPE3 (parts, patterns, or UTF) by entering 'PARTINITGO' at the ENTER NAME prompt. The system then prompts whether you wish to initialize parts, patterns, or the UTF. If you attempt to bring up a part, the above warning message is redisplayed and the system again terminates.

When the file length limit on global parts or patterns files is exceeded, the system does not allow you to add any more data to those files until the limit is increased or the files are purged. The system displays:

```
FILE LENGTH LIMIT EXCEEDED-
YOU CANNOT ADD TO THIS FILE UNTIL
THE LIMIT IS INCREASED
      ACKNOWLEDGE
```

For proper management of files with length limits, you must watch the length of files. When file length approach the maximum limit, you can move parts to other files or delete parts before they exceed the limit. If the length limit is exceeded, the parameter settings can be temporarily increased in order to reenter ICEM DDN. Once you have reentered the system, you can access the list parts menu in order to delete specific parts or move parts to a global file. Global files size can be reduced by moving parts or patterns off the files or by deleting parts and patterns.

Local File Names

Nearly 40 different local files are used in ICEM DDN. Table 2-3 lists existing local file names. You should avoid using these local file names to prevent unwanted mixing of data.

Table 2-3. Local File Names

File Name	In/Out	Menu	Use
AD20SCR	I/O	6.2.8	Delete global pattern
BULKIN	I	7.10	Bulk data input
CLFIN	I	7.1	Input CLFILE for interpretation
CLTAPE	O	7.1	Output CLFILE
CT	O	Introduction	Overlay trace

(Continued)

Table 2-3. Local File Names (Continued)

File Name	In/Out	Menu	Use
DISPSC		7.1	Internal display scratch file
EDLLOG	O	-	EDL output file
GPARTS	O	6.1.1	Save part on global file
GPARTS	I	6.1.2	Retrieve part from global file
GPLLIB	I/O	5.13	Library of compiled GPL programs and services
GRAIOF	I	5.2.2	Primary edit file for GRAPL source
GRAIOF	I	5.2.7	Input GRAPL to UTF
GRAIOF	O	5.2.8	Output GRAPL from UTF
GUTF	O	5.2.2	Global UTF for GRAPL object
GUTF	I	5.2.4	Global UTF for GRAPL object
GUTF	O	6.5.3	Global UTF for UTF SAVE
GUTF	I	6.5.4	Global UTF for UTF RESTORE
IPARTD	O	6.1.9	Independent part save
IPARTD	I	6.1.10	Independent part retrieve
IT	O	Introduction	Input trace
LIST	O	5.6.4	Attributes of entities
LOCFIL		7.1	Local file
MESHFIL	O	7.12	Mesh generator
MSTRING	I	7	Tablet menu strings (user generated)
MSDIR	I/O	7	MSTRING file directory (for system use only)
MT	O	Introduction	Menu trace
OT	O	Introduction	Output trace
PRINTR	O	5.2.3	AUTO GRAPL output file
PRINTR	O	7.1	CLPRNT output for line printer
PATTERN	I/O	6.2	Pattern library
SCRATC		7.1	Internal scratch file

(Continued)

Table 2-3. Local File Names (Continued)

File Name	In/Out	Menu	Use
SCRATCH		6.1.1	Scratch file
TAPE3	I/O	Introduction	Data base
TAPE31	I/O	Introduction	Data base scratch page storage
TAPE32	I/O	Introduction	Data base area
TAPE33	I/O	Introduction	Data base move file
TAPE4	O	18.1.6	Spline analysis output for line printer
TAPE9	O	7.2	Plot file
TFILE	I/O	7.13	Tablet pages

Entity Types and Codes

Table 2-4 lists the entity types and their respective code numbers.

Table 2-4. Entity Type/Code Number

Code Number	Entity Type Description	Code Number	Entity Type Description
0	Entity deleted	25	Reserved for future use
1	Point	26	Reserved for future use
2	Line	27	Reserved for future use
3	Arc/circle/fillet	28	Offset surface
4	Conic	29	Composite surface
5	Spline	30	Curve-driven surface
6	Composite curve	31	Bezier curve
7	Vector	32	Linear dimension
8	Point set	33	Radius dimension
9	Three-dimensional spline	34	General label/taper dimension
10	Machining curve	35	Diameter dimension
11	String	36	Angular dimension
12	Rectangular array	37	General note
13	Circular array	38	Centerline
14	Copious data	39	Section lining
15	Group	40	Feature frame
16	Variable	41	Template
17	Data graphs	42	Reserved for future use
18	Plane	43	Reserved for future use
19	Surface of revolution	44	Reserved for future use
20	Tabulated cylinder	45	Reserved for future use
21	Ruled/developable surface	46	Lathe/profile/pocket/3-axis/ 5-axis
22	Curve mesh surface	47	Composite toolpath
23	Fillet surface	48	N/C utility (copious data)
24	Reserved for future use	49	Tool

(Continued)

Table 2-4. Entity Type/Code Number (Continued)

Code Number	Entity Type Description	Code Number	Entity Type Description
50	System entity	61	Data curve
51	Reserved for future use	62	Reserved for future use
52	Hexahedron	63	Reserved for future use
53	Reserved for future use	64	Reserved for future use
54	Reserved for future use	65	Reserved for future use
55	Reserved for future use	66	Reserved for future use
56	Reserved for future use	67	Reserved for future use
57	Reserved for future use	68	Reserved for future use
58	Reserved for future use	69	Reserved for future use
59	Reserved for future use	70	Schematic element
60	Data point set	71	Schematic connect table entity

ICEM DDN Menus by Manual Title

The following list describes the organization of the 19 major ICEM DDN menus by manual title. New ICEM DDN users may find this list helpful when learning the location of menu choices. This list may be used by all ICEM DDN users to learn which manual to consult for a particular menu choice.

ICEM Design/Drafting Introduction and System Controls manual:

Chapter	Contents
1	Accessing ICEM DDN
2	Using ICEM DDN
3	MENU 1 MODALS AND FONTS 1.MENU DISPLAY 2.CONSTRUCTION MODAL 3.TOLERANCES 4.SYSTEM DECIMAL PLACES 5.CURVE FONT 6.MODIFY ENTITY FONT 7.MODIFY ENTITY LEVEL/PEN NO. 8.Reserved for Future Use 9.COLOR DISPLAY 10.BLANK/UNBLANK VIEW SELECT 11.ENTITY SELECTION CONTROL 12.DISPLAY MODAL STATUS 13.DISPLAY TITLE BLOCK 14.TERMINAL DEPENDENT MODES 15.DATA ENTRY MODE 16.ACTIVATE PAGE/CHANGE TABLET FILE 17.CHANGE TRACE FILE STATUS 18.GRID 19.THICK LINES
4	MENU 2 BLANK/UNBLANK 1.BLANK - SELECT 2.BLANK - LEVEL RANGE 3.BLANK - DISPLAYED TYPE 4.BLANK - ALL 5.UNBLANK - SELECT 6.UNBLANK - LEVEL RANGE 7.UNBLANK - DISPLAYED TYPE 8.UNBLANK - ALL
5	MENU 3 DELETE 1.SELECT 2.LEVEL RANGE 3.ALL POINTS

Chapter	Contents
6	MENU 4 FILE/EXIT FILE CURRENT PART/EXIT ICEM DDN 1.FILE - CONTINUE CURRENT PART 2.FILE - GET DIFFERENT PART 3.FILE - QUIT SESSION 4.FILE - SUSPEND SESSION 5.DO NOT FILE - CONTINUE FROM LAST FILE 6.DO NOT FILE - GET DIFFERENT PART 7.DO NOT FILE - QUIT SESSION 8.DO NOT FILE - SUSPEND SESSION

ICEM Design/Drafting Data Management manual:

Chapter	Contents
1	MENU 5 SPECIAL FUNCTIONS 1.CANON 2.GRAPL 3.MANAGE VARIABLES 4.USER-DEFINED SYMBOLS 5.LEVEL MANAGEMENT 6.ATTRIBUTE MANAGEMENT 7.Reserved for Future Use 8.USER TEXT ENTRY 9.MISC. CONSTRUCTION 10.NESTING 11.NAMED ENTITIES 12.PIPEWORK INTERFERENCE 13.GPL
2	MENU 6 DATA BASE MANAGEMENT 1.PART MANAGEMENT 2.PATTERN MANAGEMENT 3.TEMPLATE MANAGEMENT 4.Reserved for Future Use 5.USER TECH FILE MANAGEMENT 6.DATA BASE INFORMATION 7.DUMP CURRENT PART

Chapter	Contents
3	MENU 7 INPUT/OUTPUT/REGENERATION 1.Reserved for Future Use 2.PLOT 3.DISPLAY LAST SEQ. NO. USED 4.DISPLAY ENTITY SEQ. NO. 5.IDENTIFY ENTITY #N 6.IDENTIFY ENTITIES N1 TO N2 7.REGEN ENTITY #N 8.REGEN FROM N1 TO N2 9.REGEN ALL 10.BULK DATA INPUT 11.Reserved for Future Use 12.MESH GENERATOR INTERFACE 13.TABLET MANAGEMENT
4	MENU 8 DISPLAY CONTROL 1.MODALS 2.CHANGE DEPTH 3.DISPLAY A SINGLE VIEW 4.DISPLAY MULTIPLE VIEWS 5.CHANGE WORK VIEW 6.ZOOM 7.VIEW LAYOUT CONSTRUCTION 8.DISPLAY NAME MANAGEMENT 9.DEFINE AUXILIARY VIEW 10.Z-CLIP 11.CHANGE WORK SPACE 12.DEFINE WORK SPACE 13.ALIGN VIEW/WORK SPACES

ICEM Design/Drafting Basic Construction manual:

Chapter	Contents
1	MENU 9 POINT 1.SCREEN POSITION 2.KEY-IN 3.POLAR 4.DELTA 5.VECTORED 6.CIRCLE CENTER 7.ON A CIRCLE 8.CURVE END 9.INTERSECT 2 CURVES 10.SPLINE POINTS 11.ON A LINE 12.CURVE NORMAL 13.BEARING/DISTANCE 14.ON A CURVE 15.SURFACE POINTS 16.SPHERICAL 17.FAN POINTS 18.INCREMENTAL POINTS 19.MODIFY/REPLACE
2	MENU 10 LINE 1.SCREEN POSITION 2.KEY-IN 3.JOIN 2 POINTS 4.TANTO 2 CURVES 5.POINT--PARLEL TO AXIS 6.POINT--TANTO CURVE 7.POLAR 8.POINT--PARLEL TO LINE 9.POINT--PERPTO LINE 10.PARLEL TO LINE 11.PARLEL TO LINE, TANTO CURVE 12.PERPTO LINE, TANTO CURVE 13.N SEGMENT LINE 14.JOIN 2 CURVES 15.MODIFY INFINITE STATUS 16.DEFINE AXIS 17.CHAMFER 18.INTERSECT 2 PLANES 19.MODIFY/REPLACE

Chapter	Contents
3	MENU 11 ARC/CIRCLE/FILLET 1.SCREEN POS AND RADIUS 2.KEY-IN CENTER AND RADIUS 3.CENTER AND RADIUS 4.CENTER AND TAN LINE 5.CENTER AND TAN CIRCLE 6.CENTER AND EDGE POINT 7.THROUGH 3 POINTS 8.MODIFY ANGLES 9.FILLET 10.TANGENT TO 3 CURVES 11.NORMAL TO VIEW 12.MODIFY/REPLACE 13.DIVIDE INTO N SEGMENTS
4	MENU 12 OTHER CURVES 1.SPLINE 2.OFFSET CURVE 3.CONICS 4.STRING 5.CONVERT LINES/ARCS TO STRING 6.CONVERT STRING TO LINES/ARCS 7.N-GON 8.TRIM/EXTEND CURVES 9.CONVERT STRING TO POINT-SET 10.CONVERT POINT-SET TO LINES 11.HIDDEN LINE REMOVAL
5	MENU 13 ENTITY MANIPULATION 1.RECT ARRAY 2.CIRC ARRAY 3.GROUP 4.MIRROR 5.TRANSLATE 6.ROTATE 7.DUPL AND MIRROR 8.DUPL AND TRANSLATE 9.DUPL AND ROTATE 10.ARRAY EXPLODE 11.STRETCH 12.TRANSLATE THEN ROTATE 13.ROTATE THEN TRANSLATE 14.DUPL/TRANSLATE - ROTATE 15.DUPL/ROTATE - TRANSLATE 16.PROTECTED ENTITIES
6	MENU 14 DATA VERIFY 1.ONE ENTITY 2.TWO ENTITIES 3.GENERAL MEASUREMENT 4.COMPOSITE TOOLPATHS

ICEM Design/Drafting Drafting Functions manual:

Chapter	Contents
1	MENU 16 DRAFTING 1.DRAFTING MODALS 2.DIMENSION 3.SECTION LINING 4.BALLOON 5.DATUM TARGET 6.DATUM FEATURE 7.GEOMETRIC TOLERANCE FRAMES 8.SURFACE TEXTURE-BASIC SYMBOL 9.ARROW 10.NOTE 11.LABEL 12.CENTERLINE 13.MODIFY DRAFTING ENTITY 14.DETAIL MAGNIFY
2	MENU 18 ANALYSIS 1.SPLINE ANALYSIS 2.ANALYTIC AREA/PERIMETER 3.2-D SECTION ANALYSIS 4.3-D ANALYSIS
3	MENU 19 SI/US/RESIZE 1.MILLIMETERS TO INCHES 2.RESIZE

ICEM Advanced Design manual:

Chapter	Contents
1	INTRODUCTION
2	1.ADVANCED DESIGN MODALS
3	2.3-D CURVES
4	3.SURFACES
5	4.SOLIDS
6	5.CROSS SECTION SLICE
7	6.SURFACE DEVELOPMENT

ICEM Numerical Control manual:**Chapter Contents**

1	Common Menu Descriptions
2	N/C Toolpath Macro
3	Easygen: Overview
4	Generation Parameter Group
5	Easygen/GPG: (Common)
6	Easygen/GPG: (Point-to-point, Profile, and Pocket)
7	Easygen/GPG: (Lathe)
8	Menu 17 NUMERICAL CONTROL
9	Menu 17.1: N/C MODALS
10	Menu 17.2: POINT-TO-POINT
11	Menu 17.3: PROFILE
12	Menu 17.4: POCKET
13	Menu 17.5: PUNCHING
14	Menu 17.6: SURFACE MILLING
15	Menu 17.7: 5-AXIS SWARF CUTTING
16	Menu 17.8: ABSOLUTE TOOL MOTION
17	Menu 17.9: LATHE
18	Menu 17.10: N/C DEFINITIONS
19	Menu 17.11: DISPLAY AND EDIT
20	Menu 17.12: 2-SURFACE PROFILE
21	Menu 17.14: COMPOSITE TOOLPATH
22	Menu 17.15: FLAME CUTTING
23	Reserved for Future Use
24	Menu 17.17: CLFILE

ICEM GPL manual:

Chapter	Contents
1	Introduction
2	Components of a GPL Statement
3	Overview of Major Words
4	Branching and Conditional Statements
5	Modal Statements
6	Entity and Character String Statements
7	Variable Declaration, RTL I/O, and File Statements
8	Program Management Statements
9	Display Control Statements
10	Point Statements
11	Line Statements
12	Arc/Circle Statements
13	Two-Dimensional Curve Statements
14	Entity Manipulation Statements
15	Three-Dimensional Curve Statements
16	Surface Statements
17	ANSI 1973 Standard: Drafting Modal Statements
18	ANSI 1973 Standard: Dimensioning Statements
19	ANSI 1982 Standard: Drafting Modal Statements
20	ANSI 1982 Standard: Dimensioning and Other Statements
21	Numerical Control Statements
22	Interactive Statements
23	GPL Input and Output
24	Compiling a GPL Program
25	Menu 5.13 GPL

Menu 1: Modals and Fonts

3

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Using Menu 1

With this menu, you can:

- Set the modal (control) parameters for the system including display tolerance and system decimal places.
- Display modal status settings such as grid display or nondisplay, entity selection method, and cursor position display.

Fonts are display forms for curves. For example, when displaying lines, you have a choice of solid, dashed, or phantom lines.

All modals and fonts have default settings which are in effect unless you modify them.

The menu for this section is:

```
MODALS AND FONTS
 1.MENU DISPLAY
 2.CONSTRUCTION MODAL
 3.TOLERANCES
 4.SYSTEM DECIMAL PLACES
 5.CURVE FONT
 6.MODIFY ENTITY FONT
 7.MODIFY ENTITY LEVEL/PEN NO.
 8.Reserved for Future Use
 9.COLOR DISPLAY
10.BLANK/UNBLANK VIEW SELECT
11.ENTITY SELECTION CONTROL
12.DISPLAY MODAL STATUS
13.DISPLAY TITLE BLOCK
14.TERMINAL DEPENDENT MODES
15.DATA ENTRY MODE
16.ACTIVATE PAGE/CHANGE TABLET FILE
17.CHANGE TRACE FILE STATUS
18.GRID
19.THICK LINES
```

The Modals and Fonts menu offers these functions:

Menu Title	Description
1.1 MENU DISPLAY	Turns menu displays on or off.
1.2 CONSTRUCTION MODAL	Returns system to same construction operation after each completed operation.
1.3 TOLERANCES	Sets length of lines that form a curve or spline.
1.4 SYSTEM DECIMAL PLACES	Sets the number of decimal places for entering and displaying numeric data.

Menu Title	Description
1.5 CURVE FONT	Specifies solid, dashed, phantom, or centerline font type for line and curve entities.
1.6 MODIFY ENTITY FONT	Changes the curve font of an existing line or curve entity.
1.7 MODIFY ENTITY LEVEL/PEN NO.	Changes the level number at which an entity is located. With PLOT, changes pen number.
1.8 Reserved for Future Use	
1.9 COLOR DISPLAY	Assigns and modifies colors on color terminals.
1.10 BLANK/UNBLANK VIEW SELECT	Permits view select before blanking or unblanking operations.
1.11 ENTITY SELECTION CONTROL	Determines method by which entities are chosen.
1.12 DISPLAY MODAL STATUS	Displays current status of all modals and fonts settings.
1.13 DISPLAY TITLE BLOCK	Displays a title block with data on a current part.
1.14 TERMINAL DEPENDENT MODES	Permits selection of terminal dependent parameters such as display and location of dialog area on the CDC Viking 721. Turns entity dragging on and off.
1.15 DATA ENTRY MODE	Determines the method by which data is entered into the system.
1.16 ACTIVATE PAGE/CHANGE TABLET FILE	Permits activating a user-defined or standard system tablet page; permits changing a tablet or MSTRING file.
1.17 CHANGE TRACE FILE STATUS	Allows control of current trace file status.
1.18 GRID	Defines, activates, and displays the grid.
1.19 THICK LINES	Determines line thickness.

Other modals that affect specific areas in the system are not in this menu but in other menus: 8.1 DISPLAY MODALS, 15.1 ADVANCED DESIGN MODALS, 16.1 DRAFTING MODALS, and 17.1 N/C MODALS. The following sections describe the choices in menu 1, MODALS AND FONTS.

1.1 Menu Display

With this menu, you can select a modal to display menu item listings and to control the display or nondisplay of intermediate menu headings. The system displays the following menu and the current status for both prompts:

```
MENU DISPLAY
1.DISPLAY CHOICES           ON/OFF
2.DISPLAY INTERMEDIATE HEADINGS ON/OFF
```

The following sections describe the choices in this menu.

1.1.1 Display Choices

This choice allows you to select a modal to display menu item listings. When this modal is on, the menu heading and all menu choices are displayed. When this modal is off, only the menu heading is displayed. The default status is off. Experienced users often work with this modal off to speed system operation by reducing the amount of data sent to the terminal. This modal can also be operated by the M key or tablet square.

The system displays:

```
DISPLAY CHOICES           Enter:
1.ON                      1 To display menus.
2.OFF                     2 To not display menus.
```

If this modal is on and a menu string is entered, only the content of the last menu is displayed. Display of intermediate menu headings is controlled by 1.1.2 DISPLAY INTERMEDIATE HEADINGS.

1.1.2 Display Intermediate Headings

This choice allows you to set a modal which controls the display intermediate headings. Intermediate headings are menu names at the top of menus. These headings occur when using the type ahead feature and within tablet menu selections. When this modal is on, intermediate menu headings are displayed without the menus. When this modal is off, neither intermediate menu headings nor menus are displayed. The default setting is off.

Experienced users often work with this modal off to speed system operation by reducing the amount of data sent to the terminal.

The system displays:

```
DISPLAY INTERMEDIATE HEADINGS Enter:
1.ON                        1 To display intermediate menu headings.
2.OFF                       2 To not display intermediate menu
                             headings and menus.
```

1.2 Construction Modals

With these modals, you can control how the system handles construction operations (for example, the operations in 9 POINT, 10 LINE, and 11 ARC/CIRCLE/FILLET).

The Construction Modals menu is:

```
CONSTRUCTION MODALS
1.CONTINUE OPERATION MODE          ON/OFF
2.POINT MODALS
```

The following sections describe each modal individually.

1.2.1 Continue Operation Mode

With this modal, you can choose the way the system controls return from completed construction operations.

```
CONTINUE OPERATION MODE
1.ON
2.OFF
```

Enter:

- 1 To continue with the same construction operation so that it may be executed again. This is the default setting.
- 2 To return to the menu from which the operation was selected after performing the construction operations.

1.2.2 Point Modals

With this modal, you may specify various methods used to construct points in menu 9 POINT. The modal settings are displayed within the menu, as the following example demonstrates:

```
POINT MODALS
1.FAN START          SET WHEN USED
2.FAN END            POSITION
3.INCREMENTAL START ANGLE
4.INCREMENTAL END   OPEN
```

1.2.2.1 Fan Start Condition Method

Of the four possible ways to specify how the system is to define FAN POINTS, two may be set here. You will specify the other two conditions during the FAN POINTS operation. The next two modals allow you to preselect the start and end conditions, which offer four options: specifying an angle, indicating a position on the curve, selecting an existing point, or leaving the condition open-ended.

The prompts that appear during 9.17 FAN POINT creation depend on the status of the Fan Start Condition Method. Even though this mode may be preset in this section, you may jump back to the Fan Start Condition Method menu during the Fan Point operation if your default method is not what you wish to use in a particular instance. This topic is discussed in 9.17 FAN POINTS in the ICEM Design/Drafting Basic Construction manual.

After you choose a default start condition, you will return to the next higher level of system control. The following paragraphs describe the corresponding prompts that occur during Fan Points creation:

FAN START CONDITION METHOD

- 1.SPECIFY ANGLE
- 2.SCREEN POSITION
- 3.EXISTING POINT
- 4.OPEN
- 5.SET WHEN USED

Select the default method for specifying the start condition. The initial default setting is 1.SPECIFY ANGLE.

If you select 1.SPECIFY ANGLE from the Fan Start Condition Method menu, the system displays:

- 1.START ANGLE = n.nnnn

Enter the angle (in degrees) to the first new point. The angle is measured counterclockwise from an imaginary line which extends to the right through the base point and is parallel to the x-transform axis.

If you select 2.SCREEN POSITION from the Fan Start Condition Method menu, the system displays:

INDICATE START POSITION

Use the graphics cursor to select the position where you want the first point defined. The first new point will be defined on a normal to the nearest selected curve.

If you select 3.EXISTING POINT from the Fan Start Condition Method menu, the system displays:

INDICATE START POINT

Use the graphics cursor to select an existing point as the start location. If the point is located on one of the selected curves, another point will not be defined on top of the one you selected. However, if the point you selected does not lie on any of the selected curves, the first new point will be defined on an imaginary line connecting the base point and this point.

If you select 4.OPEN from the Fan Start Condition Method menu, you may leave the starting condition open-ended (undefined). You may leave either the Fan Start Condition or the Fan End Condition open, but not both.

If you select 5.SET WHEN USED from the Fan Start Condition Method menu, the system displays:

FAN START CONDITION

- 1.SPECIFY ANGLE
- 2.SCREEN POSITION
- 3.EXISTING POINT
- 4.OPEN

Select the method for specifying the fan start condition during execution.

1.2.2.2 Fan End Condition Method

The prompts that appear during 9.17 FAN POINT creation depend on the status of the Fan End Condition Method. Even though this mode may be pre-set in this section, you may jump back to the FAN END CONDITION menu during the Fan Point operation if your default method is not what you wish to use in a particular instance. This topic is discussed in 9.17 FAN POINTS in the ICEM Design/Drafting Basic Construction manual.

FAN END CONDITION METHOD

- 1.SPECIFY ANGLE
- 2.SCREEN POSITION
- 3.EXISTING POINT
- 4.OPEN
- 5.SET WHEN USED

Select the default method for specifying the end condition. The initial default setting is 1.SPECIFY ANGLE.

After you choose a default end condition, you will return to the next higher level of system control. The following paragraphs describe the corresponding prompts that occur during Fan Points creation.

If you select 1.SPECIFY ANGLE from the Fan End Condition Method menu, the system displays:

1.END ANGLE = n.nnnn

Enter the angle (in degrees) to the final point. The angle is measured counterclockwise from an imaginary line which extends to the right through the base point and is parallel to the x-transform axis.

If you select 2.SCREEN POSITION from the Fan End Condition Method menu, the system displays:

INDICATE END POSITION

Use the graphics cursor to select the position where you want the final point defined. The final new point will actually be defined on a normal to the nearest selected curve.

If you select 3.EXISTING POINT from the Fan End Condition Method menu, the system displays:

INDICATE END POINT

Use the graphics cursor to select an existing point as the end location. If the point is located on one of the selected curves, another point will not be defined on top of the one you selected. However, if the point you selected does not lie on any of the selected curves, the final point will be defined on an imaginary line connecting the base point and this point.

1.2.2.2 Fan End Condition Method

If you select 4.OPEN from the Fan End Condition Method menu, the system leaves the end condition open-ended (undefined). If the Fan Start Condition Method is set to 4.OPEN, the system displays:

EITHER THE START OR END CONDITION MAY
BE LEFT OPEN, BUT NOT BOTH.

The Fan End Condition Method menu is then redisplayed.

If you select 5.SET WHEN USED from the Fan End Condition Method menu, the system redisplay the Fan End Condition Method during each fan point operation:

FAN END CONDITION
1.SPECIFY ANGLE
2.SCREEN POSITION
3.EXISTING POINT
4.OPEN

Select the method for specifying the end
condition during execution.

1.2.2.3 Incremental Start Condition Method

Of the four possible ways to specify how the system is to define incremental points, two may be set here. You will specify the other two conditions during the Incremental Points operation. The next two modals allow you to preselect the start and end conditions, which offer four options: specifying a value, indicating a position on the curve, selecting an existing point, or leaving the condition open-ended.

The prompts that appear during 9.18 INCREMENTAL POINT creation depend on the status of the Incremental Start Condition Method. Even though this mode may be preset in this section, you may jump back to the Incremental Start Condition menu during the Incremental Points operation if your default method is not what you wish to use in a particular instance. This topic is discussed in 9.18 INCREMENTAL POINTS in the ICEM Design/Drafting Basic Construction manual.

INCREMENTAL START CONDITION METHOD

- 1.SPECIFY VALUE
- 2.SCREEN POSITION
- 3.EXISTING POINT
- 4.OPEN
- 5.SET WHEN USED

Select the default method for specifying the start condition during fan point operations. The initial default setting is 1.SPECIFY VALUE.

After you choose a default start condition, you will return to the next higher level of system control.

If you select 1.SPECIFY VALUE from the Incremental Start Condition Method menu, the system displays:

1.START VAL.= n.nnnn

Enter the value where the first new point is to be defined. Transform coordinates are used when creating Incremental Points along either the x-transform or the y-transform axis. Curve parameters are used when creating Incremental Points along one or more curves.

If you select 2.SCREEN POSITION from the Incremental Start Condition Method menu, the system displays:

INDICATE START POSITION

Use the graphics cursor to select the position where you want the first point defined. The first new point will be defined on a normal to the nearest selected curve.

If you select 3.EXISTING POINT from the Incremental Start Condition Method menu, the system displays:

INDICATE START POINT

Use the graphics cursor to select an existing point as the start location. If the point is located on one of the selected curves, another point will not be defined on top of the one you selected. However, if the point you selected does not lie on any of the selected curves, the first new point will be defined on a normal to the nearest selected curve.

If you select 4.OPEN from the Incremental Start Condition Method menu, the system leaves the starting condition open-ended (undefined). You may leave either the Incremental Start Condition or the Incremental End Condition open, but not both.

If you select 5.SET WHEN USED from the Incremental Start Condition Method menu, the system displays the Incremental Start Condition menu during all incremental points operations:

INCREMENTAL START CONDITION

- 1.SPECIFY VALUE
- 2.SCREEN POSITION
- 3.EXISTING POINT
- 4.OPEN

Select the method for specifying the start condition during execution.

1.2.2.4 Incremental End Condition Method

The prompts that appear during 9.18 INCREMENTAL POINT creation depend on the status of the Incremental End Condition Method. Even though this mode may be preset in this section, you may jump back to the Incremental End Condition menu during the Incremental Point operation if your default method is not what you wish to use in a particular instance. For more information, refer to 9.18 INCREMENTAL POINTS in the ICEM Design/Drafting Basic Construction manual.

INCREMENTAL END CONDITION METHOD

- 1.SPECIFY VALUE
- 2.SCREEN POSITION
- 3.EXISTING POINT
- 4.OPEN
- 5.SET WHEN USED

Select the method for specifying the end condition during fan point operations. The initial default setting is 1.SPECIFY VALUE.

After you choose a default end condition, you will return to the next higher level of system control. The following paragraphs describe the corresponding prompts that will occur during Incremental Points creation.

If you select 1.SPECIFY VALUE from the Incremental End Condition Method menu, the system displays:

1.END VALUE = n.nnnn

Enter the value where the final new point is to be defined. Transform coordinates are used when creating Incremental Points along either the x-transform or the y-transform axis. Curve parameters are used when creating Incremental Points along one or more curves.

If you select 2.SCREEN POSITION from the Incremental End Condition Method menu, the system displays:

INDICATE END POSITION

Use the graphics cursor to select the position where you want the final point defined. The final new point will be defined on a normal to the nearest selected curve.

If you select 3.EXISTING POINT from the Incremental End Condition Method menu, the system displays:

INDICATE END POINT

Use the graphics cursor to select an existing point as the end location. If the point is located on one of the selected curves, another point will not be defined on top of the one you selected. However, if the point you selected does not lie on any of the selected curves, the final new point will be defined on a normal to the nearest selected curve.

If you select 4.OPEN from the Incremental End Condition Method menu, the system leaves the end condition open-ended (undefined) and displays:

EITHER THE START OR END CONDITION MAY
BE LEFT OPEN, BUT NOT BOTH.

The Incremental End Condition Method menu is then redisplayed.

If you select 5.SET WHEN USED from the Incremental End Condition Method menu, the system displays the Incremental End Condition menu during all fan point operations:

INCREMENTAL END CONDITION	Select the method for specifying the end condition during execution.
1.SPECIFY VALUE	
2.SCREEN POSITION	
3.EXISTING POINT	
4.OPEN	

1.3 Tolerances

With this modal, you can set the tolerance for the display of curves and splines.

A curve is displayed as a series of connected straight lines. This modal affects the length of these lines by setting the maximum distance, in chord height, between the mathematical curve and its pictorial representation. Because a smoother curve results from the use of shorter lines, setting this modal to a smaller value results in the display of smoother curves. Since displaying a curve as a smaller number of long lines is quicker, setting this modal to a larger value enables the system to display curves and repaint displays containing curves more quickly. This modal changes the way in which the curve is displayed, but not the mathematical definition of the curve in the data base. Therefore, changing the value of this modal has no effect on operations that are applied to the curve itself. For example, the operation that defines a point at the intersection of two curves places that point at the intersection of the two mathematical definitions of the curves. This is not necessarily the crossing point of the straight lines used to display the curves.

The spline tolerance is the maximum discontinuity in the curvature of the two-dimensional spline. It has the value of 1/mm for SI units (1/inch for U.S. customary units). The default value is 0.0000039 mm (0.0001 in). Acceptable values are positive and greater than or equal to 0.000001. Smaller values slow the creation of the spline and values that are very much smaller may prevent the spline from being created, depending on the particular spline points.

1.DISPLAY TOLERANCE = 0.0	Enter the desired displayed tolerance. The default tolerance is 0.13 mm or 0.0050 inches.
2.SPLINE TOLERANCE = 0.0	Enter the desired spline tolerance. The default value is 0.00 mm or 0.0001 inches.

1.4 System Decimal Places

With this modal, you can specify the number of decimal places (digits to the right of the decimal point) allowed when you enter numeric data and the number of decimal places allowed when the system displays numeric data. The system truncates input to the number of decimal places specified by this modal. Output from the system is rounded to this number of decimal places. The system displays:

DECIMAL PLACES = n

Enter the number of decimal places. Upon entry to the system, this modal has the value 2 for SI units (4 for U.S. customary units).

If the units of measure is in feet/inches, the system prompts:

FT/IN DATA DISPLAY MODE

- 1.DECIMAL
- 2.FRACTIONS

Enter:

- 1 To have linear/distance numeric data displayed in decimal mode.
- 2 To have linear/distance numeric data displayed in fraction mode.

1.4.1 Decimal

This modal causes linear/distance numeric data to be displayed in decimal format. It prompts for number of digits after the decimal point.

DECIMAL PLACES = n

Enter the number of decimal places.

Linear/distance numeric data will be displayed as ff'ii.ii" in cases where

ff = foot measurement

' = foot symbol

ii.ii = inch measurement

" = inch symbol

Examples:

2'3.7852" which is 2 feet and 3.7852 inches.

0.01" which is 0.01 inch.

The initial default setting is 4 decimal places.

1.4.2 Fractions

With this modal you can specify that linear/distance numeric data displayed by the system is in fraction format. The system prompts for rounding of numeric data.

FEET/INCHES ROUNDING

1. 1/64 INCH
 2. 1/32 INCH
 3. 1/16 INCH
 4. 1/8 INCH
 5. 1/4 INCH
 6. 1/2 INCH
 7. 1 INCH
 8. 1 FOOT

Enter:

- 1 To display numeric data to the nearest 1/64 inch.
- 2 To display numeric data to the nearest 1/32 inch.
- 3 To display numeric data to the nearest 1/16 inch.
- 4 To display numeric data to the nearest 1/8 inch.
- 5 To display numeric data to the nearest 1/4 inch.
- 6 To display numeric data to the nearest 1/2 inch.
- 7 To display numeric data to the nearest inch.
- 8 To display numeric data to the nearest foot.

Linear/distance numeric data is displayed as ff'ii"nn/dd where

ff = foot measurement

' = foot symbol.

ii = integer part of inch measurement.

" = inch symbol.

nn/d- = fraction of an inch of the measurement; nn is the numerator and dd is the denominator.
 d

Examples:

1'2"5/8 which is 1 foot and 2.625 inches.

3"1/2 which is 3.5 inches.

Initially, this modal is set to 1/16 inch. Feet/inches rounding controls data display only, it does not affect data entry.

1.5 Curve Font

With this modal, you can specify the font used to display lines, arcs, conics, two-dimensional splines, three-dimensional splines, machining curves, strings, and Bezier curves on the graphics terminal screen.

The system draws the entity according to the setting of this modal at the time of creation, rather than the setting at the time of display.

CURVE FONT
 1.SOLID
 2.DASHED
 3.PHANTOM
 4.CENTERLINE

Enter:

- 1 To select solid lines.
- 2 To select dashed lines.
- 3 To select phantom lines (displayed as a long dash, followed by two short dashes, with this sequence repeated).
- 4 To select centerlines (displayed as a long dash, followed by a short dash, with this sequence repeated).

Upon entry to the system, the default font (solid lines) is in effect for all types of entities. This modal changes the display font only for entities created after the modal is selected.

This modal does not affect entity manipulation entities, which assume the font of the original entity.

1.6 Modify Entity Font

With this modal, you can change the display font of an existing line or curve. Repaint the screen (using the R key) to display the new font. The system displays:

MODIFY ENTITY FONT
 1.SOLID
 2.DASHED
 3.PHANTOM
 4.CENTERLINE

Select the new font for the entity selected. These fonts are the same as those described for 1.5 CURVE FONT.

INDICATE ENTITY

Use the graphics cursor to screen select the new font for the entity selected.

If you want to use another method of selection, enter CTRL-E to receive the following menu:

ENTITY SELECTION
 1.SCREEN SELECT
 2.CHAIN
 3.REGION IN
 :

Use the Entity Selection menu to select the entities whose fonts are to be changed. For more information, refer to Entity Selection in chapter 2 of this manual.

1.7 Modify Entity Level/Pen No.

With this modal, you can change the level number at which an entity exists (the default level is 0). The level assignment sorts the entities in the data base, so that certain functions can be simultaneously performed on all entities within a level. For example, if all the entities on the display are defined at level 0, this modal can change some of the entities to level 1. The level 1 entities can be blanked and unblanked using 2.2 BLANK LEVEL RANGE or 2.6 UNBLANK LEVEL RANGE and deleted using 3.2 DELETE LEVEL RANGE.

This modal, when used with the PLOT feature, can also change the pen number (0, 1, 2, and so forth through 15) of an entity (refer to 7.2 PLOT in the ICEM Design/Drafting Data Management manual). Specifying which pen is used allows characteristics such as color or weight to be varied. The default level number is 0; level numbers 0 through 1023 are valid. The default pen number is 0; pen numbers 0 through 15 are valid. The system displays:

INDICATE ENTITY

Use the graphics cursor to screen select the entities whose level and/or pen numbers are to be changed.

If you want to use another method of selection, enter CTRL-E to receive the following menu:

ENTITY SELECTION

1.SCREEN SELECT

2.CHAIN

3.REGION IN

:

RETAIN ORIGINAL

LEVEL NUMBERS?

Use the Entity Selection menu to select the entities whose level and/or pen numbers are to be changed. For more information, refer to Entity Selection in chapter 2 of this manual.

Enter:

Y To continue to the RETAIN ORIGINAL PEN NUMBERS? prompt.

N To enter new level numbers.

If you select N, the system displays:

LEVEL =

Enter a new level number.

If you select Y, the system displays:

RETAIN ORIGINAL PEN NUMBERS?

Enter:

Y To return to 1 MODALS AND FONTS.

N To enter new pen numbers.

If you select N, the system displays:

PEN =

Enter a new pen number.

1.8 Reserved for Future Use

1.9 Color Display

You can use the color display mode on any terminal, color or monochromatic. However, the colors appear only on the color terminals. When you are working on a color terminal, you must do a host repaint to view your changes. A host repaint uses the R key, as opposed to a local repaint, which uses the PAGE key. The modal menu is as follows:

```

COLOR DISPLAY
1.COLOR DISPLAY MODE
2.COLOR ENVIRONMENT

```

The following is information about the use of color:

- Group and change color display mode require host repaints to change the color.
- Groups (rectangular and circular arrays, composite curves, balloons, and surface texture symbols) return to their base entity color after the group is deleted.
- The main header has a C = 0 to 15.
- The values entered for the color table use ICEM DDN's modal for the number of decimal places.
- To see your current color display mode, enter 1.12 DISPLAY MODAL STATUS.

The following sections describe the choices in this menu.

1.9.1 Color Display Mode

With this modal, you can assign colors to entities, pens, and levels and perform color management functions.

```

COLOR DISPLAY MODE
1.COLOR BY ENTITY TYPE
2.COLOR BY PEN NUMBER
3.COLOR BY LEVEL NUMBER
4.COLOR BY ENTITY COLOR
5.CURRENT COLOR NUMBER
6.MODIFY PEN NUMBER COLOR
7.MODIFY LEVEL NUMBER COLOR
8.COLOR SPECTRUM DISPLAY
9.MODIFY ENTITY COLOR
10.TEMPORARY ENTITY COLOR

```

The following sections describe the choices in this menu.

1.9.1.1 Color by Entity Type

With this modal, entities are displayed by type. The color cannot be changed unless you change the color table. This is the default color display mode if you enter the system with a new part or you call up an old part that has this display mode saved.

Whether the color assignment was assigned by entity type or not (refer to table 3-1), the system changes the color assignment to entity type and displays:

COLOR BY ENTITY TYPE ON

You return to 1.9.1 COLOR DISPLAY MODE.

You must do a host repaint to view the color change in old entities. The newly created entities appear in the correct color.

Table 3-1. Default Color Numbers by Entity Type

Color Number	Entity Type
0	Points
1	Line, arc, conic, two-dimensional spline
2	Groups and arrays
3	Label and note
4	Linear, angular, diameter, and circular dimensions
5	Point to point, lathe, and grid
6	Three-dimensional spline, tabulated cylinder, and hexahedron
7	Section lining
8	Point set
9	Balloon, surface texture symbols, and composite curves
10	Template, vector, and data graphs
11	String
12	Tool
13	Surfaces and plane
14	True position and centerline
15	String

With this modal, you can assign and modify colors. In ICEM DDN, each color is assigned a number by which it is referenced. This number is called its color number. On the color terminals, specifically the Tektronix 4105, 4107, 4109, 4113, 4115, and 4125 and the CDC 790 with TEKEM terminals, the number of possible colors in the graphics area are shown in the following list:

Terminal Type	Number of Colors
4105	7
4107	15
4109	15
4113	7
4115	14
4125	14
790	14

1.9.1.2 Color by Pen Number

With this modal, you can distinguish between different entities by assigning them different pen numbers. The system automatically outputs the entities in the prescribed colors, just as they would look if the pens on the plotter were the same color. To change the color, change the pen color or the color table.

If you use no pen numbers and display by pen, the default pen number is 0, and all entities are drawn in color number 0.

By default, there are 16 color numbers assigned to the 16 pens. These color numbers are then reassigned by cycling through the number of colors available on your specific terminal. For example, on a seven color terminal, pen 0 is assigned color number 0, pen 1 is assigned color number 1, and so forth through pen 6. At that point the numbering begins again from 0 so that pen 7 is assigned color number 0, pen 8 is assigned color number 1, and so forth.

Table 3-2 shows the default color values.

Table 3-2. Default Color Values

Color	Default Color Number	Red-Green-Blue			Hue-Lightness-Saturation			Cyan-Magenta-Yellow		
White	0	1,	1,	1	0,	1,	0	0,	0,	0
Red	1	1,	0,	0	0,	.5,	1	0,	1,	1
Green	2	0,	1,	0	.333,	.5,	1	1,	0,	1
Blue-Cyan	3	0,	.5,	1	.584,	.5,	1	1,	.5,	0
Magenta	4	0,	0,	1	.833,	.5,	1	0,	1,	0
Yellow	5	1,	1,	0	.167,	.5,	1	0,	0,	1
Orange	6	1,	.5,	0	.084,	.5,	1	0,	.5,	1
Light orange	7	1,	.8,	.6	.084,	.8,	1	0,	.2,	.4
Light green	8	.68,	1,	.68	.333,	.84,	1	.32,	0,	.32
Dark cyan	9	0,	.67,	.67	.5,	.33,	1	1,	.33,	.33
Green-Blue	10	0,	.44,	.44	.5,	.225,	1	1,	.56,	.56
Dark red	11	.68,	0,	0	0,	.34,	1	.32,	1,	1
Light purple	12	.8,	.6,	1	.750,	.8,	1	.2,	.4,	0
Yellow-Green	13	.67,	1,	0	.222,	.5,	1	.33,	0,	1
Dark pink	14	1,	0,	.5	.917,	.5,	1	0,	1,	.5
Light red	15	1,	.3,	.3	0,	.650,	1	0,	.7,	.7

Whether the color assignment was by pen or not, the system changes the color assignment to pen number and displays:

COLOR BY PEN NUMBER ON

You return to 1.9.1 COLOR DISPLAY MODE.

You must do a host repaint to view the color change in previously created entities. Only the newly created entities appear in the correct color.

1.9.1.3 Color by Level Number

With this modal, you can distinguish between entities by putting them on different levels. The system automatically outputs the entities in the prescribed colors. To change the color, change the color level or the color table.

If you use no level numbers and display by level, the default level number is 0, and all entities are drawn in color number 0.

By default, there are 16 color numbers cycled through and assigned to each of the 1024 levels. In this way, level 0 is assigned color number 0, level 1 is assigned color number 1, and so forth through level 15. At that point the numbering begins again from 0 so that level 16 is assigned color number 0. These 16 color numbers are then reassigned by cycling through the number of colors available on your specific terminal. For example, on a 7 color terminal, the original color numbers 0 through 6 remain the same, but the remaining color numbers are reassigned by cycling through the available color numbers 0 through 6 as follows: the original color number 7 is reassigned color number 0, the original color number 8 is reassigned color number 1, and so forth.

Whether the color assignment was by level or not, the system changes the color assignment to level number and displays:

COLOR BY LEVEL ON

You return to 1.9.1 COLOR DISPLAY MODE.

You must do a host repaint to view the color change in old entities. The newly created entities appear in the correct color.

1.9.1.4 Color by Entity Color

With this modal, you can group entities without using level or pen number and display them on the screen, using up to 16 colors.

An entity always has a color associated with it.

If you do not change the defined entity color and display by entity color, the entities are drawn in the default color number 0.

The entities are displayed by entity color value. The color numbers are cycled through according to the number of colors available on your specific terminal.

Whether the color assignment was by entity color or not, the system changes the color assignment to entity color and displays:

```
COLOR BY ENTITY COLOR ON
```

You return to 1.9.1 COLOR DISPLAY MODE.

You must do a host repaint to view the color changes in old entities. The newly created entities appear in the correct color.

1.9.1.5 Current Color Number

With this modal, you can assign a color (0 through 15) to all entities created from now on.

```
1.COLOR NUMBER =          Enter a color number (range 0 through 15).  
                          The default color is 0.
```

If you enter a number outside the range (0 through 15), the system issues an error message, and you return to the 1.COLOR NUMBER = prompt.

The system retains the color number. When you reenter this choice, the color number has been set.

To view the colors before changing the new entity color, either go to 1.9.2 COLOR ENVIRONMENT to display the color table or set the automatic display of the color table on.

1.9.1.6 Modify Pen Number Color

With this modal, you can modify specific pen number(s). The change occurs on any future entity creation and on the next host repaint.

- | | | |
|------------------|---|---|
| 1. START PEN | = | Enter the starting and ending values of a |
| 2. END PEN | = | range of pen numbers. |
| 3. INCREMENT PEN | = | Enter the increment value between pens. |
| COLOR NUMBER | = | Enter the color number. |

The value of END defaults to START and INCREMENT defaults to 1.

If you enter a pen number outside the range of 0 through 15 for START and END, enter START larger than END, enter INCREMENT outside the range of 1 through 15, or enter a color number outside the range of 0 through 15, the system issues an error message and returns you to the start pen prompt.

This modal allows you to change pen numbers without changing the color table.

To view the colors before changing the pen colors, either go to 1.9.2 COLOR ENVIRONMENT to display the color table or set the automatic display of the color table on.

1.9.1.7 Modify Level Number Color

With this modal, you can change the color of specific level number(s). The change occurs on any future entity creation and on the next host repaint.

- | | | |
|--------------------|---|---|
| 1. START LEVEL | = | Enter the starting and ending values of a |
| 2. END LEVEL | = | range of levels. |
| 3. INCREMENT LEVEL | = | Enter the increment value between levels. |
| COLOR NUMBER | = | Enter the color number. |

The value of END defaults to START and INCREMENT defaults to 1.

If you enter a level number outside the range of 0 through 1023 for START and END, enter START larger than END, enter INCREMENT outside the range of 1 through 1023, or enter a color number outside the range of 0 through 15, the system issues an error message and you return to the start level prompt.

This modal allows you to change a level number color without changing the color table.

To view the colors before changing the level number color, either go to 1.9.2 COLOR ENVIRONMENT to display the color table or set the automatic display of the color table on.

1.9.1.8 Color Spectrum Display

With this modal, you can automatically display the colors of the color table on the screen. These colors are displayed in small boxes arranged vertically on the right side of the screen. The color and the color number are displayed in the box.

COLOR SPECTRUM DISPLAY

- 1.ON
- 2.OFF

Enter:

- 1 To automatically turn on the color box when a color number is needed.
- 2 To automatically turn off the color box when a color number is needed.

The modals affected are:

ASSIGN COLOR TO NEW ENTITIES	(1.9.1.5)
MODIFY PEN NUMBER COLORS	(1.9.1.6)
MODIFY LEVEL NUMBER COLOR	(1.9.1.7)
MODIFY ENTITY COLOR	(1.9.1.9)
TEMPORARY CHANGE ENTITY COLOR	(1.9.1.10)
MODIFY COLOR TABLE	(1.9.2.1)
DISPLAY COLOR TABLE	(1.9.2.5)

1.9.1.9 Modify Entity Color

With this modal, you can modify entity color. You select the new color and the entities to which the new color will be assigned. This change occurs immediately if 1.9.1.4 COLOR BY ENTITY COLOR display mode is used. The system displays:

INDICATE ENTITY

Use the graphics cursor to screen select the entities whose color you want to change.

If you want to use another method of selection, enter CTRL-E to receive the following menu:

ENTITY SELECTION

1.SCREEN SELECT

2.CHAIN

3.REGION IN

:

Use the Entity Selection menu to select the entities whose color you want to change.

For more information, refer to Entity Selection in chapter 2 of this manual.

After you select an entity or entities, the system displays:

COLOR NUMBER =

Enter the color number of the color for the entities selected.

If you enter a color number outside the range of 0 through 15 for the color number, the system issues an error message and you return to the 1.COLOR NUMBER prompt.

This modal allows you to change entity colors without changing the color table.

To view the colors before changing the entity color, either go to 1.9.2 COLOR ENVIRONMENT to display the color table or set the automatic display of the color table on.

1.9.1.10 Temporary Entity Color

With this modal, you can change the colors of selected entities on the screen by redrawing them in the selected color. The next host or local repaint restores the original colors. The system displays:

INDICATE ENTITY

Use the graphics cursor to screen select the entities whose color you want to change.

If you want to use another method of selection, enter CTRL-E to receive the following menu:

ENTITY SELECTION

1.SCREEN SELECT

2.CHAIN

3.REGION IN

⋮

Use the Entity Selection menu to select the entities whose color you want to change.

For more information, refer to Entity Selection in chapter 2 of this manual.

After you select an entity or entities, the system displays:

COLOR NUMBER =

Enter the color number of the color for the entities selected.

If you enter a value outside the range of 0 through 15, the system issues an error message and returns you to the 1.COLOR NUMBER prompt.

When selected again, this modal leaves the entities as they are and draws up new entities in the selected color. For example, you can highlight a portion of a part.

To view the colors before changing the entity color, either go to 1.9.2 COLOR ENVIRONMENT to display the color table or set the automatic display of the color table on.

1.9.2 Color Environment

With this modal, you can modify color parameters.

COLOR ENVIRONMENT

1.MODIFY COLOR TABLE

2.MODIFY COLOR SCHEME

3.RESET COLOR TABLE

4.LIST COLOR TABLE

5.DISPLAY COLOR TABLE

The following sections describe the choices in this menu.

1.9.2.4 List Color Table

With this modal, you can list the color number with HLS, RGB, or CMY values. Refer to figure 3-1 for an example of an HLS color table. The first column lists the color number. The second, third, and fourth columns list the hue, lightness, and saturation values, respectively.

HLS	COLOR SCHEME		
0	0.	1.0	0.
1	0.	.5	1.0
.	.	.	.
.	.	.	.
13	0.220	0.500	0.300
14	0.917	0.500	1.000

Figure 3-1. HLS Color Table Listing

1.9.2.5 Display Color Table

With this modal, you can view the colors. You can compare one color to another and modify it.

For each possible graphics color, the color number and a box filled with the corresponding color will be displayed on the right side of the screen.

The color boxes disappear on the next local or host repaint.

1.10 Blank/Unblank View Select

With this modal, you can request view selection before blank/unblank operations. When this modal is on, all blank/unblank operations request view selection. When this modal is off, selected entities are blanked or unblanked in all views. The default status is off. Refer to Using 1.10 BLANK/UNBLANK VIEW SELECT discussed in the beginning of chapter 4.

BLANK/UNBLANK IN SELECTED VIEWS

- 1.ON
- 2.OFF

Enter:

- 1 To select the views in which entities are to be blanked/unblanked.
- 2 To blank/unblank entities in all displayed views.

1.11 Entity Selection Control

With this modal, you can determine how entities are chosen. The system displays:

```

ENTITY SELECTION CONTROL
 1.DISPLAY SELECTION SYSTEM MODALS
 2.CHAIN SELECT MODALS
 3.SINGLE SELECT FROM GROUP
 4.DISPLAY ATTENTION POINTS OF LINES
 5.IMPLICIT POINT MODALS
 6.SET SELECT TARGET
 7.REPEAT INCLUDE/EXCLUDE
 8.CONSTRAINT SET DURATION
 9.SELECTION MODIFICATION
10.SELECTION METHOD

```

The following sections describe the choices in this menu.

1.11.1 Display Selection System Modals

With this modal, you can display the status of each of the modals that can be set in 1.11 ENTITY SELECTION CONTROL.

The following is an example of system modal display (default values are in U.S. customary units):

Example:

```

SELECTION SYSTEM MODALS
 1.CHAIN SELECT MODE:           E/D
 2.CHAIN SELECT METHOD:         SET
 3.DISALLOW PRESELECTED CURVES: ON
 4.SINGLE SELECT FROM GROUP:    OFF
 5.ATTENTION POINT OF LINES:   MID
 6.REPEAT INCLUDE/EXCLUDE:     ON
 7.CONSTRAINT SET DURATION:    ONCE
 8.SELECTION MODIFICATION:     OFF
 9.SELECTION METHOD:           SCREEN

```

1.11.2 Chain Select Modals

With this modal, you can select a modal for automatic chain selection. If undesired entities are interfering with chain selection, you can activate this modal and identify the disallowed curves before performing the chain selection. The system displays the current modal value:

CHAIN SELECT MODALS		Enter:
1.CHAIN SELECT MODE	E/D	1 To select chain select mode.
2.CHAIN SELECT METHOD	SCREEN	2 To select chain select method.
3.DISALLOW PRESELECTED CURVES	OFF	3 To disallow preselected curves.

If you select 1.CHAIN SELECT MODE from the Chain Select Modals menu, you can specify a chain with a first entity and direction or first and second entities. The system displays:

CHAIN SELECT MODE		Enter:
1.SELECT FIRST ENTITY AND DIRECTION		1 To select a first (starting) entity and identify a direction to find contiguous entities. This is the default setting.
2.SELECT FIRST AND SECOND ENTITIES		2 To select the first and second entities of the chain.

If you select 2.CHAIN SELECT METHOD from the Chain Select Modals menu, you can specify the method for selecting the entities needed for defining a chain. The system displays:

CHAIN SELECT METHOD		Enter:
1.SCREEN SELECT		1 To indicate chain entities by screen position. This is the default setting.
2.NAME		2 To indicate chain entities by name.
3.SEQUENCE NUMBER		3 To indicate chain entities by sequence numbers.
4.POINTER NUMBER		4 To indicate chain entities by pointer number.
5.SET WHEN USED		5 To indicate chain select method when needed (no default).

If you select 3.DISALLOW PRESELECTED CURVES from the Chain Select Modals menu, the system allows you to select curves which should not be included in the chain. When chain selecting, the system displays:

DISALLOW PRESELECTED CURVES

- 1.ON
- 2.OFF

Enter:

- 1 To specify a system prompt for disallowed curves prior to any chain selecting.
- 2 For no system prompt for disallowed curves. This is the default setting.

1.11.3 Single Select From Group

With this modal, you can turn on or off the ability to single select entities that are members of a group or composite curve. When this modal is on, you can single select from a group; when this modal is off, you cannot single select from a group.

SINGLE SELECT FROM GROUP

- 1.ON
- 2.OFF

Enter:

- 1 To single select entities from a group.
- 2 To not single select entities from a group. This is the default setting.

NOTE

Single select from group is not allowed when deleting entities. This modal has no effect on chain or region select. When group is allowable as a selectable entity, you must use function control keys to identify the entity type to single select from a group directly. You are not allowed to single select from a group to form another group.

1.11.4 Display Attention Points of Lines

With this modal, you can choose the point on a line where the attention indicator is placed.

DISPLAY ATTENTION POINTS OF LINES

- 1.AT MID POINT
- 2.AT POINT NEAREST CURSOR

Enter:

- 1 To have the attention indicator of a line displayed at its midpoint. This is the default setting.
- 2 To have the attention indicator of a line displayed at the point on the line nearest the cursor.

If you repaint the screen before finishing entity selection, the attention indicators of lines are displayed at the midpoint. New selections have the attention indicators near the cursor position.

In either case, you return to the next higher menu level.

1.11.5 Implicit Point Mode

With this modal, you can select implicit points. Currently, the system allows you to define implicit points automatically at the end of curves, in the middle of lines, and at the center of circles. Without implicit points, you need an extra step to enter the point menu (refer to 9 POINT in the ICEM Design/Drafting Basic Construction manual) to define the point to be selected. Implicit point selection is permitted whenever the system displays the following message during screen selection:

INDICATE POINT OR IMPLICIT POINT

When an entity other than an existing point is indicated, an attention indicator captures this entity and an implicit point is defined (a point is created). If the mode is blanked or dormant, an I indicates the position of the implicit point. If the mode is 3.DISPLAY WHEN DEFINED, a point is displayed with an attention indicator. The default is 4.DISALLOW IMPLICIT POINTS.

When IMPLICIT POINT mode is chosen, the system displays:

IMPLICIT POINT MODALS	Select the method to indicate the type of implicit point.
1.DEFINE AS BLANKED	
2.DEFINE AS DORMANT	
3.DISPLAY WHEN DEFINED	
4.DISALLOW IMPLICIT POINTS	
5.DEFINE ON CURRENT LEVEL	
6.PRESET LEVEL OF DEFINITION	

Enter

- 1 To blank any implicit point that you previously defined. The point can later be displayed by unblanking (refer to 2 BLANK/UNBLANK).
- 2 To make dormant any implicit point that you previously defined. Dormant points cannot be removed from the data base and are not processed by 5.2.3 AUTO GRAPL.
- 3 To display any implicit point as soon as it is defined. This modal avoids the possibility of defining several implicit points at the same location.
- 4 To be prohibited from defining implicit points.
- 5 To allow any implicit point defined (blank, dormant, or displayed) on the current default level.
- 6 To display:

IMPLICIT POINTS LEVEL=nnnn

You then enter the level on which all subsequent implicit points are to be defined.

1.11.6 Set Select Target

With this modal, you can increase screen selection speed by limiting the area around the cursor within which the search for entities occurs. The smaller the target size, the faster entity selection is made.

TARGET SIZE

- 1.FULL SCREEN
- 2.ENTER TARGET SIZE

Enter:

- 1 To use the full screen as the target area.
- 2 To define a region around the cursor as the target area.

If you select 1.FULL SCREEN, the search for entities is made within the entire screen area.

If you select 2.ENTER TARGET SIZE, the system asks you to specify the target size.

TARGET SIZE = 0.0000

Enter the distance from an edge to the center of an imaginary square which will define the target area (see figure 3-2).

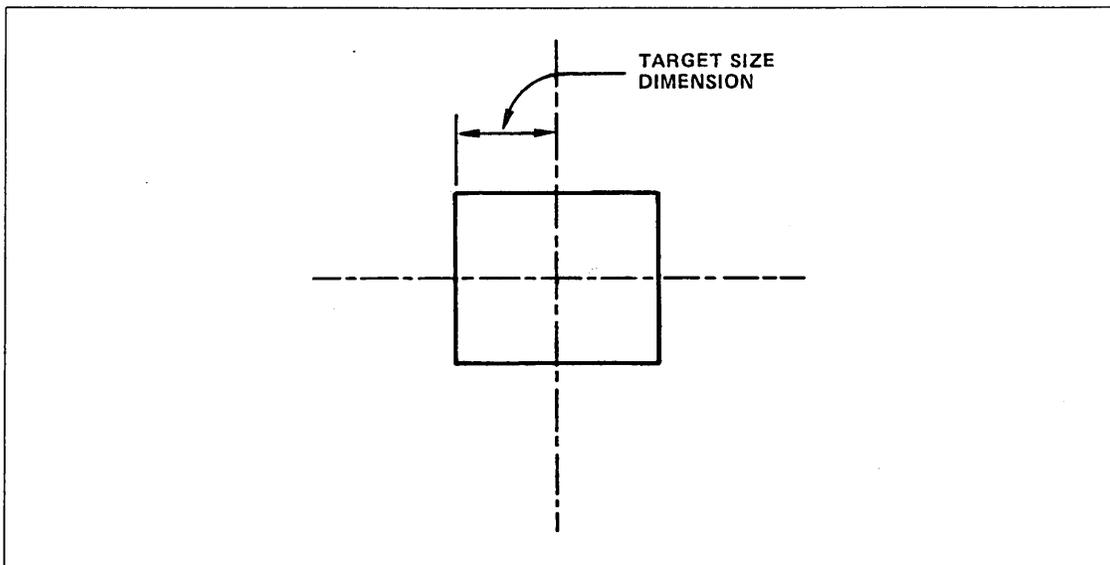


Figure 3-2. Target Size

NOTE

The target size is defined with reference to the screen itself. It is independent of the current zoom scale and view. The target size uses the current units system.

When you enter ICEM DDN, the target size defaults to:

0.5 inches if the unit system is English

12.7 millimeters if the unit system is metric

For parts created prior to V1.53, the target size is set to the default value. New parts created under V1.53 and old parts refiled under V1.53 will retain the target size specified prior to filing. Parameter setting FS can be used to specify the target size equal to the full screen (refer to Preselecting Parameter Settings in chapter 1 of this manual).

1.11.7 Repeat Include/Exclude

With this modal, you can remain at the Define Constraints menu and continue setting constraints or return after setting one constraint. This feature is similar to 1.2.1 CONTINUE OPERATION MODE construction modal. The system displays:

REPEAT INCLUDE/EXCLUDE

- 1.ON
- 2.OFF

Enter:

- 1 To enter more than one include or exclude property. This is the default setting.
- 2 To enter only one include or exclude property.

1.11.8 Constraint Set Duration

With this modal, you can select the duration of time in which a constraint set will be active. The system displays:

CONSTRAINT SET DURATION

- 1.ONCE
- 2.CONTINUOUS

Enter:

- 1 To specify that the constraint set will be active only until this selection is complete or until it is cleared. This is the default setting.
- 2 To specify that the constraint set will be active as long as this part is in use or until it is cleared.

1.11.9 Selection Modification

With this modal, you determine whether or not entity selection returns to the Modify Selection menu. This feature allows you to reject incorrectly selected entities. The system displays:

SELECTION MODIFICATION
1.ON
2.OFF

Enter:

- 1 To allow modification of selected entities.
- 2 To return from selection without modifications. This is the default setting.

1.11.10 Selection Method

This modal allows you to select a default selection method. If this selection method is valid, selection begins immediately in this method. The system displays:

SELECTION METHOD
1.SCREEN SELECT
2.NAME
3.SEQUENCE NUMBER
4.POINTER NUMBER
5.SET WHEN USED

Enter the desired selection method. Screen Select is the default setting.

Enter E or CTRL-E to return to the Entity Selection menu.

1.12 Display Modal Status

With this modal, you can display the number of currently defined views and the status of each of the modals that can be set in 1 MODALS AND FONTS.

The following is an example of system modal display (default values are in U.S. customary units):

Example:

DV SYSTEM MODALS	
1.MENU CHOICES:	ON
2.MENU HEADINGS:	OFF
3.CONTINUE OPERATION:	ON
4.DISPLAY TOLERANCES:	0.0050
5.DECIMAL PLACES:	4
6.CURVE FONT:	SOLID
7.CURSOR:	TABLET
8.BLANK/UNBLANK:	ALL VIEWS
9.COLOR DISPLAY MODE:	ENT. TYPE
10.ENTITY DRAGGING:	OFF

1.13 Display Title Block

Enter] to display more system modals. An example of the second set of system modals is as follows:

```
DV SYSTEM MODALS
 1.NUMBER OF DEFINED VIEWS:      8
 2.PEN NUMBER:                   0
 3.LEVEL NUMBER:                 0
 4.COLOR NUMBER:                 0
 5.GRID ACTIVE:                  YES
 6.GRID DISPLAYED:               YES
 7.MENU/INPUT MODE:              TABLET/TABL
 8.USER PAGE UPPER:              OFF
 9.USER PAGE LOWER:              OFF
10.FT/IN DATA DISPLAY MODE:     DECIMAL
11.FEET/INCHES ROUNDING:        1/64 INCHES
```

1.13 Display Title Block

With this modal, you can display a title block containing information on the current part. The title block is not permanent; when the screen is repainted, the title block is not redisplayed. Figure 3-3 is an example of the title block.

If the alphanumeric screen is used, the system asks if the title block is to be displayed on the alphanumeric or the graphic screen.

IND LOWER LEFT OF TITLE BLOCK

Use the graphics cursor to indicate where the lower left corner of the title block is to be displayed.

THIS SAMPLE PART NAME HAS A LENGTH WHICH IS THE MAXIMUM 70 CHARACTERS!	
SHEET=1	ZOOM =1.0000
DTOL =0.0050	ENGLISH
IN PROCESS	X-MIN=-0.0018
Y-MIN=-0.0018	X-MAX=14.4982
Y-MAX=10.8768	VIEW =1
DEPTH=0.0000	LEVEL=0
SEQ NO. =2	REL/REV= 1.59
FORMAT VIEW=NONE	

Figure 3-3. Title Block

1.14 Terminal Dependent Modes

With this modal, you can specify whether an entity should be placed in the storage or refresh display when using a Tektronix 4114 terminal. You can also change the CDC Viking 721 terminal screen settings, as well as move the entities around the screen when screen positioning is in certain functions. In addition, you can restore terminal parameter settings and activate local display files on Tektronix terminal models 4105, 4107, 4109, 4113, 4114, 4115, 4125, or CDC 790 with TEKEM.

- TERMINAL DEPENDENT MODES
- 1.STORAGE/REFRESH DISPLAY
- 2.721 MODALS
- 3.ENTITY DRAGGING
- 4.RESTORE TERMINAL PARAMETERS
- 5.LOCAL DISPLAY FILE

The following sections describe the choices in this menu.

1.14.1 Storage/Refresh Display

With this modal, you can specify whether entities should be placed in the storage or refresh display on Tektronix 4114 terminals:

STORAGE/REFRESH DISPLAY

- 1.EXISTING ENTITIES INTO STORAGE
- 2.EXISTING ENTITIES INTO REFRESH
- 3.NEW ENTITIES INTO STORAGE
- 4.NEW ENTITIES INTO REFRESH

Enter:

- 1 To select existing entities and put them in the storage display. The system displays:

INDICATE ENTITY

Use the graphics cursor to screen select entities to be put in the storage display.

If you want to use another method of selection, enter CTRL-E to receive the following menu:

ENTITY SELECTION

- 1.SCREEN SELECT
- 2.CHAIN
- 3.REGION IN
- :

Use the Entity Selection menu to select entities to be put in the storage display. For more information, refer to Entity Selection in chapter 2 of this manual.

- 2 To select existing entities and put them in the refresh display. The system displays:

INDICATE ENTITY

Use the graphics cursor to screen select entities to be put in the refresh display.

If you want to use another method of selection, enter CTRL-E to receive the following menu:

ENTITY SELECTION

- 1.SCREEN SELECT
- 2.CHAIN
- 3.REGION IN
- :

Use the Entity Selection menu to select entities to be put in the refresh display. For more information, refer to Entity Selection in chapter 2 of this manual.

- 3 To put all new entities in the storage display (entities are put in the storage display by default).
- 4 To put all new entities in the refresh display.

1.14.2 721 Modals

With this modal, you can set the CDC 721 terminal screen settings.

721 MODALS

- 1.DIALOG AREA DOWN
- 2.DIALOG AREA UP
- 3.INVERSE DIALOG AREA OFF
- 4.INVERSE DIALOG AREA ON
- 5.INVERSE GRAPHICS AREA OFF
- 6.INVERSE GRAPHICS AREA ON

Enter:

- 1 To place the dialog area in the lower quarter of the display.
- 2 To place the display area in the upper quarter of the display.
- 3 To turn off reverse text.
- 4 To reverse text in the dialog area (dark characters on a light background).
- 5 To turn off reverse graphics.
- 6 To reverse the graphics (dark lines on a light background).

1.14.3 Entity Dragging

With this function, you can locate the origin of entities either by using the cursor or by actually positioning a copy of the entities exactly where they are to be placed. This second method is entity dragging and is used in 13.5 TRANSLATE, 13.7 DUPLICATE AND TRANSLATE, and 16.13.1 NEW ORIGIN only on the Tektronix 4107, 4109, 4113, 4114, 4115, and 4125 as well as the CDC 790 with TEKEM terminals. The entities appear on the screen after the TRANSLATION MODE prompt for screen position selection, or after the ENTITY SELECTION FOR NEW ORIGIN prompt. Then you move the entities to the desired location on the screen. After you accept the location, the entities are drawn at that location on the screen.

The following menu allows you to select whether or not you wish to use the dragging feature. The system displays:

ENTITY DRAGGING

- 1.ON
- 2.OFF

Enter:

- 1 To select entity location by moving the entities around the screen.
- 2 To use the cursor to place the entities on the screen. This is the default setting.

1.14.4 Restore Terminal Parameters

You must perform a manual reset of the terminal before this function can be executed on these terminal types: Tektronix 4105, 4107, 4109, 4113, 4114, 4115, 4125, or CDC 790 with TEKEM. This function restores the terminal SETUP parameters to their settings after initialization.

RESTORE TERMINAL PARAMETERS?

Enter:

- Y To restore the terminal SETUP parameters.
- N To return to the TERMINAL DEPENDENT MODES prompt.

1.14.5 Local Display File

This menu allows you to select whether or not to use the two-dimensional local display file for these terminal types: Tektronix 4105, 4107, 4109, 4113, 4114, 4115, 4125, or CDC 790 with TEKEM.

LOCAL DISPLAY FILE

Enter:

- 1.ON
- 2.OFF

- 1 To turn the local display file (LDF) on. Turning this modal on causes all subsequent entities to reside in the LDF. A host repaint causes all displayed entities to be placed in the LDF.
- 2 To turn the LDF off. When this modal is turned off, subsequent entities are not stored in the LDF and a host repaint causes all displayed entities to be removed from the LDF.

1.15 Data Entry Mode

With this modal, you can set the mode in which data is entered to the system.

DATA ENTRY MODE

- 1.MENU/CURSOR MODE
- 2.DEFINITION SPACE MODE

The following sections describe the choices in this menu.

1.15.1 Menu/Cursor Mode

With this modal, you can select the keyboard, tablet, or graphics cursor for input.

MENU/CURSOR MODE

- 1.KEYBOARD/CROSSHAIRS
- 2.KEYBOARD/TABLET
- 3.TABLET/CROSSHAIRS
- 4.TABLET/TABLET

Enter:

- 1 To enter menu and text data from the keyboard and graphics data with the graphics cursor.
- 2 To enter menu and text data from the keyboard and graphics data from the tablet.
- 3 To enter menu and text data from the tablet and graphics data with the graphics cursor.
- 4 To enter menu, text, and graphics data from the tablet.

If you are using a Tektronix 4113, 4114, 4115, or 4125 terminal and menu 2.KEYBOARD/TABLET, 3.TABLET/CROSSHAIRS, or 4.TABLET/TABLET is selected, you are asked for the tablet type in use:

411X TABLET OPTION

- 1.OPTION 13
- 2.OPTION 14
- 3.4957 TABLET

Enter:

- 1 To indicate that you are using a Tektronix option 13 tablet.
- 2 To indicate that you are using a Tektronix option 14 tablet.
- 3 To indicate that you are using a Tektronix 4957 tablet.

1.15.2 Definition Space Mode

With this modal, you can display the request for transform coordinates or model coordinates when key-in coordinates are required for point, line, and arc construction, or you can choose which type to use during construction.

DEFINITION SPACE MODE
1. TRANSFORM COORDINATES
2. MODEL COORDINATES
3. COMBINATION

Enter:

- 1 To restrict construction to transform space coordinates only.
- 2 To restrict construction to model space coordinates only.
- 3 To select the option desired during construction. This is the default.

NOTE

When the tablet is activated, it is assumed that DEFINITION SPACE MODE is set to COMBINATION. Accordingly, you should make sure that this modal is set to COMBINATION before using the tablet squares related to key-in coordinates for point, line, and arc construction.

1.16 Activate Page/Change Tablet File

With this modal you can activate a user page, change your tablet command file, and change your MSTRING file. The names of the currently active upper pages, lower pages, tablet command files, and MSTRING files are displayed to the right of the menu choices. The menu for this modal is displayed below:

ACTIVATE PAGE/CHANGE TABLET FILE	
1.ACTIVATE UPPER PAGE	UPPRPAG
2.ACTIVATE LOWER PAGE	LOWRPAG
3.CHANGE TABLET COMMAND FILE	COMDFIL
4.CHANGE MSTRING FILE	MSTRING

Listed below are a number of key terms and concepts which apply to this modal:

Active Tablet Page:

A tablet page currently active on the upper or lower region of the fixed tablet overlay. Direct strings or MSTRINGS assigned to the squares on this page can be executed by selecting squares with a tablet pen or graphics cursor.

MSTRING:

A user-generated string of menu commands and text residing on a user-generated MSTRING file. MSTRINGS may be as long as you desire but each line of string characters for a given string in the MSTRING file must be less than or equal to 80 alphanumeric characters. You may assign the MSTRING names to user tablet page squares. When a user page square has an assigned MSTRING, the string with the associated name on the external string file is executed.

MSTRING File:

A user-generated, formatted text file external to ICEM DDN and containing named records of command strings. The first line of the record contains the name of the MSTRING. The rest of the lines contain menu commands and comments.

Tablet Command File:

The file from which user pages can be activated. When you initially enter the system, the tablet command file and tablet edit file are the same. The default name for this file is TFILE. However, the tablet edit file may be changed so it is different from the tablet command file. To make the command and edit files independent, select 7.13.1.5.2 DO NOT EQUATE EDIT AND COMMAND FILES.

Tablet Edit File:

A formatted file external to ICEM DDN containing records that represent tablet page information (page names and command strings). The default name for this file is TFILE. Pages can be edited and saved from this file. All tablet management editing functions refer to this file.

Tablet Page:

The record representing the set of direct strings or MSTRING assignments that define the functions associated with the squares of a tablet overlay page. These records reside on a formatted file with the default name TFILE, which is external to ICEM DDN.

User Page:

Tablet pages programmed by the user and stored on a tablet file. This tablet file must be defined initially when you create tablet pages and must be local to the system before the user pages are available for use or modification.

The following sections describe the choices in this menu.

1.16.1 Activate Upper Page

With this choice, you can activate a user page in the upper region of your tablet.

ENTER UPPER PAGE NAME

Enter the name of the page you wish to activate in the upper region of your tablet overlay.

To display a list of your user pages on your tablet command file, enter LIST.

To accept the current active upper page (upprpag), enter].

After you enter] or a user page, the system displays:

```
userpag ACTIVATED IN UPPER REGION
```

You then return to 1.16 ACTIVATE PAGE/CHANGE TABLET FILE.

1.16.2 Activate Lower Page

With this choice, you can activate a user page in the lower region of your tablet.

ENTER LOWER PAGE NAME

Enter the name of the page that you wish to activate in the lower region of your tablet overlay.

To display a list of your userpages on your tablet command file, enter LIST.

To accept the current active page, enter].

After you enter] or a user page number, the system displays:

```
userpage ACTIVATED IN LOWER REGION
```

You then return to 1.16 ACTIVATE PAGE/CHANGE TABLET FILE.

1.16.3 Change Tablet Command File

With this choice, you can change your tablet command file. You may then activate user pages which are stored in this new command file.

ENTER NEW COMMAND FILE NAME

Enter the name of the command file from which you wish to activate user pages. To accept the current command file, enter].

If the command file entered is not available, the system displays:

comdf11 WAS NOT FOUND.

The system then displays:

ENTER NEW COMMAND FILE NAME.

After the command file is changed, the system displays:

COMMAND FILE CHANGED TO comdf11

You are then returned to 1.16 ACTIVATE PAGE/CHANGE TABLET FILE.

NOTE

When you enter ICEM DDN, your tablet command file and your tablet edit file are the same file. That is, if you change your tablet command file, your tablet edit file is also changed; if you change your tablet edit file, your tablet command file is also changed. The command and edit files may be made independent of each other through 7.13.1.5.2 DO NOT EQUATE EDIT AND COMMAND FILES. In this case, if you change your command file, your edit file is not changed; if you change your edit file, your command file is not changed.

1.16.4 Change MSTRING File

With this choice, you can change the string file from which your external strings are executed.

ENTER NEW MSTRING FILE NAME

Enter the name of the string file from which you wish to access strings. To accept the current string file, enter].

If the string file entered is not available, the system displays:

strgf11 WAS NOT FOUND

The system then displays:

ENTER NEW MSTRING FILE NAME.

You are then returned to 1.16 ACTIVATE PAGE/CHANGE TABLET FILE.

1.17 Change Trace File Status

With this choice, you can set a modal to control trace files while using ICEM DDN. You can also activate trace files by using the T parameter in the ICEMDDN call statement (refer to Chapter 1 in this manual).

Trace files record the steps taken during a system session. This mode can help debug ICEM DDN by providing a method to duplicate problems. Trace mode produces four files, each of which records a different aspect of the session. The four files are input trace (IT), menu trace (MT), output trace (OT), and overlay and data access trace (CT). Each of these files is explained below.

Input Trace (IT) file

This file records all character, graphics cursor, and tablet input entered with a keyboard. This data can be used as input for the system to reproduce the session just traced. This is useful for documenting and reproducing problems and for generating benchmark sessions. You should pack the IT file with one of the following control statements before using the file:

```
PACK,filename.
```

```
PACK,filename,outlfn.
```

To use this file as an input file for ICEM DDN, include the I or I=lfn parameter on the system call statement.

Menu Trace (MT) file

This file contains the same data as the IT file except when input of commands for menu or text is via tablet. In this case, the keyboard equivalent of the command is recorded. The commands are reported in a readable format (example: F.1.2).

Output Trace (OT) file

This file records every character sent to the terminal from the computer. Communication problems can be discovered by using this file.

Overlay and Data Access Trace (CT) file

This file contains the binary numbers of the overlays called and the binary disk read/write information in chronological order. The disk information contains the address of the request, the length of the data, and the disk address. The CT file can be dumped with the NOS system command TDUMP.

There are two special characters that you can use on trace files.

- Enter W to stop the trace files until you enter a carriage return.
- Enter K to stop the trace files while the system prints a hardcopy.

Both W and K are written to the IT file. W and K can be entered only while you are creating a trace file and then only during menu selection. If you enter W or K when the trace file status is off, the system does not accept them and responds with a beep.

The following options run without rewinding the file, allowing multiple file, stacked trace instructions:

TRACE FILE STATUS

1.ON

2.OFF

3.CHANGE NAME

4.READ IN LFN

Enter

1 To turn on the trace file.

2 To turn off the trace file.

3 To change the trace file name.

4 To change the input file name (filename) to a previously created trace file. This file can then be used as input. When the system encounters an EOF or EOI in the file, it reverts back to filename=INPUT and accepts input from the keyboard, rather than from the specified trace file. This does not rewind the file.

If you select 3.CHANGE NAME or 4.READ IN LFN, the system displays:

ENTER LFN

Enter a local file name.

1.18 Grid

With this modal, you can define, activate, and display the grid. The grid is an invisible quadrille array of lines which run parallel to the xt and yt axes of the workspace. The intersection points of the lines are displayed as dots.

The grid is used for screen position selection. When the grid is active and the system requests a screen position, the system selects the dot nearest the graphics cursor. When the grid is displayed but deactivated, the system functions normally and selects the graphics cursor location as the screen position.

After the grid is defined with this modal, you can activate and deactivate it with function control key G (refer to table 2-1 in chapter 2 of this manual). The G key does not affect the grid display.

```
GRID MODALS
1.GRID ACTIVATION
2.GRID DISPLAY
3.SCALE DISPLAY
4.GRID PARAMETERS
```

Enter:

- 1 To toggle the grid activation. The system displays either GRID ACTIVATED if the grid was not activated, or GRID DEACTIVATED if the grid was activated. This has the same effect as the G key.
- 2 To toggle the grid display. The system displays either the grid if the grid display was off, or does not display the grid if the grid display was on.
- 3 To toggle the grid scale display. The system displays either the scale if the grid scale display was off, or does not display the scale if the grid scale display was on.

NOTE

The grid display and the grid scale display are not affected by the grid modals. If the grid display is too dense, the system does not display the grid. If the scale is too frequent, the system does not display the grid scale.

- 4 To set the grid and scale display modals.

```
GRID SPACING
1.GRID DXT = n.nnnn
2.DYT      = n.nnnn
```

Enter the grid spacing in the x and y directions. Defaults are 6.35 mm (0.25 in).

Select the size of the grid display.

```
GRID RANGE
1.SCREEN POSITION
2.KEY-IN
3.FULL SCREEN
```

Enter:

- 1 To indicate grid position coordinates by using the graphics cursor.

INDICATE LOWER LEFT CORNER

Use the graphics cursor to indicate the lower left corner of the grid.

INDICATE UPPER RIGHT CORNER

Use the graphics cursor to indicate the upper right corner of the grid.

- 2 To indicate grid position by entering coordinates.

1. LOWER LEFT-XT = n.nnnn

Enter the x and y transform coordinates for the lower left grid corner.

2. -YT = n.nnnn

1. UPPER RIGHT-XT = n.nnnn

Enter the x and y transform coordinates for the upper right grid corner.

2. -YT = n.nnnn

SCALE SPACING

1. X-GRID INCREMENT = n.nnnn

Enter the frequency of the scale numbers in x and y directions. Entering 4 produces a scale printed every four grid increments.

2. Y-GRID INCREMENT = n.nnnn

- 3 To display and activate the grid in the entire screen.

1.19 Thick Lines

With this modal, you can select one of four levels of line width. Each width is associated with a pen number and is identified by a thickness number ranging from 0 to 3. The thinnest line is 0, which is the regular line width displayed on a graphics screen. The thickest line is 3, which is approximately 3 times the regular width.

First select whether to turn the thickness control on or off or to modify the thickness. The system displays:

```
PEN THICKNESS
1.ON
2.OFF
3.SET PEN/THICKNESS
```

Enter:

- 1 To turn thickness control on.
- 2 To turn thickness control off.
- 3 To set pen thickness.

Next, select the thickness to be associated with the pen numbers. The system displays:

```
1.PEN 0 = 0
2.PEN 1 = 0
3.PEN 2 = 0
4.PEN 3 = 0
:
0.PEN 9 = 0
```

Enter the required thickness numbers to be associated with the different pen numbers.

```
1.PEN 10 = 0
2.PEN 11 = 0
:
6.PEN 15 = 0
```

Enter] to continue with pen numbers 10 through 15.

Any thickness number outside the 0 to 3 range produces this error message.

```
REENTER THICKNESS BETWEEN 0 AND 3
```

This modal controls the line thickness for solid font lines. Painting time for lines of thickness numbers 1, 2, and 3 is greater than that for lines of thickness number 0.

The thickness for new parts is related in the following manner:

- Pen numbers 0, 4, 8, and 12 are treated as one group of pens. Refer to 1.9.1.2 COLOR BY PEN NUMBER.
- Pen numbers 1, 5, 9, and 13 are a group.
- Pen numbers 2, 6, 10, and 14 are a group.
- Pen numbers 3, 7, 11, and 15 are a group.

The thickness for old parts is not grouped.

Figure 3-4 shows the line thickness for the four different numbers.

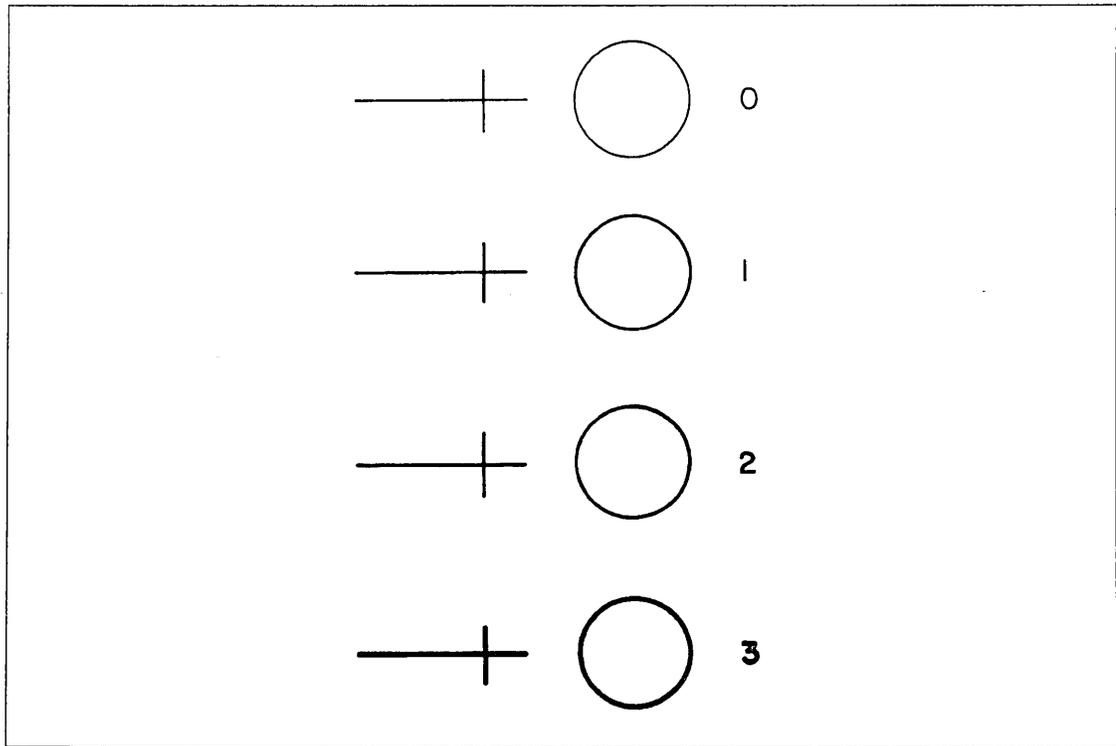


Figure 3-4. Four Levels of Line Thickness

Menu 2: Blank/Unblank **4**

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2.1 Blank-Select	4-3
2.2 Blank-Level Range	4-3
2.3 Blank-All of a Type	4-4
2.4 Blank-All	4-4
2.5 Unblank-Select	4-4
2.6 Unblank-Level Range	4-4
2.7 Unblank-All of a Type	4-5
2.8 Unblank-All	4-5

Using Menu 2

This menu controls blanking of current parts. Blanking leaves an entity in a current part but does not display it. Unblanking makes it visible again.

1.10 BLANK/UNBLANK VIEW SELECT is used exclusively with this menu. Refer to Using 1.10 BLANK/UNBLANK VIEW SELECT for more information.

The menu for this section is:

- BLANK/UNBLANK
- 1. BLANK-SELECT
- 2. -LEVEL RANGE
- 3. -ALL OF A TYPE
- 4. -ALL
- 5. UNBLANK-SELECT
- 6. -LEVEL RANGE
- 7. -ALL OF A TYPE
- 8. -ALL

The Blank/Unblank menu offers these features:

Menu Title	Description
2.1 BLANK-SELECT	In a current part, blanks selected entities.
2.2 BLANK-LEVEL RANGE	In a current part, blanks entities on selected levels.
2.3 BLANK-ALL OF A TYPE	In a current part, blanks all entities of the selected type(s).
2.4 BLANK-ALL	In a current part, blanks all entities.
2.5 UNBLANK-SELECT	In a current part, unblanks selected entities.
2.6 UNBLANK-LEVEL RANGE	In a current part, unblanks entities on selected levels.
2.7 UNBLANK-ALL OF A TYPE	In a current part, unblanks all currently blanked entities of the selected type(s).
2.6 UNBLANK-ALL	In a current part, unblanks all entities.

Using 1.10 Blank/Unblank View Select

Through the use of 1.10 BLANK/UNBLANK VIEW SELECT, you have the option of displaying or not displaying entities in specified views. This function is called selective view blank/unblank. It is independent of the blank/unblank function in that an entity can be blanked but not necessarily selectively blanked, and vice versa. For example, suppose you select a view in which an entity is to be selectively blanked. That entity is selectively blanked in that specified view and is not displayed in that view; however, the entity is still displayed in all other views, and is still unblanked. Changing the 1.10 BLANK/UNBLANK VIEW SELECT modal to ALL VIEWS and blanking that same entity causes it to be both selectively blanked and unblanked, and therefore not displayed in any view. Unblanking the entity causes it to be only selectively blanked again, and displayed in all views except the view you originally specified.

If the modal is turned on, the system displays the following when you choose a submenu from 2 BLANK/UNBLANK:

```
VIEW SELECTION
1.RANGE
2.VIEW NUMBER
```

Enter:

- 1 To select a range of views.

```
FROM VIEW =          Enter the range of views (1 to 420) to
TO VIEW =           be selectively blanked. Enter ] or [ to
                    return to the VIEW SELECTION
                    prompt.
```

If the sequence number of a group or composite curve lies within this range, the subentities within this group will be blanked, even though the sequence numbers of the subentities do not lie within this range.

- 2 To select an individual view.

```
VIEW NUMBER =       Enter the individual view number. Enter
                    [ or ] to return to the VIEW
                    SELECTION prompt.
```

You continue to the blank/unblank choice you selected.

Selective view blanking is a cumulative function. If an entity is selectively blanked in two different views in separate operations, that entity is selectively blanked in both views. To reduce the number of views in which an entity is selectively blanked, use a selective unblank function. An entity may be selectively blanked or unblanked in views 1 through 420.

An unblank with the blank/unblank view select modal set to all displayed views does not unblank views that have been selectively blanked. These views must be selectively unblanked to be redisplayed.

Hexahedrons cannot be selected with the blank/unblank or selective view blank/unblank functions. Dimensions, notes, centerlines, and feature frame symbols may be selected, but are selectively blanked only if the view number entered corresponds with the entity's view of definition.

All basic geometry, point sets, strings, arrays, vectors, three-dimensional splines, machining curves, advanced design, numerical control entities, and section lining can be blanked or selectively blanked. It is important to remember that 2 BLANK/UNBLANK only affects displayable entities; nondisplayable entities cannot be processed. These entities include composite curves, copious data, groups, variables, and system entities. Selection of groups or composite curves does not affect them but does affect the subentities from which they are created.

The following sections describe the choices in this menu.

2.1 Blank-Select

With this choice, you can blank selected entities in the current part. If 1.10 BLANK/UNBLANK VIEW SELECT is on, you are prompted to select a view. If it is off, continue with the blank/unblank operation. Refer to Using 1.10 BLANK/UNBLANK VIEW SELECT.

The system prompts you with this menu:

```
INDICATE ENTITY                               Select the entities you wish blanked.
```

If you want to use another method of selection, enter E or CTRL-E to receive the following menu:

```
CONSTRAINT SET = csetname
ENTITY SELECTION
  1.SCREEN SELECT
  2.CHAIN
  3.REGION IN
  4.ALL DISPLAYED
  5.ENTIRE PART
  6.OTHER SELECTION METHODS
  7.MODALS
  8.USE NAMED CONSTRAINT SET
  9.CLEAR CONSTRAINTS
 10.DEFINE CONSTRAINTS
```

2.2 Blank-Level Range

With this choice, you can blank entities in the current part that are defined on particular levels. If 1.10 BLANK/UNBLANK VIEW SELECT is on, you are prompted to select a view. If it is off, continue with blank/unblank operations. Refer to Using 1.10 BLANK/UNBLANK VIEW SELECT.

The system displays this prompt:

```
1.FROM LEVEL   = 0                               Enter the level range and increment.
2.TO LEVEL     = 0
3.BY INCREMENT = 1
```

Nondisplayable entities such as groups are not processed at their levels, but all subentities within these entities are processed at their levels. For example, a group exists at level 0 with two arcs in the group at level 1, and you enter a level range of level 0 to level 0. The arcs at level 1 are not blanked.

2.3 Blank – All of a Type

With this choice, you can blank all entities in the current part that are of a type or set of types you select from the Entity Types menu (refer to Entity Selection in chapter 2 of this manual). If 1.10 BLANK/UNBLANK VIEW SELECT is on, you are prompted to select a view. If it is off, continue with the blank/unblank operation. Refer to 1.10 BLANK/UNBLANK VIEW SELECT.

2.4 Blank – All

With this choice, you can blank all entities in the current part. If 1.10 BLANK/UNBLANK VIEW SELECT is on, you are prompted to select a view. If it is off, continue with the blank/unblank operation. Refer to 1.10 BLANK/UNBLANK VIEW SELECT.

2.5 Unblank – Select

With this choice, you can unblank selected entities that are currently blanked. This allows you to view specific data in an organized manner, such as all labels, dimensions, and notes. If 1.10 BLANK/UNBLANK VIEW SELECT is on, you are prompted to select a view. If it is off, continue with the blank/unblank operation. Refer to Using 1.10 BLANK/UNBLANK VIEW SELECT.

ENTITY SELECTION	Select the entities you wish unblanked.
1.SCREEN SELECT	
2.CHAIN	
3.REGION IN	
:	

2.6 Unblank – Level Range

With this choice, you can unblank all entities in the current part that are defined on particular levels. If you create many entities on different levels, this operation provides a clear, organized view of each level. If 1.10 BLANK/UNBLANK VIEW SELECT is on, you are prompted to select a view. If it is off, continue with blank/unblank operations. Refer to using 1.10 BLANK/UNBLANK VIEW SELECT.

The system displays this prompt:

1.FROM LEVEL = 0	Enter the level range and increment.
2.TO LEVEL = 0	
3.BY INCREMENT = 1	

Nondisplayable entities such as groups are not processed at their levels, but all subentities within these entities are processed at their levels. For example, a group exists at level 0 with two arcs in the group at level 1, and you enter a level range of level 0 to level 0. The arcs at level 1 are not unblanked.

2.7 Unblank—All of a Type

With this choice, you can unblank all entities that are currently blanked and that are of a type or set of types you select from the Entity Types menu (refer to the Entity Selection in chapter 2 of this manual). This allows you to view specific data in an organized manner, such as all labels, dimensions, and notes. If 1.10 BLANK/UNBLANK VIEW SELECT is on, you are prompted to select a view. If it is off, continue with the blank/unblank operation. Refer to 1.10 BLANK/UNBLANK VIEW SELECT.

2.8 Unblank—All

With this choice, you can unblank all entities in the current part that are currently blanked. If the current part contains no blanked entities, this operation has no effect. If 1.10 BLANK/UNBLANK VIEW SELECT is on, you are prompted to select a view. If it is off, continue with the blank/unblank operation. Refer to 1.10 BLANK/UNBLANK VIEW SELECT.

Menu 3: Delete

5

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3.1 Select	5-3
3.2 Level Range	5-3
3.3 All Points	5-3

Using Menu 3

The Delete operation is used primarily to remove some or all of the entities from the current part or from the data base.

The menu for this section is:

- DELETE
- 1. SELECT
- 2. LEVEL RANGE
- 3. ALL POINTS

The Delete menu offers these functions:

Menu Title	Description
3.1 SELECT	In a current part, deletes entities of any type.
3.2 LEVEL RANGE	In a current part, deletes all entities on one or more specified levels.
3.3 ALL POINTS	In a current part, deletes all displayed points.

Because delete operations totally delete entities from the data base, the system demands a confirmation of the requested deletion. An entity must be recreated to be returned to the data base.

The system displays the following prompts (if applicable) during use of this menu:

CAUTION-DELETE ENTITY?	Indicates that the entity to be deleted is used in the definition of another entity. Entering Y causes the entity to become dormant (the data defining the entity remains in the data base, but the entity is not displayed).
ENTITY IS PART OF A GROUP DELETE GROUP STATUS?	Indicates that the entity selected is part of a group or composite curve. Subentities within these types cannot be deleted without first deleting the group or composite curve to which they belong.
ENTITY IS PART OF COMPOSITE CURVE	

DELETE COMPOSITE CURVE STATUS?

Enter:

Y To delete the group or composite curve to which the entity belongs. After the group or composite curve status is deleted, the system deletes the entity or entities selected.

N To leave the group or composite curve status unchanged and proceed to the next entity selected, or, if no other entities exist, to return to the main menu.

DELETE ENTITIES IN
COMPOSITE SURF?
DELETE CURVES IN
COMPOSITE CURVE?

Indicates that a group (13 ENTITY MANIPULATION), composite curve, or composite surface (15 ADVANCED DESIGN) has been selected for deletion.

DELETE ENTITIES IN GROUP?

Enter:

Y To delete the group, composite curve, or composite surface, and the entities within it.

N To delete only the group, composite curve, or composite surface, but not the entities within it.

These prompts are displayed only once for each entity type encountered. Answers to prompts influence the entities selected.

After performing a deletion, you return to the next higher menu level by using] rather than a control key or the F key. The deletion from the data base takes place only upon entry of].

The following sections describe the choices in this menu.

3.1 Select

With this choice, you can delete selected entities. The system displays:

INDICATE ENTITY

Use the graphics cursor to screen select the entities you wish to delete.

If you want to use another method of selection, enter CTRL-E to receive the following menu:

CONSTRAINT SET = csetname

Select one or more entity types. Enter] when all desired types are chosen.

ENTITY SELECTION

1.SCREEN SELECT

2.CHAIN

3.REGION IN

4.ALL DISPLAYED

5.ENTIRE PART

6.OTHER SELECTION METHODS

7.MODALS

8.USE NAMED CONSTRAINT SET

9.CLEAR CONSTRAINTS

10.DEFINE CONSTRAINTS

3.2 Level Range

With this choice, you can delete all the entities in the current part that are on particular levels. This menu modal includes entities blanked in all views, entities selectively blanked in the work view, entities that are off-screen with respect to the work view, and drafting entities that are not displayed in the work view.

The system displays this prompt:

1.FROM LEVEL = 0

Enter the level range and increment.

2.TO LEVEL = 0

3.BY INCREMENT = 1

3.3 All Points

With this choice, you can delete all the displayed points in the current part.

DELETE ALL POINTS?

The system requests confirmation that all displayed points in the current part are to be deleted.

Enter:

Y To delete all displayed points.

N To exit from this operation and return to 3 DELETE without performing this operation.

This menu offers eight choices for filing or not filing parts, including the option of suspending the session. The system displays:

FILE CURRENT PART/EXIT ICEM DDN Select the desired operation.

1. FILE-CONTINUE CURRENT PART
2. -GET DIFFERENT PART
3. -QUIT SESSION
4. -SUSPEND SESSION
5. DO NOT FILE-CONTINUE FROM LAST FILE
6. -GET DIFFERENT PART
7. -QUIT SESSION
8. -SUSPEND SESSION

If you select 1. FILE-CONTINUE CURRENT PART from the File Current Part/Exit ICEM DDN menu, the system files the current part and you may continue working on the part. The system displays:

FILE COMPLETE

If you select 2. FILE-GET DIFFERENT PART from the File Current Part/Exit ICEM DDN menu, the system files the current part and you may create or retrieve a different part.

If you select 3. FILE-QUIT SESSION from the File Current Part/Exit ICEM DDN menu, the system files the current part and you leave the system.

If you select 4. FILE-SUSPEND SESSION from the File Current Part/Exit ICEM DDN menu, the system files the current part and temporarily suspends ICEM DDN. The system displays:

ICEM DDN SUSPENDED

During 4. FILE-SUSPEND SESSION, you may execute any available application, procedure (EDL, if available), or system command. When you wish to reenter ICEM DDN, use the ICEMDDN execution command. When you reenter, the terminal configuration, part name, drafting standards, and units of measurement prompts do not reappear but are automatically reloaded to their previous settings. You are prompted by the ICEM DDN main menu.

NOTE

If you select 3. FILE-QUIT SESSION, the system automatically performs a PACK PART operation (rearranges TAB2 and TAB3 data to follow TAB1 entity order). Two messages may occur as a result of the PACK PART operation. The system may display:

PART HAS BEEN FILED
PART RENEW RECOMMENDED TO REDUCE SIZE

or this message:

PART HAS NOT BEEN FILED.
PART RENEW RECOMMENDED
TO CORRECT PART PROBLEM(S).

If you select 5.DO NOT FILE-CONTINUE FROM LAST FILE from the File Current Part/Exit ICEM DDN menu, the system abandons all work done since the last current part filing and you continue to work on the filed version of the current part. The system displays:

CONTINUE FROM LAST FILE?

If you enter N, you return to the File Current Part/Quit Session menu. If you enter Y, you return to the filed version of the current part.

If you select 6.DO NOT FILE-GET DIFFERENT PART from the File Current Part/Exit ICEM DDN menu, the system abandons all work done since the last current part filing and gets a different part. The system displays:

GET DIFFERENT PART WITHOUT FILING?

If you enter Y, the part will not be filed and you will return to the ENTER PART NAME prompt. If you enter N, you return to the File Current Part/Exit ICEM DDN menu.

If you select 7.DO NOT FILE-QUIT SESSION from the File Current Part/Exit ICEM DDN menu, the system abandons all work done on the current part and you leave the system. The system displays:

QUIT SESSION WITHOUT FILING?

If you enter Y, the part will not be filed and the session will end. If you enter N, you return to the FILE Current Part/Exit ICEM DDN menu.

If you select 8.DO NOT FILE-SUSPEND SESSION from the File Current Part/Exit ICEM DDN menu, the system saves all work done on the current part and temporarily suspends ICEM DDN. The system displays:

ICEM DDN SUSPENDED.

During 8.DO NOT FILE-SUSPEND SESSION, you may execute any available application, procedure (EDL, if available) or system command. When you wish to reenter ICEM DDN, use the ICEM DDN execution command. When you reenter, the terminal configuration, part name, drafting standards, and units of measurement prompts do no reappear but are automatically reloaded to their previous settings. You are prompted by the ICEM DDN main menu.

NOTE

Both [and] will return you to the main menu without filing or leaving the current part.

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Glossary

A

A

Active Tablet Page

A tablet page currently active on the upper or lower region of the fixed tablet overlay.

Alpha Assist

A terminal that displays alphanumeric data.

Alphanumeric

The letters of the alphabet (A through Z) and the digits (0 through 9).

ANSI

American National Standards Institute. English (U.S. customary) dimensions are specified in feet and/or inches. Metric dimensions are specified in millimeters.

Assigned Entity Color

ICEM DDN preassigned default color for entities.

Attach

To establish user communication with a direct access primary file.

Attention Indicator

A small oval that the system displays on an entity to indicate that the entity has been selected.

Auxiliary View

A view that can be user-defined. The standard views (top, bottom, right, left, front, back, isometric, and auxiliary) are defined by the system.

B

Baud Rate

The rate at which data passes over the communication line between the terminal and the computer.

BFL

Basic function lower area of the main tablet overlay.

BFU

Basic function upper area of the main tablet overlay.

Blanking

A process applied to entities in the current part where the entities remain in the part, but are not displayed on the screen. Contrast with Deleting.

C

Chain Select

The process of selecting a series of contiguous curves.

Character Cell Background

A rectangular matrix in which a textual character is defined.

CMY

Cyan, magenta, and yellow color scheme.

Color Number

System-assigned numbers for display colors.

Constraint Set

A set of user-defined properties or characteristics that an entity must possess in order to be selected.

Contiguous Curves

Adjacent curves that share a common endpoint or that have endpoints within a short distance of each other.

Coordinate Axes

The lines that form a right-handed, three-dimensional frame of reference. The model axes (x, y, and z) and the transform axes (xt, yt, and zt) are referenced from a shared origin point in which $x=0$, $y=0$, and $z=0$.

Coordinate Space

A space created by the position (rotation and translation) of the coordinate axes. There are two types of coordinate space: model and transform.

Coordinates

The position of a point in relation to the x-, y-, and z- or xt-, yt-, and zt-axes.

Curve

A line, arc, conic, or two-dimensional spline. In some cases, it also includes points, three-dimensional splines, strings, composite curves, machining curves, and Bezier curves.

D

Data Base

An integrated set of files, tables, arrays, and other data structures.

Data Capture

The system capability to save as a variable either a default parameter value or a previously entered parameter value displayed on the screen.

DBM

The data base management tablet overlay.

Default Value

A value used by the system if] is entered in response to a data entry prompt. It is also the initial value assigned to a modal until it is changed.

Deleting

The removal of entities from the data base. Contrast with Blanking.

Depth

The current value of the workplane along the z- or zt-axis of the workspace.

Dialog Text Color

The color of the text in ICEM DDN menus, prompts, and messages.

DIN

Deutsche Industrie Norme (German industry standards).

Direct Access File

Permanent file that can be attached directly to a job without any local copy being generated. All changes to this file are made to the file itself.

Direct String

A string of menu commands and text associated with a tablet page overlay square. The string is stored within the tablet file.

Dormant Entity

An entity created by the system for the purpose of defining another entity. Dormant entities cannot be displayed or manipulated. All dormant entities have sequence numbers.

Dragging

The movement of selected entities around the screen in order to view their position at any given point. The entities are drawn in the accepted location.

E

English (U. S. customary) Mode

The condition in which all entities are defined in English (U. S. customary) units (inches and/or feet).

Entity

The representation of a geometric construction in the ICEM DDN data base. Examples are points, lines, arcs, and spheres.

Entity Type Numbers

System-assigned code numbers used to identify specific entity types such as line, group, and copious data.

F

File

To save the changes made to a part on a permanent part file.

Font

The method used to represent a line or curve in a display. Examples of fonts are solid, dashed, phantom, and centerline.

Function Control Key/Square

A keyboard/tablet character that has a special function in ICEM DDN such as menu and entity selection.

Function Control Mode

The state in which ICEM DDN accepts control input, such as menu selection or entity selection, rather than alphanumeric information. Contrast with Key In Data Mode.

G

GPL

A graphics programming language. See the ICEM Design/Drafting GPL manual.

Graphics Color

A color used in the graphics portion of the ICEM DDN displays.

Graphics Cursor

The cursor symbol used to locate or define entities by screen position. The graphics cursor can be crosshairs or some other cursor symbol.

Graphics Terminal

Terminal that can display and manipulate graphic information as well as alphanumeric characters.

GRAPL

A graphics programming language. See the ICEM Design/Drafting GRAPL Programming Language manual.

H

Hidden Lines

Line segments that are obscured from view in display of a three-dimensional object.

HLS

Hue, lightness, and saturation color scheme.

I

I/O

Input/output facility.

IAF

Interactive Facility.

ICEM DDN

Control Data's integrated computer-aided engineering and manufacturing software application for design, drafting, and numerical control.

ICEMDDN

The name of the direct access file that contains ICEM DDN.

Implicit Point

A point automatically generated by the system at curve endpoints, midpoints, intersections, and circle centers.

Interactive

Job processing in which the user and the system communicate with each other, rather than processing in which the user submits a job and receives output later.

K

Key In Data Mode

The state in which ICEM DDN accepts alphanumeric information rather than control input. Contrast with Function Control Mode.

L

LA

Local assist parameter setting.

LD, LDF

Local display file parameter setting.

Level Management

A method of assigning entities to different levels for management purposes.

Level Number

A number assigned to a collection of entities.

LFN

Local file name.

Local Assist

Terminal or microprocessor generated character sets and grids.

Local Display File

Terminal internal memory in which segments containing graphics are defined. Segments can be locally repainted.

Local File

Any file that is currently associated with a job.

M

MA

Menu area terminal parameter setting.

Menu

A list of options used to perform operations in ICEM DDN.

Message

Text written by the system to display information, errors, or warnings. See also Prompt.

Modal

A user-assigned status or value that controls the operation of ICEM DDN. Examples are modals for setting system decimal places and for activating the grid.

Model Coordinate Space

The space created by the position of the x-, y-, and z-axes. This space is displayed as the front view, view 1. See Transform Coordinate Space.

MSTRING

A user-generated string of menu commands and text that resides on an MSTRING file.

MSTRING File

A user-generated, formatted text file external to ICEM DDN that contains named records of command strings.

N

N/C

Numerical control.

NC

The numerical control tablet overlay.

Normal

Perpendicular.

NOS

Network Operating System.

O

Operating System

The set of system programs that controls the execution of user programs and commands.

Operation Complete --]

A keyboard/tablet operation that completes the current operation.

Operation Reject -- [

A keyboard/tablet operation that rejects the previous operation. The system returns to the preceding prompt.

P

Parameter

A variable whose values determine the operation or characteristics of a system.

Part Name

A series of alphanumeric characters that identify a part or drawing used in conjunction with a sheet number.

Permanent File

A file saved by the system between terminal sessions.

PFN

Permanent file name.

Point

A geometric construction located by x-, y-, and z-coordinates.

Pointer Number

The number assigned to an entity that describes the location in the data base of that entity's parameters.

Prompt

A screen display requiring user action. See also Message.

R

Region Select

A process of selecting all the entities within or outside a specified region.

Rescale

To change the scale factor and redraw a part using the new scale so all entities in the part are displayed.

RGB

Red, green, and blue color scheme.

Rotate

To revolve a construction about an axis.

S

Scalar

A quantity that has magnitude only. Contrast with Vector.

Scale Factor

Ratio of the current display with respect to the data base.

SC1, SC2

The ICEM Schematics tablet overlays.

Sequence Number

A unique sequential number associated with each entity.

SF

The special functions tablet overlay.

Sheet Number

A subdivision of a part name. Sheets can be numbered from 0 to 9,999 with a part name.

SI

Système International d'Unités (international system of units). Dimensions are calculated in metric units. Lengths have units of millimeters. Areas have units of millimeters squared unless otherwise specified.

Single Select

A process of selecting individual entities one at a time.

Standard Page

A preprogrammed tablet page that is always available for use.

Standard Page Overlay

The rectangular, colored plastic sheet with the symbols and text used to select pre-programmed menu choices from the tablet.

Standard Views

The system-generated coordinate systems from which the user can view a display of the part surfaces from these view points: front, back, top, bottom, right, left, isometric, and auxiliary.

Surface Paths

A modal that allows users to define the surface of objects along two parameters of flow, u paths (horizontal) and v paths (vertical).

System

The ICEM DDN software system.

T

Tablet Command File

The file from which user pages can be activated.

Tablet Edit File

A formatted file external to ICEM DDN containing records that represent tablet page information (page names and command strings).

Tablet Page

The record representing the set of direct strings or MSTRING assignments that define the functions associated with the squares of a tablet overlay page.

TAPE3

A local file on which parts are filed and from which parts are retrieved.

Temporary File

A nonpermanent file associated with a job only during job processing.

Terminal Configuration

The hardware and software characteristics required to send and receive data.

Text

Alphanumeric characters and symbols used in notes, labels, and dimensions.

TFILE

A local file for storing a page being modified.

Thick Lines

A modal that allows selection of line thickness.

Trace File

A file in which the step-by-step input by a user during a work session is recorded.

Transform Coordinate Space

The space created by the position of the x_t -, y_t -, and z_t -axes. This space is displayed in any view other than view 1. See Model Coordinate Space.

Transformation of Coordinates

The mapping of the x_t -, y_t -, and z_t -coordinates into the x -, y -, and z -coordinates.

TT

Terminal type parameter setting.

U

U Path

A curve on a surface in one of two parametric directions. See V Path.

Unblank

A procedure for making visible entities that have been blanked by the user.

User Page

Tablet pages programmed by the user and stored on a tablet file.

User Page Overlay

A user-generated graphics representation of the functions programmed on a user page.

V

V Path

A curve on a surface in one of two parametric directions. See U Path.

Vector

A quantity that has magnitude and direction. It is commonly represented by a line segment with directionality. The line's length represents the magnitude and its orientation in space represents the direction. Contrast with Scalar.

View

A display of coordinate space.

W

Work Plane

A specific plane in workspace on which two-dimensional entities are constructed.

Work View

The view in which screen input is accepted.

Workspace

The space in which entity construction and specification occurs.

Z

Zoom

To enlarge or decrease the size of the display proportionately.

Hardware Considerations

Tektronix graphics terminals support several tablet models. The following list describes the various applications.

Terminal Number	Tablet Number
4014	4953, 4954
4105	No tablet is supported
4107, 4109, 4125	4957
4113, 4114, 4115	Option 13, Option 14, or 4957

The hardware for Tektronix 4105, 4107, 4109, 4113, 4114, 4115, and 4125 consists of a tablet, pen, and terminal interface board.

The hardware for Tektronix 4014 consists of a tablet, pen, power supply module, and terminal interface board. The interface board has a number of strapping options which control the operation of the tablet. These must be properly set for the ICEM DDN interface to work properly. The following list describes each option and its correct setting for these terminals. These settings do not apply to the Tektronix 4113, 4114, 4115, or 4125 terminals.

Option	Setting
CR	IN
Header	CONTROL
Large/small	SMALL
Delay	IN
ESUP	IN
COMSUP	IN
STATUS	OUT

Refer to the Tektronix Graphics Tablet manual (070-1791-01) for location and procedures to follow for setting these options.

The active area on the tablet is 260.1 mm by 260.1 mm (10.24 in by 10.24 in). It is important that this area be defined so proper placement of the tablet page can be achieved. There is no physical definition of this active area indicated on the tablet, so it must be defined manually. To do so requires enabling the tablet locally.

To enable the tablet on the Tektronix 4014 terminal, proceed as follows:

1. Set the LINE/LOCAL switch on the Tektronix terminal to LOCAL.
2. Enter (ESC) ! 5. The red ready light on the tablet power module should be lighted. If it is not, enter the escape sequence again, (ESC) ! 5.
3. With the ready light on, bring the tip of the pen near the tablet surface in the middle of the tablet. This causes the data light on the power module to blink rapidly. It indicates that the pen is present.
4. Move the pen toward the edge of the tablet. Continue moving until the data light stops blinking. This point is on the edge of the active area of the tablet. A number of these points around the edges of the active area completely define this square area.

NOTE

(ESC) is the escape key.

During this procedure, do not press the pen against the tablet surface (indicated by the pen light on the power module being lighted). This would disable the tablet. However, if this happens, the tablet can be reenabled by entering (ECS) ! 5 twice.

Since the active area of the tablet is square and the display screen on the terminal is rectangular, there is a portion of tablet that is not visible on the screen. This is the upper 62.0 mm (2.44 in) of the active area of the tablet. This feature of the hardware is used in the tablet interface by assigning a special function for this upper portion during graphics input. The visible and invisible parts of the tablet can be found by enabling the tablet and moving the pen around the tablet in presence and watching the alphanumeric cursor on the display screen. The cursor does not follow the pen in the vertical direction in the invisible portion of the tablet.

Enter (ESC) ! 8 RETURN and return the LINE/LOCAL switch on the terminal to the LINE position after this procedure is completed.

Placement of Tablet Overlay Pages

Figures B-3 through B-11 are copies of the ICEM DDN tablet overlay pages. Figure B-3 shows the main tablet overlay. It is divided into three sections. The top area is the fixed area; that is, it cannot be programmed. The middle area is called the upper page. The bottom area is called the lower page. The upper and lower pages may be programmed. Refer to 7.13 TABLET MANAGEMENT in the ICEM Design/Drafting Data Management manual. Figures B-4 through B-11 show standard pages that can be activated in either the upper or lower page areas.

SC1 and SC2 on the fixed area are for users of ICEM schematics. Refer to the ICEM Schematics Reference Manual for more detailed information.

NOTE

Figures B-3 through B-11 are full-scale tablet overlays provided for use on the graphics tablet. (The section on registering the tablet overlay describes how to find the bottom left and right corners of the active tablet area and position the overlay.) Figures B-12 through B-19 are copies of the tablet overlay pages that cross-reference menu choices.

Activating Standard Pages

When you turn the tablet on, Basic Functions Upper (BFU) and Basic Functions Lower (BFL) are the default active pages. When you activate the basic function pages, the system displays one of the following messages:

BFU ACTIVATED

BFL ACTIVATED

These pages can be activated only in their own areas. If you want to activate a different page, choose the proper square from the top row of squares on the fixed area of the tablet. The system will then acknowledge your selection:

nnn UPPER ACTIVATED

nnn LOWER ACTIVATED

nnn is the abbreviation for the chosen page such as DFT (Drafting).

Activating User-Defined Pages

Figure B-11 shows a blank page called the user-defined page. You can program this page so that if you select a square, the system calls a string of commands that you have entered. Refer to 7.13 TABLET MANAGEMENT in the ICEM Display/Drafting Data Management manual. You can activate the user-defined page using 1.16 ACTIVATE PAGE/CHANGE TABLET FILE or by selecting USER DEFINED UPPER or USER DEFINED LOWER on the fixed area of the tablet overlay.

Registering the Tablet Overlay

To position the ICEM DDN tablet overlay on the Tektronix 4957 tablet, use the following procedure:

1. Locate the active boundary of the Tektronix 4957 digitized tablet.

Move the graphics cursor device toward the lower left corner of the tablet until the crosshairs form an L or the cursor is positioned in the lower left screen corner. The current location of the graphics cursor device on the tablet represents the lower left corner of the active boundary on the tablet (refer to figure B-1).

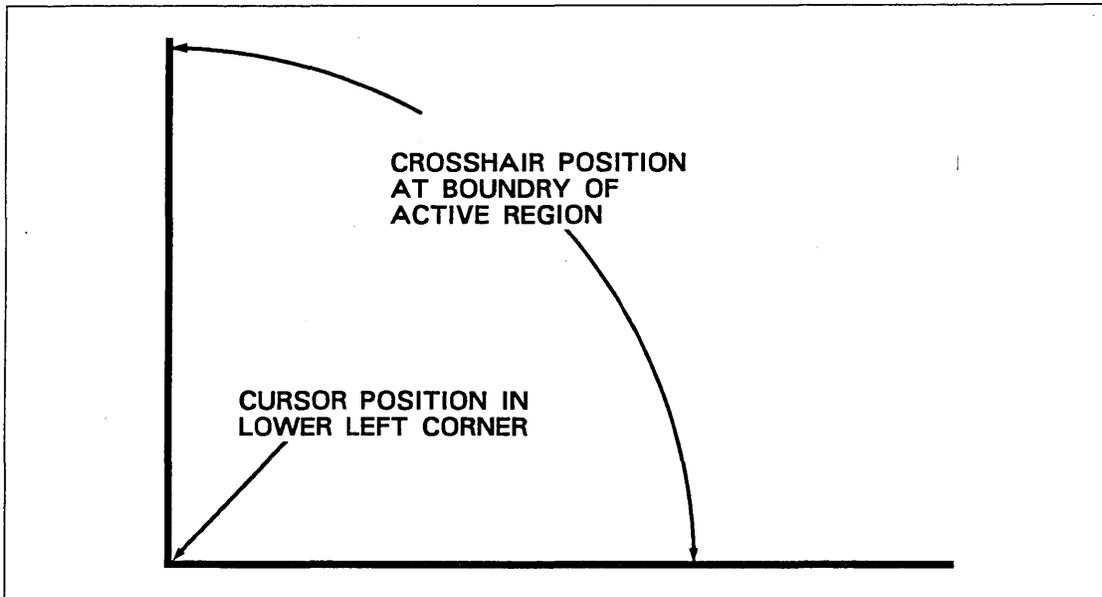


Figure B-1. Locating the Lower Left Corner of the Active Region

2. Register the ICEM DDN overlay on the tablet.

Position the lower left active corner of the ICEM DDN tablet overlay so that it coincides with the previously located active boundary of the Tektronix 4957 tablet (refer to figure B-2).

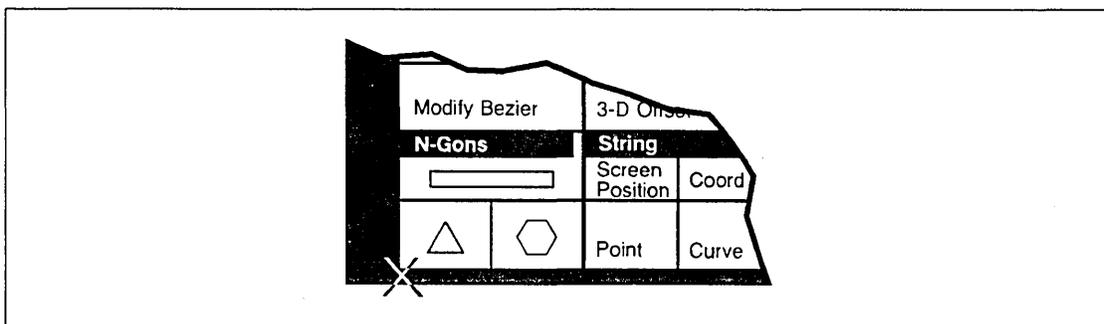


Figure B-2. Registering the Overlay

60458080 E

ICEM DDN Tablet Overlay

Version 1.60



BFU	BFL	AD Upper	AD Lower	DFT Upper	DFT Lower	N/C Upper	N/C Lower	DBM Upper	DBM Lower	DC Upper	DC Lower	SC1 Upper	SC2 Lower	USER Upper	USER Lower	Change Level/ Pen	Change Color		Delete Last Entity			
[Operation Reject		Y Yes] Operation Complete		N No		Repaint Local Host		Return		Display Current Menu Note	File Continue Quit		Suspnd New Part	Upper Case Lower Case	Do Not File Continue Quit		Pan ← → ↑ ↓			
A Arc	B	C Curves	D Depth	E	F	G Grid	H Section	I Space		? Help	! Emb Txt	7	8	9	/	Zoom Auto Max-Min Save as Base				Diag Position New Center	1/2 X New Center Scale	2X Enter Scale
J	K	L Line	M Menus	N Tool Pth	O	P Point	Q	R Repaint	Back Space	;	Main Menu Entity	4	5	6	*	Return	Retrieve	Name	Zoom from			

	S	I	U	V	W	^	T	Z	(	)	Select Menu	1	2	3	-	to Base	Zoom	Zoom	Hdcopy																						
	!	"	#	\$	%	&	'	(	)	,	Other Options	0	.	=	+	Change Zoom Mode																									
	11	12	13	14	15	16	17	18	19							Entire Layout	Work View	Select Window	All Windows																							
BFU	Point		Transform XT,YT,ZT		Line		Transform XT,YT,ZT		Arc		Display Control		Display Views																													
	Screen Position		Model X,Y,Z		Screen Position		Model X,Y,Z		Screen Position and Radius		Model X,Y,Z,R		Change Work Space		Chg Wk View		Top-6 Front-1		Front-1 Right-3		ISO1-8		One		Last Layout																	
	Delta		Curve End Point		Join 2 Points		Join 2 Curves		Center Point and Radius		Center Point Point on Edge		Define Work Space		Define Aux View		Align Views		Two Views Above Below		Side by Side		Std Four		Std Eight		Last Multi View															
	Regenerate Spline Points		On an Arc at an Angle		Parallel to a Line at a Distance		Thru a Point & Parallel to a Line		Thru 3 Points		Tangent to 3 Curves		Delete		Select		Screen		Chain		Run		List		Recover																	
	Arc Center		Intersect Curve		Thru Point		Fillet		Specify Radius		Unspec Radius		Region In		Region Out		All Points		Level		Continue		Change Library		Manage Files																	
	Along a Curve at a Distance		On a Curve at a Parameter		Thru Point Tangent to Curve		Parallel to Line Tangent to Curve		Center Point Tangent Line		Center Point Tangent Circle		Blank		Select		Level		All		All of a Type		Screen		Chain		Last Entity		Name													
	Fan Points		Polar		Perpto Line Tangent to Curve		Tangent to 2 Curves		Modify Angles		Polar Arc		Unblank		Select		Level		All		All of a Type		Region In		Region Out		All Dsplyd		Modals													
	Surface Point		Modify Point		Chamfer		Modify Status Infinite/Finite		Level/Pen		Modify Font		Constraint Sets		Use		Clear		List		Include Level		Include Font		Include Type		Include Color		Include Pen													
	Create Bezier		2-D Offset		2-D Spline		Part Merge		Mirror		Trans		Rotate		Rect Array		Trim/Extend Curves		One End Screen		Two Ends Screen		Middle Screen		Two Curves at Intersection		Define		Name		Delete		Exclude Level		Exclude Font		Exclude Type		Exclude Color		Exclude Pen	
	Modify Bezier		3-D Offset		3-D Spline		Part Integrity		Dupl Mirror		Dupl Trans		Dupl Rotate		Circular Array		Modals		Display Modals		Data Entry		Sys Dec Places		Variable Calc		Display Tol		Name Entity		List Part File		Drawing Status									
N-Gons		String		Draft Curves		Point Sets to Lines		Stretch		Trans Rotate		Rotate Trans		Array Explode		Implicit Points		Off		Blanked		Dormnt		Display		Screen		Name		Seq		Set										
Point		Curve		To Surface		Lines/Arcs to String		Group		Dupl Trans Rotate		Dupl/ Rotate Trans		Project Entities		Color Spectrum		On		Off		Display		Entity Selection Control		Set Target		Modify Select		Cnstrnt Duration		Attn Pt of Lines										
																Color Method		By Pen		By Level		By Entity		Entity Color		Single frm Grp		Chain Select		E:D		E E										
																Modify Color		Pen		Level		Entity		Temp Color		Font		Drag		On		Off										
																Surface Paths		Color Table		Reset Color Table		Color Scheme		List Color Table		Continue Oper		On		Off												
																Entity Manipulation		Grid Display		On		Off		Blank / Unblank		Select Views		All Views		Data Verify		One Entity		General Measurement								
																Grid Activate		On		Off		Grid Parameters		Two Entities		Screen Position		Canon														
																Pattern Management		Modals		Create		Copy		Delete																		
																List Primary		List Second		Retrieve		Change Primary		Change Secondary																		

Figure B-3. Main Tablet Overlay

ICEM DDN Tablet Overlay

Version 1.60



BFU	BFL	AD Upper	AD Lower	DFT Upper	DFT Lower	N/C Upper	N/C Lower	DBM Upper	DBM Lower	DC Upper	DC Lower	SC1 Upper	SC2 Lower	USER Upper	USER Lower	Change Level/ Pen	Change Color		Delete Last Entity
[Operation Reject		Y Yes		] Operation Complete		N No		Repaint Local Host		Return		Display Current Menu Note	File Continue Quit	Suspnd New Part	Upper Case Lower Case	Do Not File Continue Quit		Pan ← → ↑ ↓	
A Arc	B	C Curves	D Depth	E	F	G Grid	H Section	I Space	? Help	! Emb Txt	7	8	9	/	Zoom Auto Max-Min Diag Position 1/2 X 2X				
J	K	L Line	M Menus	N Tool Pth	O	P Point	Q	R Repaint	Back Space	;	Main Menu	4	5	6	*	Save as Base	New Center	New Center Scale	Enter Scale
S 2D Spln	T Text	U	V	W	X	Y	Z Zoom	(o) Degree	±	:	Entity Select Menu	1	2	3	-	Return to Base	Retrieve Zoom	Name Zoom	Zoom from Hdcopy
! 11	" 12	# 13	\$ 14	% 15	& 16	' 17	(18	) 19	, 20	\ 21	Other Options	0	.	=	+	Change Zoom Mode Entire Layout Work View Select Window All Windows			
BFU		Point		Line		Arc		Display Control		Display Views		BFU							
Screen Position		Transform XT,YT,ZT Model X,Y,Z		Screen Position		Transform XT,YT,ZT Model X,Y,Z		Screen Position and Radius		Transform XT,YT,ZT,R Model X,Y,Z,R		Change Work Space	Chg Wk View	Top-6 Front-1	Front-1 Right-3	ISO1-8	One	Last Layout	
Delta		Curve End Point		Join 2 Points		Join 2 Curves		Center Point and Radius		Center Point Point on Edge		Define Work Space	Define Aux View	Align Views	Two Views Above Below Side by Side		Std Four	Std Eight	Last Multi View
Regenerate Spline Points		On an Arc at an Angle		Parallel to a Line at a Distance		Thru a Point & Parallel to a Line		Filllet		Thru 3 Points		Tangent to 3 Curves		Delete Select Screen Chain		GPL Run List Recover			
Blank		Unblank		Constraint Sets		Region In		Region Out		All Points		Level		Continue		Change Library		Manage Files	
Select		Level		All		All of a Type		Screen		Chain		Last Entity		Name		Region In		Region Out	
Select		Level		All		All of a Type		Region In		Region Out		All Dsplyd		Modals		Include		Include	

Basic Functions Upper

Basic Functions Upper

BFL	Arc Center	Intersect Curve		Thru Point		Specify Radius	Unspec Radius	Use	Clear	List	Include Level	Include Font	Include Type	Include Color	Pen	
		On 1st Curve	On 2nd Curve	Horiz	Vert											Auto Ctr No Trim	Auto Ctr Trim	Define	Name	Delete	Exclude Level	Exclude Font	Exclude Type	Exclude Color	Exclude Pen
	Along a Curve at a Distance	On a Curve at a Parameter	Thru Point Tangent to Curve	Parallel to Line Tangent to Curve	Center Point Tangent Line	Center Point Tangent Circle	Trim/Extend Curves									
							One End Screen	Two Ends Screen	Middle Screen	One End Bound	Two Ends Bound	Middle Bound	Two Curves at Intersection			
	Fan Points	Polar	Perpto Line Tangent to Curve	Tangent to 2 Curves	Modify Angles	Polar Arc	Modals									
							Display Modals	Data Entry	Sys Dec Places	Variable Calc	Display Tol	Name Entity	List Part File	Drawing Status		
	Curve Normal	Incremental	Tangent to Curve at an Angle	Polar Line	Divide Arc Into N Segments	Modify/Replace Arc	Implicit Points				Selection Method					
							Off	Blanked	Dormnt	Display	Screen	Name	Seq	Set		
	2-D Scr Pos	2-D Point	Along XT Axis	YT Axis	Arc Menu	Color Spectrum	Entity Selection Control				Color Method					
							On	Off	Display	Display Modals	Set Target	Modify Select	Cnstrnt Duration	Attn Pt of Lines	By Pen	By Level	By Entity	Entity Color	Single frm Grp	Chain Select
3-D Scr Pos	3-D Point	Along 1 Curve	2 Pts	Modify Point	Chamfer	Modify Status Infinite/Finite	Modify	Modify Font	Modify Color	Font	Drag	Data Verify				
												Level/Pen	Pen	Level	Entity	Temp Color	On	Off	One Entity	General Measurement
Surface Point	Point Menu	Divide Line Into N Segments	Line Menu	Surface Paths	Grid Display	Blank / Unblank	Data Verify	Grid Activate	Pattern Management	List Primary	List Second	Retrieve	Change Primary	Change Secondary		
															Color Table	Reset Color Table
Other				Entity Manipulation				Grid Display		Blank / Unblank		Data Verify				
Create Bezier	2-D Offset	2-D Spline	Part Merge	Mirror	Trans	Rotate	Rect Array	On	Off	Select Views	All Views	One Entity	General Measurement			
Modify Bezier	3-D Offset	3-D Spline	Part Integrity	Dupl Mirror	Dupl Trans	Dupl Rotate	Circular Array	On	Off	Grid Parameters	Two Entities	Screen Position	Canon			
N-Gons		String		Draft Curves		Point Sets to Lines		Stretch		Trans Rotate		Rotate Trans		Array Explode		
Triangle	Hexagon	Screen Position	Coord	To Depth	Lines/Arcs to String	Group	Dupl Trans Rotate	Dupl/Rotate Trans	Project Entities	Modals	Create	Copy	Delete			

Figure B-3. Main Tablet Overlay

N/C	Point to Point		Profile		Pocket		Surface Milling		5 Axis Swarf	Abs TL Motion	Lathe Rough	Lathe Contour		Lathe Drill		Lathe Thread		N/C		
	Generate	Modify GPG	Generate	Modify GPG	Generate	Modify GPG	3 Axis Default		Multax, From, Set Point	Multax, From, Set Point	From, Set Point	Generate	Modify GPG	Generate	Modify GPG	Generate	Modify GPG			
Numerical Control	GPG from TP	GPG from File	GPG from TP	GPG from File	GPG from TP	GPG from File	3 Axis Set Pt	5 Axis Set Pt	Default	Default	Default	GPG from TP	GPG from File	GPG from TP	GPG from File	GPG from TP	GPG from File			
	GPG to File	Read GPG "PTP"	GPG to File	Read GPG "PRO"	GPG to File	Read GPG "POC"	5 Axis Default					GPG to File	Read GPG "LC"	GPG to File	Read GPG "LD"	GPG to File	Read GPG "LT"			
	2 Surf Profile		3 Axis Flange		Punching		Flame Cutting		CLfile/CLprint		CLfile/CLprint Modals			Display/Edit		Editor Modals				
	Multax, From, Set Point		Multax, From, Set Point		Standard		From, Set Point		Create	Intrp	Circle Records	Partno	CLfile Input	Blank Screen	New TP	Existing TP	Cmd Mode	TL Dsply Incrmt	TL Dsply Type	Macro File
	Default		Default		Notching		Cut		Compact II	Post Process	No. Of Points	CLfile Option	Trans Scale	Color Number	New File	Existing File	Text Location	Every N Points/ Spacing	Dynamic /Static Display	Macro Display
					Nibbling		Mark	Fast Mark	Input Format	Output Format	Stops	CLprint Option	Display	Display/Edit Commands						
														Print	Copy	Renumber				
	Tool Management				N/C Modals															
	Define a Tool		Delete a Tool		Inspect All Tools		Display N/C Modals		Spindle Direction		Tolerances		3-D Toolpath Space		Delete		Move		Variable Calculation	
	Inspect/Modify a Tool		List Tool Names		Define Tool Display		Multax Mode		Feed Rates		Tool Command Suppression		GPG File Name		Insert		Update/Quit		N/C Verify	
Composite Tool Paths																				
List		Define		Delete		Coolant Mode		Spindle Speeds		Rapid Feed Mode		Editor Modals		Locate		Tool Display		Macro Execution		
Review		Edit		Display Surface Normal	Reverse Surface Normal	Execute a Macro	Define Var	Clearance/ Retract Plane		Circular Interpolation		Surfacing Modals		Replace		Print/ Tool Display		Matrix Copy		

Figure B-4. Numerical Control Overlay

DFT	Create Drafting Entities				Modify Drafting Entities				Drafting Modals				Special Symbols			DFT
	Horizontal Dimension	Vertical Dimension	Parallel Dimension	Parallel Dimension	New Text Origin	New Display Values	Display Modal Settings	Char Size	Draft Scale	Display Ratios	∅	↓	□			
	Angular Dimension	Radius Dimension	Diameter Dimension	Rect Dim	Add/Change Tolerance	Balloon Modification	Arrow Length	Text Angle Control	Dimen Origin	Dimen Offset Dists	Decimal Places	∇	±	└		
	Thickness Dimension	Taper Dim	Chamfer Dimension	Define Origin	Add/Change Limits	Datum Target Modification	Arrow Align	Section Align	Section Lining Matr	Section Lining Matr	[	o]		
	Note	Datum Target	Datum Feature	Horiz	Delete Tolerance/Limits	Feature Frame Modification	Auto Tail Loc	Char Slant	Character Set	Std	User	Sphere Dia/Rad	Iso Dft			
	Label	Balloon	Arrowhead	Arc Length Dimension	Modify Level/Pen	Basic	Arrow Place	Ext Dim Ctrl	Font	Repetitive Feat	On	Off	Lin Dim Sym			
	Detail Magnify	Section Lining	Section Arrow	Geometric Tol	Modify Decimal Places	(Ref) Not to Scale	Inside	Other	Data Verify	None	None	Dia	Radius			
			Character Set	Dimension Origin	Dimension Origin	Modals Menu	Text Origin	One Entity	Center							
			Surf Texture	Replace String	Extension Line Status	User Defined Characters	Delta	Auto	Two Entities	Center						
			Center Line	Delete Line	Dimension Line Status	Pattern Management	Create	Auto Tol/Lim	Off	Lower Left	Lower Right					
			Point	Bolt Circle	Add Prefix	Remove Prefix	Text Slant	Text Angle	Presets	Set When Used	On	Off				
							List Primary	List Second	Retrieve							

Figure B-5. Drafting Overlay

AD	3-D Curves								Modals	Surface Development			AD
										Created Curve Type			
Advanced Design	Vector				Spline		Bezier Curve		Surface Paths	Solids			
	Screen Position	Enter	Two Planes	Sum/Diff	Scalar Product	Cross Product	Display Surf N	Reverse Surf N		3-D	Create	Hexahedron	Toroid	Spheroid
Surfaces													
						Facetting		Modify Surface Paths	Ellipsoid	Circular Rod			
Revolution	Tabulated Cylinder	Ruled	Developable	Curve Mesh	Fillet								
						Segment							
Offset	Sphere	Cylinder	Torus	Cone	Composite	Segment							
Plane													
Coefficients		3 Noncolinear Points	Thru Point and Perpto Vector		Thru 2 Points Perpto Plane								
Thru Point Parallel to Plane		Parallel to Plane at a Distance	Thru Point Perpto 2 Planes		Two Lines		Projected	Curve-Driven					

Figure B-6. Advanced Design Overlay

DBM	Tablet Management				Sequence Number									DBM
	Create Page	List Pages	Change File	Tablet Modals	Identify last Number Used	Identify Entity								
	Modify Page	Display Page	Copy Page	Rename Page	Identify Number	Identify Range	Drawing Status							
	Level Management				I/O Regeneration									
	Define	List	Create Modify Pen Table		Regenerate Entity Number	Regenerate from N1 to N2								
	Delete	Create Assign Level Table	Execute Pen Table		Regenerate All									
	Attribute Management						Template Management							
	Create	Copy	Search	Identify			Create in UTF	Unlink Master	Delete Master	Create Instance	List			
	List On File	Display	Report Generation	Delete	Modify	Create Plot File	Retrieve from UTF	Redefine Master	Delete from UTF	Unlink Instance				
	List	Delete	Save On GUTF			Data Base Information	SI US Units	Independent Save	Global Save	List File	Rename Current Part	Merge Into Current Part		
	Initialize	Restore from GUTF				Dump Current Part	Resize	Independent Restore	Global Restore	Delete	Change Status	Pack		
	Variables													
	Move from UTF to RTL	Move from RTL to UTF				Entity Name					Pattern Management			
	List from UTF	List from RTL				List	Attach	On	Off	Check Part	Modals	Create	Copy		Delete
					Search	Detach	Change Name	Read In File	Renew Part	List Primary	List Second	Retrieve	Change Primary	Change Secondary

Figure B-7. Data Base Management Overlay

DC	Modals		Depth Entry		View Assoc		Layouts				Zt Clip		Define Auxiliary View	Display Views				DC
	Display Modals		Enter	Point	All Views		Enter View Layout Construction		Move Window	Add View	On	Off	Define Auxiliary View	One	Right/Left	Prev Multi	Prev Layout	
	View Selection Mode		Delta Curve	User Choice	Single Select		View Alignment		Stretch Window	Replace View	Resize		Change Work View	Top/Bottom	Select Four	Eight STD	Enter Layout	
	Number	Name	Screen Select		Work View		Modify Layout Name		Unblank View	Delete View from Layout	Pan ← →		Define Display as Layout	STD Views		Zoom Extent		
	View of Curve		User Choice		User Choice		Copy Layout Under New Name		Blank View	Create Format View	↑	↓		Top/Front/Right/ISO 1		Enter Scale	Auto Max/Min	
	Zoom Origin Mode		Rescale Mode		Alignmnt Scale		Entity Display		Workspace Selection Mode				Define Work Space					
	Screen Position	Coord	Move View By Delta		Scale	Ratio	Layout Units		Unchanged	Display	Space Number		Work View Space		Rotate About Axis		Thru Point Along Axis	
	Point	Delta from Curve	User Choice		Scale and Ratio		Set to Reference		Do Not Display	Space Name		Space of View		Parallel to Plane		Thru Three Points		
	View Borders		View Names		Color Spectrum		Display Name Management		Screen Select Space		User Choice		Enter Matrix		Thru Two Lines			
	Display Mode		Work Names		Color Method		List Saved Zoom Scale		Rename Layout		Space of Curve		Thru Point Perpendicular to Line		New Origin			
	Some	All	View Axes		Modify Color		Delete Zoom Scale		List Layouts		Hidden Line Removal		Blanked		One End	Two End	Align View/Workspace	
	Never	Work Axes	Pen	Level	Entity	Temp Color	Delete View	Delete Layout	List Views in a Layout		— · —	— · —	Middle	Entire Entity				

Figure B-8. Display Control Overlay

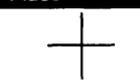
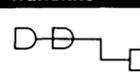
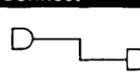
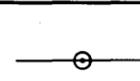
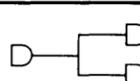
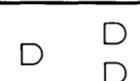
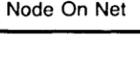
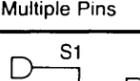
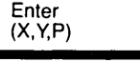
SC1 Schematics 1	Place	Translate	Connect	Delete		Blank			Grid Display	Scale Display	SC1 Schematics 1	
	 Screen Position	 Element	 Two Pins	 Direct	Element by Screen Select	Net by Screen Select	Page 0	Value Notes	Signal Names	Grid Display		Scale Display
	 Node On Net	Region	 Multiple Pins	 Logical (No Graphics)	Element by Logic Name	Net by Number	Unblank			Set Grid Parameters		
	 Enter (X,Y,P)	Net Segment	 Assign Signal Names	Add Note	Note	Pin Connection	Page 0	Value Notes	Signal Names	.1x.1 Grid Full Screen		
	 Input Value Note	Net Corner	Note	Rescale Note	Page	Logic Name	Element Value	Note	Resequence Net Numbers	.2x.2 Grid Full Screen		
	Input Parameter List	Rotate		Arrowhead		Replace			Repetition			
		45°	90°	Screen Position	Net Segment by Screen Select	Pin Number	Logical Pin Number	Signal Name	Resequence Net Numbers	On		Off
		180°	270°	End of Curve						Select Additional Model Library		

Figure B-9. ICEM Schematics 1 Overlay

SC2 Schematics 2	Model	Design Check	Reports					Curve Font	Drafting Modal Status	Schematic Modal Status	SC2 Schematics 2	
	Library Summary	All	Element Summary	Page Summary	Part List Summary	Net Detail Physical	Page Display Content		Arrowhead Size	Pin Verify On Off		
	Detail	Unused Pins	Element Detail Screen Select						Modify Font 	Text Justify Left Right		Note Justify Left Right
			Logic Name	Net List Summary	Net Detail by Signal Name	Net Detail by Net Number				Center		Note Parameters
	Modify	Unused Page Connectors	Drawing Management				Back Annotation		Color Control	Character Size		Note Character Size
			List File		Global Save	Data Base Information				Slant Status On Off		Parallel Line Spacing
Delete	Duplicate Logic Names	Output Files						Element Name Auto On Auto Off	Character Fine Coarse	Auto Connect Terminate		
		Tekroute Input (ESROUT)	Syscap (ESSCAP)	Plot (TAPE 9)	Design Checking (ELDATA)			Element Seq Number Reset	Standard User	Signal Name Auto On Auto Off		
Create	Duplicate/Missing Pins	Parts List (ESPARTS)	Net List Physical (ESNETP)	Net List Logical (ESNETL)		Select Net Color	Assign Section Auto On Auto Off		Snap to Pin Tolerance			
					Set Pen Number	Thick Lines		Request Page Access	Net Sequence Reset			

Figure B-10. ICEM Schematics 2 Overlay

SC2 Schematics 2	Model	Design Check	Reports				Curve Font	Drafting Modal Status	Schematic Modal Status	SC2 Schematics 2	
	Library Summary	All	Element Summary	Page Summary	Part List Summary	Net Detail Physical	Page Display Content		Pin Verify On Off		
			Element Detail Screen Select					Modify Font 	Text Justify Left Right		Note Justify Left Right
	Detail	Unused Pins	Logic Name	Net List Summary	Net Detail by Signal Name	Net Detail by Net Number			Center		Note Parameters
			Drawing Management						Character Size		Note Character Size
	Modify	Unused Page Connectors	List File		Global Save	Data Base Information			Slant Status On Off		Parallel Line Spacing
			Rename Current DWG	Delete DWG	Global Restore	Dump Current DWG	Back Annotation	Color Control	Character		Auto Connect Terminate
			Output Files					Element Name Auto On Auto Off	Fine Coarse		Signal Name Auto On Auto Off
	Delete	Duplicate Logic Names	Tekroute Input (ESROUT)	Syscap (ESSCAP)	Plot (TAPE 9)	Design Checking (ELDATA)		Element Seq Number Reset	Standard User		
							Select Net Color	Assign Section Auto On Auto Off			Snap to Pin Tolerance
Create	Duplicate/Missing Pins	Parts List (ESPARTS)	Net List Physical (ESNETP)	Net List Logical (ESNETL)		Set Pen Number	Thick Lines	Request Page Access	Net Sequence Reset		

Figure B-10. ICEM Schematics 2 Overlay

The image shows a 10x20 grid of cells, representing a user-defined page layout. The grid is enclosed in a thick black border. The top row of cells contains numbers 1 through 20, serving as column headers. The first column of cells contains numbers 1 through 10, serving as row headers. All other cells in the grid are empty.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Figure B-11. User Defined Page

ICEM DDN Tablet Overlay Version 1.60																		CONTROL DATA			
BFU	BFL	AD Upper	AD Lower	DFT Upper	DFT Lower	N/C Upper	N/C Lower	DBM Upper	DBM Lower	DC Upper	DC Lower	SC1 Upper	SC2 Lower	USER Upper	USER Lower	Change Level Pen 1.7	Change Cqlgr 1.9.1.5	Delete Last CTRL D			
[	Y	]	N	Repaint		Return	Display Current Mem M.M	File	Upper Case	Do Not File	Pen								
Operation Reject	Yes	Operation Complete	No	Local PAGE	Host R	Note 16.10	Continue 4.1	Suspend 4.4	Quit 4.3	New Part 4.2	Lower Case	Quit 4.7	New Part 4.6	← Z.15.1	→ Z.15.2	↑ Z.15.3	↓ Z.15.4				
A Arc	B	C Curves	D Depth	E	F	G Grid	H Section	I Space	? Help	! Emb Txt	7	8	9	/	Zoom						
J	K	L Line	M Menus	N Tool Pth	O	P Point	Q	R Repaint	Back Space	;	Main Menu	4	5	6	*	Auto Max 2.11	Diag Posit 2.9	1/2 X 2.7	2X 2.6		
S	T Text	U	V	W	X	Y	Z Zoom	(o) Degree	±	:	Entity Select Menu	1	2	3	-	Save as Base 2.12	New Center 2.2	New Center Scal 2.4	Enter Scal 2.8		
!	"	#	\$	%	&	'	(	)	,	\	Other Options	0	.	=	+	Return to Base 2.9	Retrieve Zoom 2.14	Name Zoom 2.13	Zoom from Hdc 2.16	
11	12	13	14	15	16	17	18	19	,							Change Zoom Mode					
																Entire Layer 2.17.1	Work View 2.17.2	Select W 2.17.4	All W 2.17.3		
Point		Line		Arc		Display Control		Display Views		Delete		CPL		Selection Methods							
+	Transform XT,YT,ZT 9.2.1	+	Transform XT,YT,ZT 10.2.1	⊕	Transform XT,YT,ZT,R 11.2.1	Change Work Space 8.11	Chg Wk View 8.5	Top-6 Fro 8.4.7	Front-1 Rig 8.4.8	ISC 8.3.8	One 8.3	Last Layer 8.4.1									
Screen Position 9.1	Model X,Y,Z 9.2.2	Screen Position 10.1	Model X,Y,Z 10.2.2	Screen Position and Radius 11.1	Model X,Y,Z,R 11.2.2	Define Work Sp 8.12	Define Aux View 8.9	Align Views 8.13	Two Views Above 8.4.4	Side by Side 8.4.5	Std Four 8.4.9	Std Eight 8.4.10	Last Multi View 8.4.3								
Δ	Delta 9.4	Curve End Point 9.8	Join 2 Points 10.3	Join 2 Curves 10.14	Center Point and Radius 11.3	Center Point Point on Edge 11.6	Select 3.1	Screen 3.1.E.1	Chain 3.1.E.2	Run 5.13.3	List 5.13.4	Recover 5.13.1									
							Region In 3.1.E.2	Region Out 3.1.E.6.4	All Points 3.3	Level 3.2	Continue 5.13.2	Change Library 5.13.5	Manage Files 4.8								
							Blank	Level 2.2	All 2.4	All of a Typ 2.3	Screen E.1	Chain E.2	Last Ent E.6.2	Name E.6.1							
							Unblank				Region	Region	All	Modals							

Regenerate Spline Points 9.10	On an Arc at an Angle 9.7	Parallel to a Line at a Distance 10.10	Thru a Point & Parallel to a Line 10.8	Thru 3 Points 11.7	Tangent to 3 Curves 11.10	Select 2.5	Level 2.6	All 2.8	By a Type 2.7	In E.3	Out E.6.4	Display E.4	E.7
Arc Center 9.6	Intersect Curves On 1st Cur 9.9.1 On 2nd Cur 9.9.2 Current Depth 9.9.3 True 9.9.4	Thru Point Horiz 10.5.1 Vert 10.5.2 Other 10.5	Thru Point Perpto Line 10.9	Fillet Specify Radius 11.9.1 Unspec Radius 11.9.2 Auto Ctr No Trim 2.1 Auto Ctr Trim 1.1	Constraint Sets Use E.8 Clear E.9 List E.10.13 Include Le E.10.1 Include Fo E.10.5 Include Tv E.10.4 Include Co E.10.3 Include Pe E.10.2	Define E.10	Name E.10.15	Delete E.10.14	Exclude Level E.10.6	Exclude Font E.10.10	Exclude Type E.10.9	Exclude Color E.10.8	Exclude Pen E.10.7
Along a Curve at a Distance 5.9.1	On a Curve at a Parameter 9.14	Thru Point Tangent to Curve 10.6	Parallel to Line Tangent to Curve 10.11	Center Point Tangent Line 11.4	Center Point Tangent Circle 11.5	Trim/Extend Curves One End Screen 12.8.1 Two Ends Screen 12.8.3 Middle Screen 12.8.5	One End Bound 12.8.2	Two Ends Bound 12.8.4	Middle Bound 12.8.6	Two Curves at Intersection 12.8.7			
Fan Points 9.17	Polar 9.3	Perpto Line Tangent to Curves 10.12	Tangent to 2 Curves 10.4	Modify Angles 11.8	Polar Arc 5.9.3	Models Display Mod 1.12	Data Ent 1.15	Sys Dec Place 1.4	Variable Cal 6.2.1	Display Tol 1.3	Name E 6.11.2	List Part 6.13	Drawing Stat 1.13
Curve Nodes 2-D Scr P 9.12.1 2-D P 9.12.2 3-D Pa 9.12.3 3-D Point 9.12.4	Incremental Along XT 9.18.1 YT Axis 9.18.2 Along T Curve 9.18.3 2-D 9.18.4	Tangent to Curve at an Angle 5.9.2	Polar Line 10.7	Divide Arc Into N Segments 11.13	Arc Menu 11	Implicit Points Off 1.11.5.4 Blanked 1.11.5.1 Normal 1.11.5.2 Display 1.11.5.3	Selection Method Screen 1.11.10.1 Name 1.11.10.2 San 1.11.10.3 Cat 1.11.10.5						
Surface Point 9.15	Point Menu 9	Divide Line Into N Segments 10.13	Line Menu 10	Mirror 13.4	Trans 13.5	Color Spectrum On 1.9.1.8.1 Off 1.9.1.8.2 Display 1.9.2.5	Entity Selection Control Set 1.11.6 Modify Set 1.11.9 Cnstrnt Du 1.11.0 Attn Pt of 1.11.4						
Other				Stretch 13.11	Trans Rotate 13.12	Color Method By Pa 1.9.1.2 By L 1.9.1.3 By E 1.9.1.1	Single Im Grp On 1.11.3.1 Off 1.11.3.2 E.D. 1.11.2.1.1 E.E. 1.11.2.1.2						
Create Bezier 15.2.7.1	2-D Offset 12.2.1	2-D Spline 12.1	Part Merge 6.1.7	Mirror 13.4	Trans 13.5	Modify Color Pen 1.9.1.6 Level 1.9.1.7 Entity 1.9.1.9 Temp 1.9.1.10	1.10.2	1.10.2	1.10.1	1.10.2	One E 14.1	General Measurement 14.3	
Modify Bezier 15.2.7.2	3-D Offset 12.2.2	3-D Spline 15.2.1	Part Integrity 6.1.11	Dupl Mirror 13.7	Dupl Trans 13.8	Color Color 1.9.2.1 Reset 1.9.2.3 Color Select 1.9.2.2	1.18.1	1.18.1	1.18.4	Two E 14.2	Screen Position 5.9.4	Canon 5.1	
N-Gons 12.7.2	String Screen Po 12.4.1 Coord 12.4.2	Draft Curves To Depth 15.2.4.1	Point Sets to Lines 12.10	Stretch 13.11	Trans Rotate 13.12	Modify Color Color 1.9.2.1 Reset 1.9.2.3 Color Select 1.9.2.2	1.18.1	1.18.1	1.18.4	Two E 14.2	Screen Position 5.9.4	Canon 5.1	
12.7.1 12.7.3	Point 12.4.3 Curve 12.4.4	To Surface 15.2.4.2	Lines Arcs to String 12.9	Group 13.3	Dupl Trans 13.14 Dupl Rotate 13.15	Pattern Management Modals 6.2.1 Create 6.2.2 Copy 6.2.6 Delete 6.2.4.1	List Primary 6.2.5.1	List Second 6.2.5.2	Retrieve 6.2.3	Change Primary 6.2.7	Change Secondary 6.2.8		

Figure B-12. Main Tablet Overlay (with Cross-References to Menu Choices)

N/C	Point to Point		Profile		Pocket		Surface Milling		5 Axis Swarf		Abs TL Motion		Lathe Rough		Lathe Contour		Lathe Drill		Lathe Thread		N/C
	General	Modify	General	Modify	General	Modify	3 Axis		Multax, From, Set Point	Multax, From, Set Point	From, Set Point		General	Modify	General	Modify	General	Modify	General	Modify	
	17.2.1	17.2.2	17.3.1	17.3.2	17.4.1	17.4.2	17.1.2, 17.1.6	17.1.2, 17.1.6	17.7	17.1.2.1, 17.1.8	17.9.1		17.9.2.1	17.9.2.2	17.9.3.1	17.9.3.2	17.9.4.1	17.9.4.2	17.9.4.1	17.9.4.2	
	GPG from TP	GPG from File	GPG from TP	GPG from File	GPG from TP	GPG from File	3 Axis	5 Axis	Default	Default	Default		GPG from TP	GPG from File	GPG from TP	GPG from File	GPG from TP	GPG from File	GPG from TP	GPG from File	
	17.2.3	17.2.4	17.3.3	17.3.4	17.4.3	17.4.4	17.1.2.1, 17.1.6	17.1.2.1, 17.1.6	17.7.N.N	17.1.2.1, 17.1.8.N.N	17.9.1.N.N		17.9.2.3	17.9.2.4	17.9.3.3	17.9.3.4	17.9.4.3	17.9.4.4	17.9.4.3	17.9.4.4	
	GPG to File	Read GPG	GPG to File	Read GPG	GPG to File	Read GPG	5 Axis						GPG to File	Read GPG	GPG to File	Read GPG	GPG to File	Read GPG	GPG to File	Read GPG	
	17.2.5	17.2.4	17.3.5	17.3.4	17.4.5	17.4.4	17.1.2.1, 17.1.6	17.1.2.1, 17.1.6					17.9.2.5	17.9.2.4	17.9.3.5	17.9.3.4	17.9.4.5	17.9.4.4	17.9.4.5	17.9.4.4	
	2 Surf Profile		3 Axis Flange		Punching		Flame Cutting		CLfile/CLprint		CLfile/CLprint Modals		Display/Edit		Editor Modals						
	Multax, From, Set Point		Multax, From, Set Point		Standard		From, Set Point		Create	Intrp	Circle	Partno	CLfile	Blank	New	Existing	Cmd	TL Dsply	TL Dsply	Macro	
	17.12		17.13		17.5.N.N.1		17.15		17.17.2	17.17.3	17.17.3	17.17.1.6	17.17.9	17.17.12	17.11.3	17.11.4	Moda	Incr	Type	File	
	Default		Default		Notching		Cut		Compact II	Post Process	No. Of Points	CLfile Option	Trans Scale	Color Number	New File	Existing File	Text Location	Every N Points	Dynamic Static Display	Macro Display	
	17.12.N.N.4		17.13.N.N		17.5.N.N.2		17.15.N.1		17.17.4	17.17.5	17.17.1.4	17.17.1.7	17.17.1.10	17.17.1.13	17.11.1	17.11.2	1.2	3	6	1.8	
					Nibbling		Mark	Fast Mark	Input Format	Output Format	Stops	CLprint Option	Display		Display/Edit Commands		Print	Copy	Renumber		
					17.5.N.N.3		17.15.N.2	17.15.N.3	17.17.1.1	17.17.1.2	17.17.1.5	17.17.1.8	17.17.1.11		2	7	9.1				
	Tool Management				N/C Modals																
Define a Tool		Delete a Tool		Inspect All Tools		Display N/C Modals		Spindle Direction		Tolerances		3-D Toolpath Space		Delete	Move	Variable Calculation					
17.10.1.1		17.10.1.3		17.10.1.5		17.1.1		17.1.4		17.1.8		17.1.12		3	8	9.2					
Inspect/Modify a Tool		List Tool Names		Define Tool Display		Multax Mode		Feed Rates		Tool Command Suppression		GPG File Name		Insert	Update/Quit	N/C Verify					
17.10.1.2		17.10.1.4		17.10.1.6		17.1.2		17.1.5		17.1.9		17.1.13		4	10	9.3					
Composite Tool Paths																					
List		Define		Delete		Coolant Mode		Spindle Speeds		Rapid Feed Mode		Editor Modals		Locate	Tool Display	Macro Execution					
17.14.1		17.14.3		17.14.5		17.1.3		17.1.6		17.1.10		17.1.14		5	11	9.4					
Review		Edit		Display Surface Normal		Reverse Surface Normal		Execute a Macro		Define a Macro Var		Clearance/Retract Plane		Circular Interpolation		Surfacing Modals		Replace	Print/Tool Display	Matrix Copy	
17.14.2		17.14.4		17.1.2		17.1.2		17.10.3		17.10.4		17.1.11		17.1.15		17.1.15		6	12	9.5	

Figure B-13. Numerical Control Overlay (with Cross-References to Menu Choices)

Create Drafting Entities				Modify Drafting Entities				Drafting Modals				Special Symbols			
Drafting	Horizontal Dimension 16.2.1	Vertical Dimension 16.2.2	Parallel Dimension 16.2.3.4	Parallel Dimension 16.2.3.N	New Text Origin 16.13.1	New Display Values 16.13.5	Display Modal Settings 16.1.16	Char Set 16.1.1.1	Draft Scale 16.1.6	Display Rate 16.1.4	⊗.U	↓.D	□.S	DFT	
	Angular Dimension 16.2.5	Radius Dimension 16.2.6	Diameter Dimension 16.2.7	Rect Dim Define Origin 16.2.11.1	Add Change Tolerance Limits 16.13.4.1	Balloon Modification 16.13.13	Arrow Length 16.1.10.1	Text Angle Control 16.1.5	Dimen Offset 16.1.11	Decimal Places 16.1.4.2.1	↙.B	↑.@	↘.C		
	Thickness Dimension 16.2.4	Taper Dim Cor 16.2.8.1	Chamfer Dimension 16.2.9	Arc Length Dimension 16.2.10	Add Change Limits 16.13.4.2	Datum Target Modification 16.13.14	Arrow Align 16.1.10.2	Section Align 16.3.1.3.1	Section Lining Mod 16.3.1.1	Section Lining Mod 16.3.1.1	[.L	○.L	].R	
	Note 16.10	Datum Target 16.5	Datum Feature 16.6	Geometric Tol .005 A B 16.7.1	Delete Tolerance Limits 16.13.9	Feature Frame Modification 16.13.15	Auto Tail Loc 16.1.13.1	Char Slant 16.1.1.3.1	Character Set Std 16.1.1.2.1	Character Set User 16.1.1.2.2	Sphere Dia Rad 16.1.4.3.2	Iso Dpt 16.1.14			
	Label 16.11	Balloon 16.4	Arrowhead Curve End 16.9.1.1	Surf Texture Ar 16.8.1	Modify Level Pen 1.7	Basic 16.13.12	Arrow Place Automatic 16.1.9.1.1	Ext Dim Ctrl 1 16.1.8.1	Font 1.5.1	Font 1.5.2	Repetitive Feed 16.1.4.3.3.1	Lin Dim Sym None 16.1.4.3.1.1			
	Detail Magnif 16.14	Section Lining 16.3.2	Section Arrow 16.9.2	Center Line Circle 16.12.2	Modify Decimal Places 16.13.17	(Ref) 16.13.3	Inside Outside 16.1.9.1.2	Text Origin Position 16.1.3.1	Data Verify One Entity 14.1	Data Verify One Entity 14.1	Lin Dim Sym Dia 16.1.4.3.1.2	Lin Dim Sym Radius 16.1.4.3.1.3			
				Circle 16.12.2	Character Set Std 16.13.12.1	Dimension Origin 16.13.16	Modals Menu 16.1	Text Origin Coords 16.1.3.2	Text Justify Center 16.1.2.2	Text Justify Center 16.1.2.2					
				Circle 16.12.2	Modify Text 16.13.6	Extension Line Status 16.13.10	User Defined Characters 5.4	Pattern Management Modals 6.2.1	Auto Tol/Lim Off 16.1.4.5.1	Auto Tol/Lim Off 16.1.4.5.1	Lower Left 16.1.2.1	Lower Right 16.1.2.3			
			Circle 16.12.2	Replace String 16.13.6	Dimension Line Status 16.13.11	Pattern Management Modals 6.2.1	Auto Tol/Lim Off 16.1.4.5.1	Auto Tol/Lim Off 16.1.4.5.1	Auto Tol/Lim Off 16.1.4.5.1	Auto Dim Text 16.1.4.1.1	Auto Dim Text 16.1.4.1.2				

Figure B-14. Drafting Overlay (with Cross-References to Menu Choices)

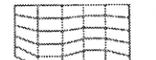
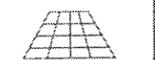
AD	3-D Curves						Modals	Surface Development			AD
	 Composite Curve 15.2.5	 Cross Section Slice 15.5	 Draft Curve 15.2.4	 Surface Intersection 15.2.3	 Surface Edge Curve 15.2.2			Created Curve Type 15.1.1	 Developable Surface Lay 15.5.1	 Developable Feature Lay 15.5.2		Projected Entity 15.16
Advanced Design	Vector			Spline			Bezier Curve		Solids		
	Screen 15.2.6.1	Enter 15.2.6.2	Two 15.2.6.9	Sum/Dir 15.2.6.10	Scalar 15.2.6.5	Cross 15.2.6.6	3-D 15.2.1	Create 15.2.7.1	Surface Paths 15.1.3		
	Two Point 15.2.6.3	Surface Normal 15.2.6.4	Length Angle 15.2.6.8	Modify Replace 15.2.6.12	Normalize 15.2.6.7	Point Angle Line-Vector 15.2.6.11	2-D 12.1	Modify 15.2.7.2	Hexahedron 15.4.1	Toroid 15.4.4	Spheroid 15.4.2
	Surfaces						Facetting 15.3.18.1				
	 Revolution 15.3.2	 Tabulated Cylinder 15.3.3	 Ruled 15.3.4	 Developable 15.3.5	 Curve Mesh 15.3.6	 Fillet 15.3.7	Modify Surface Paths 15.3.18.2		Ellipsoid 15.4.5	Circular Rod 15.4.3	
	 Offset 15.3.8	 Sphere 15.3.9	 Cylinder 15.3.10	 Torus 15.3.11	 Cone 15.3.12	 Composite 15.3.13	Segment 15.3.14				
	Plane										
	Coefficient 15.3.1.1	3 Noncolinear Points 15.3.1.2	Thru Point and Perpto Vec 15.3.1.5	Thru 2 Points Perpto Plane 15.3.1.6							
	Thru Point Parallel to Plane 15.3.1.3	Parallel to Plane at a Distance 15.3.1.4	Thru Point Perpto 2 Planes 15.3.1.7	Two Lines 15.3.1.8	 Projected 15.3.15	 Curve-Driven 15.3.16					

Figure B-15. Advanced Design Overlay (with Cross-References to Menu Choices)

DBM	Tablet Management				Sequence Number		Drawing Status 6.13					DBM				
	Create Page 7.13.2	List Pages 7.13.7	Change File 7.13.8	Tablet M7.13.9	Identify last Number Used 7.3	Identify Entity 7.5										
	Modify Page 7.13.3	Display Page 7.13.6	Copy P7.13.10	Rename P7.13.4	Identify Number 7.4	Identify Range 7.6										
	Level Management				I/O Regeneration											
	Deline 5.5.2	List 5.5.3	Create Modify Pen Table 5.5.6		Regenerate Entity Number 7.7	Regenerate from N1 to N2 7.8										
	Delete 5.5.4	Create Assign Level Table 5.5.5	Execute Pen Table 5.5.7		Regenerate All 7											
	Attribute Management				Template Management											
	Create 6.1	Copy 6.3	Search 5.6.7	Identify 5.6.6	Create in UTF 6.3.1	Unlink Master 6.3.3							Delete Master 6.3.5	Create Instance 6.3.7	List 6.3.9	
	List On Files 5.6.8	Display 5.6.5	Report Generation 5.6.9	Delete 5.6.4	Modify 5.6.2	Create Plot File 7.2							Retrieve from UTF 6.3.2	Redefine Master 6.3.4	Delete from UTF 6.3.6	Unlink Instance 6.3.8
	List 6.5.1	Delete 6.5.2	Save On GUT 6.5.3		Data Base Information 6.6	SI/US Units 19.1							Independent Save 6.1.9	Global Save 6.1.1	List File 6.1.3	Rename Current Part 6.1.4	Merge Into Current Part 6.1.7
Initialize 6.5.5	Restore from GUTF 6.5.4			Dump Current Part 6.7	Resize 19.2	Independent Restore 6.1.10	Global Restore 6.1.2	Delete 6.1.5	Change Status 6.1.6	Pack 6.1.8						
Variables				Entity Name		Part Management		Pattern Management								
Move from UTF to RTL 5.3.1	Move from RTL to UTF 5.3.2			List 5.11.1	Attach 5.11.2	On 1.17.1	Off 1.17.2	Check Part 6.1.11.1	Modals 6.2.1	Create 6.2.2	Copy 6.2.6	Delete 6.2.4.1				
List from UTF 5.3.3	List from RTL 5.3.4			Search 5.11.4	Detach 5.11.3	Change Name 1.17.3	Read In File 1.17.4	Renew Part 6.1.11.2	List Primary 6.2.5.1	List Second 6.2.5.2	Retrieve 6.2.3	Change Primary 6.2.7	Change Secondary 6.2.8			

Figure B-16. Data Base Management Overlay (with Cross-References to Menu Choices)

DC	Modals		Depth Entry		View Assoc		Layouts			Z-Clip		Define Auxiliary View	Display Views				DC							
	Display Modes 8.1.8		Enter 8.1.1	Point 8.1.2	All Views 8.1.10.1		Enter View Layout Construction 8.7			Move Window 2	Add View 4	On 8.10.1	Off 8.10.2	Change Work View 8.5	One 8.3	Right/Left 8.4.5		Prev/Next 8.4.3	Prev/Next Layout 8.4.1					
Display Control	View Selection Mode		Screen Select 8.1.2.3		Work View 8.1.10.3		View Alignment 12			Unblank View 6		Delete View from Layout 8		Pan		Define Display as Layout 8.4.11		STD Views		Zoom Extent				
	Number 8.1.2.1	Name 8.1.2.2					Modify Layout Name 9			Blank View 7		Create Format View 11		Z15.1		Z15.2		Top/Front 8.4.7	Right/Back 8.4.8	Last Scale 1	Base Scale 2			
	View of Curve 8.1.2.4		User Choice 8.1.2.5		User Choice 8.1.10.4		Copy Layout Under New Name			Align/Scale		Entity Display		Workspace Selection Mode		Define Work Space								
	Zoom Origin Mode		Move View By Delta 8.1.3.5		Rescale Mode		Layout Units 1.1			Unchanged 1.3.1		Display 1.2.1		Space Number 8.1.9.1		Work View Space		Rotate About Axis 8.12.1						
	Screen Position 8.1.3.1	Center 8.1.3.2			Scale and Ratio 8.1.4.1		Set to Reference 1.3.2			Do Not Display 1.2.2		Space Name 8.1.9.2		Space of View 8.1.9.6		Parallel to Face 8.12.2		Thru Point Along Axis 8.12.5						
	Point 8.1.3.3	Delta from Curve 8.1.3.4	User Choice 8.1.3.6		Color Spectrum		Display Name Management			Screen Select Space 8.1.9.3		User Choice 8.1.9.7		Space of Curve 8.1.9.4		Enter Matrix 8.12.3		Thru Three Points 8.12.6						
	View Borders 8.1.5		View Names 8.1.6		Color Method		List Saved Zoom Scale 8.8.5			Rename Layout 8.8.7		Space of Curve 8.1.9.4		Thru Point Perpendicular to Line 8.12.4		New Origin 8.12.8								
	Display Mode		Work Names 8.1.11		Modify Color		Delete Zoom Scale 8.8.6			List Layouts 8.8.8		Hidden Line Removal		Blanked 12.11.5		One End 1								
	Some 2	All 3	View Axes 8.1.7		Pers 8.1.6		Level 8.1.7		Entity Color 8.1.9		Temp Color 8.1.10		12.11.1		12.11.2		Two End 2							
	Never 1	Work Axes 8.1.12		Color Table 8.1.9.2.1		Reset Color Table 8.1.9.2.3		Color Scheme 8.1.9.2.2		List Color Table 8.1.9.2.4		Delete View 8.8.3		Delete Layout 8.1.10		List Views in a Layout 8.8.9		12.11.3		12.11.3		Align View/Workspace 8.13		

Figure B-17. Display Control Overlay (with Cross-References to Menu Choices)

SC1 Schematics 1	Place  Screen Position 20.2.2	Translate  Element 20.5.1	Connect  Two Pins 20.7.2	Direct  Direct 20.7.4	Delete  Element by Screen Select 20.6.5	Net by Screen Select 20.6.3	Blank Page 0 20.10.5	Value Notes 20.10.4	Signal Names 20.10.3	Grid Display 1.18.2	Scale Display 1.18.3
	Node On Net 20.2.4	Region 20.5.5	Multiple Pins 20.7.3	Logical (No Graphics) 20.7.5	Element by Logic Name 20.6.4	Net by Number 20.6.2	Unblank Page 0 20.10.10	Value Notes 20.10.9	Signal Names 20.10.8	.1x.1 Grid Full Screen 1.18.4	
	Enter (X,Y,P) 20.2.3	Net Segment 20.5.3	Assign Signal Names 20.7.6	Add Note 16.10	Note 20.6.7	Pin Connection 20.6.1				.1x.1 Grid Diagonal Position 1.18.4	
	Input Value Note 20.3.1	Net Corner 20.5.4	Note 20.5.2	Rescale Note 20.8.7	Page 20.6.8	Logic Name 20.8.2	Element Value 20.8.4	Note 20.8.5	Resequence Net Number 20.8.8	.2x.2 Grid Full Screen 1.18.4	
	Input Parameter List 20.3.2	Rotate 45° 20.5.7 90° 20.5.8 180° 20.5.9 270° 20.5.10	Move Data Between Pages 20.4.2	Arrowhead Screen Position 16.9.1.1 End of Curve 16.9.1.2	Net Segment by Screen Select 20.6.6	Pin Number 20.8.3	Logical Pin Number 20.8.6	Signal Name 20.8.1	Request Page Display 20.4.1	Repetition On 20.1.2.1 Off 20.1.2.2	Select Additional Model Library 20.2.1.5

Figure B-18. ICEM Schematics 1 Overlay (with Cross-References to Menu Choices)

SC2 Schematics 2	Model	Design Check	Reports				Curve Font	Drafting Modal Status	Schematic Modal Status
	Library Summary 20.12.1.1	All 20.13.2	Element Summary 20.9.1	Page Summary 20.9.4	Part List Summary 20.9.3	Net Detail Physical 20.9.7	Page Display Content 20.4.3	16.1.16	20.1.1
			Element Detail					Arrowhead Size 16.1.7	Pin Verify 20.7.1.5.1
			Screen Select 20.9.2.1					16.1.2.1	20.7.1.5.2
	Detail 20.12.1.2	Unused Pins 20.13.3	Logic Name 20.9.2.2	Net List Summary 20.9.5	Net Detail by Signal Name 20.9.8	Net Detail by Net Number 20.9.6		Text Justify	Note Justify
								Left 16.1.2.1	Right 16.1.3.2
		Drawing Management					Center 16.1.2.2	Note Parameters 20.1.4	
		List File 6.1.3		Global Save 6.1.1	Data Base Information 6.6		Character Size 16.1.1	Note Character Size 20.1.4.3	
Modify 20.12.3	Unused Page Connector 20.13.4	Rename Current DWG 6.1.4	Delete DWG 6.1.5	Global Restore 6.1.2	Dump Current DWG 6.7	Back Annotation 20.1.4	Slant Status	Parallel Line Spacing 20.1.6	
		Output Files					16.1.1.3.1	16.1.1.3.2	
							Color Control 20.4.5	Auto Connect Terminate 20.7.1.1	
Delete 20.12.4	Duplicate Logic Names 20.13.5	Tokroute Input (ESROUT) 20.11.4	Syscap (ESSCAP) 20.11.5	Plot (TAPE 9) 7.2	Design Checking (ELDATA) 20.13.1		Element Name	Signal Name	
							Auto On 20.2.1.1.1	Auto Off 20.2.1.1.2	
							Element Seq Number Reset 20.2.1.2	Fine 16.1.1.6.1	
							Assign Section	Coarse 16.1.1.6.2	
							Auto On 20.2.1.3.1	Auto Off 20.2.1.3.2	
Create 20.12.2	Duplicate Missing Pins 20.13.6	Parts List (ESPARTS) 20.11.1	Net List Physical (ESNETP) 20.11.3	Net List Logical (ESNETL) 20.11.2			Standard 16.1.1.2.1	User 16.1.1.2.2	
							Auto On 20.2.1.3.1	Auto Off 20.2.1.3.2	
							Thick Lines 1.19	Request Page Access 20.4.4	
								Snap to Pin Tolerance 20.7.1.4	
								Net Sequence Reset 20.7.1.3	

Figure B-19. ICEM Schematics 2 Overlay (with Cross-References to Menu Choices)

Binary Control

C

Many systems on which ICEM DDN runs have local mods, nonstandard operating systems, or operating systems that cannot support ICEM DDN. The system control utility allows the user or the installation analyst to designate which system calls are not to be made. The local analyst can control it by changing the binary with COPYLDR. The user controls it by designating the parameter M=nnnnnn in the ICEM DDN call statement (nnnnnn is the octal sum of the M values in the following list). Setting a bit in the M parameter setting inhibits the corresponding system call.

Refer to table C-1 for system call procedures.

Table C-1. System Call Procedures

Operating System	Octal Number	System Call
NOS	400000	UFP - Accounting (cannot be set by the user; see COPYLDR).
	200000	CPM - Time limit.
	100000	CPM - ASL (SETTSL).
	040000	CPM - JSL (SETJSL).
	020000	TLX - TSTATUS (not synchronous is assumed).
NOS - Asynchronous	001000	0016 - TRMDEF (B1=).
	000400	TLX - CSET ASCII.
NOS - Asynchronous	000200	TLX - Prompt off.
NOS/BE or SCOPE	000100	CON - Connect input.
	000040	CON - Connect output.
	000020	RWE+GCC - Check for intercom and GCC.
	000010	UAA - Accounting (cannot be set by the user; see COPYLDR).
ALL	000004	All accounting on, only sensed when set by COPYLDR. Reserved.
	000002	Reserved.
	000001	Reserved.

COPYLDR/ADDLDR

D

COPYLDR and ADDLDR are utilities that allow binary changes to the ICEM DDN binary.

COPYLDR is a utility that copies records from one file to the other, building a random index in the first record. This index is used by the fast overlay loader for random reads of overlays.

ADDLDR copies records from one file to the end of the other. The random index in the first record is updated.

The formats are:

COPYLDR(ifile,ofile,s,m)

ADDLDR(ifile,ofile,s,m)

Parameter	Description	Default Setting
ifile	Name of input file.	*OLD*
ofile	Name of output file.	*LGO*
s	Change to 5000 table flag.	Not selected.
m	ICEM DDN execution mask.	Not selected.

ICEM DDN execution mask. Refer to table C-1, System Call Procedures.

NOTE

When the bit is set, the corresponding system call is not made.

This appendix is provided for ICEM DDN users on Control Data's data service known as CYBERNET. CYBERNET users access ICEM DDN through CYBERNET NOS. Some minor differences exist between the execution of ICEM DDN on CYBERNET NOS and standard NOS. This manual describes the use of ICEM DDN on standard NOS, with modifications for CYBERNET NOS/TELEX documented in this appendix.

CYBERNET On-Line Documentation

An on-line documentation capability called EXPLAIN is available for CYBERNET products. To access ICEM DDN on-line information on CYBERNET NOS, enter the following command before executing ICEM DDN:

```
EXPLAIN,ICEMDDN
```

To list a subtopic, type:

```
EXPLAIN,ICEMDDN,subtopic name
```

Subtopic Name	Description
ALL	List of all ICEM DDN subtopic names.
CHANGES	Revisions to ICEM DDN in the latest release.
DESCRIBE	Brief description of ICEM DDN features.
DOCUMENT	ICEM DDN manuals and documentation.
EXAMPLE	ICEM DDN example, plus example references.
GTA	Information on the use of ICEM DDN with a graphics terminal assist (GTA).
NEWS	Latest ICEM DDN news bulletin.
SUPPORT	ICEM DDN support.
UNIPLLOT	Usage of UNIPLLOT/UNIPOST with ICEM DDN, including utility routine DDNUTIL.
USAGE	ICEM DDN execution information.

USING ICEM DDN ON CYBERNET

ICEM DDN users who are not using EDL must be familiar with elementary interactive usage procedures before they can use ICEM DDN. The interactive usage procedures required to use ICEM DDN are described in the Introduction. All procedures described in the Introduction are valid on CYBERNET, with the exception of the procedure used to execute ICEM DDN.

To execute ICEM DDN on CYBERNET, enter the following command:

```
BEGIN,,ICEMDDN,parameter string
```

The terminal baud rate parameter is included on the BEGIN,,ICEM DDN command. It must be the first parameter in the parameter string. All other valid ICEM DDN parameters listed in the Introduction may be included on the BEGIN,,ICEM DDN command in any order. The following parameters are not documented and are valid only on CYBERNET:

Parameter	Description
JS=value	Job step SBU limit. This value sets the SBU limit for the ICEM DDN run. The default value for the SBU-priced version of ICEM DDN is JS=5000. The default value for the hourly priced version of ICEM DDN is JS=15000. If the limit is reached while ICEM DDN is executing, you may increase the limit by entering S,nnnn (nnnn is the new value).
V=value	When there is more than one version of ICEM DDN on CYBERNET, ICEM DDN users access the version they require by including V=value on the BEGIN,,ICEM DDN command. For example:

```
BEGIN,,ICEMDDN,1,V=153,JS=7000
```

Creating Plots with ICEM DDN on CYBERNET

There are many differences between the procedures used to create plots on standard NOS and CYBERNET NOS. For information on the procedures used to plot on CYBERNET NOS, enter the following commands before executing ICEM DDN:

```
EXPLAIN,ICEMDDN,UNIPLLOT
```

```
EXPLAIN,UNIPLLOT
```

System Error Indicators

F

The messages described in this appendix can occur during an ICEM DDN session.

The following error message occurs when a part's data base has reached the maximum allowable size. To continue making additions to your current drawing, some data base space must be freed. In many cases, some data base space can be freed by executing the 6.1.8 PART PACK and/or the 6.1.11.2 RENEW PART operation.

TABLES FULL, ACKNOWLEDGE

Enter] or [to return to the main menu.

The following error message occurs when the sequence number reaches 65,535 and an attempt is made to define another entity. A part that has had entities deleted may be resequenced to allow for more entity definition. This may be accomplished by executing the 6.1.11.2 RENEW PART function.

MAXIMUM SEQUENCE NUMBER ENCOUNTERED, ACKNOWLEDGE

Enter] or [or return to the main menu.

The following error message occurs when 420 views have been defined on a part and an attempt is made to define another view. A part that has had views deleted or a view which has no entities defined (other than the standard views) may be packed to allow for more view definitions. This may be accomplished by executing the 6.1.11.2 RENEW PART function.

VIEW TABLES FULL, ACKNOWLEDGE

Enter] or [to return to the main menu.

The following error message is displayed when the system tries to evaluate a data base pointer for which there is no corresponding disk location. In other words, the system could not get the information necessary to continue because the location of the information was incorrect. The table number displayed is the number being accessed at the time the error occurred. Valid table numbers are 1 through 5. Table numbers 1 through 3 indicate that entity information was being accessed. Table 4 corresponds with view information and table 5 corresponds with view entity name information. The pointer number displayed is the incorrect data base address.

UNDEFINED ADDRESS ENCOUNTERED TABLE (table number being accessed)
POINTER (data base pointer)
CORELOAD (core load number)
LAST ENTITY ACCESSED
ENTITY TYPE (entity type)
SEQUENCE NO. (entity sequence number)

Enter] or [to return to the main menu.

The core load number is the program overlay number that was executing when the undefined address was encountered. The entity type and sequence number displayed is that of the last entity accessed before the error occurred.

The message indicates that a function failed because an unexpected value was encountered. If the unexpected value came from the data base, this may indicate data base trouble, especially if this occurred during zoom or repaint operations. To check for data base problems, use the function 6.1.11.2 CHECK PART. To repair the part, use the 6.1.11.1 RENEW PART function.

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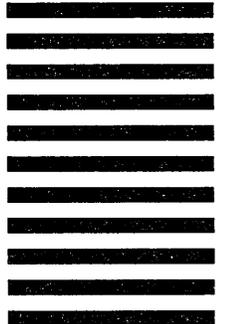
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