

What's New in CADD5[®] 5i Release 14

CADD5[®] 5i Release 14

DOC40175-012

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GB2366639B 13-October-2004	GB2353376 05-November-2003	5,140,321 18-August-1992
GB2363208 25-August-2004	GB2354686 15-October-2003	5,423,023 05-June-1990
(EP/DE/GB)0812447 26-May-2004	6,545,671 B1 08-April-2003	4,310,615 21-December-1998
GB2365567 10-March-2004	GB2354685B 18-June-2003	4,310,614 30-April-1996

(GB)2388003B 21-January-2004	GB2354683B 04-June-2003	4,310,614 22-April-1999
6,665,569 B1 16-December-2003	6,608,623 B1 19-August-2003	5,297,053 22-March-1994
GB2353115 10-December-2003	6,473,673 B1 29-October-2002	5,513,316 30-April-1996
6,625,607 B1 23-September-2003	GB2354683B 04-June-2003	5,689,711 18-November-1997
6,580,428 B1 17-June-2003	6,447,223 B1 10-September-2002	5,506,950 09-April-1996
GB2354684B 02-July-2003	6,308,144 23-October-2001	5,428,772 27-June-1995
GB2384125 15-October-2003	5,680,523 21-October-1997	5,850,535 15-December-1998
GB2354096 12-November-2003	5,838,331 17-November-1998	5,557,176 09-November-1996
GB2354924 24-September-2003	4,956,771 11-September-1990	5,561,747 01-October-1996
6,608,623 B1 19-August-2003	5,058,000 15-October-1991	(EP)0240557 02-October-1986

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Preface

What's New in CADD5 5i Release 14 provides information on new functionalities and enhancements added to CADD5 since CADD5 5i Release 13.

Related Documents

The following documents may be helpful as you use *What's New in CADD5 5i Release 14*:

- *Concurrent Assembly Mock-up User Guide and Menu Reference*
- *Design and Drafting User Guide and Menu Reference*
- *Explicit Modeling User Guide and Menu Reference*
- *Hidden Line Removal (and AEC HLR) User Guide and Menu Reference*
- *HVAC User Guide and Menu Reference*
- *Parametric Modeling User Guide and Menu Reference*
- *Piping User Guide and Menu Reference*
- *Ship Electrical Menu and Technical Reference*

Book Conventions

The following table illustrates and explains conventions used in writing about CADD5 applications.

Convention	Example	Explanation
Menu selections and options	List Section option, Specify Layer field	Indicates a selection you must make from a menu or property sheet or a text field that you must fill in.
User-selected graphic location	X, d ₁ or P1	Marks a location or entity selection in graphic examples.
User input in CADD5 text fields and on any command line	<code>cvaec.hd.data.param</code> <code>tar -xvf /dev/rst0</code>	Enter the text in a CADD5 text field or on any command line.
System output	<code>Binary transfer complete.</code>	Indicates system responses in the CADD5 text window or on any command line.
Variable in user input	<code>tar -cvf /dev/rst0 filename</code>	Replace the variable with an appropriate substitute; for example, replace filename with an actual file name.
Variable in text	tagname	Indicates a variable that requires an appropriate substitute when used in a real operation; for example, replace tagname with an actual tag name.
CADD5 commands and modifiers	INSERT LINE TANTO	Shows CADD5 commands and modifiers as they appear in the command line interface.
Text string	"SRFGROUPA" or 'SRFGROUPA'	Shows text strings. You must enclose text string with single or double quotation marks.
Integer	<i>n</i>	Supply an integer for the <i>n</i> .
Real number	<i>x</i>	Supply a real number for the <i>x</i> .
#	# <code>mkdir /cdrom</code>	Indicates the root (superuser) prompt on command lines.
%	% <code>rlogin remote_system_name -l root</code>	Indicates the C shell prompt on command lines.
\$	\$ <code>rlogin remote_system_name -l root</code>	Indicates the Bourne shell prompt on command lines.

Window Managers and the User Interface

According to the window manager that you use, the look and feel of the user interface in CADD5 can change. Refer to the following table:

Look and Feel of User Interface Elements

User Interface Element	Common Desktop Environment (CDE) on Solaris, HP, and IBM	Window Manager Other Than CDE on Solaris, HP, IBM, and Windows
Option button	ON — Round, filled in the center OFF — Round, empty	ON — Diamond, filled OFF — Diamond, empty
Toggle key	ON — Square with a check mark OFF — Square, empty	ON — Square, filled OFF — Square, empty

Online User Documentation

Online documentation for each book is provided in HTML if the documentation CD-ROM is installed. You can view the online documentation in the following ways:

- From an HTML browser
- From the Information Access button on the CADD5 desktop or the Local Data Manager (LDM)

Please note: The LDM is valid only for standalone CADD5.

You can also view the online documentation directly from the CD-ROM without installing it.

From an HTML Browser:

1. Navigate to the directory where the documents are installed. For example,
 - `/usr/apl/cadds/data/html/htmldoc/` (UNIX)
 - `Drive:\usr\apl\cadds\data\html\htmldoc\` (Windows)
2. Click `mainmenu.html`. A list of available CADD5 documentation appears.
3. Click the book title you want to view.

From the Information Access Button on the CADD5 Desktop or LDM:

1. Start CADD5.
2. Choose Information Access, the *i* button, in the top-left corner of the CADD5 desktop or the LDM.
3. Choose DOCUMENTATION. A list of available CADD5 documentation appears.
4. Click the book title you want to view.

From the Documentation CD-ROM:

1. Mount the documentation CD-ROM.
2. Point your browser to:
CDROM_mount_point/html/doc/mainmenu.html (UNIX)
CDROM_Drive:\html\doc\mainmenu.html (Windows)

Online Command Help

You can view the online command help directly from the CADD5 desktop in the following ways:

- From the Information Access button on the CADD5 desktop or the LDM
- From the command line

From the Information Access Button on the CADD5 Desktop or LDM:

1. Start CADD5.
2. Choose Information Access, the *i* button, in the top-left corner of the CADD5 desktop or the LDM.
3. Choose COMMAND HELP. The Command Help property sheet opens displaying a list of verb-noun combinations of commands.

From the Command Line: Type the exclamation mark (!) to display online documentation before typing the verb-noun combination as follows:

```
#01#!INSERT LINE
```

Printing Documentation

A PDF (Portable Document Format) file is included on the CD-ROM for each online book. See the first page of each online book for the document number referenced in the PDF file name. Check with your system administrator if you need more information.

You must have Acrobat Reader installed to view and print PDF files.

The default documentation directories are:

- /usr/apl/cadds/data/html/pdf/doc_number.pdf (UNIX)
- CDROM_Drive:\usr\apl\cadds\data\html\pdf\doc_number.pdf (Windows)

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Documentation Comments

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New Features and Enhancements

This document provides an overview of what is new in CADD5 5i Release 14. CADD5 5i Release 14 includes a number of significant improvements in capability and usability. These enhancements and considerations are grouped and described according to the following themes.

- Usability
- Hidden Line Removal and Drawing Generation
- Routed Systems
- Shipbuilding Design
- Design and User Support
- Database Enhancements
- General Enhancements

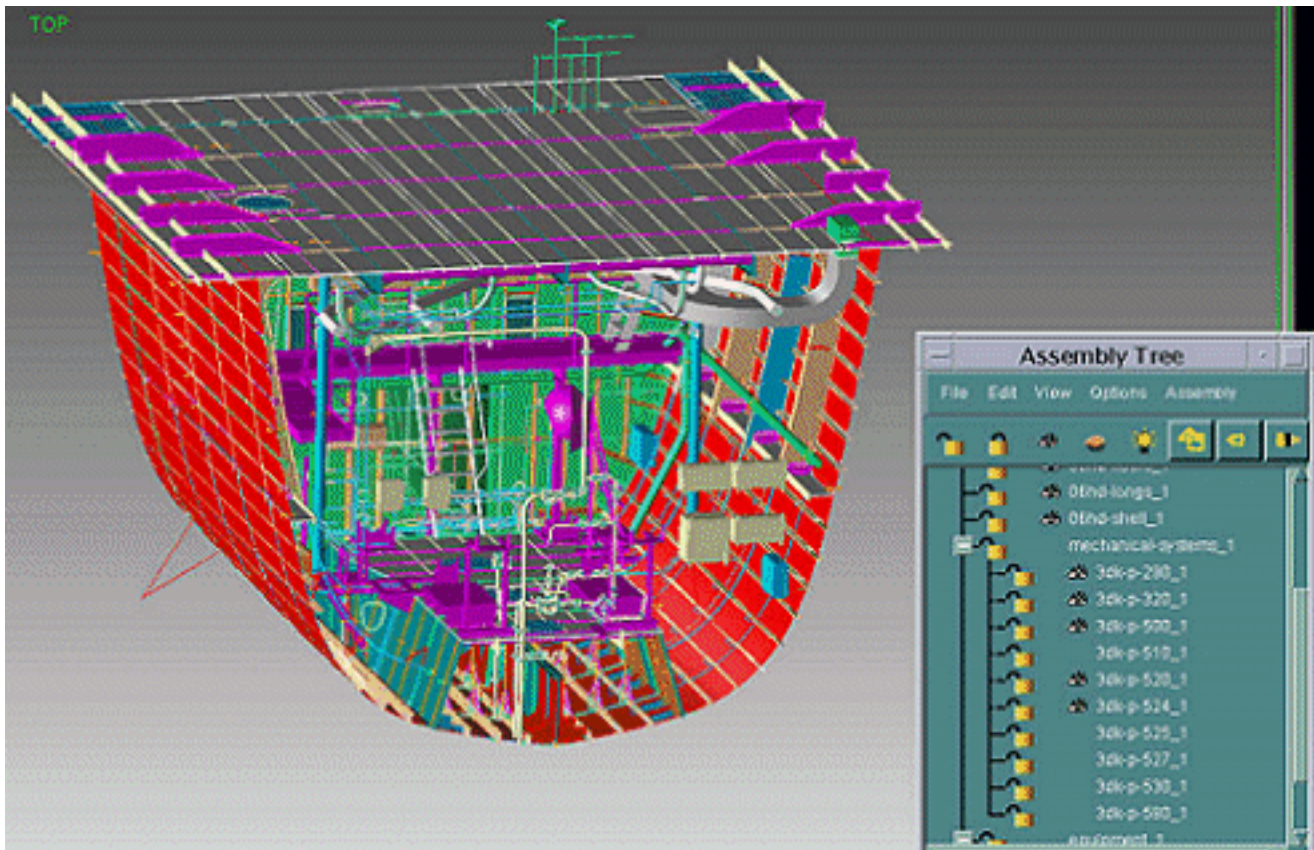
For detailed information, refer to the product-specific online document.

Usability

Graphics-related enhancements are described in the following sections. See the *Explicit Modeling User Guide and Menu Reference* for details.

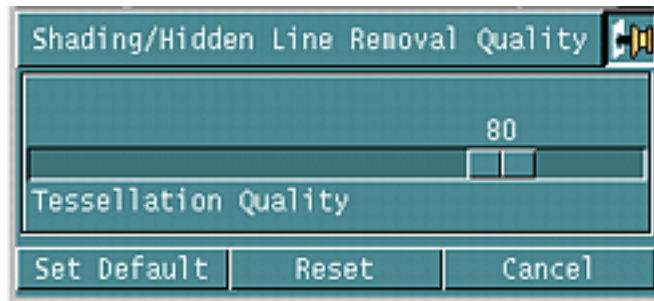
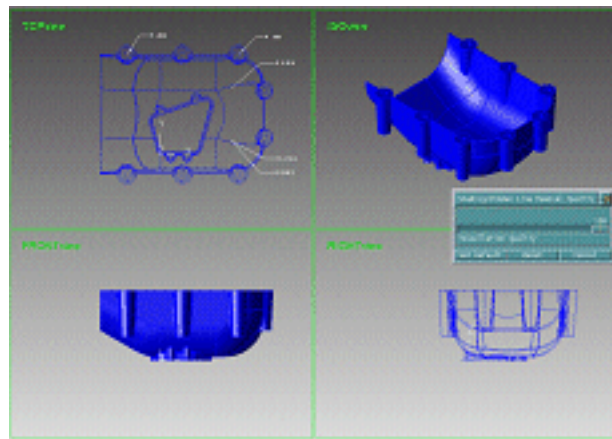
Powerful Design Graphics Capability

This latest release of CADD5 now offers the ability to design in a single graphics window, switching the display between wire frame, fully shaded or graphically hidden line-removed rendering in the explicit environment. This powerful new capability enables new levels of productivity in design and visualization. It gives better understanding of complex design scenarios by visualizing a true representation and thereby helps eliminate misunderstandings and interferences.

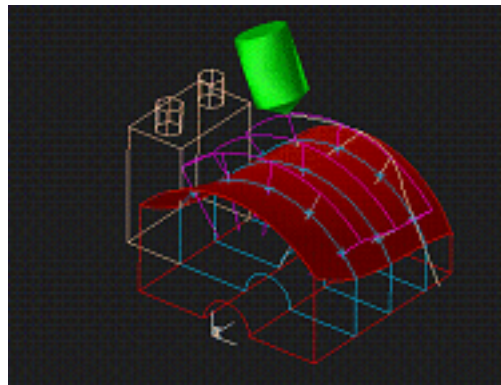


This is the first phase of a two-phase project and aims to deliver a fully capable design environment supporting all CADD5 explicit design applications relevant to the supported platforms. The second phase will support drawing, labeling, text, dimensions, plotting, and other manufacturing output available in the older graphics mode.

You have the choice of rendering a snapshot or interactively working with a different display style in each view using a slide bar to adjust image quality.



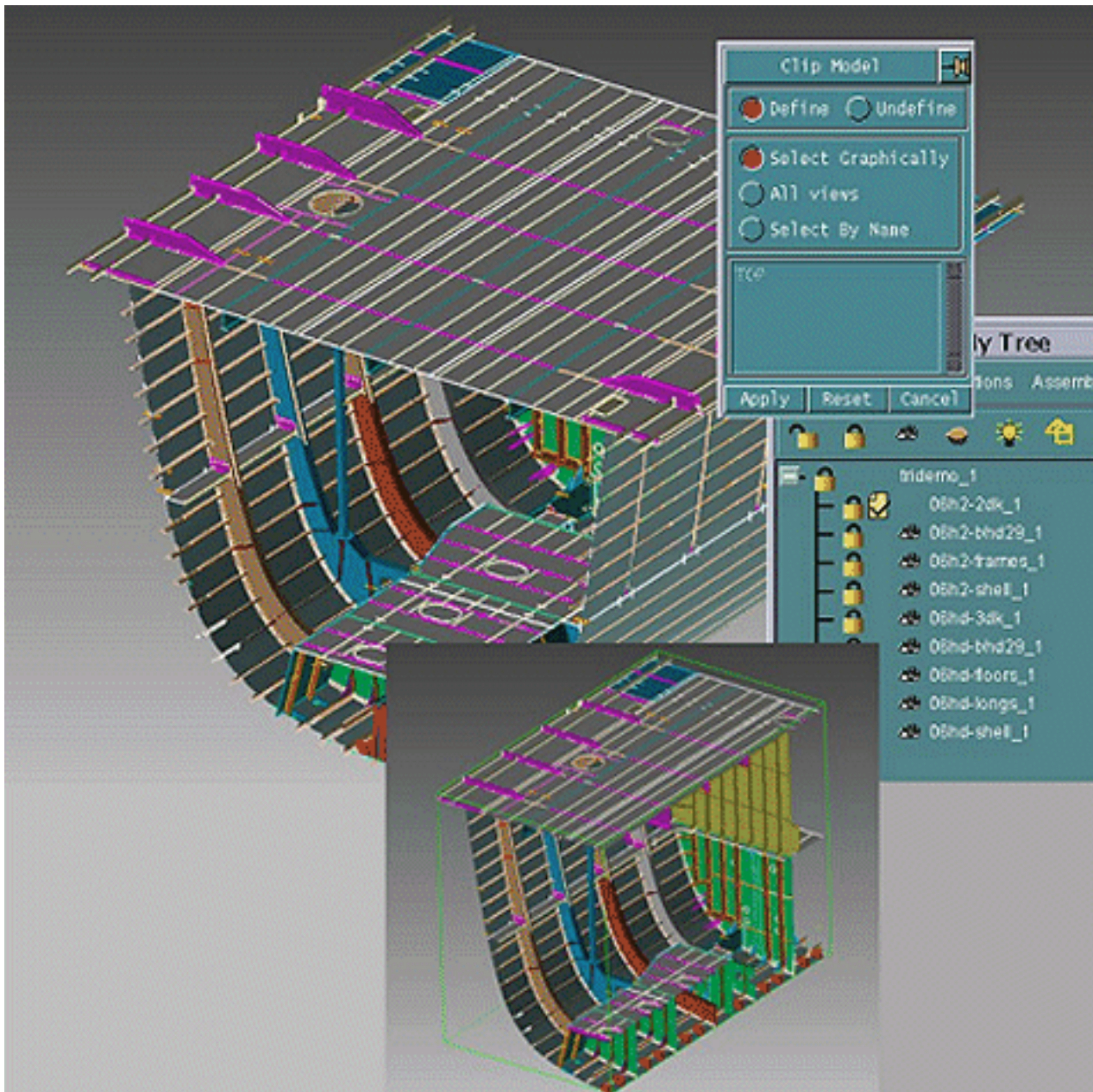
Within CVNC you can render the work surface, or the tool piece, or both.



3D View Clipping and Zoning

The powerful new design graphics capability is augmented by introducing the ability to clip the visible data in the model space within each view by a bounding box or zone. This allows the user to quickly remove the scenery and focus on the data needed to progress the design, strongly complementing the capabilities of

CAMU when working in large complex assemblies. A view may be clipped differently from the other views in use or not clipped at all.



New Commands

The new single-window explicit graphics environment is the default graphics environment for CADD5 5i Release 14. Set the `EXP_SINGLE_WINDOW` environmental variable to `no` to switch to the older graphics mode.

In the new single-window explicit graphics environment you can display the work area in gradient color by setting the values of the `CADDS_BACKGROUND_TOP` and `CADDS_BACKGROUND_BOTTOM` environmental variables for the top and bottom colors of the gradient, respectively.

The following new commands are available in the new explicit graphics environment:

- **RENDER VIEW**
Temporarily displays a solid image of the entities in the selected views by shading the model, removing hidden lines, displaying hidden lines as dashed lines, or by displaying a wireframe form.
- **CHANGE RENDerview**
Sets the default rendering style of the view by shading the model, removing hidden lines, displaying hidden lines as dashed lines, or by displaying a wireframe form.
- **ECHO VIEWNAME**
Displays or hides the viewnames of all the views on the active drawing.
- **EXIT RENDERMODE**
Switches all graphics to the CVGIM graphics mode.
- **SELECT GRAPHSHADE**
Modifies shading parameters such as tessellation quality and lighting of the model.
- **INSERT LIGHTSOURCE**
Inserts a new directional light source that focuses on the model.
- **DELETE LIGHTSOURCE**
Removes the selected light source.
- **SELECT HIGHLIGHT**
Sets the color for highlighting an entity when the entity is selected.
- **SHADE TOOL**
Displays the turning or milling tools as shaded graphics or wireframe entities.
- **SHADE WORK**
Displays the surfaces or solids selected for machining as shaded graphics or wireframe entities.

- **DEFINE CLIPMODEL and UNDEFINE CLIPMODEL**

Clips graphics in the Explicit and CAMU Explicit environments by defining or undefining a 3-dimensional clip box in the selected view or views within the model space. These commands are available in both, the new single-window explicit graphics environment and the older graphics mode with OGL graphics.

Hidden Line Removal and Drawing Generation

Enhancements in Hidden Line Removal and Drawing Generation are described in the following sections.

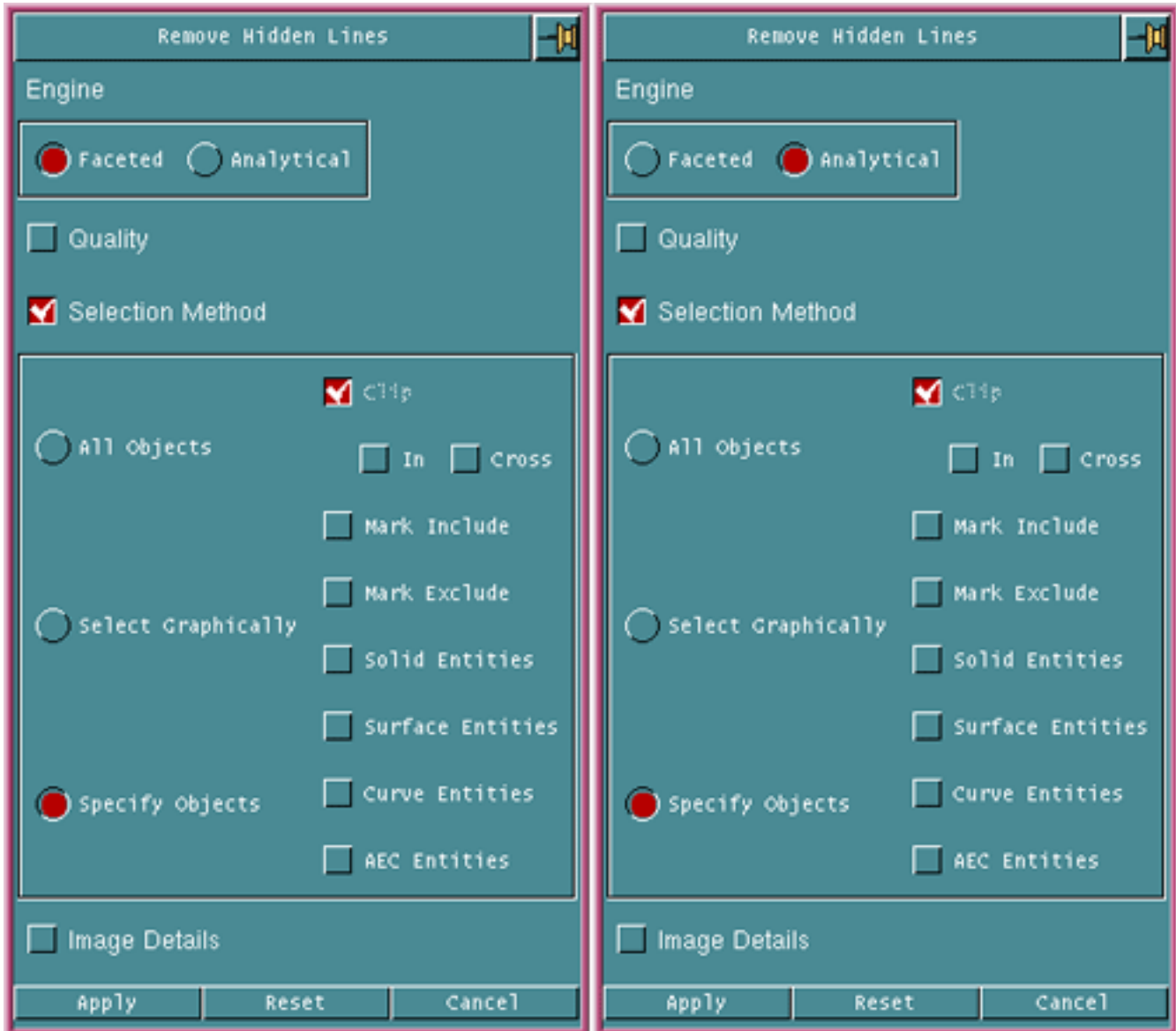
Hidden Line Removal

The following new functionalities are available for Hidden Line Removal (HLR).

Choosing Entities for Hidden Line Removal

- You can use the new Clip, In, and Cross options in the Remove Hidden Lines property sheet to remove hidden lines from entities that are only present within selected view boundaries, or crossing these boundaries, or both.
- You can use the new Mark Include and Mark Exclude options in the Remove Hidden Lines property sheet to remove hidden lines only from marked entities among the entities selected for HLR, or only from unmarked entities.

Figure 1-1 Remove Hidden Lines Property Sheet



Improved Hidden Line Removal Messages

When you perform an HLR operation, a warning message appears if the selected entity is not a properly formed solid. For viewed entities, this warning message now displays the name of the part or component, its instance name (ID name), and its Master Index Pointer (MIPTR) in the original part as follows:

In Part mode:

```
Warning: Cant find solid for entity 328295.  
Miptr 328295 is miptr 66151 in the part NVORM, IDName PART.1.
```

In Assembly mode:

```
Warning: Error in reading solid entity 324785.  
Miptr 324785 is miptr 62641 in the model VALVE, component  
valve_1.
```

See the section, “Removing Hidden Lines,” in the *Hidden Line Removal (and AEC HLR) User Guide and Menu Reference* for details.

UPDATE HLRIMAGE Command

You must now run the UPDATE HLRIMAGE command on an HLRed image in the same mode in which the image was created, that is, either in the standard mode or in the exploded mode. Otherwise, the command is aborted and a warning message is displayed.

Drawing Generation

The following sections describe the enhancements in Drafting and Detailing. See the *Design and Drafting User Guide and Menu Reference* for details.

Associative Multiple Arrowhead Labels

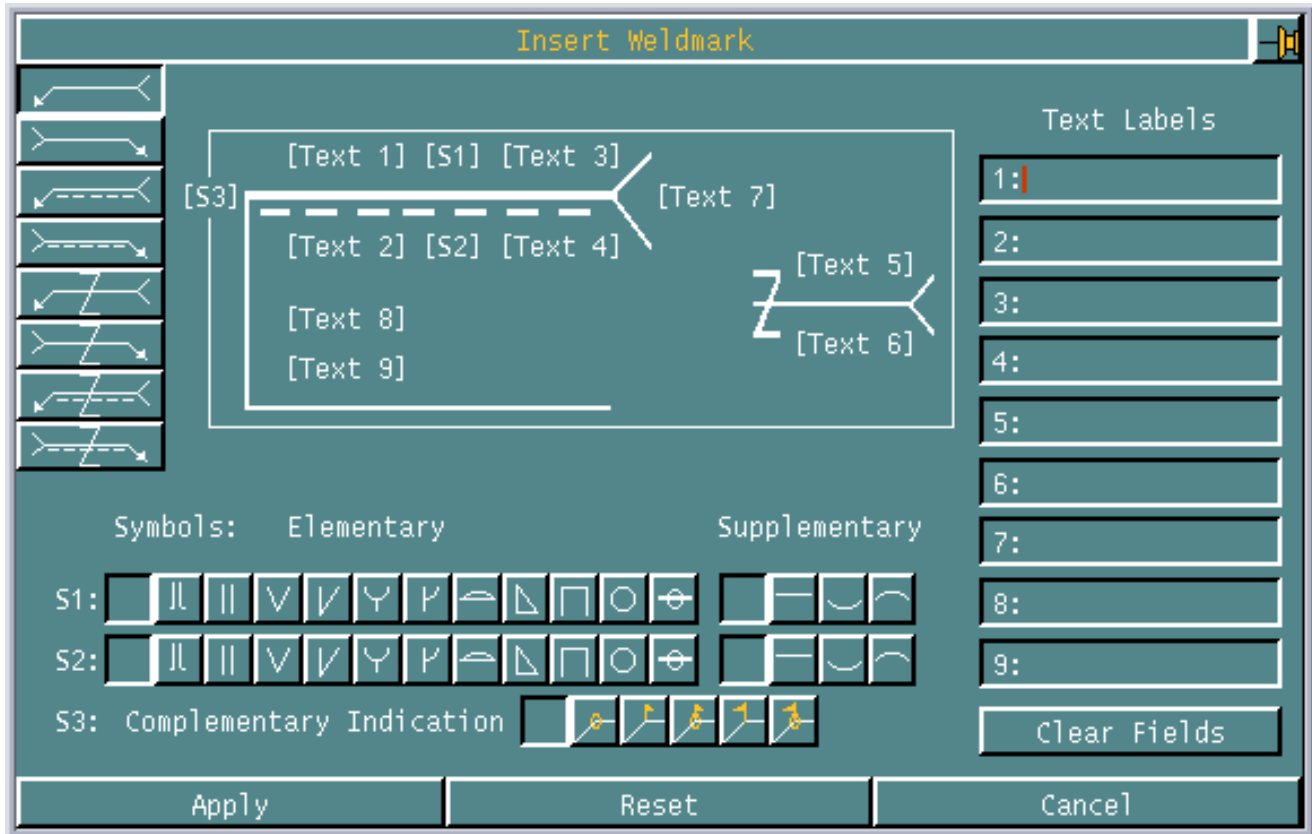
- You can now insert associative multiple arrowhead labels.
- You can now perform the following operations on labels in Context Sensitive Dimensioning (CSD):
 - Drag segments of single or multiple associative arrowhead labels.
 - Drag segments of single or multiple nonassociative arrowhead labels.
 - Drag vertices of single or multiple associative arrowhead labels.
 - Drag vertices of single or multiple nonassociative arrowhead labels.
 - Drag the arrowhead or the entire label along the entity with which the label is associated.

See the section, “Modifying Dimension Components,” in the *Design and Drafting User Guide and Menu Reference* for details.

Text Labels for a Weld Symbol

You can now insert up to nine text labels at a weld symbol using the Insert Weldmark property sheet.

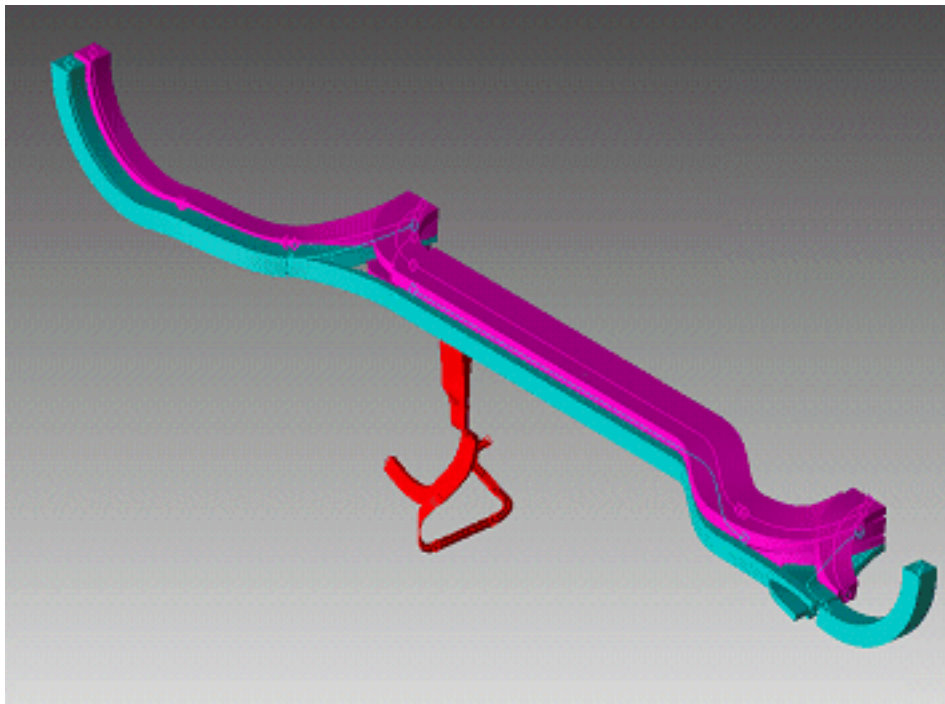
Figure 1-2 Insert Weldmark Property Sheet



See the section, “Weld Marks,” in the *Design and Drafting User Guide and Menu Reference* for details.

Routed Systems

Enhancements in Heating, Ventilation, and Air Conditioning (HVAC), Cableway, and Piping are described in the following sections. This latest release of CADD5 5 includes powerful new capabilities to route rotated or curved HVAC, or both, and curved twisted cableway.



HVAC Enhancements

The HVAC enhancements are described in the following sections. See the *HVAC User Guide and Menu Reference* and *Heating Ventilation and Air Conditioning Reference* for details.

Duct Line Routing

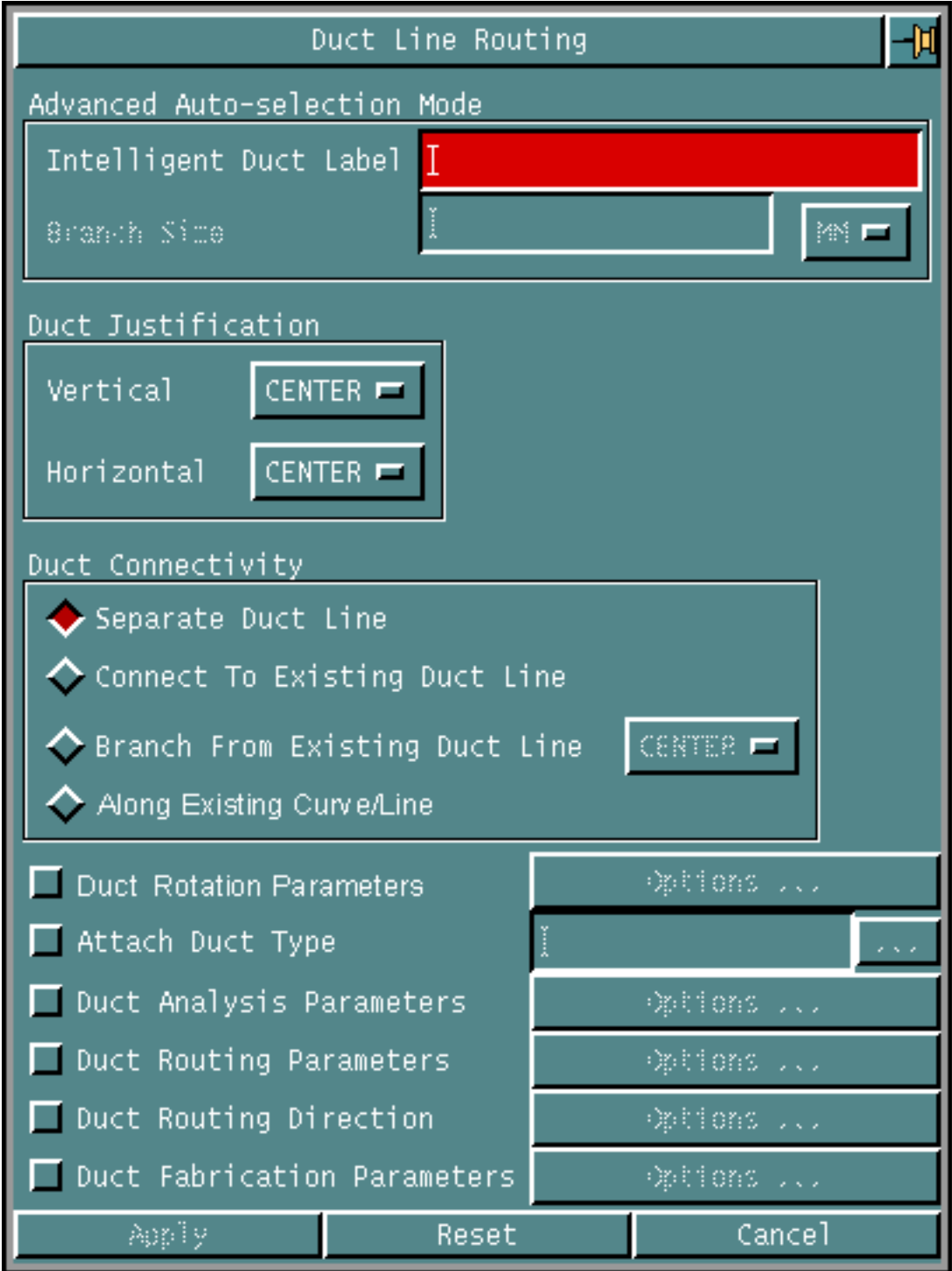
You can now route duct lines along existing curves or lines. These curves are called guiding curves. You can also set the cross-section orientation (rotation). You can use any of the following entity types as guiding curves:

- Arc
- B spline
- Conic
- Curve pole

- Draft curve
- Line
- Nodal line
- Nspline
- Spline
- String

The Along Existing Curve/Line option on the Duct Line Routing property sheet allows you to route a duct line along an existing curve or line.

Figure 1-3 Duct Line Routing Property Sheet



See the section, "Routing Duct Lines," in the *HVAC User Guide and Menu Reference* for details.

Marking Penetration on Structural Objects

You can now use the INTERSECT COMMAND to mark the cross sections of intersection of Nlines and Nfigures.

See the section, “Intersecting Entities,” in the *Explicit Modeling User Guide and Menu Reference* for details.

HVAC and Piping - Common Enhancements

Enhancements common to HVAC and Piping are described in the following sections. Differences, if any, are also mentioned.

Reconstructing Selected Ductline or Pipeline Spools

You can now reconstruct a single selected spool or a few selected spools in a spooled duct line or pipeline using the Partial option in the Ductline Spool Generation/ Reconstruction property sheet or in the Pipeline Spool Generation/ Reconstruction property sheet, respectively.

Figure 1-4 Duct Line Spool Generation / Reconstruction Property Sheet

The image shows a software dialog box titled "Duct Line Spool Generation / Reconstruction". It contains several sections for configuring duct line processing. The "Duct Line Selection Method" section has three radio buttons: "Digitized Duct Line" (selected), "All Duct Lines in Active Part", and "Specified Line Numbers" (with an empty text field and a browse button). The "Duct Line Spool Generation" section has two radio buttons: "Duct Line Spool Generation" (selected) and "Duct Line Reconstruction". Under "Duct Line Spool Generation", there is a checked checkbox for "Partial" and two text fields for "From Spool" and "To Spool", each with a browse button. Below this is a checked checkbox for "Create Duct Line Spool Label Legend". The "Text Height" and "Text Width" fields are both set to "2.0000" and have a grid icon. The "Start Spool Number" field contains "SPOOL#1", and the "Increment Value" field contains "1", both with grid icons. The "Label/Legend Creation Layer" checkbox is unchecked, with a grid icon next to it. At the bottom are three buttons: "Apply", "Reset", and "Cancel".

Figure 1-5 Pipe Line Spool Generation / Reconstruction Property Sheet

The image shows a software dialog box titled "Pipe Line Spool Generation / Reconstruction". It contains several sections of controls:

- Pipe Line Selection Method:** Three radio buttons: "Digitized Pipe Lines" (selected), "All Pipe Lines in Active Part", and "Specified Line Numbers" (with an empty text field and a "...").
- Generation/Reconstruction Options:** A radio button for "Pipe Line Spool Generation" (selected) and another for "Pipe Line Reconstruction". Under "Pipe Line Spool Generation", there is a checkbox for "Fitting At Spool Point" (with an "Options ..." button) and a dropdown menu for "Fitting Inclusion" set to "Include". Under "Pipe Line Reconstruction", there are checkboxes for "Partial From Spool" and "To Spool", each with a text field and a "...".
- Advanced Options:** Two checkboxes: "Interactive Spool Generation" and "Create Pipe Line Spool Label Legend".
- Text Formatting:** Two fields: "Text Height" and "Text Width", both set to "0.1560" with a grid icon to the right.
- Spool Labeling:** A text field for "Start Spool Number" containing "SPOOL#1", a field for "Increment Value" set to "1" with a grid icon, and checkboxes for "Label/Legend Creation Layer", "Maximum Spool Length" (set to "238,2105" with a grid icon), "Maximum Bend Number" (set to "4" with a grid icon), and "Bend Collision Plane Checking".
- Buttons:** "Apply", "Reset", and "Cancel" at the bottom.

You can use the Partial option to select the spool or spools to be reconstructed. You can either select the spools or specify a series of spools by typing the starting spool label and ending spool label in the From Spool and To Spool fields, respectively.

See the sections, “Generating or Reconstructing Ductline Spools,” in the *HVAC User Guide and Menu Reference*, or “Generating or Reconstructing Pipeline Spools,” in the *Piping User Guide and Menu Reference* for details.

Unique Spool Name Across Ductlines or Pipelines

While generating a duct line or a pipeline database, you can now choose to prevent duplication of spool names across parts in the selected project of the Oracle database.

See the sections, “Ductline External Database,” in the *HVAC User Guide and Menu Reference*, or “Pipeline External Database,” in the *Piping User Guide and Menu Reference* for details.

Manipulating and Copying Duct or Pipe Elements

You can now edit an existing duct or pipe element or create a copy of an existing duct or pipe element with the same or revised attribute values as the original duct or pipe element.

Figure 1-6 Manipulate Duct Element Property Sheet

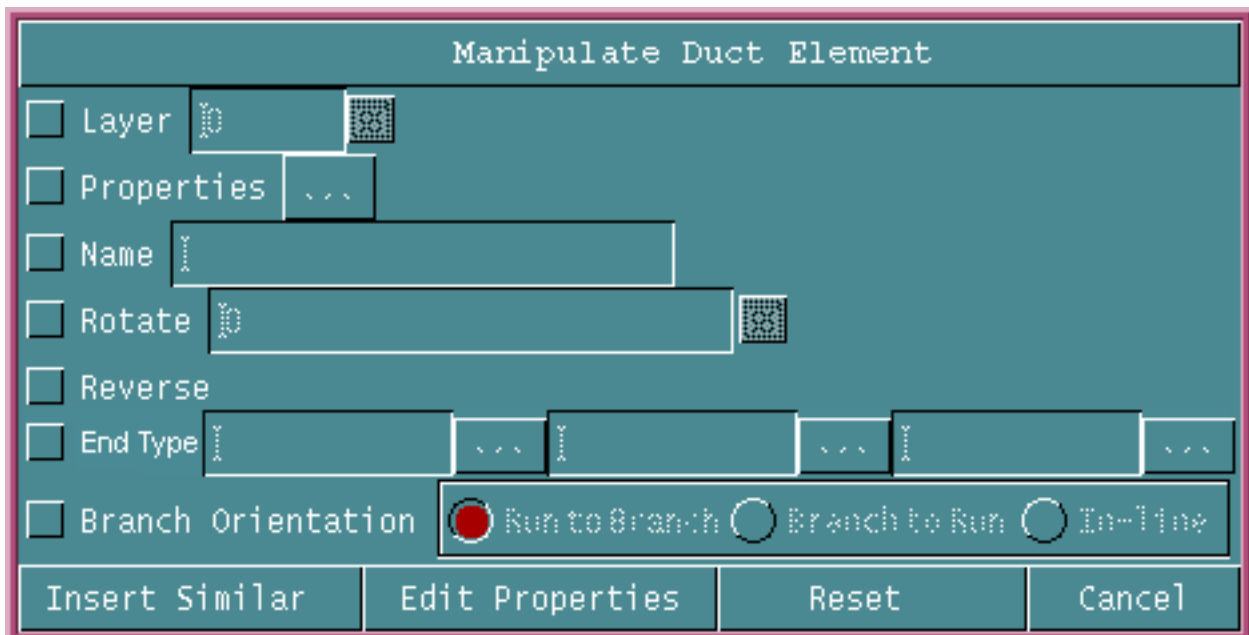
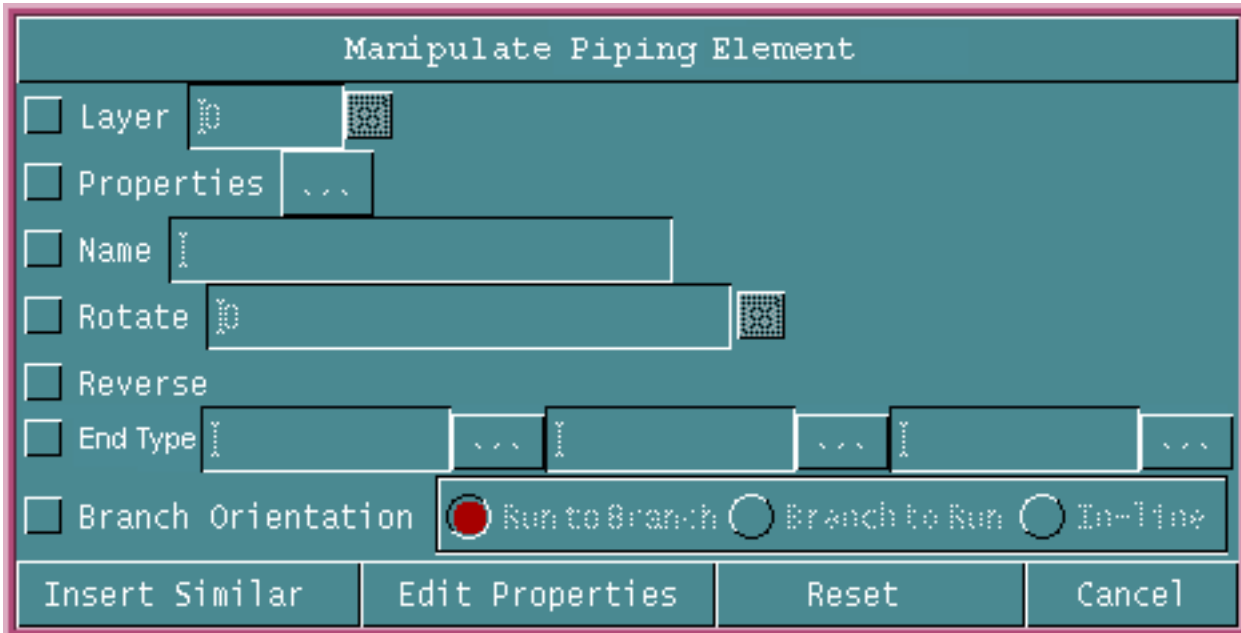


Figure 1-7 Manipulate Piping Element Property Sheet



You can also modify the following attributes of a duct or a pipe element after creating the duct or pipe element.

- Layer on which the duct or pipe element lies
- Properties
- Name
- Angle of rotation
- End types of the inlet, outlet, and branch type Cnodes of the duct or pipe element
- Branch orientation

See the sections, “Manipulating Duct Elements,” in the *HVAC User Guide and Menu Reference*, or “Manipulating Pipe Elements,” in the *Piping User Guide and Menu Reference* for details.

Additional Columns in the Duct or Piping Report

You can now choose to display the following new columns in the duct or piping report in addition to the existing columns:

- Layer
- MIPTR

- Properties of the duct or pipe elements
- UID
- X-, Y-, and Z-coordinates

See the sections, “Reporting Ductlines with Options,” in the *HVAC User Guide and Menu Reference*, or “Generating a Piping Report (with Options),” in the *Piping User Guide and Menu Reference* for details.

Cable Enhancements

Cable-related enhancements are described in the following sections. See the *Ship Electrical Menu and Technical Reference* for details.

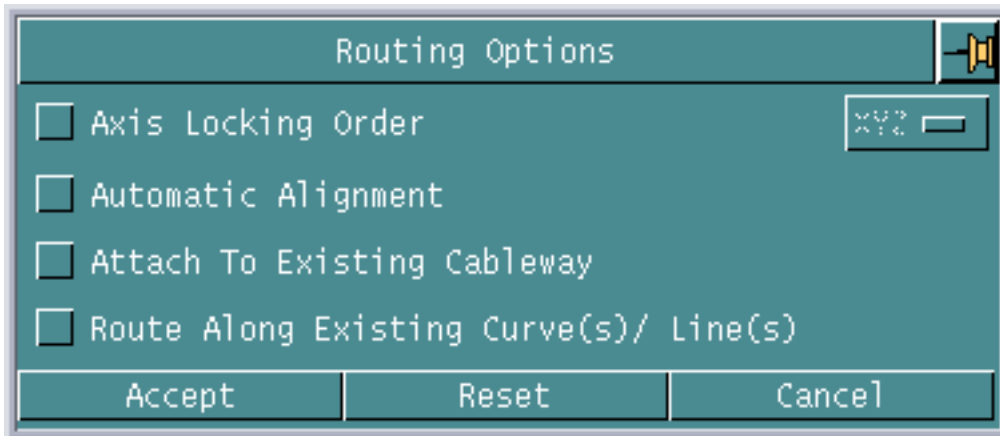
Cableway Routing

You can now route cableways along existing curves or lines. These curves are called guiding curves. You can also set the cross-section orientation (rotation) and the cross-section size along each segment of the guiding curves. You can use any of the following entity types as guiding curves:

- Arc
- Bspline
- Conic
- Curve pole
- Draft curve
- Line
- Nodal line
- Nspline
- Spline
- String

You can route a cableway along existing curves or lines using the Along Existing Curve/Line option on the Routing Options property sheet.

Figure 1-8 Routing Options Property Sheet



See the section, “Routing Cableways,” in the *Ship Electrical Menu and Technical Reference* for details.

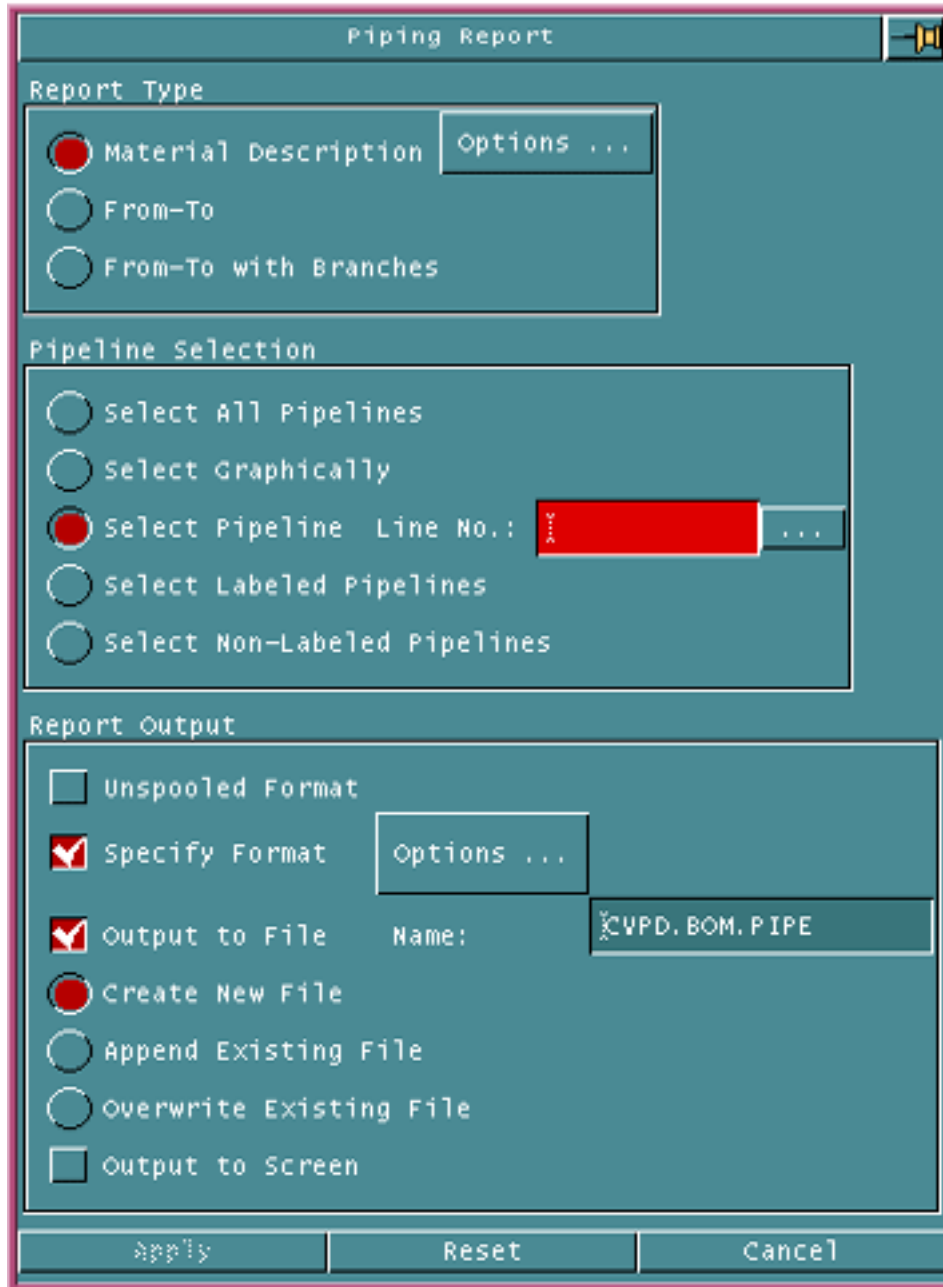
Piping Enhancements

Piping enhancements are described in the following sections. See the *Piping User Guide and Menu Reference* and *Piping Reference* for details.

Interspool Entities in Piping Report

You can now choose to display interspool entities such as gaskets and fittings in the Piping report, by using the Unspooled Format option in the Piping Report property sheet.

Figure 1-9 Piping Report Property Sheet

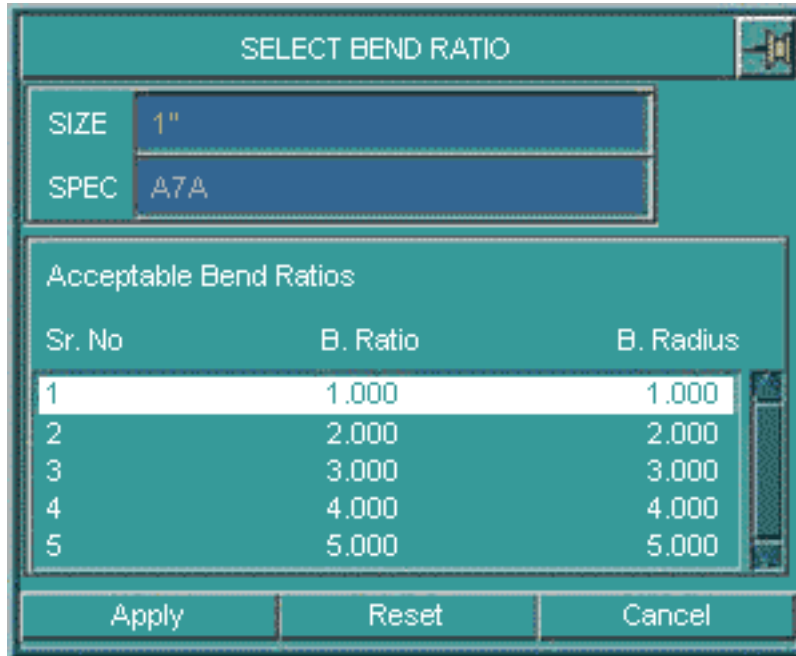


See the section, “Generating a Piping Report (with Options),” in the *Piping User Guide and Menu Reference* for details.

Multiple Pipe Bending Machines

While inserting a pipe bend, you can now choose to select the bend ratio from a list of predefined bend ratios.

Figure 1-10 Select Bend Ratio Property Sheet



The Select Bend Ratio property sheet displays a list of bend ratios specified in the BEND_MACHINE_LIST file. This file contains the bend ratio and the allowable clamp length, mapped against several combinations of size and specification of the bend for multiple bending machines.

See the section, “Inserting Pipe Bends (with Options),” in the *Piping User Guide and Menu Reference* for details.

Bend Insertion Failure Message

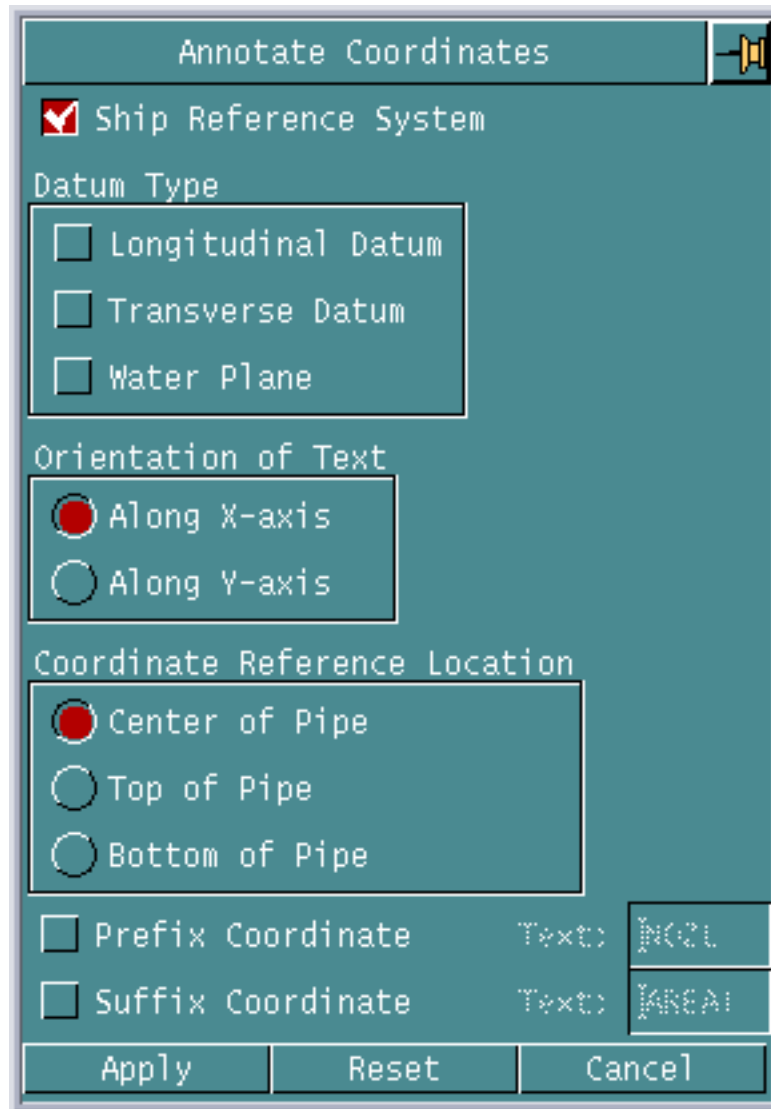
If the pipeline bend insertion process fails, a detailed error message is now displayed listing the pipeline MIPTR, the coordinates of the vertex, and the reason for the failure.

Annotate Coordinates

In addition to the Northing/Southing, Easting/Westing, and Elevation datum types, you can now perform the annotate coordinates operation along the Longitudinal, Transverse, or Water Plane datum of the Ship Reference System.

The Annotate Coordinates property sheet has been enhanced to provide this functionality.

Figure 1-11 Annotate Coordinates Property Sheet



See the section, “Annotating Coordinates (with Options),” in the *Piping User Guide and Menu Reference* for details.

Inserting Fittings at Spool Points

You can now insert a fitting set at a spool point by using the Fitting at Spool Point option in the Pipe Line Spool Generation/ Reconstruction property sheet.

See the section, “Generating or Reconstructing Pipeline Spools,” in the *Piping User Guide and Menu Reference* for details.

Clamp Length Check

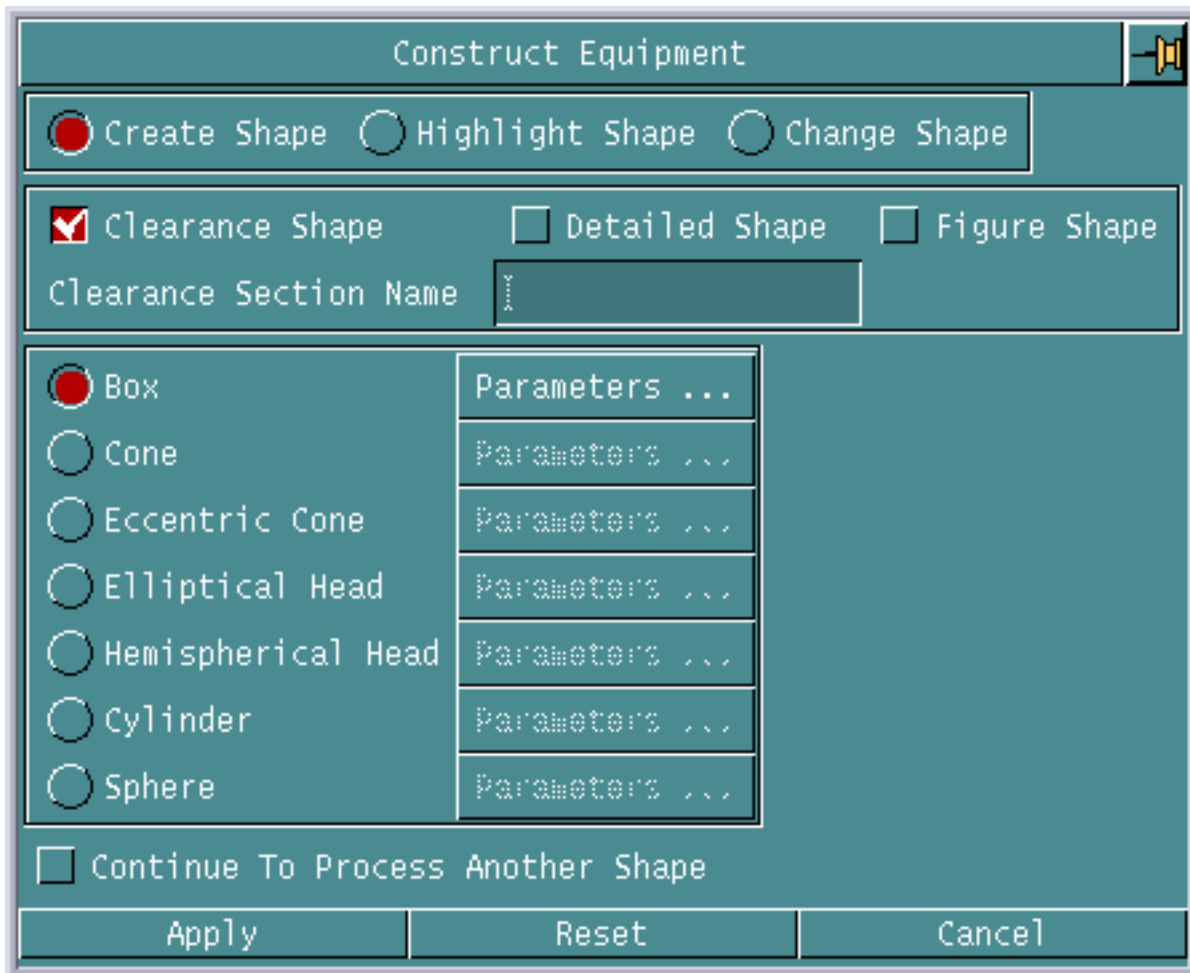
While creating a pipe bend, a warning message is now displayed if the clamp length is less than the allowable clamp length. The inserted bend is highlighted in light green. The list of allowable clamp lengths is stored in the `pmaninfo` file.

See the section, “Inserting Pipe Bends (with Options),” in the *Piping User Guide and Menu Reference* for details.

Multiple Clearances in Equipment

You can now add more than one clearance type to any equipment. You can create a clearance shape by using the Clearance Shape option in the Construct Equipment property sheet.

Figure 1-12 Construct Equipment Property Sheet



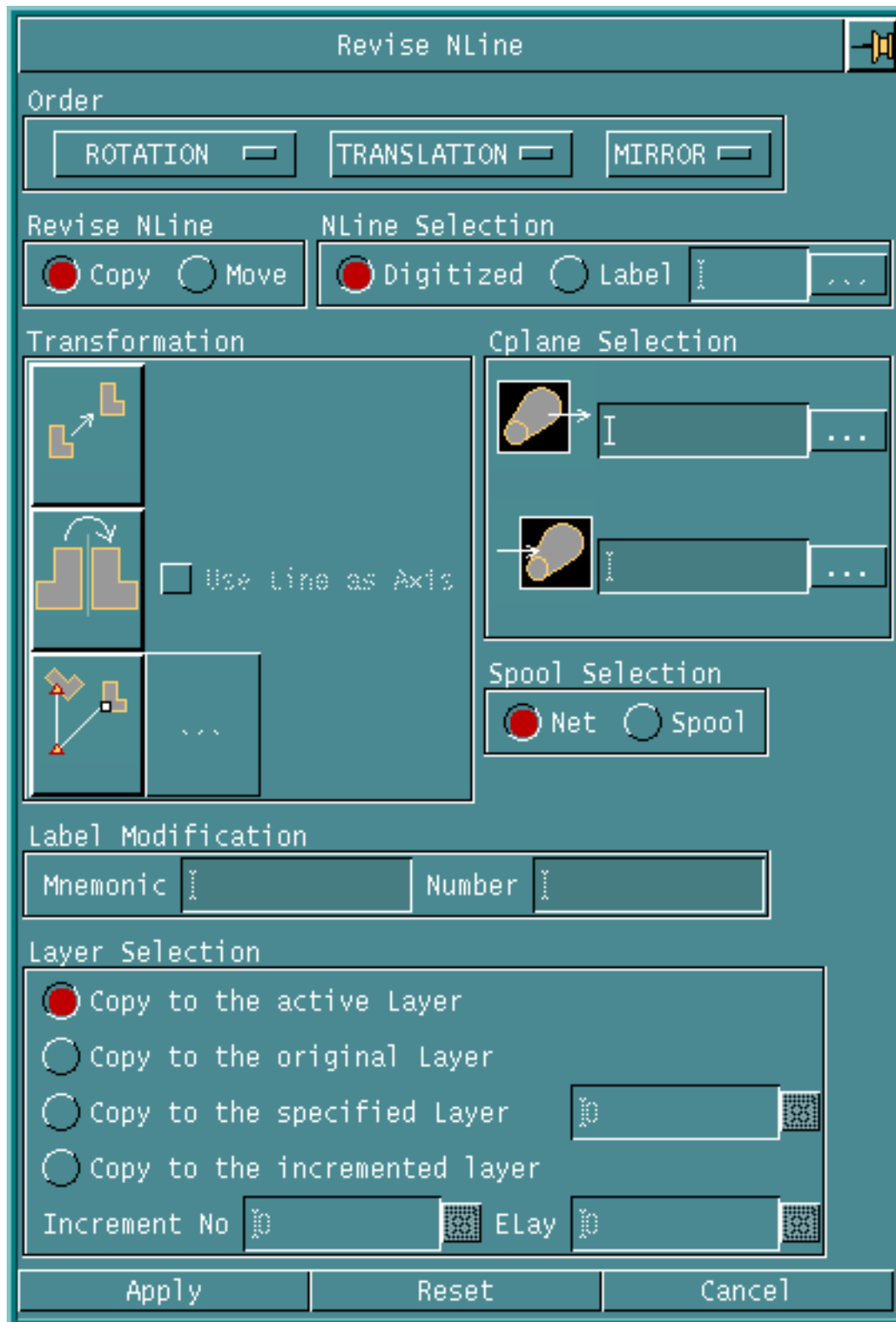
The Clearance Shape option creates a new property named `CLNAME` to store the clearance section name.

See the section, “Constructing Equipment,” in the *Piping User Guide and Menu Reference* for details.

Copying Nlines With Entire Nline Network

Using the new Revise Nline property sheet, you can now copy Nlines or selected Nline spools with their entire Nline network, that is, the Nlines and their fittings.

Figure 1-13 Revise NLine Property Sheet



See the section, “Copying Pipelines,” in the *Piping User Guide and Menu Reference* for details.

Shipbuilding Design

Enhancements in CV Hull and Structural Modeling are described in the following sections.

CV Hull

Enhancements in CV Hull are described in the following sections. For more information, refer to *CV Hull Manufacturing Commands*.

Displaying Associated Plates in Stiffener Drawings

You can now choose to display all STplates related to the stiffener in the stiffener drawing. This new feature allows you to display the profile of the STplate if the STplate is parallel to and lying on the flange or web surfaces of the stiffener. The STplates perpendicular to or inclined at an angle to the stiffener but touching the stiffener (web or flange), are represented as lines marked with appropriate thickness lines. For perpendicular or inclined plates, you can control the display of the STplate by using the following parameters in the `nestparams` file:

- STIFF-THICK-OFFSET-DIST
- STIFF-THICK-LINE-LENGTH
- STIFF-THICK-LINE-LOCATION
- STIFF-THICK-LINE-STYLE

Creating Cutouts in Not To Scale Mode

You can create cutouts in structural objects even while generating a drawing in the Not To Scale mode.

Related STobjects in the Shell Expansion Drawing

In a shell expansion drawing, you can now display trace lines of all STobjects, that is, stiffeners and plates, that are related to each other or welded together. You can also specify the marking fonts for the tracing lines against the following variables in the `nestparams` file:

- SHEXP-SEAM-FONT for seam weld trace lines
- SHEXP-BUTT-FONT for butt weld trace lines
- SHEXP-STELEMENT-FONT for stiffener trace lines
- SHEXP-STPLATE-FONT for STplate trace lines

Display of Single Stiffener Across Plate Boundaries

By modifying the value of the `PANEL-STIFFENER-LAYOUT` parameter defined in the `nestparams` file, you can now modify the display of a single stiffener that crosses multiple plates.

- If the value of the `PANEL-STIFFENER-LAYOUT` parameter is zero, then one stiffener line and one thickness line for each plate is displayed in the panel drawing. If this parameter is not defined in the `nestparams` file, then its value is considered to be zero.
- If the value of the `PANEL-STIFFENER-LAYOUT` parameter is one, then only one single stiffener line and one thickness line for the stiffener are displayed.

Stiffener Web Direction

In panel drawings, the direction of the stiffener web on adjacent plates near the plate edge is displayed whenever the stiffener length is more than half the plate length.

Fonts for Front and Back STObjects

In ship drawings, you can now represent stiffeners in the front and back of the panel by using different fonts. The methods for specifying the fonts for the front and back stiffeners are as follows in the order of precedence:

- The `FRONT-STIFF-MARKING-FONT` and `BACK-STIFF-MARKING-FONT` parameters in the `nestparams` file.
- The type of object defined using the `STClass` property in the `classifications` file.
- The `STIFF-MARKING-FONT` parameter in the `nestparams` file. Use this option to display the same font for the front and back stiffeners.
- Default. If you do not specify any of the above options, then the front stiffeners are displayed in solid font, while the stiffeners are displayed in dashed font.

Better Layer Control for Flanged Plates

You can now differentiate between bending lines and stiffener lines by displaying them in different fonts.

Bending lines are displayed in the font specified for the new parameter, `IGES-ROLL-LINE-LAYER`, in the `nestparams` file, while stiffener lines are displayed in the font specified for the `IGES-GEOM-MARKING-LAYER` parameter.

Plate Bevel Text

While creating structural welds, you can now specify the direction of the bevel opening of the weld, that is, if the bevel opening should be at the top or bottom of the plate.

You can insert bevel symbols in plate drawings, and bevel text in the nesting file for butt and seam welds.

Structural Modeling Enhancements

Enhancements in Structural Modeling are described in the following sections. See the *Advanced Structural Modeling User Guide and Menu Reference* for details.

Additional Parameters for Ship Drawings

You can now generate ship drawings by specifying additional parameters such as:

- The section plane on which the drawing is to be generated
- The vertical and horizontal extents of the drawing

See the section, “Generating Ship Drawings,” in *CV Hull Manufacturing Commands* for details.

Line Fonts in Section Drawings

By modifying the value of the STIFF-REP parameter in the `nestparams` file, you can now use either single or double lines in section drawings to represent the stiffener landings whose axes are parallel to the section plane.

The representation of stiffener landings based on each value of the STIFF-REP parameter is as follows:

- Zero, for a double line representation
- One, for a single line representation
- Two, for a single or double line representation, based on the following conditions:

A double line representation is used when:

- The depth of the stiffener is parallel to the section plane. In this case, the outline of the complete profile is displayed.
- The width of the stiffener is parallel to the section plane and the stiffener section crosses the section plane, even though the stiffener axis is parallel to

the section plane. In this case, the complete profile of the stiffener is not displayed. Instead, only the web that crosses the section is displayed in a double line font.

A single line representation is used when the width of the stiffener is parallel to the section plane and the stiffener does not cross the section plane, that is, the stiffener just touches the section plane.

See the section, “Generating Ship Drawings,” in *CV Hull Manufacturing Commands* for details.

Stiffener Drawing for Bars in a Stiffener

You can now create a stiffener drawing only for the bars in a fabricated stiffener, while ignoring other components of the stiffener that are made of plates. You can generate a drawing for each bar of the fabricated section.

See the section, “Generating Stiffener Drawings,” in *CV Hull Manufacturing Commands* for details.

STCLASS Property on Structural Object Placement

You can now insert the `STCLASS` property while creating an `STObject` and assign a Ship Classification Code to it.

You can either type the ship classification code manually or select from a predefined list of ship classification codes specified in a `classdata` file.

See the section, “Creating Structural Objects,” in the *Advanced Structural Modeling User Guide and Menu Reference* for details.

Twisted Stiffener on Multiple Surfaces

You can now insert a twisted stiffener over multiple surfaces using either a single axis curve running over multiple surfaces or joining multiple axis curves running over multiple surfaces.

- If you select a twist curve as the twist entity, then the cross section of the structural element is twisted toward the twist curve at each point on its axis.
- If you select a twist surface as the twist entity, then the element cross section follows the normal direction of the twist surface at each point on the axis.

See the section, “Creating Structural Element,” in the *Advanced Structural Modeling User Guide* for details.

Copying Structural Objects With Their Attributes

You can now choose to copy SObjects with their attributes while transforming them, that is, while moving, rotating, or mirroring them. All attributes of the SObject except the name of the original SObject are copied to the target SObject.

Design and User Support

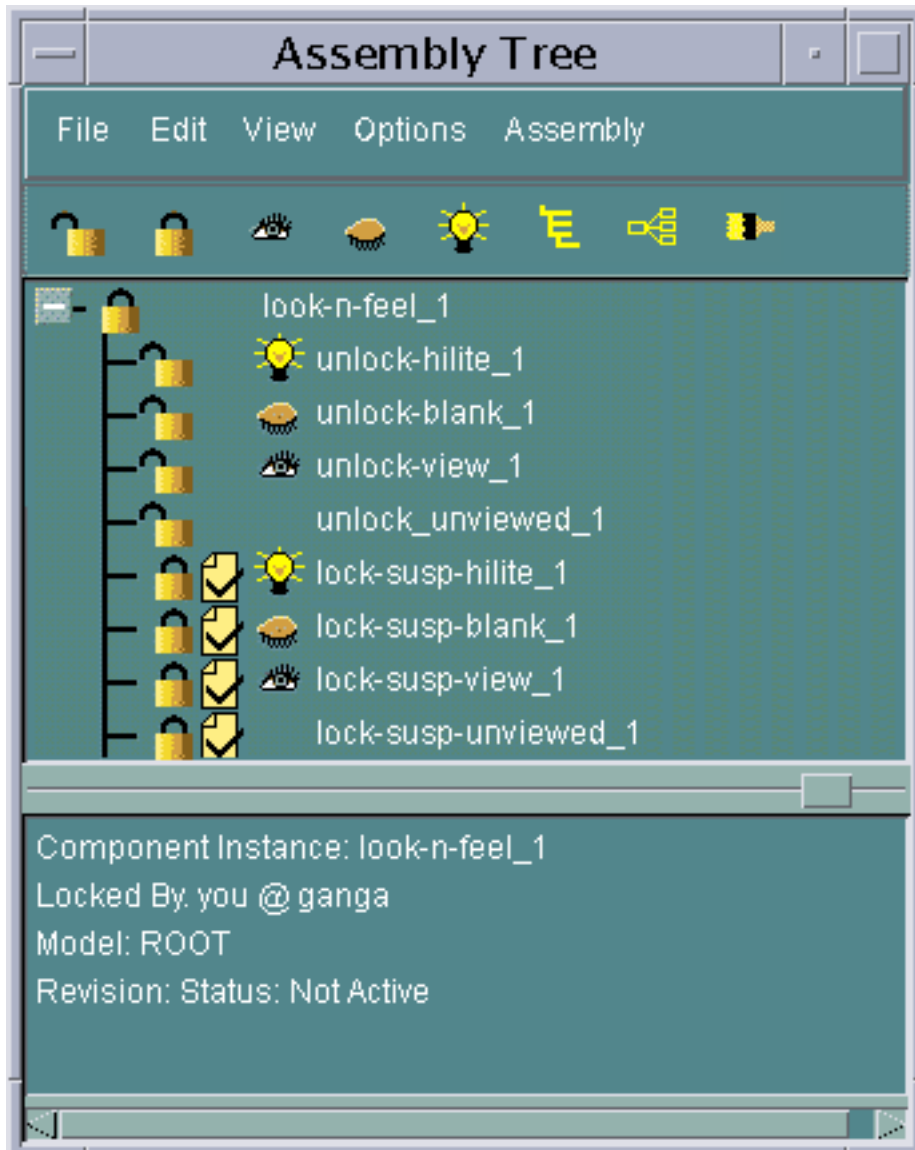
Enhancements in Design and User Support are described in the following sections. See the *Concurrent Assembly Mock-up User Guide* and the *Parametric Modeling User Guide and Menu Reference* for details.

Assembly Tree Window

The assembly tree window now has the following features:

- The assembly tree window is now split into two parts, that is, the assembly tree and the status window. The status window displays the properties of the node that is currently selected in the assembly tree.

Figure 1-14 Assembly Tree



- You can switch the states of the component nodes by double-clicking the corresponding icon in the assembly tree.
- The assembly tree now contains a toolbar that provides you with options to perform some important operations through a single mouse click.
- You can now control the default size and location of the assembly tree by using the new environmental variable, `CV_ASSEMBLY_GEOM`.
- You can choose to display either the model names or component names of the nodes in the assembly tree.

See the section, “Assembly Tree,” in the *Concurrent Assembly Mock-up User Guide and Menu Reference* for details.

Saving and Restoring Viewstates

You can now save the viewstates of an assembly to a file and restore them whenever required by clicking the Save/Restore Viewstates option on the Adrawing menu on the top bar.

You can also choose restore the viewstates of one adrawing to another adrawing of the same assembly using the same option.

See the section, “Basic Steps to Create an Alternate View,” in the *Concurrent Assembly Mock-up User Guide and Menu Reference* for details.

Parametric History Validation Tool

The Parametric History Validation Tool is a new utility that reruns all the commands in a parametric part and reports the success or failure of the operation. You can run this utility using one of the following methods:

- Run the REGENERATE HISTORY GO command
- Select the Regen History option on the Parameter menu on the top bar.
- Middle-click the model node, that is, the root node in the history tree and select the Regen History option on the menu that appears.

If any command fails while the Parametric History Validation tool reruns all the commands, then the reexecution process is aborted and the reasons for the failure and the possible fixes are listed in the report window. You can also choose to write this information to a text file.

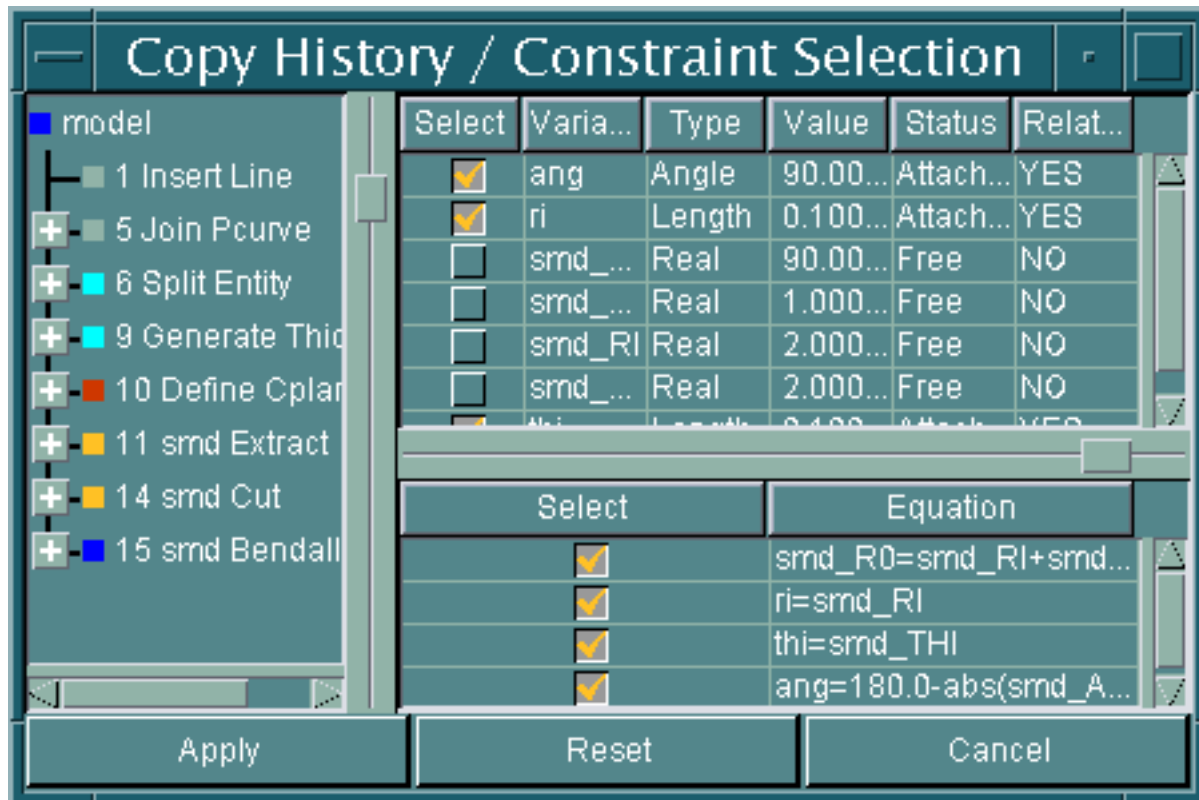
See the section, “Parametric History Validation Tool,” in the *Parametric Modeling User Guide and Menu Reference* for details.

Copying Constraints and Equations While Reusing Part History

While performing a Reuse History operation, you can now choose to copy the variables, constraints, and equations related to a part, in addition to the geometry of the part.

The new Copy History / Constraint Selection property sheet contains the options to select the constraints and equations to be copied from the source part to the destination part.

Figure 1-15 Copy History / Constraint Selection Property Sheet



You can select the option for each variable or equation, or both, to copy it to the destination part.

When you click any of the nodes in the history tree, the constraints section of the history tree displays all the constraints related to the selected node, while the equations section displays all the equations related to the selected node.

Click the root model node to display all the constraints and equations in the part.

See the section, “Copying the Part History,” in the *Parametric Modeling User Guide and Menu Reference* for details.

Database Enhancements

Database-related enhancements are described in the following sections. See *Managing CADD5 5i* for details.

The validate_db Utility

The `validate_db` utility and the `CHECK DBASE` command now detect and report the following corruptions in AEC entities:

- Invalid SObjects
- Zero-length stiffeners
- Zero-material plates
- Self-referencing SObjects

See the section, “Validating a Part,” in *Managing CADD5 5i* for details.

The COMPARE PART Command

The `COMPARE PART` command has been extensively enhanced with this release of CADD5 5. An alternative method of comparison has been introduced using the part UID and sequence numbers where parent child relationships exist between the parts. The command now includes AEC entities in the types that may be compared. As a standalone utility, the command can also be invoked by `EPD.Connect` and the results reviewed in Visualizer or the 3D viewer. The command now provides the following functionalities.

- You can now compare two parts that share a parent-child relationship.
- Using the new `IDENT` modifier, you can now write identical entities in the parts compared, to the output part.
- The entities in the output part are now displayed in different colors as follows:

Color	Description
Green	Entities unique to the first part
Red	Entities unique to the second part
Orange	Entities in the first part that are modified in the second part
Blue	Identical entities in both the parts

- This command now identifies and compares the differences in the following types of entities:
 - Bsurface

- Cnode
- Cpoint
- Cpole
- Cylinder
- Nodal line
- Nspline
- Nsurface
- Ruled surface
- Solid
- Spline
- Spoint
- Surface of revolution
- Tnode

See the section, “Managing Parts,” in the *Explicit Modeling User Guide and Menu Reference* for details.

General Enhancements

The following sections describe general enhancements.

COPY ENTITY Command

The COPY ENTITY command has a new modifier, SAMLAY, that enables you to copy the selected entity or entities to the same layer from which each entity is copied.

See the online help file for the COPY ENTITY command for details.

Checking Concurrency of Nfigures in Parts

You can now use the new REPORT NFIG command to generate a report that displays the status of the instances of an Nfigure in a part. This report displays the following information about instances of Nfigures:

- Type (local, external or nested)
- MIPTR (Master Index Pointer)
- Status (OUT-OF-DATE or UP-TO-DATE)

See the online help files for the REPORT NFIG command for details.

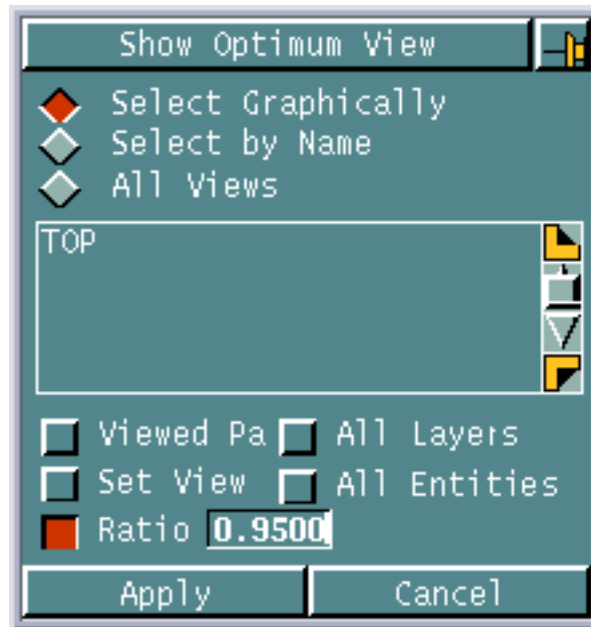
Optimum Zoom

You can now set the zoom status to ensure that all visible entities fit in the view. Using this functionality, you can frame all visible model entities in one or many views.

You can set the zoom status by selecting the Optimum Zoom option on the Zoom menu, or by using the ZOOM VOPT command.

The Show Optimum View property sheet contains various options required for performing an optimum zoom operation.

Figure 1-16 Show Optimum View Property Sheet



See the section, “Manipulating View Displays,” in the *Explicit Modeling User Guide and Menu Reference* for details.

Reverse Blanking

You can now convert all blanked entities in a model to unblanked entities and vice versa, using reverse blanking. You can do this by selecting the Blank/Unblank option on the Entity menu or by using the BLANK ENTITY command along with its REVERSE modifier.

See the section, “Controlling Visibility of CPL Symbols, View Frames, and Other Features,” in the *Explicit Modeling User Guide and Menu Reference* for details.

Discriminate Active Layer

You can now display all the entities on all layers except the active layer, in a color that you select. This distinguishes the entities on the active layer from the other entities.

You can perform this action by selecting the Set Layer Color option on the Setup menu or by using the DISCRIMINATE LAYER command along with its ACTIVE modifier.

See the section, “Managing Layers from the Layer Bar,” in the *Explicit Modeling User Guide and Menu Reference* for details.

Enhancements in Layer Selection

You now have the option to select the first free layer in a part by clicking the following option on the layer bar.



You can also select the active layer at the time that the part was last filed, by clicking the following option on the layer bar.



See the section, “Managing Layers from the Layer Bar,” in the *Explicit Modeling User Guide and Menu Reference* for details.

Creating Cplanes

You can now create Cplanes along any plane on an entity using the CREATE CPLANE command.

See the online help for the CREATE CPLANE command for details.

Count of Model Entities

You can now count the number of model entities in a part by using the Count Model Entities option on the Query menu or by using the COUNT ENTITIES command along with its MODEL modifier.

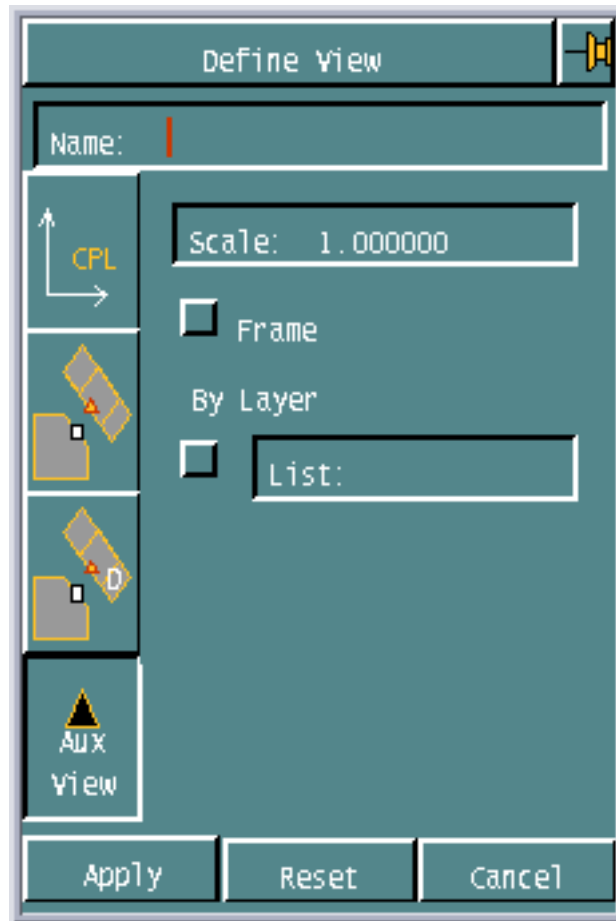
See the section, “Counting Entities,” in the *Explicit Modeling User Guide and Menu Reference* for details.

Defining Auxiliary Views

You can now create a new view for the active model by copying a portion of the existing view and reusing the available layers.

You can perform this action by using the Define option on the View menu. The Define View property sheet contains the options required to create an auxiliary view.

Figure 1-17 The Define View Property Sheet



Alternatively, you can define an auxiliary view by using the `DEFINE AUXVIEW` command.

See the section, “Creating Views into Model Space,” in the *Explicit Modeling User Guide and Menu Reference* for details.

