Updating "Using Autodesk Inventor" to Release 5

Appendix R5–1

Introduction

Chapter 1 outlines the concepts of parametric solid modeling, assembly modeling, and engineering drafting. It also provides a brief introduction to Inventor and familiarizes you with the design support system that helps you while you are designing. This appendix complements Chapter 1 by delineating the following features in Autodesk Inventor 5:

- ⇒ Application Programming Interface
- ⇒ Design Support System
- ⇒ Interoperability
- ⇒ Design Management
- ⇒ Third Party Partner Applications
- ⇒ 3D Standard Parts

Application Programming Interface

In R5, you can use Microsoft's Visual Basic for Applications (VBA) to access Autodesk Inventor's application programming interface (API) to construct programs to perform the following tasks:

Tasks	Functions
Sketches	For constructing and editing sketches, including sketch plane, sketch geometry, and geometric and dimension constraints
Features query and construction	For querying and constructing extruded, revolved, hole, pattern, and work features
Dynamic attributes	For attachment of data to object
Assembly constraint construction	For querying and constructing assembly constraints
Printing	For automating printing process
Data exchange	For translation of data to various formats
User selection and mouse events	For selection of objects
Custom graphics	For construction of graphics by using external applications
Highlighting graphics	For highlighting objects in the graphics window
Additional browser tab	For adding tabs to the browser
Transactions	For nesting of transaction in a single operation

Tasks	*Functions*
Selection set	For objects selection using the Select command
Render styles	For accessing rendering styles
Part materials	For accessing and modifying all the existing material definitions and construction of new materials
Menu customization	For constructing new menus custom sub menus

Design Support System

The Design Support System (DSS) has a number of components: Help System, Autodesk On-line, What's New About Autodesk Inventor, Visual Syllabus, Design Professor, Design Doctor, and Sketch Doctor. In R5, it has several enhancements:

Help for AutoCAD Users

R5 includes a set of help topics to help AutoCAD users migrate to Autodesk Inventor. These help topics are available in the Getting Started dialog box and the Help Topics dialog box. To learn migrating from AutoCAD to Inventor by using the Getting Started dialog box, perform the following steps.

1. Select Getting Started in the Open dialog box. (See Figure 1–1.)
2. In the Getting Started tab of the Open dialog box, select Learn about AutoCAD to Inventor Help. (See Figure 1–2, the Get to Know Inventor dialog box.)
3. Close the dialog box after reading the dialog boxes.

Figure 1–1
Getting Started

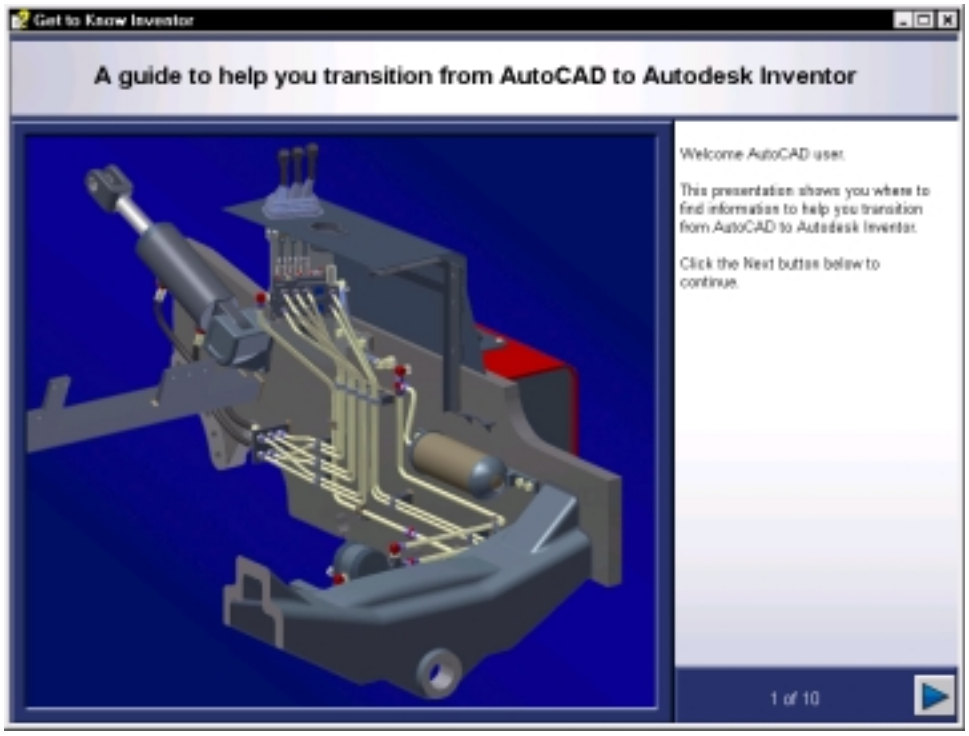

Figure 1–2
Get to Know Inventor dialog box

To learn migration by using the Help Topics dialog box, perform the following steps.

1. Select New from the Open dialog box and start a new part file.
2. Select Help Topics from the Standards toolbar. (See Figure 1–3.)
3. Select Help for AutoCAD users.

Here you will find several useful links:

⇒ Welcome to Inventor

⇒ Show me Inventor

⇒ Use AutoCAD data

⇒ Frequently asked questions

⇒ Command map

4. Close the Help Topics dialog box after reading the linked pages.

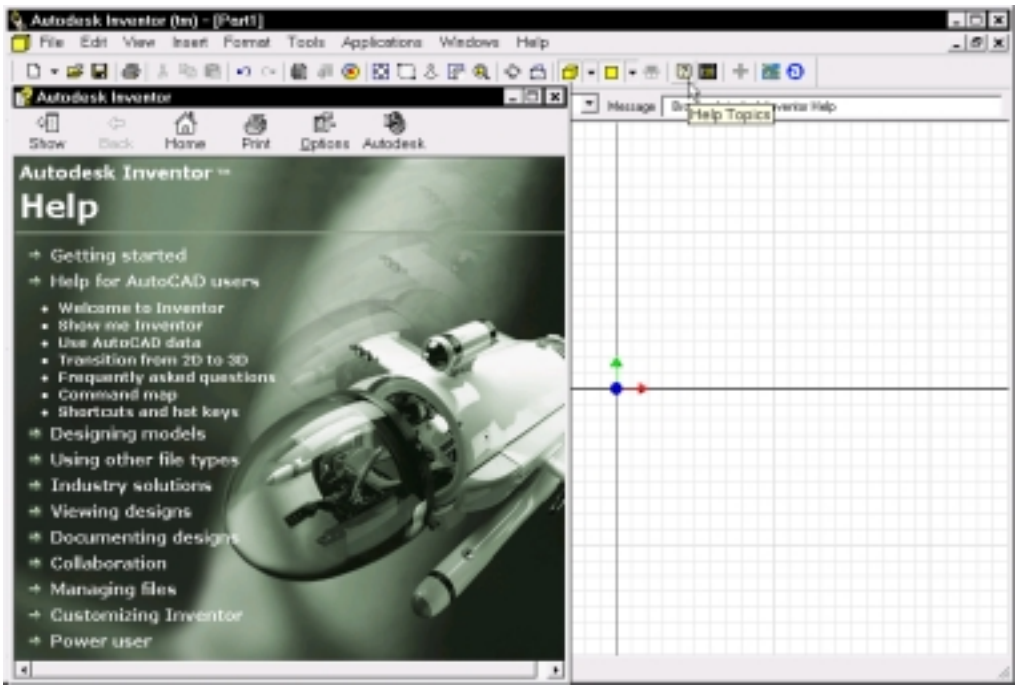

Figure 1–3
Help Topics dialog box

Support Assistance

The support assistance provides technical support information about Autodesk Inventor and other resources. To find out the new enhancements in the Support Assistance, perform the following steps:

1. Select Support Assistance Help from the Help pull-down menu. (See Figure 1–4.)

In the Contents tab of the Autodesk Inventor 5 Support Assistance dialog box, you will find two support topics: Welcome and Solution index.

2. Expand the list in the Content tab to find out what kind of support assistance are available.

By using the Support Assistance, you learn the following topics:

⇒ Customization

⇒ Documentation

⇒ Error Messages

⇒ Features and Commands

⇒ Installation, Configuration, and Performance

⇒ Interoperability/File & Data Translation

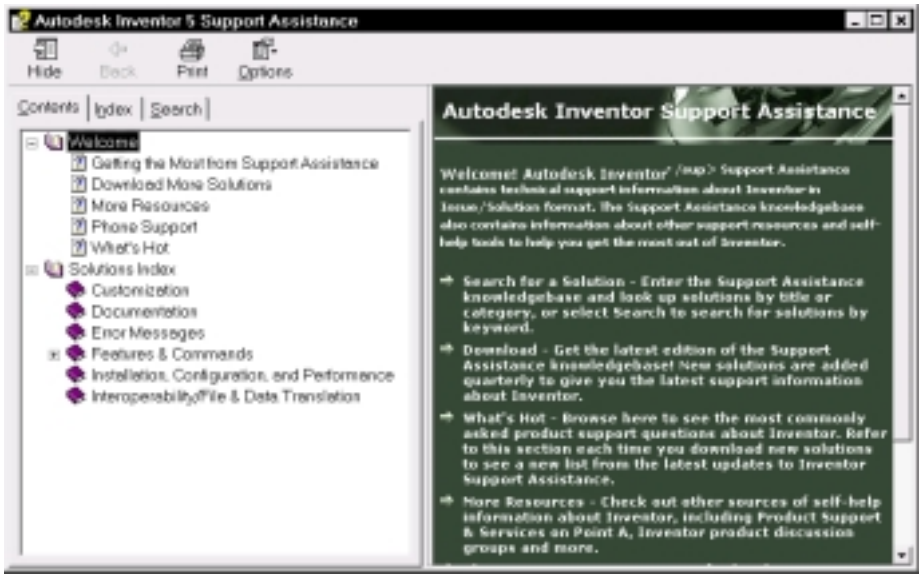

Figure 1–4
Selecting Support Assistance from the Help Topics dialog box

3. Close the dialog box after reading.

Programming Help

In R5, the Autodesk Inventor Application Programming Interface reference guide is accessible from the Help pull-down menu. The programming help includes objects, methods, properties, events, and enums. To read the API reference guide, perform the following steps:

1. Select Programming Help from the Help pull-down menu. (See Figure 1–5.)
2. Close the reference after reading.

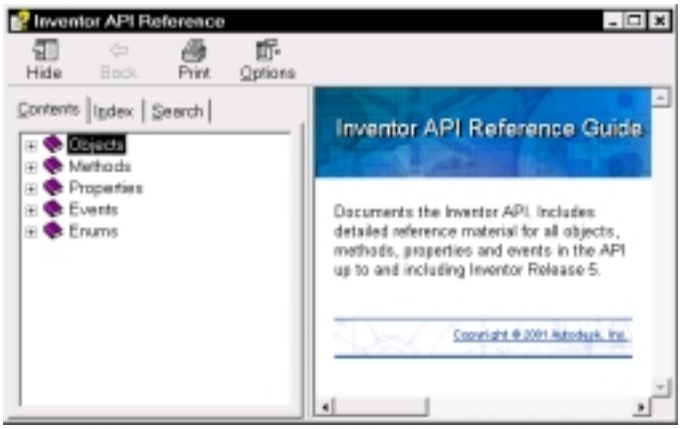

Figure 1–5
Inventor API Reference

Interoperability

Apart from opening and saving the four kinds of Inventor files (Part file, assembly file, presentation file, and drawing file), you can open various kinds of file formats in Autodesk Inventor and export Inventor files to various file formats.

Open

You can open the following file formats:

- ⇒ AutoCAD Drawing (*.dwg)
- ⇒ DXF (*.dxf)
- ⇒ IGES (*.igs, *.ige, *.iges)
- ⇒ Pro/Engineer File (*.prt*, *.asm*)
- ⇒ SAT (*.sat)
- ⇒ STEP (*.stp, *.ste, *.step)

Save As

You can save an Inventor part file to:

- ⇒ BMP (*.bmp)
- ⇒ IGES (*.igs, *.ige, *.iges)
- ⇒ SAT (*.sat)
- ⇒ STEP (*.stp, *.ste, *.step)
- ⇒ STL (*.stl)
- ⇒ Streamline Part Packages (*.ptp)
- ⇒ XGL Files (*.xgl)
- ⇒ ZGL Files (*.zgl)

You can save an Inventor drawing file to:

- ⇒ Drawing Files (*.dwg)
- ⇒ DXF (*.dxf)
- ⇒ BMP (*.bmp)
- ⇒ Drawing Web Format (*.dwf)
- ⇒ Streamline Drawing Packages (*.dwp)

You can save an Inventor Presentation file to:

- ⇒ BMP (*.bmp)

You can save an Inventor assembly file to:

- ⇒ BMP (*.bmp)

⇒ IGES (*.igs, *.ige, *.iges)

⇒ SAT (*.sat)

⇒ STEP (*.stp, *.ste, *.step)

⇒ Streamline Assembly Packages (*.amp)

⇒ XGL Files (*.xgl)

⇒ ZGL Files (*.zgl)

In R5, major enhancement on interoperability concerns AutoCAD and Mechanical Desktop files. When you open a .dwg file, the open wizard will automatically determine whether the file is an AutoCAD file or a Mechanical Desktop file and provides appropriate options accordingly. To open a Mechanical Desktop file, perform the following steps:

1. Select Open from the File pull-down menu.
2. In the Open dialog box, select a Mechanical Desktop file and select the Options button. (See Figure 1–6.)

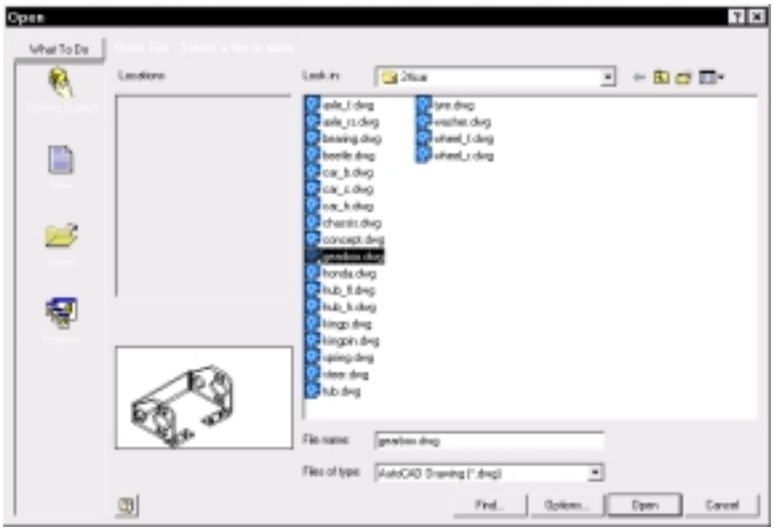

Figure 1–6
Opening a Mechanical Desktop file

3. In the Read DWG/DXF File dialog box, select the Mechanical Desktop File button and select the Next button. (See Figure 1–7.)
4. In the Read MDT File — Select Model Translation and Drawing Layout dialog box, check the Translate Parts and Assemblies button and select the Next button. (See Figure 1–8.)

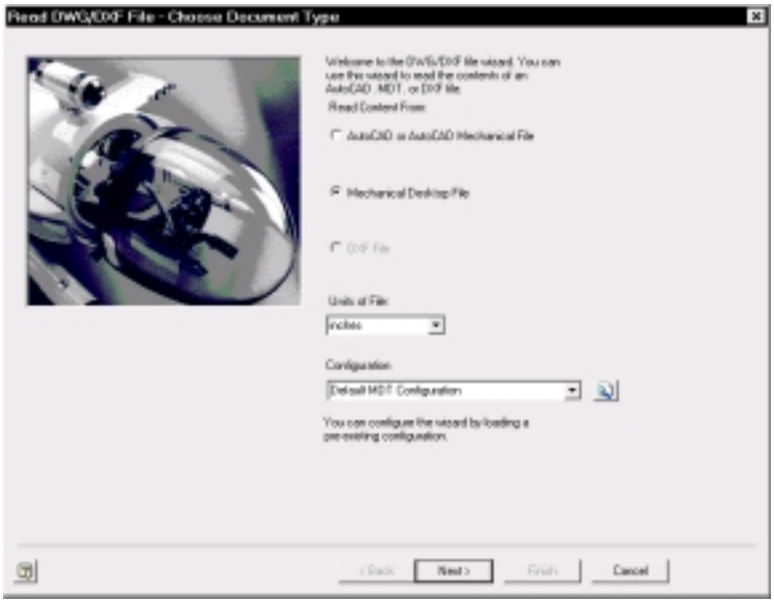

Figure 1–7
Read DWG/DWF File — Choose Document Type dialog box

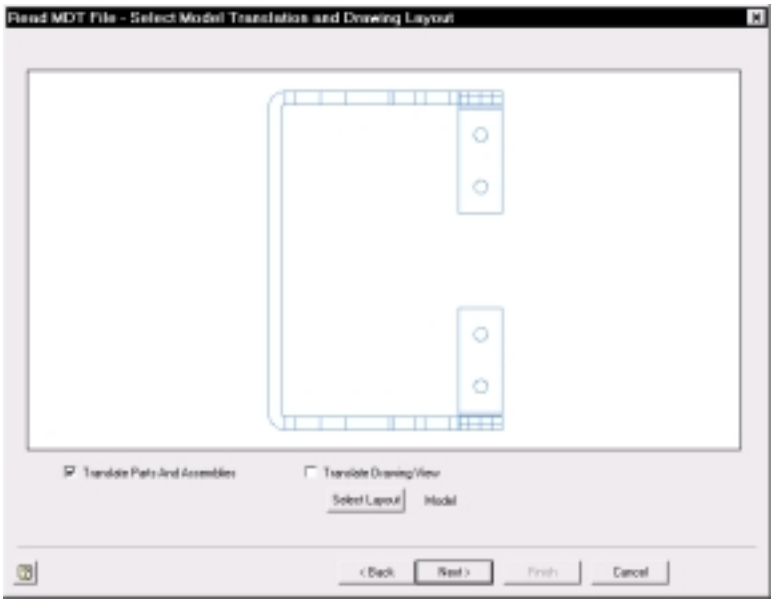

Figure 1–8
Read MDT File — Select Model Translation and Drawing Layout dialog box

5. In the Read DWG/DXF File — Choose Destination dialog box, set the Part Options, select a destination directory, and select the Finish button. (See Figure 1–9.)

The selected Mechanical Desktop drawing is opened and converted into an Autodesk Inventor file. (See Figure 1–10.)

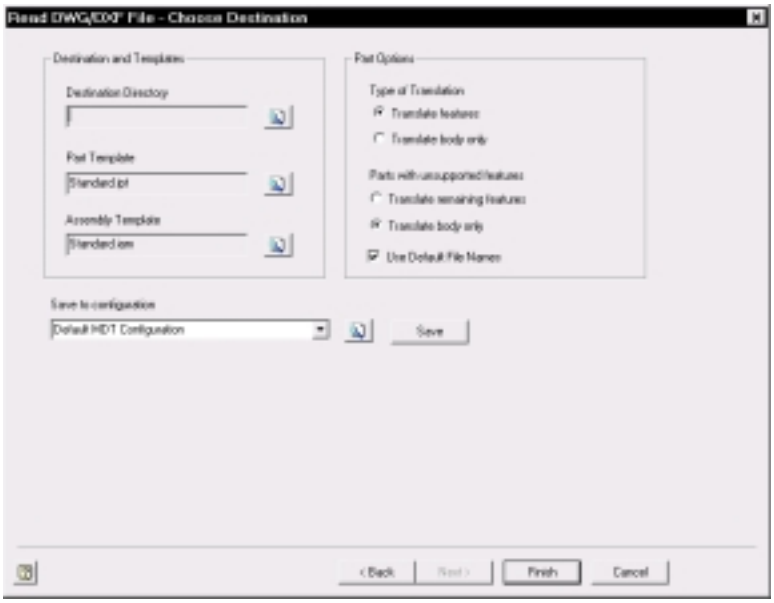

Figure 1–9
Read MDT/DXF File — Choose Destination dialog box

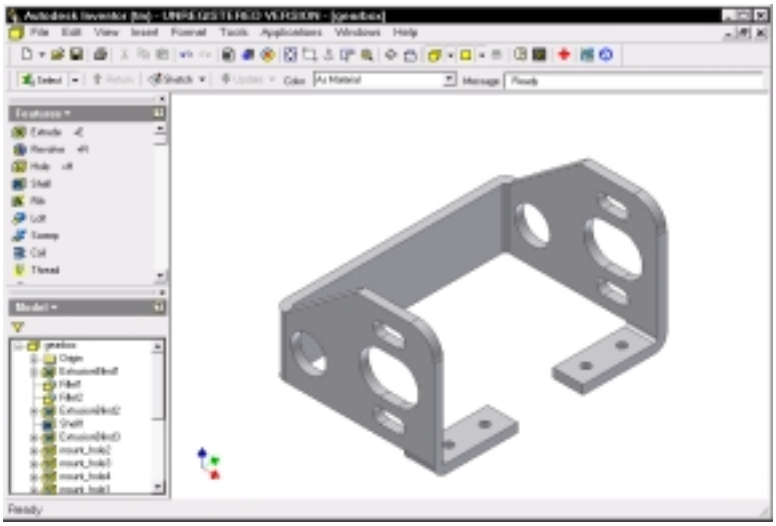

Figure 1–10
Mechanical Desktop file opened

You can save an Inventor drawing file to an AutoCAD file by performing the following steps:

1. Select Open from the File pull-down menu.
2. Select an Autodesk Inventor drawing file. (See Figure 1–11.)

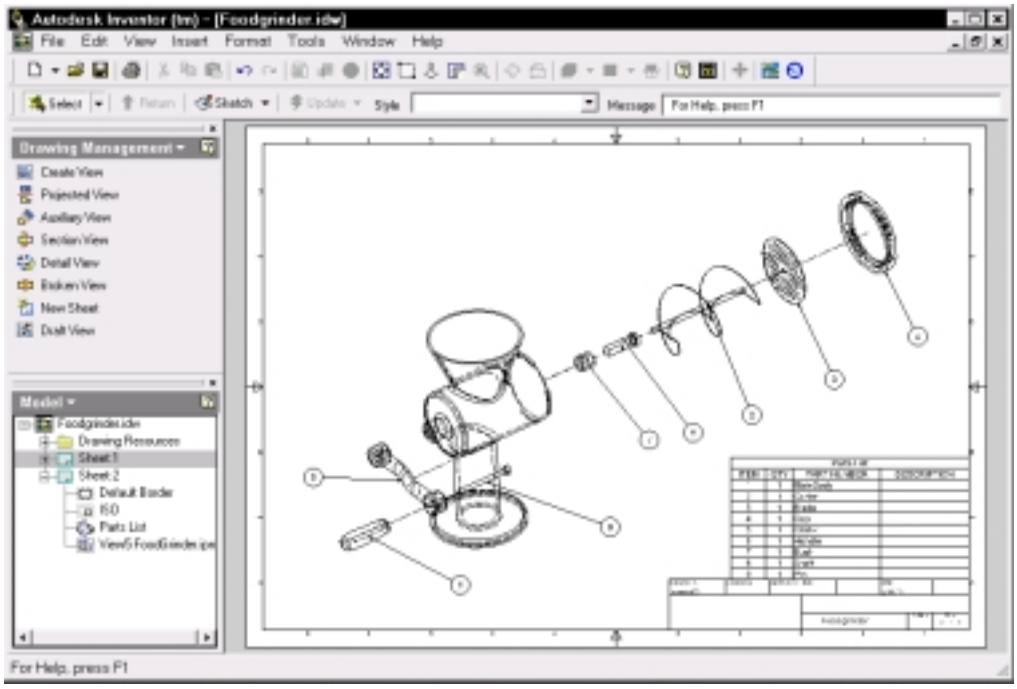

Figure 1–11
Autodesk Inventor drawing file

3. Select Save Copy As from the File pull-down menu.
4. In the Save Copy As dialog box, select AutoCAD Drawing (*.dwg) from the Save As Type pull-down box and select the Options button. (See Figure 1–12.)

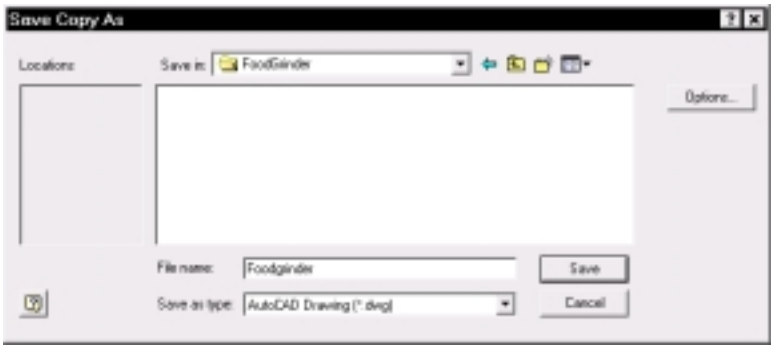

Figure 1–12
Save Copy As dialog box

5. In the DWG File Export Options dialog box, select file version, set options, and select the Next button. (See Figure 1–13.)
6. Select appropriate properties from the Available Properties list box and select the Add button.
7. Select the Next button. (See Figure 1–14.)

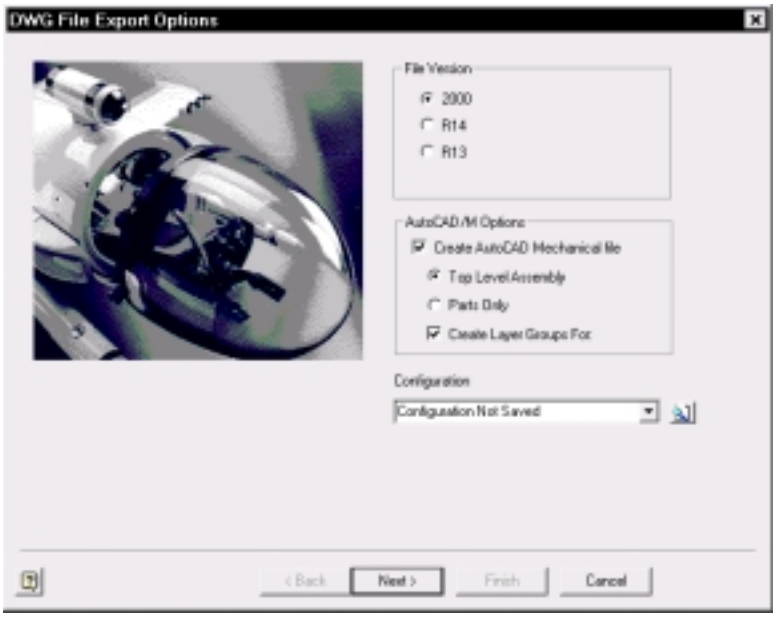

Figure 1–13
DWG File Export Options dialog box

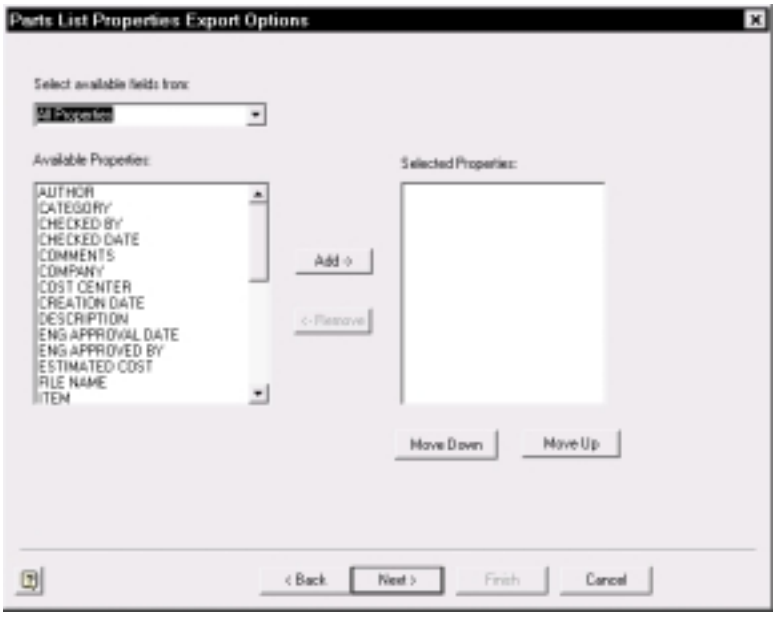

Figure 1–14
Parts List Properties Export Options dialog box

8. In the Layers Export Mapping dialog box, select the Finish button. (See Figure 1–15.)

The Autodesk Inventor drawing file is converted to an AutoCAD drawing. Figure 1–16 shows the converted file opened in AutoCAD.

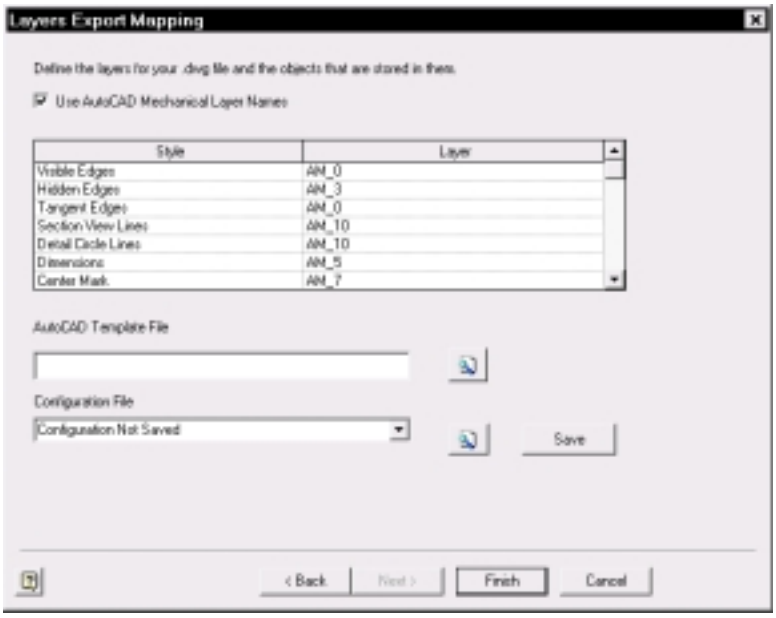

Figure 1–15
Layers Export Mapping dialog box

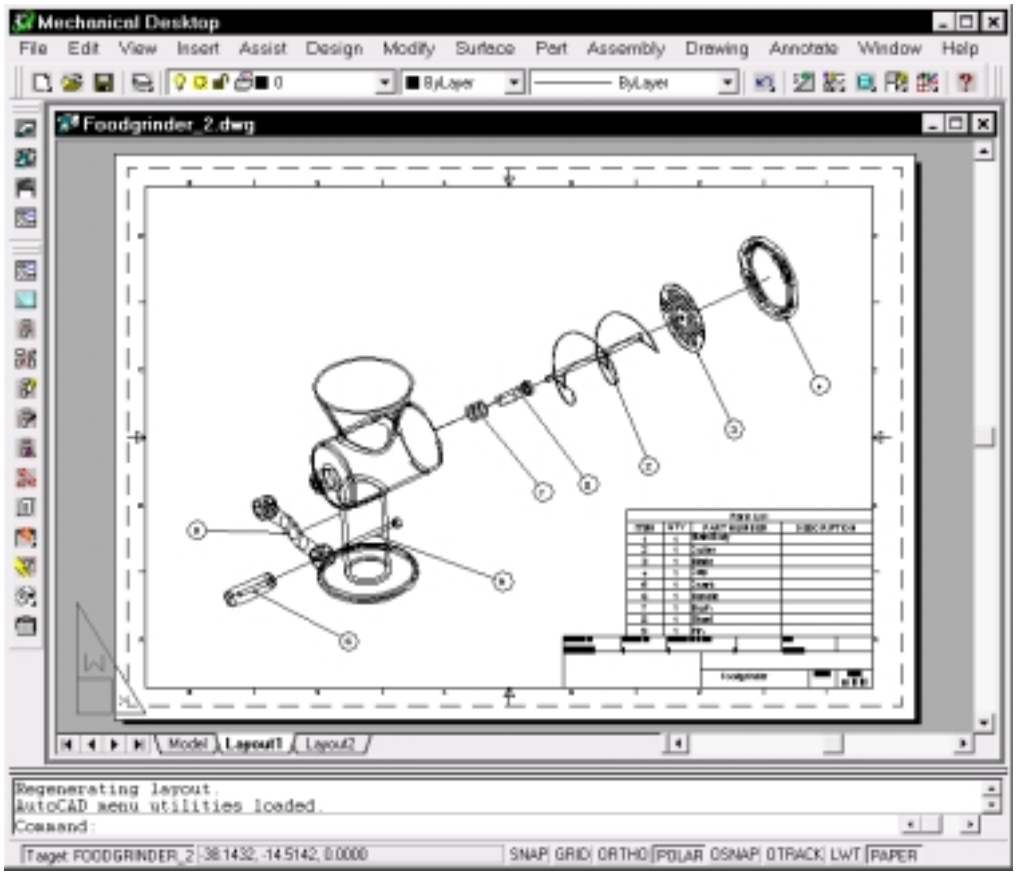

Figure 1–16
AutoCAD drawing converted from an Autodesk Inventor drawing file

Design Management

Design management tools help you manage your design. There are several enhancements in R5.

Design Assistant

There are two ways to use the Design Assistant: Select Design Assistant from the File pull-down menu or select a file in the Windows Explorer, right-click, and select Design Assistant. (See Figure 1–17.)

The left pane of the Design Assistant dialog box has three buttons: Properties, Preview, and Manage. Figure 1–18 shows the properties of the selected assembly file.

To view a component without opening it in Autodesk Inventor, you select it from the Design Assistant, right-click, and select View. (See Figure 1–19.)

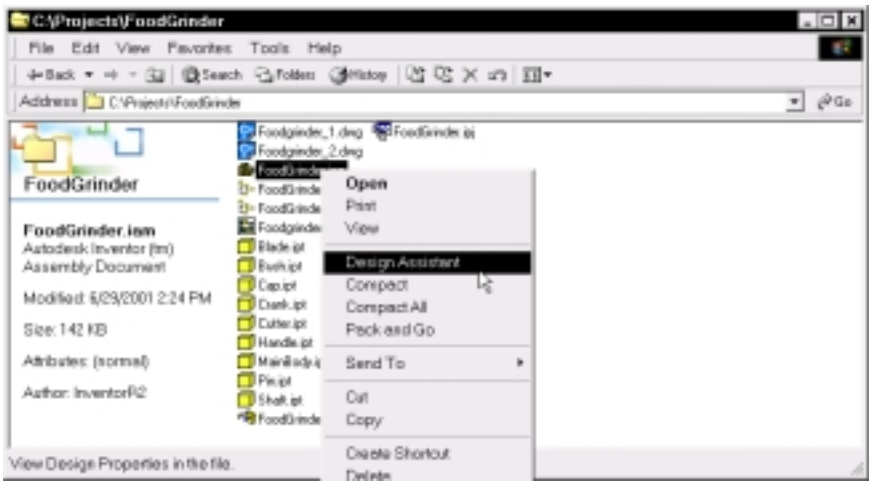

Figure 1–17
Using Design Assistant from the Windows Explorer

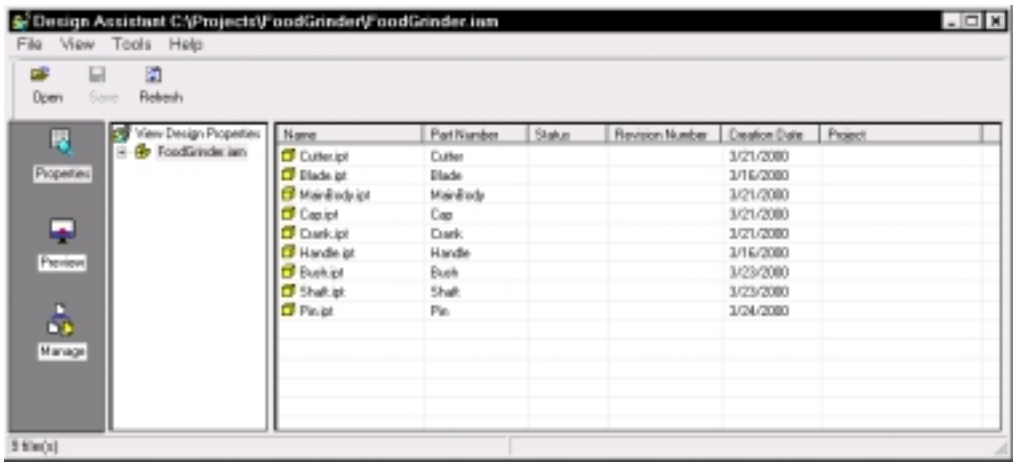

Figure 1–18
Properties of an assembly file in the Design Assistant

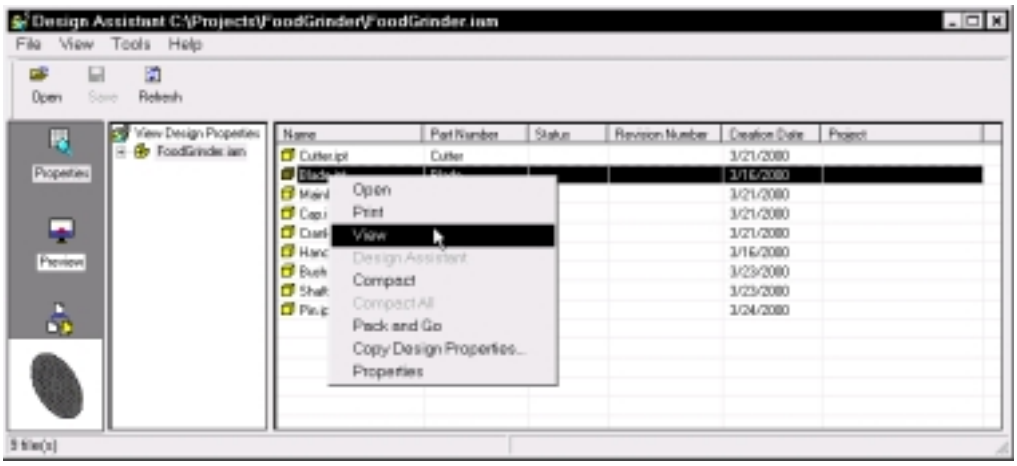

Figure 1–19
Selecting View in the right-click menu

In the Viewer shown in Figure 1–20, you can zoom, pan, and rotate the display of the component.

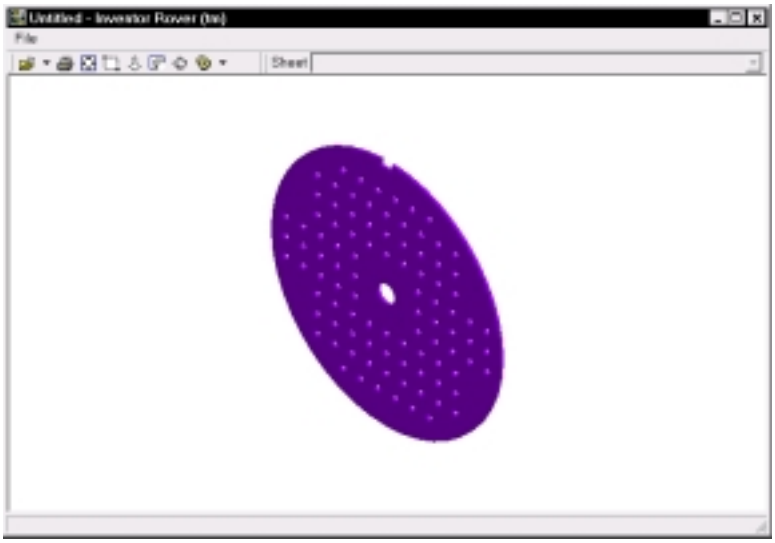

Figure 1–20
Viewer

To view the components quickly in preview images, you can select the Preview button in the Design Assistant. (See Figure 1–21.)

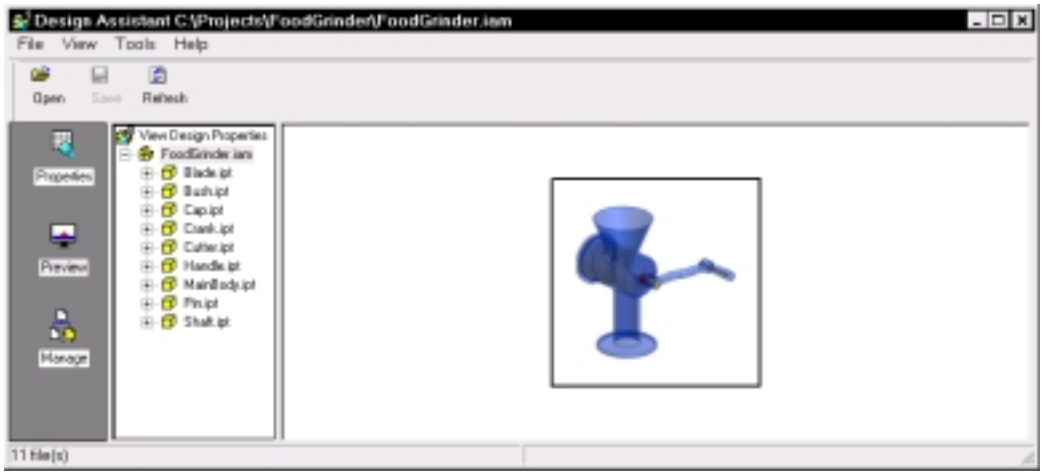

Figure 1–21
Preview

To manage the component files of an assembly, you select the Manage button. (See Figure 1–22.) To search for the files that reference the specified file, you select Where Used from the Find cascading menu from the Tools pull-down menu. (See Figure 1–23.)

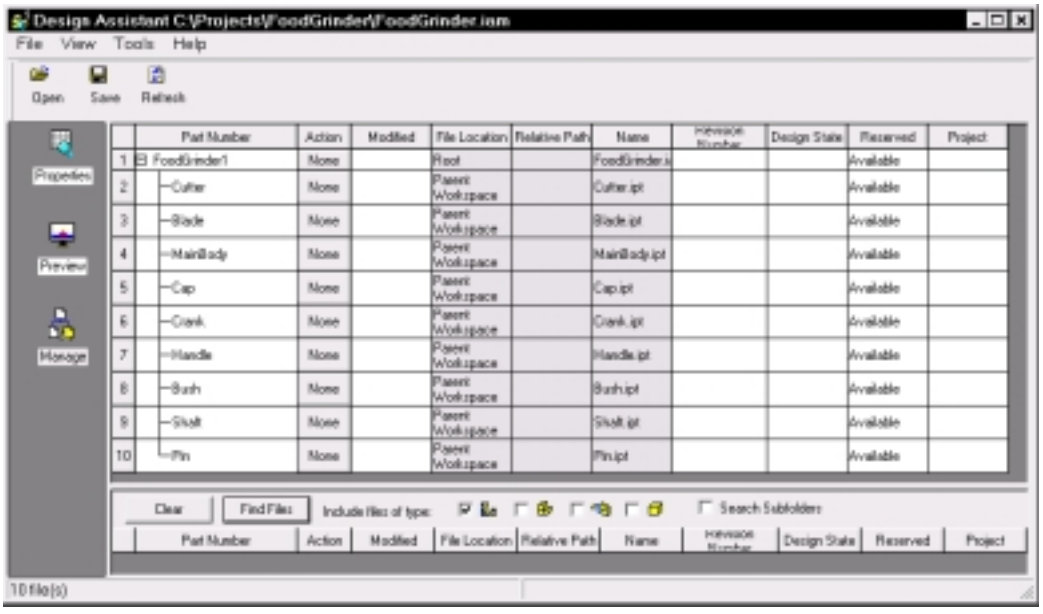

Figure 1–22
Managing files in the Design Assistant

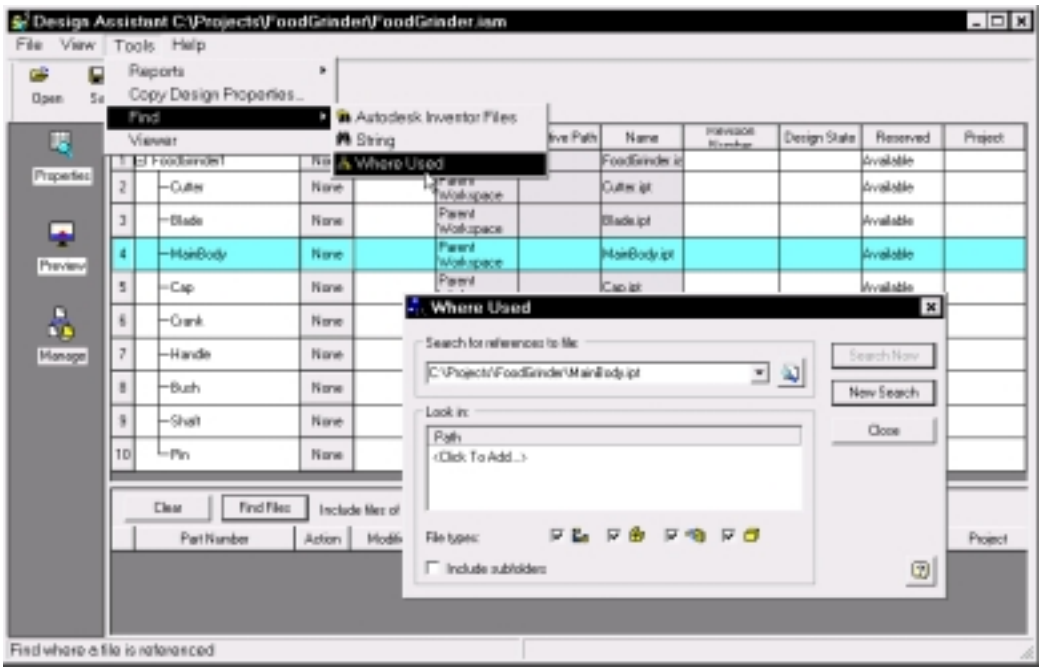

Figure 1–23
Where Used dialog box

By selecting a component and right-click, you select Properties and discover the properties of the selected component. (See Figure 1–24.)

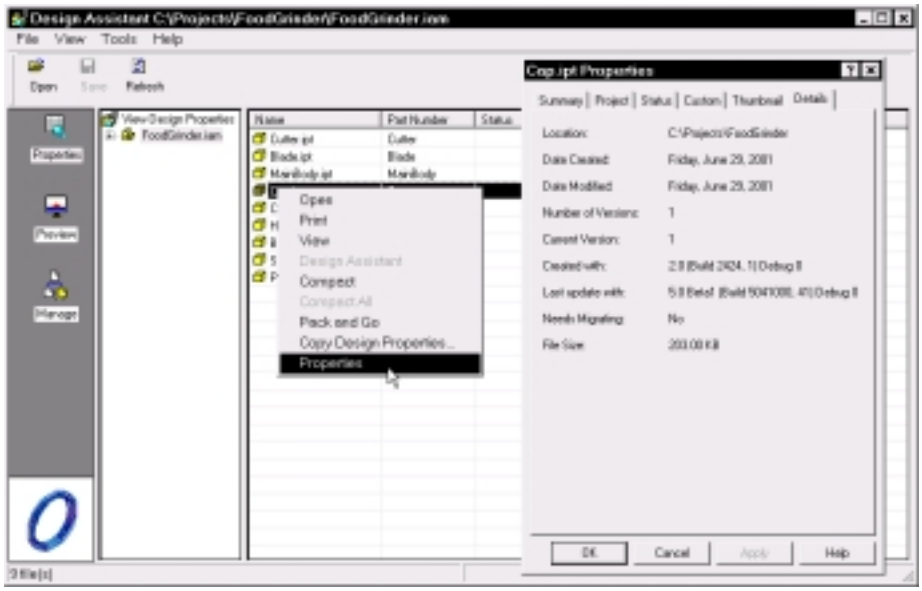

Figure 1–24
Properties

Pack and Go Wizard

Using the Pack and Go wizard, you package a set of Inventor files in a project and all of its referenced files in a single location. You can access Pack and Go wizard by using the right-click menu from the Windows Explorer or Design Assistance. (See Figure 1–17 and Figure 1–24.) In R5, you can create complete document sets of a given assembly. The Pack and Go dialog box is shown in Figure 1–25.

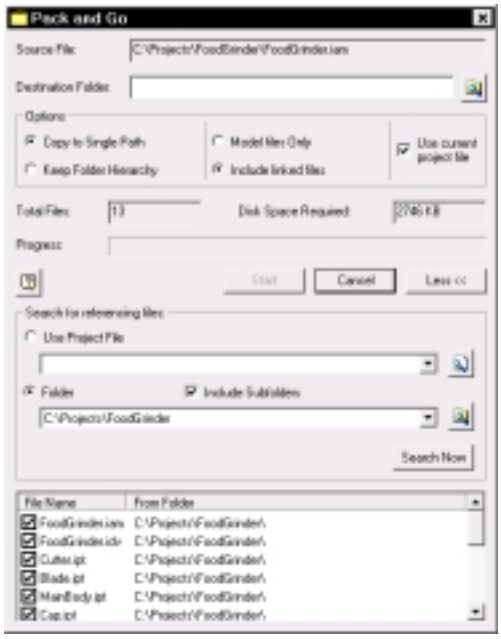

Figure 1–25
Pack and Go dialog box

Volo View

Volo View is a design viewing application that enables you to view files constructed by using Autodesk Inventor 5 and AutoCAD 2002. Figure 1–26 shows an Inventor file viewed in Volo View application. By using the Volo View application, you view, mark up, and print Inventor files.

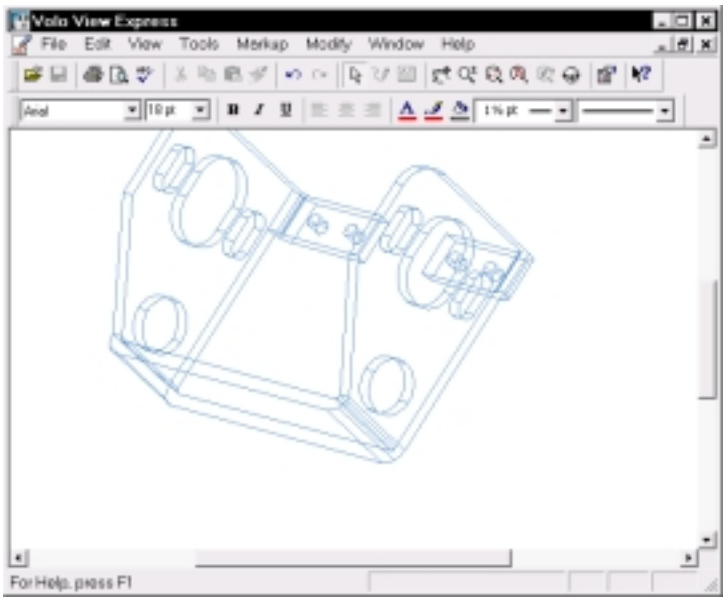

Figure 1–26
Volo View application window

Third Party Partner Applications

In a computerized manufacturing system, you use various computer-aided tools in addition to computer-aided design tools. Listed below are a number of companies providing applications that work with Autodesk Inventor.

Power Piping

Power Piping is a product of CAD Management Group, Inc. It provides fully parametric Autodesk Inventor solid parts for dragging and dropping into an Inventor assembly. Figure 1–27 shows the website of the company.

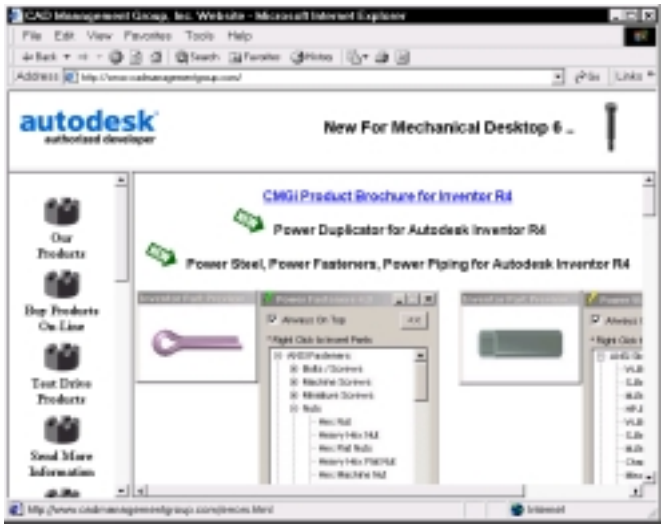

Figure 1–27
Power Piping product

Design Space Product

DesignSpace is a product of Ansys, Inc. Using Design Space product, you set up and simulate your assembly designs and communicate your results with the rest of your company. Figure 1–28 shows the website of the company.

Figure 1–28
Design Space product

visualNastran 4D

visualNastran 4D is a product of MSC. Working Knowledge. This product provides motion and FEA (Finite Element Analysis) simulation on Autodesk Inventor assemblies. Figure 1–29 shows the product's website.

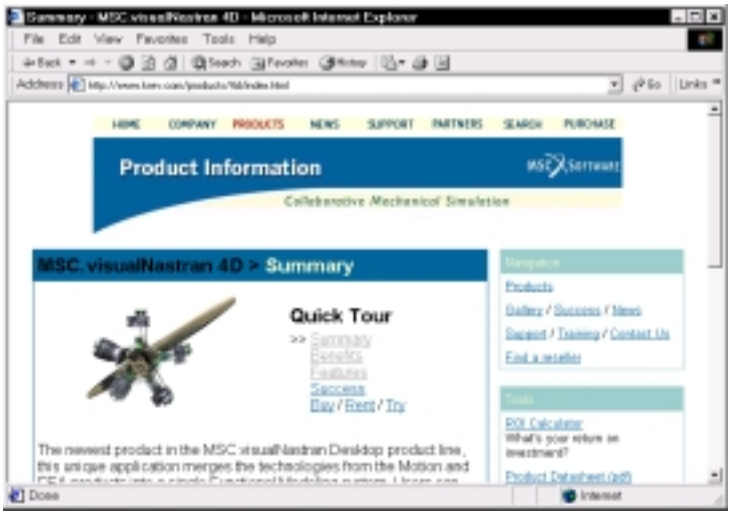

Figure 1–29
visualNastran product

COSMOS/DesignStar

COSMOS/DesignStar is a product of Structural Research and Analysis Corp. It is a design analysis tool that is fully associative with Autodesk Inventor. Changes in either application automatically update the other. Figure 1–30 shows the product's website.

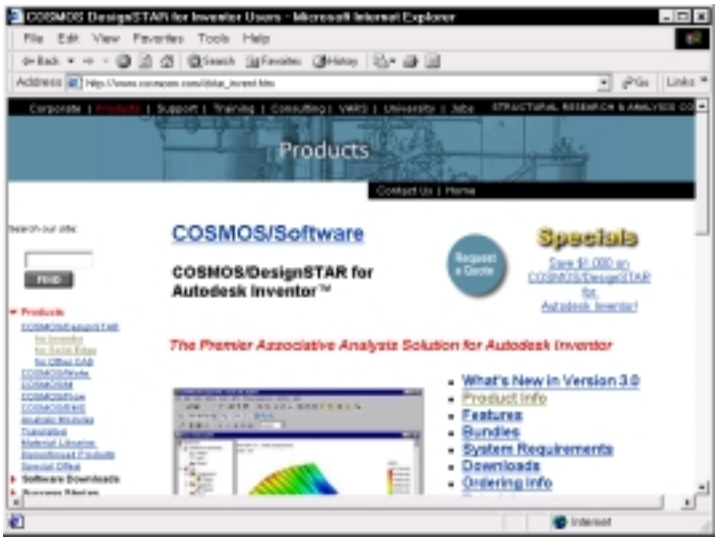

Figure 1–30
COSMOS/DesignStar

EdgeCAM Solid Machinist

EdgeCAM Solid Machinist is a product of Pathtrace, Inc. It is a CNC programming system. Figure 1–31 shows the company's website.

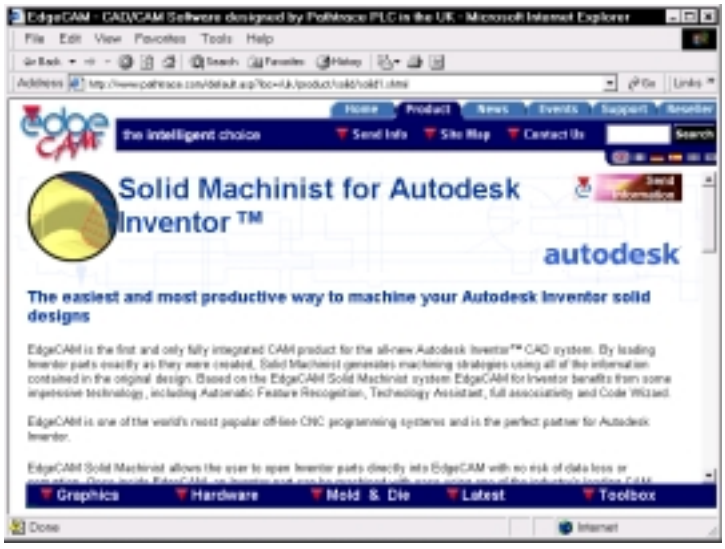

Figure 1–31
EdgeCAM Solid Machinist

CADVerter

CADVerter is a product of Theorem Solutions, Ltd. Using CADVerter, you convert STEP files generated from Autodesk Inventor to various CAD file formats. (See Figure 1–32.)

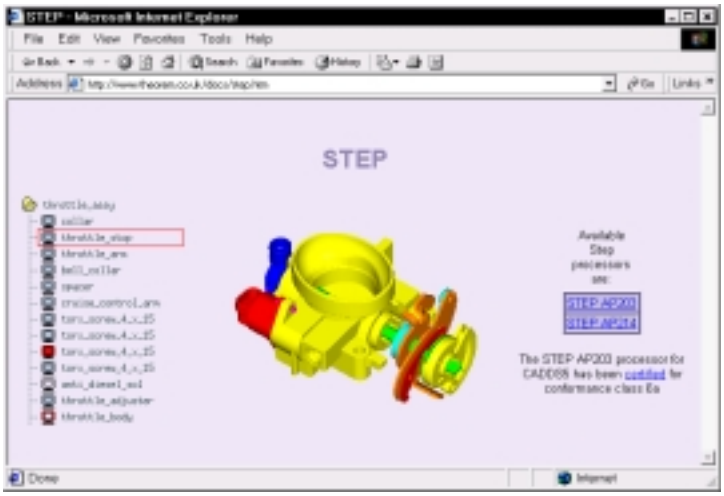

Figure 1–32
CADVerter

AutoManager Meridan

AutoManager Meridan is a product of Cyco Software. It is a document management application. Figure 1–33 shows the company's website.

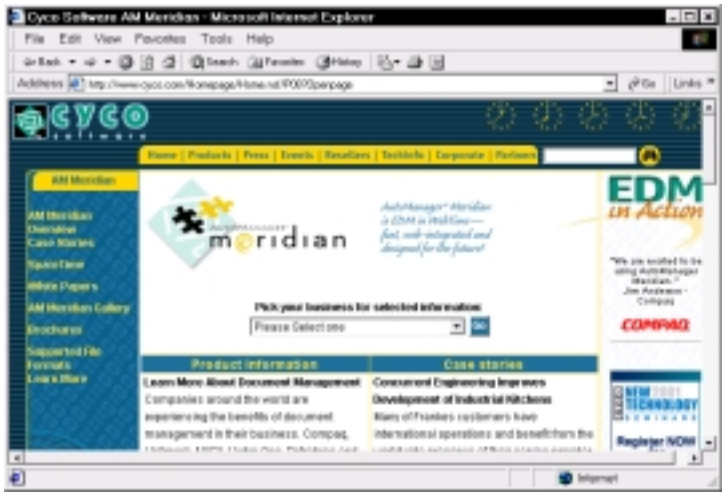

Figure 1–33
AutoManager Meridian

SmartInventor

SmartInventor is a product of Smart Solution, Ltd. It is a product data management application for Inventor files. Figure 1–34 shows the product's website.

Figure 1–34
SmartInventor

3D Standard Parts

Use of standard parts and components largely reduces the time to complete a design. Standard parts constructed in Autodesk Inventor, AutoCAD, and 3D Studio Viz formats are available from many leading suppliers of standard parts in the form of iDrop parts. You select the standard iDrop parts from the supplier and drag them to your design. To install iDrop in your computer, you may visit the Autodesk iDrop website (http://iDrop.Autodesk.Com). (See Figure 1–35.)

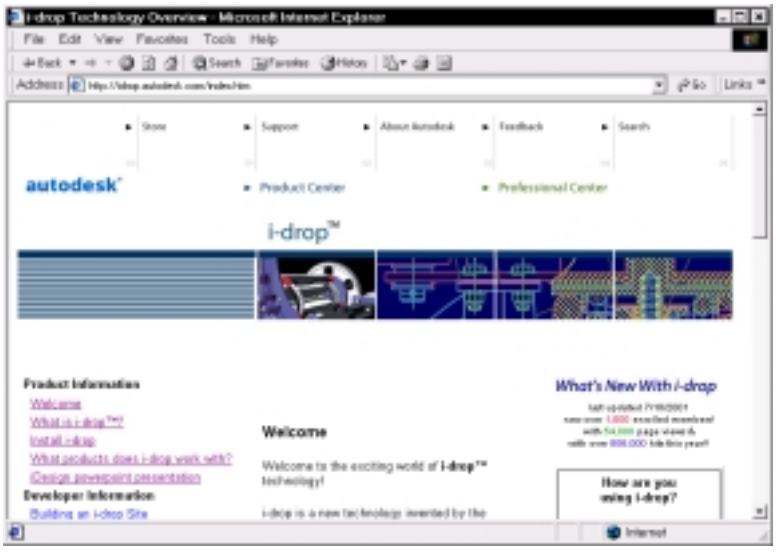

Figure 1–35
iDrop

You can access standard Inventor parts from Redspark catalogs. Figure 1–36 shows the website of www.redspart.com. To obtain updates and access to supplier parts, you can go to Autodesk point A website. (See Figure 1–37.)

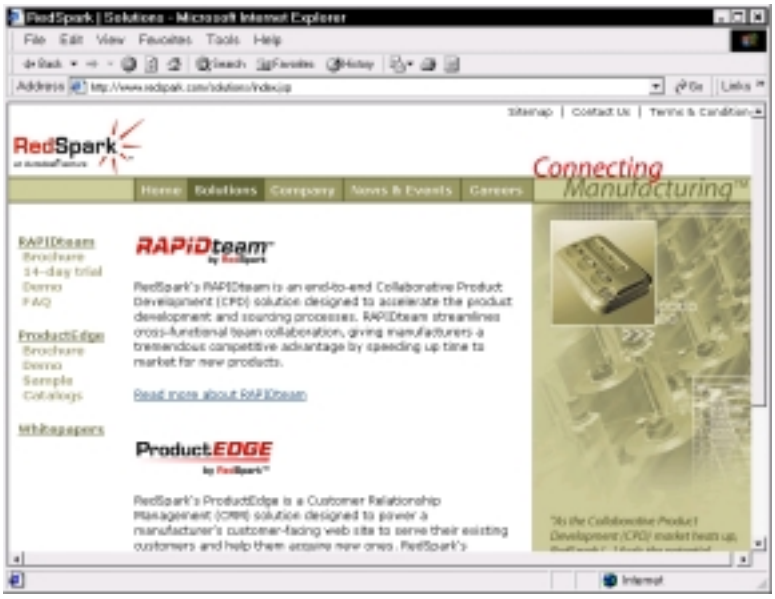

Figure 1–36
Redspark — Supply chain source for engineering

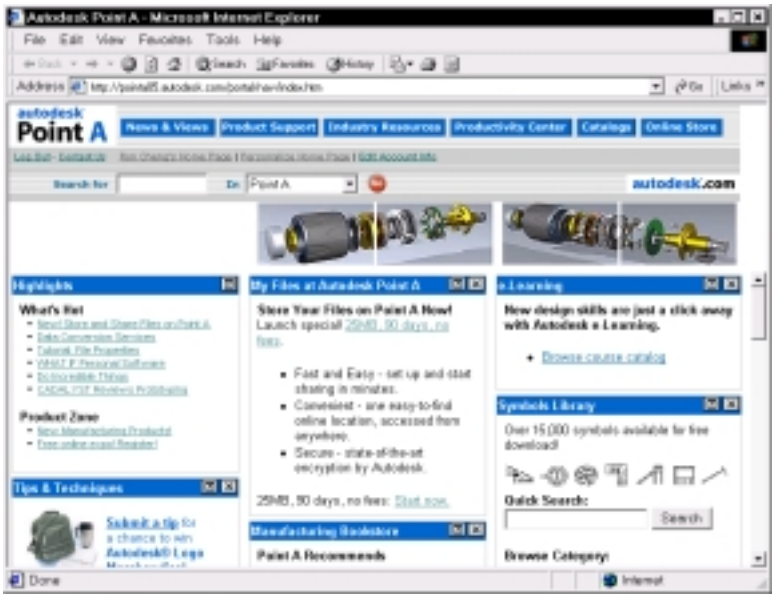

Figure 1–37
PointA — Online design resource and community portal