What's New in CADDS 5 Revision 7.0?

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Chapter 1

What's New in CADDS 5 Revision 7.0

This document provides an overview of what is new in CADDS 5 Revision 7.0. For detailed information, please refer to the product specific on-line documentation.

Redefining Productivity in Product Development

CADDS 5 Revision 7.0 is the most comprehensive design automation tool set available for Electronic Product Definition (EPD), Computervision's innovative, integrated approach for the entire product development process. CADDS 5 provides a wide range of integrated, interoperable modules spanning concept, design, analysis, drafting, and manufacturing; enabling flexibility within disciplines; and providing special tools for specific industries. Just as important, CADDS 5 has the best hybrid modeling and an assembly-centric architecture that helps development teams to work concurrently and collaboratively -- for dramatic reductions in development time and costs and faster, more accurate design the first time.

CADDS 5 Revision 7.0 offers new features, enhancements, and tools that continue its leadership in team-oriented, assembly-centric design and development and make CADDS 5 the easiest-to-use, high-end design automation software on the market.

CADDS 5 Revision 7.0 extends parametric capabilities and benefits to more applications and design-build team members. It provides a wide variety of customer-driven enhancements that make product development work throughout an extended enterprise -- including drawing generation -- faster, easier, and more productive than ever before.

New Features for Component Modeling

Integrated 3D Sketcher

- A new, improved constraint solver by D-Cubed, the de-facto standard for handling a broader range of constraint cases
- Undo/Redo function
- A point-on-curve constraint, a unique capability for better capturing design intent and preserving it throughout sketch modifications
- A new import function allowing you to parameterize legacy 2D geometry and make it dimension driven. You can import legacy 2D geometry, add intelligent constraints to it, and use the results during 3D parametric modeling.
- Interactive highlighting of overconstrained conditions. Whenever you add a constraint that results in an overconstrained condition, the system instantly highlights the overconstrained geometry and the constraints that cause it. This powerful feature also detects overdefined geometry, geometry for which certain values of dimensions may lead to overconstraint, even though the current set of values is acceptable.

NURBS Surface Design

Improved surface quality and data exchange are the result of the following enhancements to NURBS Surface Design:

- Data Reduction. New algorithms, added to 18 commands, automatically reduce the degree and/or number of segments in NURBS (non-rational B-spline) curves and surfaces to:
  - Improve shape quality
  - Reduce database size
  - Improve exporting data to Bezier-based systems
- Tangency matching. New modifiers help improve tangency matching by:
  - Enabling the use of laws to define the magnitude of tangency fields during surface creation operations
  - Giving you precise control over the area of deformation during tangency matching operations

Draft Angle Generation

Added draft angle capabilities make it easier to design and modify models of cast and molded parts. It allows you to:

- Add an incremental angle to a face that has previously been drafted
- Change the draft angle on faces between fillets. During the draft angle operation, the tangency condition between the drafted face and the adjoining fillets is preserved.
- Apply draft relative to non-planar faces

Graphical History Tree

This new ease-of-use feature displays complete parametric modeling history as a hierarchical graph, helping designers to understand and navigate complex parametric models.

Other Modeling Ease-of-Use Enhancements

CADDS 5 Revision 7.0 provides unified layer names and allows you to:

- Select a layer by selecting an entity
- Highlight and select geometry that lies on a given plane or face of a solid
- Generate polycurves from non-planar, untrimmed geometry. You can use the resulting polycurves directly in sweeping operations.
- Define a modeling plane by selecting the face of a solid, trimmed surface or a planar curve
- Generate lines and planes that are normal or tangent to existing curves or surfaces
- Compare sets of geometry, identifying differences between versions of geometric models

Assembly Modeling

Navigator Integration

The EPD.Connect (Optegra®) product structure navigator is now integrated with both Optegra Configuration Master and CADDS 5 Concurrent Assembly Mock-Up (CAMU). By using the EPD.Connect navigator, CAMU users gain access to the enterprise product structure and associated processes.

Assembly Mass Properties

This new function for assemblies eliminates the need to manually update procedures. Assembly Mass Properties:

- Automatically calculates mass properties for components or an entire assembly
- Automatically updates the mass properties when component shapes, locations, or orientations change.

Assembly-Centric FEA

Assembly-centric FEA supports concurrent engineering by providing analysts with direct access to master model geometry. See "Analysis" on page 1-7 for more details.

Drawing Generation

Ease-of-Use Enhancements

As part of a renewed focus on drawing generation, CADDS 5 Revision 7.0 makes drawing generation more productive, associative, and easy-to-use. Enhancements include:

- Easier mouse dynamics in the drawing (explicit) environment, consistent with those in the modeling environment
- An option to automatically blank tangent edges during hidden-line removal
- Associative center lines on drawings
- Simultaneous display of exploded and unexploded assemblies on the same drawing sheet

Lower Case Text

All CADDS 5 text and fonting capabilities have been upgraded to support lower case text.

Analysis

StressLab

Customer-driven enhancements improve the productivity of designers and analysts. They include:

- An improved NASTRAN interface: read/write enhancements facilitate using StressLab as a pre- and post- processor for NASTRAN
- Ease-of-use enhancements for displaying and reorienting local elements, preserving groups during mesh refinement, and restricting the deletion of finite elements
- Assembly-centric FEA (finite element analysis)

Assembly-Centric FEA

Assembly-Centric FEA supports concurrent engineering by providing analysts with direct access to the master model geometry. It:

- Allows finite element models to reference geometric models in different databases, yet be fully associative to them. This eliminates the need for analysts to copy the master model geometry
- Enables meshing and analyzing assembly models, not just component models
- Simplifies and automates the propagation of changes

Manufacturing

CVNC High Speed Machining

- A new roughing operation that generates roughing toolpaths with better surface finish, in less time. Particularly useful in moldmaking applications, CVNC High Speed Machining can eliminate the need for semi-finishing operations by increasing the speed of NC programming and machining.
- Plunge and retract enhancements, enabling ramped, vectored, and radial plunges and retracts
- A new corner machining operation which automatically locates and machines the intersections of surfaces, fillet corners, etc. The corner machining operation is much easier to set up and use than conventional surface intersection machining operations.
- Reduction in data output for 2 1/2-axis machining. This minimizes machine stutter and vibrations when machining at high speeds and feeds for improved surface finish
- Upgrades to number of operations providing improved support for solid geometry

Sheet Metal Features.

- A new task set enabling sheet metal features to be associated with sheet metal models
- An additional CADDS 5 features capability that adds and removes material at the same time
- New, dedicated feature management icons
- A library of 18 ready-to-use sheet metal features

Shipbuilding

Enhancements for Hulls, Heating Ventilation and Air-conditioning (HVAC)

- Hull enhancements, including:
  - Improved plate generation
  - Enhanced division facilities
  - Improved generation of cut-outs
  - Provision for tertiary structures
  - Flexible creation of structural objects
  - Manufacturing outputs and interfaces
  - Data links to Oracle for EPD
  - A ship reference system
  - Shell expansion drawings
- HVAC manufacturing improvements

New Product: CV6142 Ship Electrical

Ship Electrical facilitates cableway modeling, cable routing and cable management for power and signal transmission in ships, offshore platforms, and chemical/petrochemical plants.

This software application contains four modules:

- Cable Block Diagram

  A 2D schematic module used for generating block diagrams. This module facilitates the definition of cables and their connections between source and destination equipment. It provides automatic cable number generation and generation of relational database management system tables. The RDBMS tables are used by the Cable Routing and Cable Management modules.

- Cableway Routing and Cableway Insertion

  A 3D design module used for developing cableway arrangement models. This module enables designers to define available pathways between equipment locations within the ship or plant. Information is stored within RDBMS tables for use by the Cable Routing and Cable Management modules.

- Cable Routing

This module provides interactive and automatic routing of defined cables through available cableways and cabletrays, based on data in the other modules. Cable autorouting by third party cable management systems, such as icePIC and CABSYS, can also be used in conjunction with this module.

- Cable Data Management

  This modules provides report generation of cable, cable tray and cableway information stored in the RDBMS tables.

Plotting Enhancements

The following are enhancements to plotter drivers:

- All CV Vector Plotter Drivers, with the exception of the VDF and GPLOT drivers support banner output.
- All CV Vector Plotter Drivers support the `lasttext` file and `firsttext` file configuration commands.
- The CV Calcomp plotter driver supports your changes to internal command tables in order to send output to a plotter connected to an MVS system.
- the `lpsetup` script supports the setting of printers using the HP RTL plotter driver.
- The HP RTL plotter driver outputs initialization strings for specific printers, based on the printer type, specified in a command-line option.
- The `rasplot` script enables the passage of command-line options to the HP RTL driver from the CADDS 5 command PLOT DOT using commands in the configuration file.

Programming and System Management

CV-DORS Parametric Interface

This expands CV-DORS to provide third-party developers with programmatic access to parametric models. It allows you to develop programs that can read parameters, change them, and regenerate an updated model. The CV-DORS Parametric Interface is useful for optimization applications and program-driven family-of-parts design.

CVact Programming Enhancements

CVact now provides a new Slide-Off dialog box, a new slider (scale) class, the ability to directly start a CR function from CADDS 5, horizontal and vertical scroll bars for scrolling text, and a calculator inverse function supporting inverse sine, cos, and tan functions.

Database Maintenance

New database management capabilities include the

- Ability to call third-party database checkers
- Ability to validate solid models by identifying out-of-tolerance or invalid geometry and topology. This helps to protect data integrity and prevent downstream problems.

Platforms for CADDS 5 Revision 7.0

CADDS 5 Revision 7.0 is available on the following platforms:

- Sun OS 4.1.4
- Solaris 2.5.1
- HP-UX 10.20
- Digital UNIX 4.0A
- SGI IRIX 6.2 and 6.3
- IBM AIX 4.1.4

For more detailed configuration information please see the *CADDS 5 Revision. 7.0 Configuration Guide* - May 1997 (CUS-9705-000).

New Support

CADDS 5 Revision 7.0 runs in the Common Desktop Environment (CDE) on Solaris 2.5.1. This provides a common look and feel and common APIs across multiple UNIX implementations. CADDS Raster Mode (CV1050) is now available on Digital UNIX and IBM AIX. CVact (CV0540) is now available on SunOS and IBM AIX. The Versatec Raster Plot filter is now included with all CV packages.

Withdrawn Support

CADDS 5 Revision 7.0 requires the latest Operating Systems available from each platform vendor. Support for the following earlier revisions is dropped:

- Solaris 2.4/2.5
- Digital UNIX 3.2
- HP-UX 9.05/9.07/10.10
- SGI IRIX 5.3