July/August 2006

AUGI World

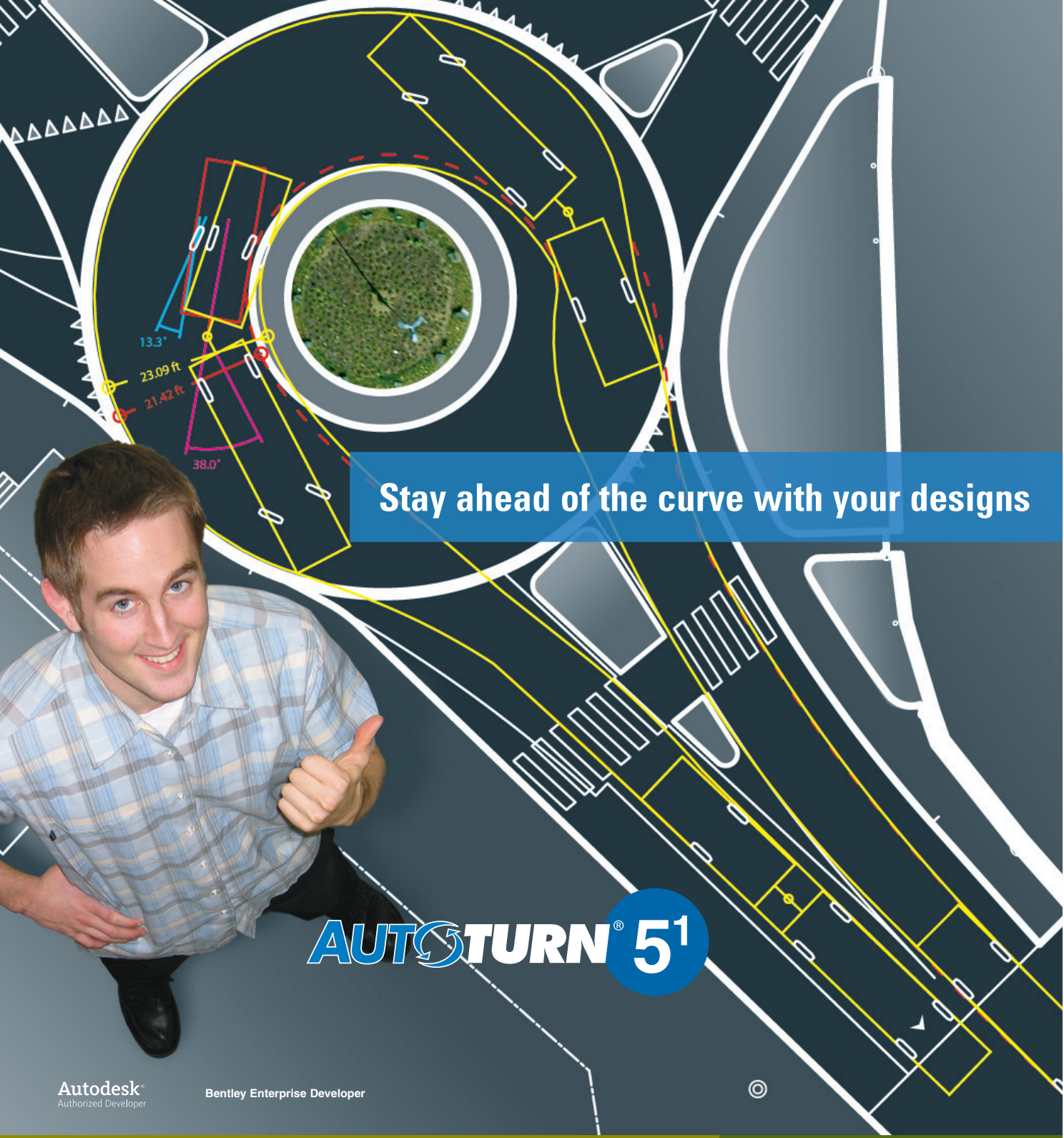
The Official Publication of Autodesk User Group International

Issues & Answers FOR CAD Managers

The Art of Juggling Multiple CAD Packages

Training Inside & Outside the Box

www.AUGI.com



Stay ahead of the curve with your designs

AUTOTURN® 5.1

Autodesk® Authorized Developer

Bentley Enterprise Developer

Want to design like the pros? Then you need the software that knowledgeable transportation design professionals across the world rely on to get their roadway projects done right, on time and under budget.

Let **AutoTURN 5.1** show the way for your complex vehicle turning maneuvers. Extremely practical and easy to use, AutoTURN now has one-of-a-kind, sophisticated features such as vehicle front and rear steering linkages. You can specify different ratios for ranges of steering angles between front and back wheels for even greater usability - ideal to evaluate if your multi-axle semi-trailers, trucks and articulated buses are able to navigate narrow roadways or tight curb radiuses. And intelligent tools like the powerful 'Hunting' ability and dynamic turn radius displays allow you to see the optimal path for your vehicle which means less time and tedious guesswork for your design projects. **Pick the right way to do designs.**

To learn more visit us at **www.transoftsolutions.com** and download a free trial version today.

©2006 Transoft Solutions Inc. All rights reserved. All other brand names, product names, or trademarks belong to their respective holders.

Transoft solutions

Driving productivity through innovation

The Leader in Customer Satisfaction

TCS Workstations
We offer the industry's most powerful and flexible combinations in single or multiple processor platforms using industry standards of MS Windows and Intel Processors. TCS Workstations are designed and guaranteed for optimum performance with Autodesk software solutions.

Autodesk Certified Training
As an Autodesk Training Center we offer training for all Autodesk products. See class schedule online or contact us to schedule a training session at your facility or in a city near you. Available anywhere in the United States.

Hewlett Packard Large-Format Solutions

hp designjet 110+	$975
hp designjet 500 24"	$2,050
hp designjet 500 42"	$2,950
hp designjet 800	Request Quote
hp designjet 1050c+	$6,250
hp designjet 1055cm+	$8,250
hp designjet 4000	$9,250
hp designjet 4000ps	$11,250
hp designjet 815mfp	Request Quote

KIP
Create a profit center for your company by bringing all your large format needs in house.

AutoCAD LT 2007

AutoCAD LT 2007	$775
AutoCAD LT 2007 upgrade	$325
AutoCAD LT 2007 5 user pack	$3595
Symbols 2000	$95

Hewlett Packard 11X17

hp business inkjet 2800	$495
hp laserjet 5100	$1,425
hp color laserjet 5550n	$3,495

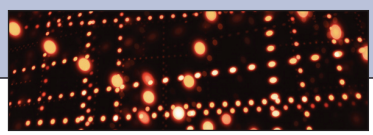
Comprehensive Solutions for Design Professionals

- Hewlett Packard Designjet/Laserjet Sales, Service, Support and Supplies
- TCS Workstations offering the industry's most powerful components and stability
- Autodesk Training Center
- PNY Video Cards – industry leading graphic card for virtually any application
- Friendly, knowledgeable Technical Support

Autodesk
Authorized Reseller

the cad store www.thecadstore.com 800.576.6789

Table of Contents



feature

Issues & Answers FOR CAD Managers

- The Art of Juggling Multiple CAD Packages
- Training Inside & Outside the Box

8

AUGIWorld

Editorial
Managing Editor
Marilyn Law
marilyn.law@augiworld.com

Technical Editor
David Harrington
david.harrington@augiworld.com

Columnists
The CAD Manager: Mark W. Kiker
Education & Training: Matt Murphy
Customizing & Programming: Lee Ambrosius
Architectural Desktop: Melinda Heavrin
Autodesk Revit: Christopher Fox
On the Back Page: David Kingsley

Contributing Authors
David Keener
Mike Partenheimer
Tom Weir

Art & Production
Tim Varnau
tim.varnau@augiworld.com

Advertising
Paul Buel
paul.buel@augiworld.com

Controller
Larry Teeter
larry.teeter@augiworld.com

Publisher
Rich Uphus
rich.uphus@augiworld.com

AUGI Board of Directors, 2006
Richard Binning, *President*
Chris Lindner, *Vice President*
R. Robert Bell, *Treasurer*
Bill Adams, *Secretary*
Mark W. Kiker
Rick McNeil
Mike Perry
Glenn Pope

Subscription
You can manage your *AUGIWorld* subscription, change preferences, mailing address, and other information online at www.AUGI.com/myaugi. If you need further assistance, please contact Donnia Tabor-Hanson at membership@augi.com.

AUGIWorld is a trademark of Autodesk User Group International (AUGI) www.augi.com. AUGI and Autodesk are registered trademarks of Autodesk, Inc. in the U.S. and other countries. All other brand names, product names, or trademarks belong to their respective holders. *AUGIWorld* is published by Solidvapor, Inc., 19601 James Road, Noblesville, IN 46062.

Publications Mail Agreement # 40733013
Return Undeliverable Canadian Addresses to
Station A
PO Box 54
Windsor, ON N9A 6J5
Email: cpcreturns@wdsmail.com

BPA International membership applied for August 2002.

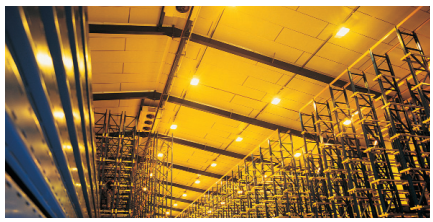
© Copyright 2006 Solidvapor, Inc. All rights reserved.

Table of Contents

4 **The CAD Manager**
Approved Software Lists

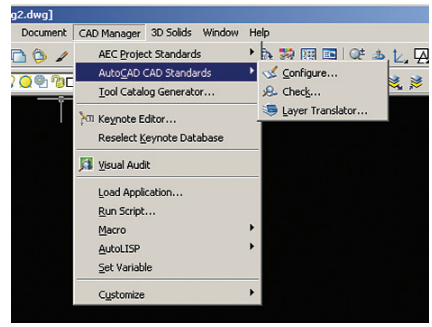
6 **Education & Training**
Determining the Relevancy of Learning

14 **Revit Structure 3 Rocks!**
What's New and Improved in the Engineer's Revit?



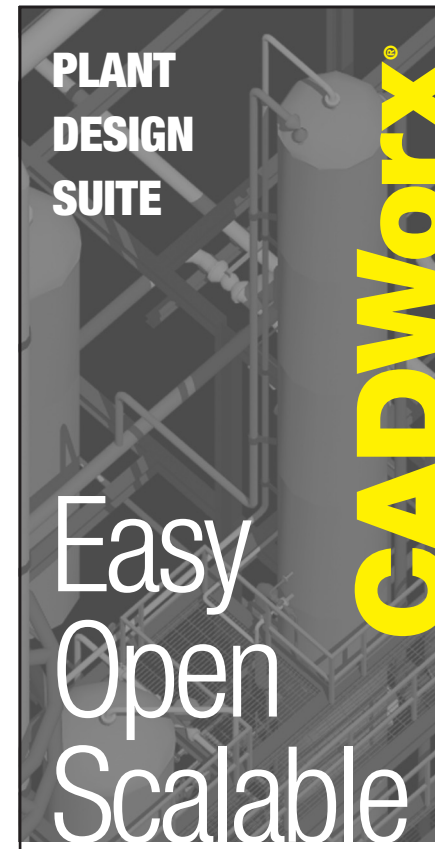
18 **Command Reactors Provide Control**

22 **Managing Inventor Files**
Or: Where is that Whip and Log Chain?



24 **ADT CAD Management**
Standards Implementation

28 **On The Back Page**
3D or Not 3D? There Is No Question!



Why is CADWorx one of the fastest growing AutoCAD®-based plant design suites on the market?

Because it has all the tools to produce intelligent plant designs, including:

- Piping
- Steel
- Cable trays/Ducting
- Collision detection
- Equipment
- Bills of material
- Isometrics
- Flow schematics
- Instrument loop diagrams
- Bi-directional links to analysis programs
- Walkthrough and visualization

AutoCAD® 2006 Compatible — Autodesk

CADWorx delivers!

Contact us to find out how you can improve your design efficiency.

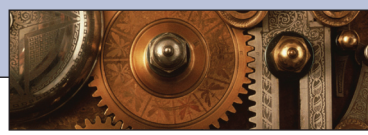
COADE® ENGINEERING SOFTWARE

1-800-899-8787
sales@coade.com

DOWNLOAD FREE DEMO

www.coade.com

Autodesk, the Autodesk logo, and AutoCAD are registered trademarks of Autodesk, Inc. ©2005 COADE, Inc.



Approved Software Lists
(Defining the Juggle)

One of the cover story articles in this issue is about juggling multiple CAD packages and what comes into play as you try to keep all the balls in the air. You will have a number of software tools that are on various releases, working with differing hardware, and more. The longer the list, the tougher the juggle. In order to help simplify your life you may want to develop an Approved Software list. Here is why you need one and how to develop it.

Everyone wants to use the software with which they are familiar. It is easier and more comfortable. When someone hires on they tend to want to bring their preferred tool into the mix if it is not there already. This just adds to the juggling act you are already performing. In order to limit or slow this process, develop an Approved Software list of what your firm uses and the function provided by each product.

An Approved Software list is just a record of the software that has already been tested and used and has proven effective in your office. Each piece of software on the list has been verified to work with other tools you have. When someone wants to buy software, if it is on the list then it can easily be purchased, installed, and put into production. If is not on the list then you should define some steps to get it reviewed and approved for addition to the list.

Starting the list

You can start your list by simply documenting what you are using right now. List everything that you have installed. The next time someone wants to add a new tool, refer to the list. Work toward refining and eliminating those tools that are outdated, under-supported, or have few trained users. If there are multiple tools that essentially do the same thing, then work toward selecting one tool and removing the others from use. Gradually, you will consolidate and the list will shorten. Often just getting the list on paper will make you realize why you are so tired—you are juggling a lot more than you think.

Define selection criteria

Here are a few guidelines I have used to add software to the list.

1. Functionality – does the new tool do something that no other tool can do?
2. Stability – is the tool mature enough not to cause concerns?
3. Working with existing tools – does it blend well with the other tools on the list?
4. File format compatibility – does it speak the language of your platform?
5. Existing user expertise – does anyone in your office know how to use it?
6. Cost – is it a good value for the dollar?
7. Are there other tools that may do the job better, cheaper, faster – is it the best of breed or just the one that someone saw a demo on?
8. Training needs – how easy will it be to obtain training and get users up to speed?
9. Past experience of users using the tool at other firms – did anyone use it elsewhere? What where their experiences?

If it is an industry-standard tool, then the review and approval process will not take too much time. You know the tools that the industry uses in your environment. You may know people who have used them and you can discuss it over the phone or at

Advantages of an Approved Software List

Not every user will have every tool. Not every user needs every tool. The list is a compilation of all tools used "somewhere" in the firm. The list will not be used to refuse anyone software; rather, it is more of a starting point for getting software approved for purchase. You should seek to purchase and support items that are on the list. The list will expand as new tools are added. In order for users to purchase an item that is not on the list, they should get it approved and added to the list.

The list will also help when someone is wondering what tool is used for what function. By reviewing the list he or she can see which tools are used. Software policy should also dictate that users can only run software purchased by your firm.

The second level of use for the list is to help with training efforts. The training may come in the form of formal classes or it may be a video conference class, phone call, presentation, or book. Training will be limited to the tools on the list.

The third level of use for the list is to develop a listing of software experts for each tool. The list can be expanded to include the names of employees who are considered experts; you can encourage them to share expertise with others and funnel questions to them.

The goal is to apply technology to business needs and problems that may arise. You do not want to create a restrictive environment. You should strive to balance the needs and desires of the users with your ability to support, develop, and maintain the systems. You also must keep the legal requirements of the software licensing and seat counts in mind.

your local coffee stop. Believe me, buying someone a cup of joe or even lunch will be worth it to get the inside scoop on a tool you have never used.

If there is a tool that you want to add and have used before in another firm, then it can quickly be approved. If there is some new tool that no one has used, however, you should slow down a little and take a closer look.

The whole point of the list is to develop a process that defines the selection criteria for software. You do not want to have a willy-nilly approach to selecting tools. It should not be based on personal opinion, an individual's title and position on the corporate ladder, or just blind guessing.

Support the list

The list is a guideline for what is purchased and supported. Strive to support any and all tools that are needed by your users. What this will do (hopefully) is prevent someone from purchasing software that has not been tested or at least refine their expectations related to your support of the tool. Talk to management and users about what they can expect in the way of support for each tool. Some require more than others. Some will need expanded CAD standards and others will need only small amounts of guidance.

Agree that support will be focused on the approved software. If someone has a tool that is not on the list, then you should not be expected to provide support. It may not even be correct for users to have tools that are not on the list. You should get up to speed and be trained on the tools that are on the list and be ready to expand their use and provide relief to users.

Add it, remove it, or review it

If a tool is not on the list, you can either add it to the list after approval, uninstall it, or grant a temporary waiver while you investigate it. As a matter of policy, all unlicensed software or software that is not owned by your firm should be removed or purchased. No tool that someone brought from home should be used on your company equipment. Check all the licensing guidelines for the tools you own.

If you are having someone test out a tool, then make sure that they let you know what they are doing. Use a rigorous process for review and documentation of the testing. Let several people test out the tool—not just the person who is requesting it. Once the testing is done you can seek to add the item to your list and push forward with purchases.

Publish the list

When you have developed the list, publish it. Make sure that everyone knows what the options are in the toolbox you have approved. Use the list to help users define what tools are allowed and which are not. Move everyone in the direction of using the approved tools.

The Approved Software list can help you narrow the overload of software that may be in your office. It may take some time to get the list to shrink, but if you stick with it, it can help immensely. By keeping the list up to date and letting everyone know what is on it, you can assist your firm by narrowing the list of software that can be purchased and supported, thereby minimizing training efforts and headaches.

Mark W. Kiker is a member of the AUGI Board of Directors. He is the General Editor of BLAUGI and also publishes caddmanager.com, the CADD Managers Journal, and the caddmanager.com blog. He is currently Director of Technology for HMC Architects in Ontario, California, and can be reached at mark.kiker@augi.com

Fast Track Design
Come visit us at AUGI CAD Camp 2006
FlexPLANT
Industrial Design Series
1-888-FlexCAD
www.flexplant.com
PI Integrated Systems is a leader in providing industrial facility design software for the Process & Plant industries. PI's second-generation FlexPLANT family of equipment layout and piping design programs augments its highly productive 2D FlexCAD modules with powerful new 3D capabilities. Call or email for a 30-day trial CD to discover for yourself and your company what over 3500 others have experienced as the quick-start, ease-of-use, & Flexible implementation of PI Integrated's Industrial Design Series.
IDS-3DDesigner
FlexCAD pipe, valve & fittings (PVF), as well as equipment - in 3D
IDS-FLOW
- P&ID's with equipment, valve, instrument & line lists
IDS-PIPE
- Equipment layout & PVF runs
IDS-STEEL
- Civil, Structural & Architectural
IDS-ISO
- spool drawings with BOMs
PI Integrated Systems
P.O. Box 7786
Houston TX 77270
Autodesk® Authorized Developer
Autodesk® Authorized Unique Application Reseller

Determining the Relevancy of Learning

I'm sure you've had the opportunity to see the new release of AutoCAD®. Whenever a new release comes out, I often find that people decide not to install, train people on, and use the new release. One group takes the approach, "We're going to skip upgrading to this release and wait until the next one." A second feels "There is nothing in this release that applies to how we use the product."

Now I'm not going to say these statements are wrong. They are not. Every company needs to make the best decision based on its design needs. My point is that both individuals and companies typically come to one of the two decisions above without gathering all the facts to make a truly sound decision.

So how do you make the best decision in determining whether or not this release is the one to upgrade to, install, train users on, and implement? Have you seen or used the new release? Do you rush to get training for your staff first? How do you decide what's best for you and your company? Let's cover how I believe you can make the best-informed decision.

Making an informed decision

Let me outline some of the key dos and don'ts when it comes to making an informed decision.

1- Don't listen to the experts.

Have you ever gone to a movie that the critics hated, but you loved? There are dozens of critiques on the current release on the software. Read them. But don't take those reviews as the answer that applies to you. Those reviews will help point you to the major feature sets. Read and save that information.

2- Do download and read the white papers and testimonials.

Autodesk loves to publish and post white papers. These papers give you the fat and skinny on the software. They also give you information on the intended audience for the release. The current release of AutoCAD is prominently labeled as the 3D release. Because of that, some people are dismissing it immediately as "not for me" because "we don't do 3D." So how do you know 3D is not for you if you have never even read a single white paper to find out what it can do? Read the testimonials, too. These are quotes and success stories by real users.

3- Do attend a launch event or webcast.

As soon as we have First Customer Ship ("FCS" as it's known), there is a fast and

furious rush by every dealer to host a multitude of "launch events." These events consist of some live presentations and PowerPoints filled with feature sets and benefits.

Autodesk also offers live webcasts, just in case you missed the dealer launch event. The webcasts are also posted so you can watch them at your leisure. You'll need more than dial-up for this. Consider viewing these casts from multiple presenters. You'll always get a different slant or view on a topic from another presenter. Note those differences.

4- Don't ask for a demo. Do ask for an on-site review.

A review is different from an on-site demo. You've seen the demo at the launch event and webcast. Now you want someone to review your current design process and provide a summary of recommendations on how the new release applies to you. Once that review is done, you can request a demo or presentation, but request that at least a portion of it be done with some sample data from your existing project files. Provide these files to the dealer or presenter well in advance. This will give you a sense of its implementation and practicality.

5- Do take an update training class.

Get your hands on the software! There is no better way to get a feel for the software than to get trained on it. I always recommend taking a class from an authorized Autodesk Training Center or ATC. Check the ATC locator at www.autodesk.com for those that are "2007 ready." These ATC sites are recognized for having trainers who have taken approved training and passed a feature-based exam. They know the software and can provide insight that is use-based information and not sales-based information.

6- Do explore the new features in the software.

The "What's New?" or the New Features Workshop dialog box is the first thing people see when they fire up the new version of the software. This dialog box is packed with AVI and video files as well as processes and techniques for using the new feature set in its designed use. Use it.

Review all the data and make an informed decision

As a professional, you have a constant stream of daily demands in both your personal and professional life. But in order to determine what is best for you and your company, you need to allocate the time and effort to gather as much information as you can about any new release before you upgrade, install, and implement it.

I hope you've found my six key points helpful in forming a decision about new software. These are not the end-all points and there may be others that I haven't identified. What's important is that you gather as much data as you can as well as practical experience before you give it the thumbs-up or thumbs-down.

Good luck and until next time, keep that dialog box open.

Matt Murphy is a member of the Autodesk Training Center Advisory Board (ATCAB) and an Autodesk Approved Instructor (AAI). He teaches AutoCAD productivity seminars at Autodesk University, AUGI CAD Camps and private companies. He can be reached at matt.murphy@ACADventures.com

Worldwide Class in Session

The AUGI Training Program (ATP) is a peer-to-peer, forum-based training center dedicated to AUGI members around the world. Whether you're new to CAD or a veteran of the workforce, there is sure to be a class for you!

ATP highlights:

- **Free,** instructor-led, online supplemental training via the AUGI Forums
- Students decide what they want to learn and when they learn it
- Instructors available for questions throughout the session
- New classes added every month
- Class is **always** in session!

To find out more about the AUGI Training Program and to view current course offerings, visit www.AUGI.com/eduction (click on the AUGI Training Program link).

AUGI invites its members who are interested in sharing what they know with their peers to become involved as ATP instructors. To learn more about teaching through the ATP, contact the AUGI Education team at **team-atp@AUGI.com**.

See you in class!

www.AUGI.com/education

Today's CAD manager faces any number of tasks in a given day and they all carry the same air of urgency. Two of the biggest tasks facing any CAD manager are successfully juggling multiple CAD packages and ensuring that staff is properly trained. After all, it isn't as if all of the CAD packages that coexist in a typical environment manage themselves and integrate smoothly on their own. Likewise, most CAD managers don't see 10 fully trained professionals step off the bus and arrive at their door waiting to slide seamlessly into the staff roster and work at full speed. No, such things take time, forethought, strategizing, perhaps a little luck, and more than a little patience.

The two articles that compose this issue's CAD management cover story address both of those critical issues and offer good advice on performing both tasks effectively. In "The Art of Juggling Multiple CAD Packages," author Mark Kiker tells how to manage the "mixed bag" of CAD packages from multiple vendors and running on multiple hardware platforms. In the second article, "Training Inside and Outside the Box," Mike Partenheimer addresses the equally challenging task of training users and offers many suggestions for how to get the job done.

Two big tasks. One CAD manager. Here are the issues, and some answers.

The Art of Juggling Multiple CAD Packages

The days of proprietary CAD packages running on high-dollar hardware are long gone. The days of constraints of available CAD packages limiting your ability to choose are also gone. Today most firms are using multiple CAD packages, from multiple vendors on multiple hardware platforms. It is really a mixed bag of tools that companies use to get the job done.

Luckily, these days there are a wide variety of tools from which to choose, whether you work in manufacturing, civil, engineering, or architecture. Wikipedia lists 39 different major developers creating CAD software. This does not include CAM, CAE, CAFM, and PDM software. Tenlinks.com has an entire navigation list of AutoCAD add-ons that comprises more than 40 categories, some containing up to 30 tools each.

Wow—talk about software overload. Many of us are operating a multiple platform, multiple tool environment. Let's take a look at some tips to organize this circus of software.

When I went to the circus as a kid I was always amazed (still am) at the ability of the jugglers. They would take oranges or apples or balls and toss them in the air with ease. As they fell to earth they were then somehow controlled and returned to mid air. As the jugglers' skill levels advanced, they moved on to more dangerous objects such as knives, hatchets, fire, chainsaws. Amazing. I have always wanted to learn to juggle, but have never taken the time to see if I could pick it up. According to the International Juggling Association, June 17, 2006 was World Juggling Day. Maybe I should have joined in the fun and gotten some instruction. But I digress…

Working in a mixed house

Today's CAD environment is packed with a diverse set of software. We live in a melting pot of tools. A very mixed house. Sometimes I feel like I am a juggler for my CAD environment. Multiple CAD software packages, multiple plotters, multiple projects, multiple standards, multiple offices, and multiple users. How many plates are you spinning?

Juggling versions

If your office is like mine you have projects that span software releases. AutoCAD® 2007 is available now, but you might not be able to update all of your project files to the new release, which has a different file format. Some projects may be near completion and staying with an older version may be the best plan of attack.

You will also be dealing with files from others that come in versions other than the one you are using. Knowing how to convert files and how to effectively save down to your version is a must.

Juggling data

Don't forget about mixed data. Whenever you exchange data from one firm to another, there exists a mixed data state. This too can cause many difficulties.

I have many times been through the ringer after a manager comes to me thinking that if he is provided with data it will save time. Wrong. Getting data from others is a huge "red flag," in my book. Remember what Mom always said: "Don't touch that data! You have no idea where it has been." Many times it can be corrupt, incorrect scale, wrong layers, or generated in another CAD package. When you get bad files from others, who pays to fix it?

Autodesk has several tools, such as DWG TrueView, DWG TrueConvert, and RealDWG, which help ensure the integrity of the DWG files that are being created in other packages. This might help keep things sane.

Juggling in 3D

Another area that could cause problems is mixed dimensions—2D vs. 3D.

A recent survey on my website (www.caddmanager.com) revealed that 36 percent of us operate in a mixed environment, 26 percent work mainly in 2D, 31 percent are totally 2D, and only 7 percent is totally 3D.

Moving from 3D to 2D can cause problems as users forget that OSNAPS work in 3D. I have seen many files that do "weird things" because the user did not realize that he was snapping from one elevation to another.

The goals

We need to establish several overarching goals that drive our offices and teams. When juggling you need to keep the objects from colliding in mid air. With CAD you need to keep them from colliding on a project. By thinking through the path that all your tools will travel we can minimize the collisions and improve the process.

1. Unifying the document output

When working in a multi-platform environment, you need to focus on getting the basics down first. This means getting the

hardcopy output from all of your software to look the same. Despite the fact that you are working with multiple tools, you want to make sure that the project plot output all looks the same no matter what package you are using. Pen tables should be adjusted. Plotters set up to match. Print a hardcopy target print from your main plotter from the base software that you use and then go to every other plotter (if you have more than one) and get everything to match the original output.

Adjust pen tables to match between software packages. This might be tough to do since some flexibility available in one package may not exist in another. Try to get one plot style table for all files. It can be done. Using client plot styles is often required, so keep your flexibility.

Check the output hardcopy between plotters. Keep in mind that some plotters have greater ability to do screening and shading. Adjust hatching and screened images to match. You may have to dumb down your output a bit. Be sure to always check the original hardcopy output to visually verify.

2. Fully trained users

This is a tough one. Getting everyone up to speed on multiple packages is one of the hardest things to get done. Get management to back you in your efforts to make your team bi-CAD-lingual.

Focus on the baseline tools in the software packages you have. Strive for every user to have a baseline of expertise. Don't expect everyone to be an expert in every tool. Focus on one package. Use it as a base camp for your expedition into other tools. Relate ideas and concepts between packages by using terminology from the base tool.

Let each package stand alone. Don't handicap one package because of the limitations of another. Don't expect everyone to know everything and don't forget to get your staff (and you) trained. See "Training Inside and Outside the Box" for more training advice.

3. Productivity enhancement

The real return on effort comes from getting the tools you use to increase productivity. Multiple packages can work against productivity. In order to avoid this, zero-in on small innovations and tailor each tool to get the job done. This would include LISP routines, CUI files, MDL files (for Microstation), scripts, batch routines, and whatever you can find to make things faster.

Make sure that you document your routines. Don't expect your team to remember. Structure the documents the same and group routines together under headings. You may also want to organize them alphabetically so people can easily find the one they want.

DISADVANTAGES OF A MIXED HOUSE

- Collaboration between office/clients/subs is handicapped
- Supporting mixed platforms is difficult
- Interchange of data between versions can cause problems
- Keeping track of what tool to use
- Keeping people trained in multiple packages
- Migrating to new releases and still needing to use the old one
- Maintaining CAD Standards that span platforms and versions
- Customizing multiple tools

ADVANTAGES OF A MIXED HOUSE

- You can deliver in diverse platforms
- Allows one-stop shopping for clients
- Keeps you on the front edge of technology
- Pads your resume
- Allows you to leverage vendor relationships
- Allows each user to use the best tool for each job

4. Clean CAD Files

No matter what software you are using the goal should be to create clean CAD files. Keep pushing toward this goal. Make sure the users know what is expected in each package. Try to unify your standards so that the concepts and guidelines are similar.

Set up base camp

By selecting one package as the main tool you allow greater focus on the main problems and solutions. Most often your office will have one tool that is the *de facto* standard for projects. It may be the one that most people are good at or the one that clients demand. If you don't have a natural choice, then select one package as your main focus.

Base your standards on it. Develop them for this package and then tweak them for the others. Don't jam one set of standards into all tools. Keep them flexible and geared toward the design tool you are using.

Base your productivty on it. Dedicate yourself to getting the most out of the package. Think and rethink how you use the tools and features. Keep adding to the talents of the team through training.

Base your training on it. Develop training manuals or buy them for the package. Get everyone up to speed and then start training in other tools. Refer back to the base tool when training. Levels in Microstation are just like Layers in AutoCAD. Same concepts, different wording.

Build your standard graphics in one package. Generate all your symbols and standard details in one package and convert them to the other. This will allow you to make sure that all the graphics match. Obviously, you may have to modify intelligent content like fields, tags, attributes, and such for another package, but by generating the files in one package, you can save some time and keep everything in order.

Juggling apples and apples

Even when you have software from the same vendor you may end up with different versions of the same tool.

Stay in one version for the length of the project. Do not try to migrate in the middle of a project. Migrate to the next version at the start of the next project. Try to keep migration in one direction only. Only moving forward. Don't do a lot of "backward" saving.

When you do move forward, move everyone on the same project at the same time. Be sure to communicate with project teams to coordinate the move. Don't catch them by surprise. Let them know when the change is coming. Let everyone in the office know which projects are moving and which ones are not.

Using the tools you have

There are a boat-load of tools that come inside of Autodesk products that may help keep your sanity. Look into these and see how they can help you correct some of the troubles that may arise.

- CAD Standards Checker in AutoCAD
- Project Standards in ADT
- ETransmit or Archive
- Layer Translator
- Reference Manager

I will cover these topics in future issues.

Mark W. Kiker is a member of the AUGI Board of Directors. He is the General Editor of BLAUGI and also publishes caddmanager.com, the CADD Managers Journal, and the caddmanager.com blog. He is currently Director of Technology for HMC Architects in Ontario, California, and can be reached at mark.kiker@augi.com

Issues & Answers FOR CAD Managers

Training Inside & Outside the Box

You have a fine staff. You have the latest, greatest software. But with new AutoCAD features being introduced on a yearly cycle—as well as the release of relatively new and different CAD products such as Autodesk Revit, Autodesk Inventor, and Autodesk Civil 3D—getting the most out of your staff requires more than just good intentions.

You need to invest in some training. But what kind of training do you use? That determination is not easy. There is no silver bullet solution. Putting together a comprehensive training program takes a lot of thought, a lot of time, a lot of effort, and a lot of planning. You'll find that you'll need to offer many different types of training in order to satisfy many different issues. Your trainees have different skill levels, different knowledge gaps, different attitudes, different learning abilities, and different personal schedules.

Things to consider

On the surface, training looks like an easy issue to resolve: Pack up your staff, send them to an AutoCAD® class, and four days later they're experts! But wait! That's simply not true! First of all, it's not possible to retain all of the information you receive during a four-day class. Secondly, that class will have a limited focus such as AutoCAD basics or Level 1 Architectural Desktop. Sure, if you send enough trainees to fill a class, you can get your Authorized Autodesk Training Center to customize the class for you, but this solution still targets only a small portion of your overall training needs. You also have to worry about company standards, workflow process, integrating third-party and custom applications, company hardware, and more. These types of training needs aren't available in regularly scheduled training classes.

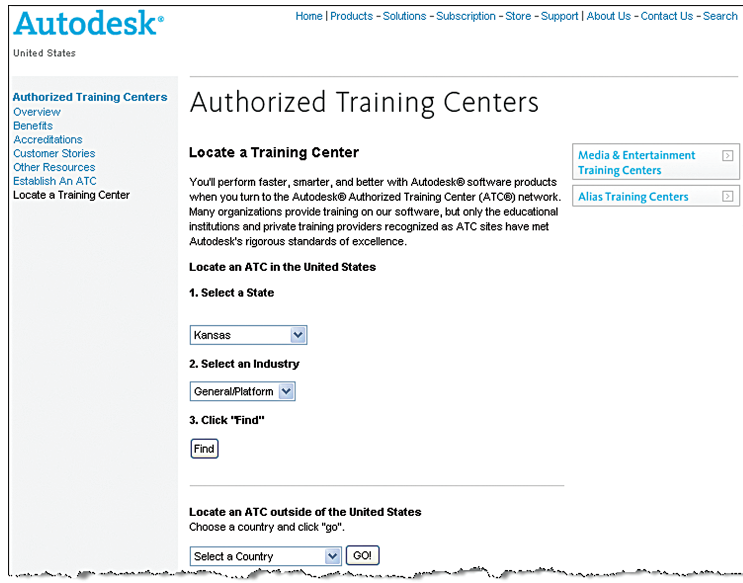


Figure 1 – Autodesk's Training Center Locator

You'll need training solutions that include many different things—from new hire orientations to addressing current in-office issues to changes in workflow process to traditional AutoCAD and vertical application lessons.

Therefore, an effective training program today must include many different course and skill-level options. You'll want to consider a skills assessment for every single training candidate to make efficient use of their time and your training budget. Depending on the size of your firm, you may want to develop a customized training regimen for each individual member of your CAD staff.

Classroom training

When you think of training, you probably think of the traditional classroom approach. Classroom training is just one possibility. You can't limit your thinking to that type of training alone.

But, for the moment, let's focus on classroom training. Deciding between hands-on training and seminar-style training is your first consideration.

With hands-on training you'll need software and a workstation for each student. Your class size will be limited by the software and hardware available to you. Seminar-style training doesn't yield the immediate tactile reinforcement of hands-on, but in this case, class size isn't limited by hardware, it is limited by the size of the room or availability of your staff.

If you opt for a hands-on classroom training program, there are many things to consider and cost is usually among the first. As you dig into planning your program, however, you'll find that cost takes a back seat to more significant issues and it is these other issues that actually set your parameters. Issues of concern include, but are not limited to, production impact on office staffing, training location, motivation of trainees, resistance from production managers, trainee truancy and accountability, course content, project deadlines, quality of instruction, make-up sessions for absentees, availability of training hardware, outsourcing the program, class size limits, staggering class schedules to accommodate personal schedules, establishing trainee prerequisite knowledge levels, tracking trainee's progress, office political pressure, juggling last-minute schedule changes, selection process of trainees, and simply managing all of these very complicated training program issues. With all of these factors in play, you have to be rather creative in order to succeed.

Getting creative

I've had the good fortune to discuss training issues with a number of CAD managers. Creativity seems to be their strong suit. Here are some of their ideas.

Establish manager overview training sessions. This addresses a few issues. By giving the managers an overview of the training their team members will receive, they'll become invested in the process. They'll see, first hand, the long-term benefit of pulling staff off of short-term project deadlines for training purposes. Additionally, they'll be in a position to determine who on their staff should receive the training. Be sure to keep them updated of the training schedule well in advance so their team members can be scheduled to avoid project deadline conflicts.

Break multi-day training courses into smaller segments presented over a longer period of time. This addresses the project deadline and staffing issues resulting in more support from production managers. It also gives attendees the opportunity to avoid information overload—too much, too quick and out of their memory in a week—and allows them to try their new tools in production and then ask practical follow-up questions at the next training session.

If the thirst for knowledge isn't motivation enough for your staff, bribe them! Furnish sandwiches or pizza for lunch with a CAD seminar as your floor show. These types of lunch-and-learn sessions are very popular. Nothing seems to get staff motivated like free food. If a user happens to figure out how dynamic blocks work with pepperoni, everybody wins. One CAD manager told me he flings a candy bar in the direction of anyone who answers a question correctly during his classes. His trainees are actually disappointed when not given the opportunity to answer.

Many firms, mine included, ask their employees to share the burden of a training program. The reason is simple: it's a shared benefit. The trainee enhances his or her own marketable professional skills while the firm cultivates a more sophisticated and talented production staff. That's a win-win situation. The undesirable alternative would have your firm hire employees with new skill sets already in place to displace existing employees. No one wants that.

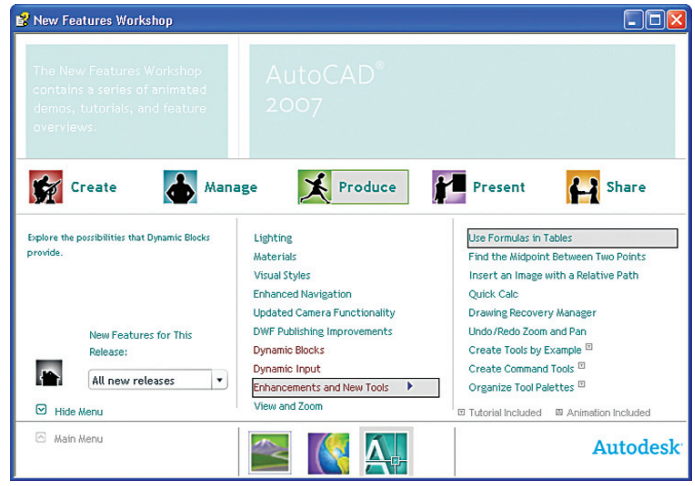


Figure 2 – AutoCAD New Features Workshop

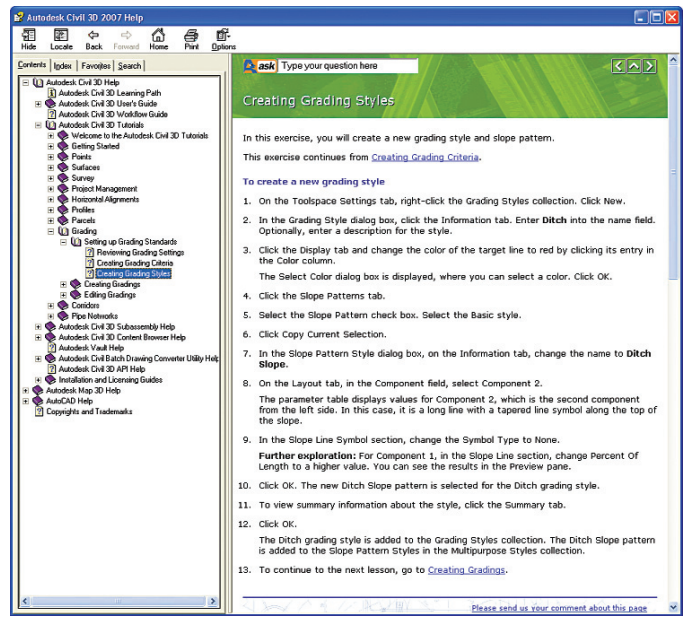


Figure 3 – Autodesk Product Tutorials

In order to share the burden, full-day classes are scheduled so that half of the class occurs during office hours and the other half occurs during off hours. A little creative scheduling yields a program that allows your trainees to work half a day on their project deadline, get an afternoon's worth of training, a half-hour break for a company furnished dinner, finish the training on their own time, and be headed home by 8:30 in the evening. Compare that with an evening class at a community college. Attendees are ahead by a half-hour of their own time and a free meal.

Remember, you'll want to measure your training progress so you'll be prepared to justify training expenses to upper management. This can be as complicated as establishing pre- and post-training skills assessments or as simple as trainee self- evaluations.

Other training

A half-day, one-on-one new employee orientation regarding company standards is an effective way to get people started in the right direction. As a new employee, they are inundated with a flood of new information. It's unrealistic to expect them to remember everything covered in their orientation. Be sure to have good documentation so the trainee can

concentrate on your message, understand underlying concepts, and then know they can use that documentation as a standards reference.

Assigning a "CAD Captain" to each production team gives users someone to rely on for leadership and results in some on-the-job training. This mentor must be given the freedom to assist other users on the team apart from his/her own production responsibilities. Overload them—burn them out—and nobody wins.

For your all-star talent, consider sending them to Autodesk University. Nothing will charge their batteries more than an opportunity to learn from experts, network with highly motivated peers, gain industry insights, and have fun doing it. Also consider an AUGI CAD Camp. CAD Camps are one-day events very similar in format to Autodesk University. Be sure to check www.cadcamp.com for locations and dates.

For some individuals, immersion training is an outstanding option. Immersion training combines instruction for technical and production skills in computer basics, basic AutoCAD skill updates, vertical application training, people skills, and personal improvement. Think of it as a self-improvement seminar for CAD users. One company to offer immersion training, CVIS, regularly schedules both CAD Pilot Jump Schools and CAD Manager Boot Camps, mostly on the west coast. You can find information about their immersion training at www.cvis.com.

Check your state or local government to see if there are any funded training programs available in your area. While not offering the training directly, the state of California funds such a program. Restrictions such as type of firm, attendance guarantee, and length of employment do apply. If your firm and trainee meet the qualifications, your trainee is eligible to attend classes consisting of 100 hours of instruction for a nominal fee. Available courses depend on the contracting school. During my career I have attended funded classes in AutoLISP, advanced 3D AutoCAD, and Land Desktop. You'll need to locate a contracted school in your area or have you own firm qualify to do the training. Information for California's program can be found at www.etp.ca.gov.

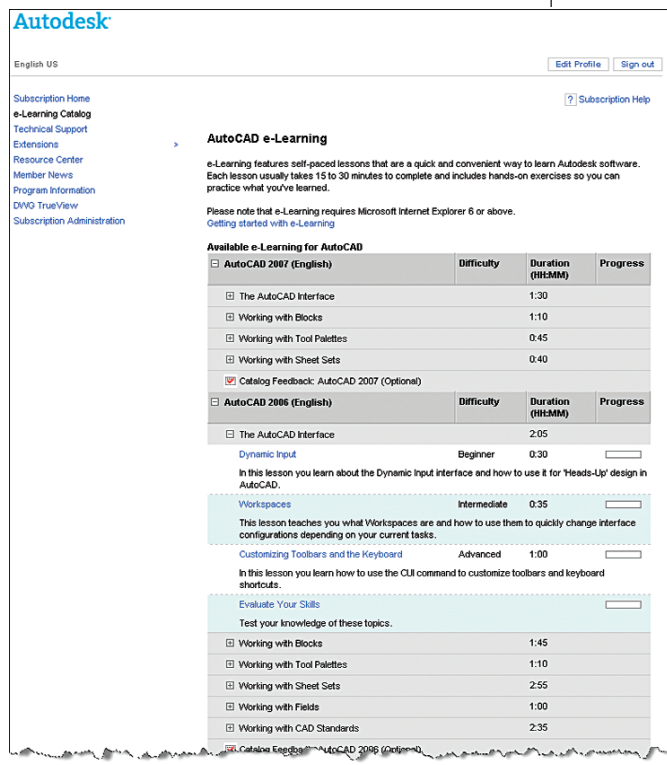


Figure 4 – Autodesk Subscription e-Learning

Other formats

Besides the traditional classroom setting, many other training formats exist. Most are easily available and many of them are free! These other options, while limited in content, may still help fill gaps in your overall training initiative.

Autodesk has done an outstanding job placing training resources right in their products and making them easily available. Two such resources, New Features Workshop (See Figure 2) and Tutorials (See Figure 3), are located on the Help pull-down menu. Users can learn at their own pace with the comfort of their own familiar workstation.

For those of you on subscription, e-Learning is available on the subscription website (See Figure 4). Access to this wonderful training resource is even easier in 2007 with the addition of a link on the Help pull-down menu. e-Learning offers dozens of 30- to 60-minute lessons for beginning, intermediate, and advanced users. It even includes post lesson assessments so you can evaluate your skills.

AUGI has its own ongoing training program, which is free to all members. The AUGI Training Program (ATP) offers several classes a month for all skill levels. These classes have an advantage over other online training resources—instructors. Trainees can interact with other participants and their instructors via forum threads to have their questions answered. Click on the Education link at www.AUGI.com and follow the AUGI Training Program links for more information (See Figure 5).

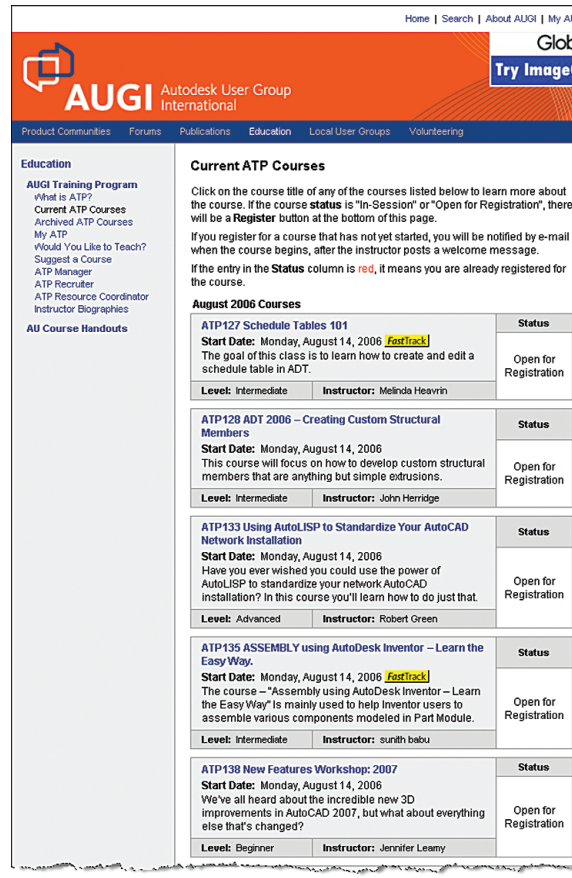


Figure 5 – AUGI Training Program

Figure 6 – Autodesk weekly product webcast

There are a number of training CDs on the market for purchase. This type of training gives users an audio/visual experience that can be paused, rewound, and replayed. Specific lessons can be targeted to your trainees as necessary. These types of CDs are available from companies such as Advanced Graphics Technology (AGT) (www.agtcad.com) and Landnut (www.landnut.com) via direct purchase.

Autodesk presents weekly webcasts for vertical products such as Civil 3D. These one-hour sessions give you an audio/visual learning experience via the Internet (See Figure 6). Topics vary and presenters include both non-Autodesk industry leaders and Autodesk product development staff. These outstanding presentations give attendees the opportunity to submit questions online and receive immediate replies from the experts. Archived sessions are available for web replay, but Autodesk also offers free DVDs making on-demand viewing even easier. Simply use the phrase "webcast" to search Autodesk's website, then click the link for the desired product found in the search results.

While these formats all seem to be targeted to individual users, they could also be used in a group learning situation. Simply set up a computer with a projector in your lunch or conference room, add some speakers, and play the CD or DVD for the group. The New Features Workshop or Tutorials might also play well this way with one individual operating the system for the group.

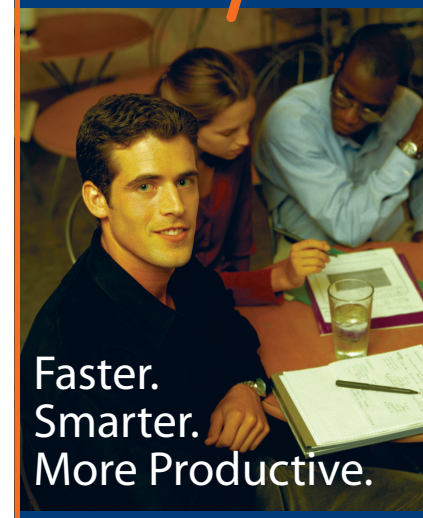
These days, recording your own CD or DVD for future playback is relatively easy and inexpensive. Use a video camera to record your classroom training sessions then burn them on a DVD. For a more polished presentation, use screen capture software, such as TechSmith's Camtasia (www.techsmith.com), to capture your screen movements and voice onto a CD or DVD. Both of these can be replayed whenever needed.

No longer a luxury

Using current software requires a talented staff that can efficiently leverage most aspects of that new technology. Software is evolving too quickly to rely on your ability to "figure it out on your own." To stay competitive, you need to assist your staff in mastering their professional skills. Training has become a necessity—whether it's on-the-job, after work, during lunch, or part of a structured company program.

An Autodesk user since 1990 and long- time AUGI member, Mike Partenheimer is the Corporate CAD Manager of Hall & Foreman, Inc (HFI) a southern California based Civil Engineering firm. Mike is the immediate past president of the Civil CAD Consortium (C3) and a contributing editor for Inside AutoCAD. He can be reached at mikepartenheimer@hotmail.com.

AUGI
CAD CAMP



We guarantee that a day spent at an AUGI CAD Camp learning and networking event will teach you new techniques that will impact your productivity immediately. You'll learn best practices from leading instructors, then take your education even further through peer-to-peer networking.

Coming to a city near you!

Denver, CO September 14
Cincinnati, OH September 28
Phoenix, AZ October 3
Jacksonville, FL October 5
Milwaukee, WI October 10
St. Paul, MN October 12
Birmingham, AL October 17
Paramus, NJ October 19
San Diego, CA October 26
Washington, DC December 5

We are continually expanding our list of the many regional AUGI CAD Camp events in cities throughout the U.S., Canada, and abroad. Visit www.CADCamp.com to learn more.

AUGI Autodesk User Group International

Revit Structure 3 Rocks!

What's New and Improved in the Engineer's Revit?

Editor's Note:

This month's article is by Tom Weir—engineer, CAD manager, noted author, and educator. Check out what he has to say about Revit Building's younger sibling, Revit Structure, these days affectionately known as RS3.

Next month we will look hard at Revit's detailing capacities. Remember the old saying: "the devil is in the details!"

The Revit community has always had a strong online presence. AUGI's own forums are some of the best sources for tips and information. Personal Revit websites and blogs are starting to pop up, too. Check out www.revitfamilyman.com, revit.blogspot.com, revitoped.blogspot.com and reviteer.blogspot.com

There will almost certainly be a number of others up and running by the time this article is printed.

—Chris Fox, AUGI Revit Editor

Impressive functionality

Autodesk® Revit® Structure, first introduced in June 2005, marked the beginning of the next phase in the history of Revit software. It has become a platform that boasts Architectural, Structural, and MEP modules. Revit Structure 2 was published soon after that, maintaining the quick pace of development that we in the Revit community have come to expect.

Now Revit Structure 3 builds on those initial releases with impressive additions to its functionality. Improvements are seen in the areas of engineering workflow, modeling, construction document preparation, as well as better multidiscipline interoperability with other products.

My objective in this article is to discuss several of what I consider to be the more important improvements to Revit Structure, rather than to simply list the changes. For a complete listing of changes and additions you can contact your local Revit Structure dealer.

Roof systems

Most notable for me is a new approach to modeling roof systems.

Steel-framed buildings with "flat" roofs for commercial buildings can be tricky to model. The steel members need to slope from ridge lines to roof drains, thus producing warped framing bays.

Truth is, with Revit Structure 2 it could only be accomplished with awkward, time consuming solid sweeps of each member.

Now we have new capabilities within Revit Structure 3. The first is that we can automatically attach the tops of columns to the underside of the roof deck. We can also now set the elevations of beams at each end, independent of the roof plane. Added to this is the ability to draw the members in plan with a 3D snapping tool that automatically snaps the new beam end to a sloping intersecting member, at top dead center.

With these improvements a new methodology can be applied to structural roof creation. On a recent middle school project I had a chance to try it out and here's the way I did it.

I first created the warped 1 1/2" metal deck roof object by a using solid blend form.

Then I attached the tops of the wide flange columns to the underside of the warped deck, thus setting the tops of steel for the columns. (Prior to this I would have had to get into a section view for "each" column and eyeball it into position; inaccurate and very time consuming.)

Next I drew the girders from column to column using the 3D snapping feature to snap to the column tops. Finally, I added the beam in-fills to the sloping girder members, again using the 3D snapping. This workflow will make roof creation a snap (pun intended)!

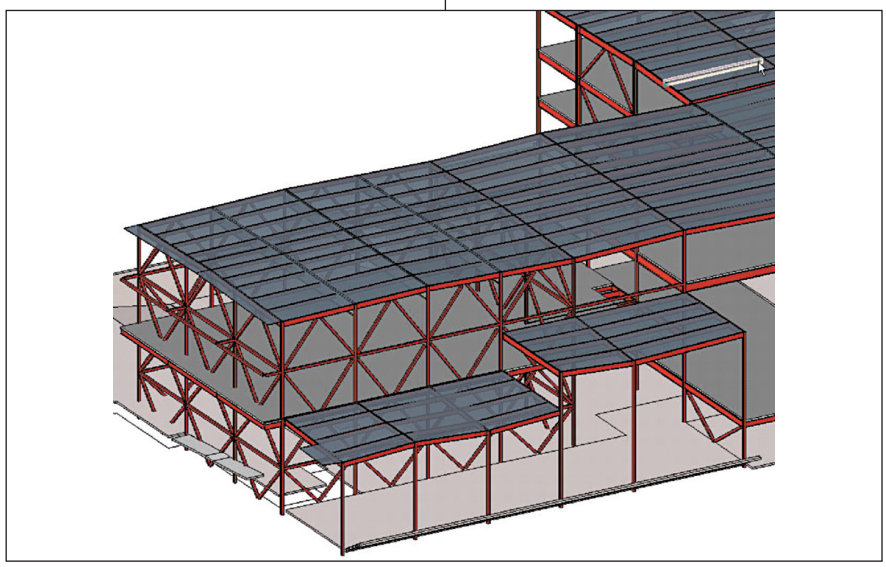


Figure 1 – The middle school gymnasium

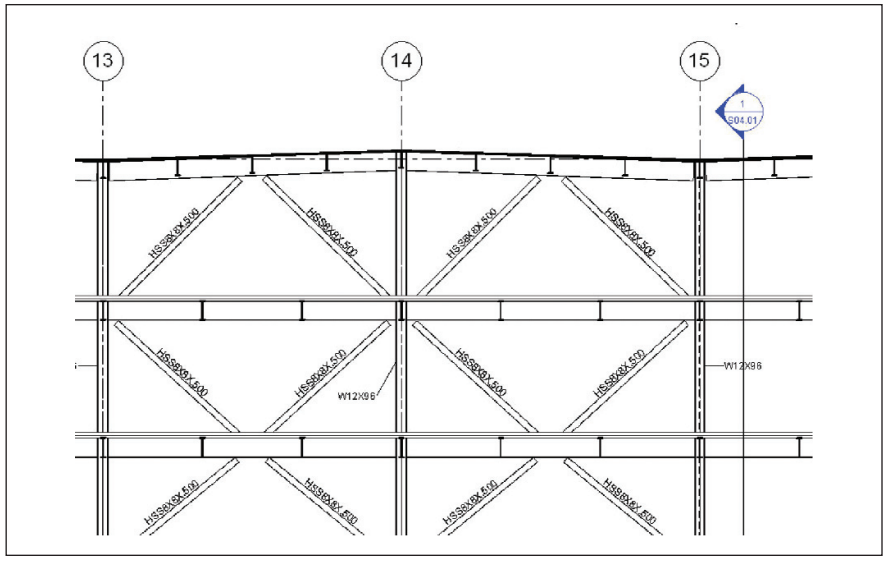


Figure 2 – Roof sloping at braced frame

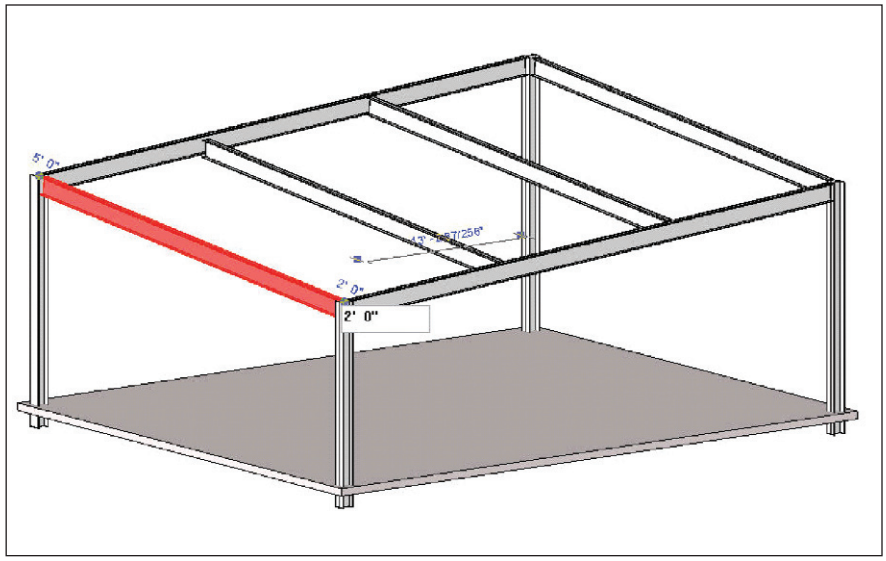


Figure 3 – Beam ends now move independently

Document preparation

Another important set of additions and enhancements in Revit Structure 3 concerns construction document preparation. In the past the modeling capabilities have been strong, but finishing the details has been a weaker part of the program. That is quickly changing.

2D detail component libraries have been greatly expanded with more than 500 new components organized within the 16 CSI divisions.

The import and export of Drafting Views is now possible. Until now we could not exchange drafting views between projects which made setting up typical detail libraries very inconvenient. Any drafting view can now be saved to a Library file and reused from project to project.

In addition to manual rebars, Area Reinforcement can now be applied to modeled slabs or walls. The rebar will then show in each section view that is cut. It seems that we are getting more and more complete displays when we cut sections, requiring less 2D detailing to finish.

The Graphical Column Schedule has improved considerably since Revit Structure 2. One important feature is that we can now sort and display columns by material, such as steel and concrete columns. We can easily hide some levels from the schedule if we want to as well. Rather than showing one box for each column the schedule now can group columns of similar properties together in one box, reducing the schedule size and making it more understandable. For larger projects, we can now split our schedule across multiple sheets. One addition I would like to see is in a future release is the ability to add rows at the bottom of the schedule for base plates and details numbers.

Interoperability

Now that Revit is a true software platform with multiple disciplines, the linking of Revit files has become a major issue of concern. Revit Structure 3 has added new features to help control the display of linked files and has increased the categories that can be copied and monitored during the project.

In Revit Structure 2 we had little control over the display of linked files. But in this new release a link display settings dialog box has been added that allows the link to display exactly as it is in the source file. Alternatively, the linked file can use the visibility settings of the host file. Great flexibility!

Autodesk®

If 2D and 3D aren't seamless, you just get less.

Idea:

Confidently use existing 2D AutoCAD® files to create new 3D designs.

Realized:

Autodesk Inventor® software, the #1 selling 3D mechanical design application, is the best choice for AutoCAD® users for several reasons. Being the only software to combine 2D AutoCAD and 3D solid modeling in one environment is just one of them. Now you can move to 3D and see your ideas come to life, without giving up your investment in 2D. Try doing that with a software package that doesn't include a 2D application. To learn more about how Autodesk Inventor gives you the best of both worlds, visit autodesk.com/bestchoice

Image courtesy of the engineering team at YORK International Corp., Refrigeration Systems Division of North America

Autodesk, AutoCAD, and Autodesk Inventor are registered trademarks of Autodesk, Inc., in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. © 2006 Autodesk, Inc. All rights reserved.

AUTODESK INVENTOR®
BEST CHOICE FOR AUTOCAD USERS

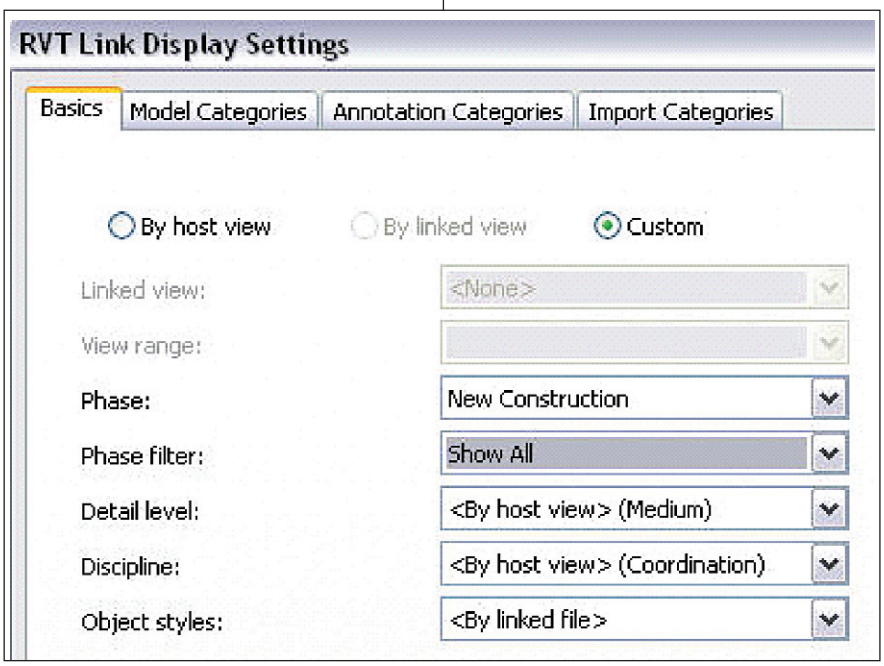


Figure 4 – New Revit link display dialog box

The Copy/monitor feature has been expanded and working with architects using Revit Building 9 is getting better and better.

In Revit Structure 3 we can now monitor walls, floors, and openings from the linked Revit architectural model, (as well as the girds, columns, and levels we can monitor now in Revit Structure 2).

Import/export

Exporting to AutoCAD® has been improved considerably. Especially important is the ability to export all objects with specific "by layer" values, providing us much more flexibility. Hidden line representation in all categories has been extended as well as more export layer categories.

Two pesky problems regarding exporting have been fixed. First, the hatching for walls is not put on the wall layer anymore, but rather on a Patt layer (in the AIA scheme). The second is that paperspace viewports are put on a no plot layer rather than layer 0.

With the new 2D DWF export, Revit Structure objects are exported as logical elements, not just lines. This allows for better coordination with architects, consultants, and contractors who can see the real properties of your structural elements.

I am becoming a big fan of 3D DWF exports as well. If you have not tried it with your model, I urge you to do so. For clients with no knowledge of Revit this is an easy way to share your 3D work.

The analytical model

Engineers will appreciate the new member support checks and model consistency checks that have been added to help validate the analytical model before sending it to analytical software. Also, load tags can now be tagged and scheduled.

Test drive

You'll want to take advantage of the many improvements in this new version of Revit Structure. If you haven't tried it yet, download a 30-day trial version and give it a spin. For those already involved, this upgrade will prove very worthwhile.

Revit Structure 3 demonstrates, once again, the continuing commitment of Autodesk to be an aggressive leader within the AEC industry as we continue transitioning into the Building Information Modeling era.

Tom Weir is the CAD/IT manager at Brandow & Johnston Associates in Los Angeles, consulting structural engineers. He authored the AOTC Essentials manual in 2005 for Revit Structure and is President of the Los Angeles Revit Users Group. Tom is moderator on the AUGI Revit Structure forum and was a speaker at Autodesk University. Tom would like to thank Marie Olivares of Autodesk Revit for her assistance in preparing this article.

Autodesk®

Let's review.

Autodesk® Design Review software finally gets everyone on the same page by allowing your product team to digitally mark up and measure your mechanical designs. And all comments are tracked, then easily round-tripped back into your original 2D or 3D design, meaning the review process is much more accurate and manageable.

Tell your product team to download a free trial today at autodesk.com/TryDesignReview

Autodesk and DWF are registered trademarks or trademarks of Autodesk, Inc., in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product offerings and specifi-cations at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document. © 2006 Autodesk, Inc. All rights reserved.

AUTODESK DESIGN REVIEW DWF

Command Reactors Provide Control

Creating a set of CAD standards is much easier than actually making sure that users follow and use them. AutoLISP® can be used to help make sure that certain types of objects are placed on the correct layer, even if the user doesn't set the correct layer current before drawing the object. AutoLISP allows you to watch for command activity or when objects are added to a drawing through the use of reactors. In this article, I will show you how to implement and use command reactors to control which layer objects are placed on.

What's a Reactor?

Reactors have been in AutoCAD® since AutoCAD R14 with the introduction of the Visual LISP Integrated Development Environment (VLIDE) to subscription customers, but it was included in AutoCAD 2000 for all users. AutoCAD uses reactors (or events) internally to detect when specific things occur at different levels—such as applcation changes or objects being added to or modified in a drawing. When a reactor or event is processed, a call back function is executed, which informs AutoCAD that something should happen.

There are more than 15 different types of reactors offered by AutoCAD. Reactors, like AutoLISP functions and variables, are drawing specific and must be loaded with each drawing in which you want the reactors to work. Most commonly you load your reactors using the Acaddoc.lsp file, but they can be loaded using the APPLOAD command or the LOAD function. When adding a reactor, you must make sure that you don't load it more than once to avoid any potential problems. One last caveat about reactors is that the use of the COMMAND function should be avoided because AutoCAD is already busy doing something else and the command sequence might not be carried out right away. So to work around the problem, you should use the VLA- and VLAX- functions when you want to modify objects.

Defining a command reactor

Command reactors are one type of reactor found in AutoCAD and are used to monitor when a command is started, has ended, or has been cancelled. This allows you to detect when certain commands have been used and to do something in response to the reactor, such as change the current layer or the value of a system variable. The basic steps needed to get a reactor to work are listed below.

1. Create a new AutoLISP file using Notepad or the Visual LISP Editor, or open the Acaddoc.lsp file.

2. Add the Visual LISP statement (VL-LOAD-COM) if it isn't already in the file.

3. Add the reactor using the VLR-COMMAND-REACTOR function and be sure to test to see if the reactor is already loaded before adding the reactor. The VLR-COMMAND-REACTOR function returns a reactor object if the reactor is successfully added.

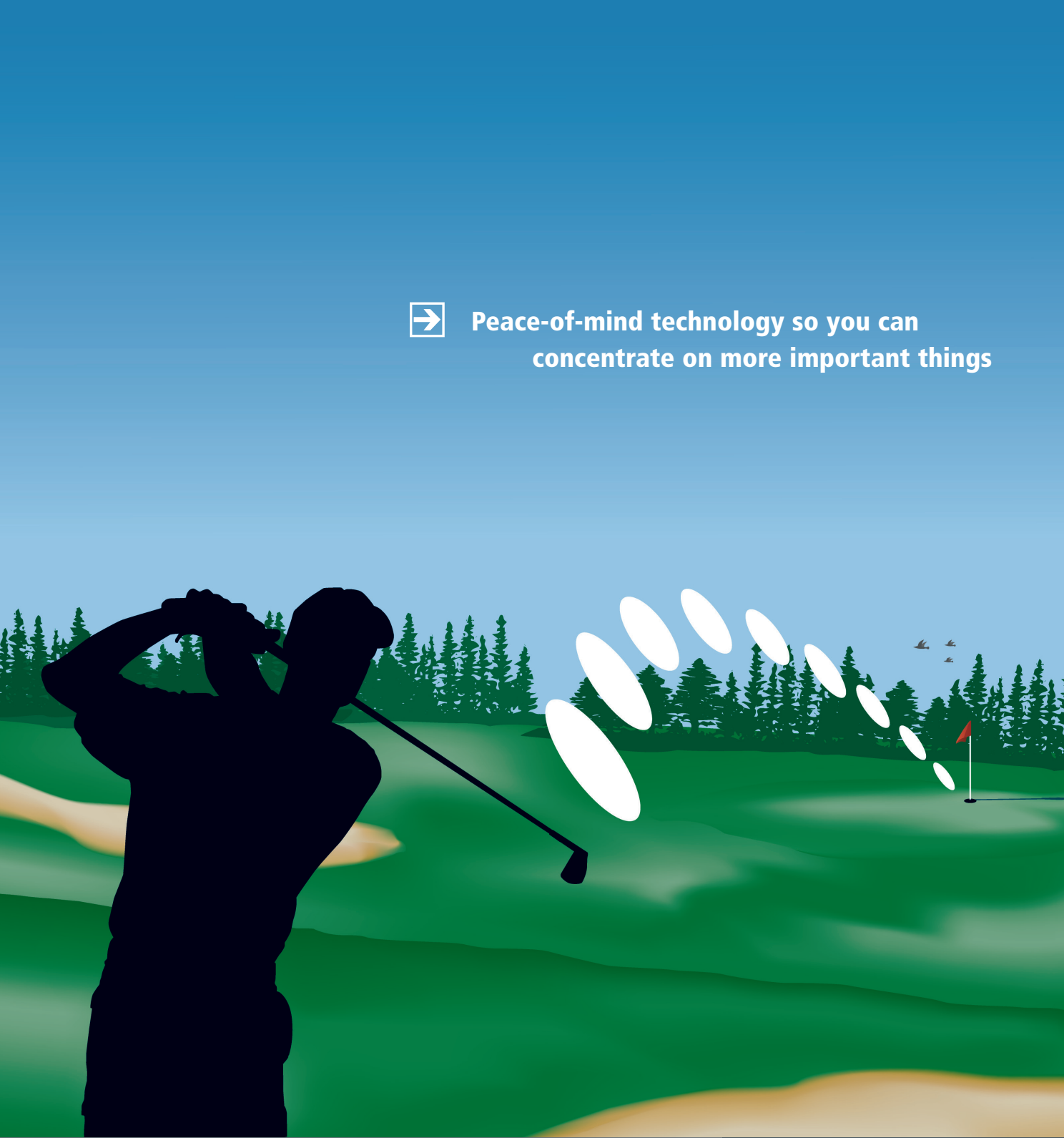
4. Define the LISP function using the DEFUN function that will be used as the call back for the reactor.

5. Repeat steps 3 and 4 for each reactor that you want to add.

6. Load the new AutoLISP file or create a new drawing to load the Acaddoc.lsp file.

Using command reactors to manage the placement of objects on a layer

The example below shows how to add command reactors that are used to switch to a specific layer when hatch or dimension



Since 1991, Transoft Solutions Inc. has been providing innovative CAD software for transportation and civil design professionals. Developed with safety in mind, our solutions can help you minimize the risks inherent in design work, no matter the size of your project. As well, they'll help you meet your objectives more resourcefully, giving you more time to get your 'hole-in-one' story straight.

To learn more about our safety oriented, time-saving products come and visit us at www.transoftsolutions.com

Transoft solutions

Driving productivity through innovation

GUIDSIGN AUTOTURN PARKCAD AEROTURN

©2006 Transoft Solutions Inc. All rights reserved. All other brand names, product names, or trademarks belong to their respective holders.

```
;; Load the Visual LISP library
(vl-load-com)

;; Check to see if our custom command reactors
;; have been loaded into the current drawing
(if (= hyp-rctCmds nil)
  ;; Add the command reactors and the custom callbacks
  (setq hyp-rctCmds (vlr-command-reactor nil '((:vlr-commandCancelled . hyp-cmdAbort)
                                               (:vlr-commandEnded . hyp-cmdAbort)
                                               (:vlr-commandCancelled . hyp-cmdAbort)
                                               (:vlr-commandWillStart . hyp-cmdStart)
                                              )
                    )
  )
)

;; Callback used when the user presses ESCape
;; or when the command ends by itself or due to
;; a problem
(defun hyp-cmdAbort (param1 param2)
  ;; Check to see if our global variable has a value
  ;; if it does then set the layer current
  (if (/= hyp-gClayer nil)
    (setvar "clayer" hyp-gClayer)
  )

  ;; Clear the global variable
  (setq hyp-gClayer nil)
)

;; Callback used when a command is started
(defun hyp-cmdStart (param1 param2)

  ;; Store the current layer in a global variable
  (setq hyp-gClayer (getvar "clayer"))

  ;; Check to see what command has been started, the
  ;; command name is stored in the param2 variable
  (cond
    ;; If the QDIM command is active then set the layer
    ;; to the Dims layer
    ((= (car param2) "QDIM")(setvar "clayer" "DIMS"))

    ;; If either the HATCH, BHATCH or GRADIENT command
    ;; is active then set the current layer to Hatch
    ((or (= (car param2) "HATCH")
   (= (car param2) "BHATCH")
   (= (car param2) "GRADIENT")
     )
       (setvar "clayer" "Hatch")
    )
  )
)
```

objects are added to a drawing using the HATCH, BHATCH, GRADIENT, or QDIM commands. These are very basic ideas just to get the concept across; really good reactors need to be aware of whether the command is being called from an AutoLISP routine to avoid conflicts with custom applications (see sidebar).

Once the AutoLISP code is loaded, make sure the layers Dims and Hatch exist in the drawing. Then create some dimensions with the QDIM command. After the command is completed you should notice that the dimension(s) are placed on the Dims layer. Then create a closed area and use the HATCH command; the newly created hatch object(s) should be placed on the Hatch layer. You could expand the concepts further by building conditionals to test other variables that might be based on existing customization so that the same program could be used by architectural and civil disciplines.

Worth the learning curve

Reactors are great for helping to eliminate additional steps that drafters might normally have to do on their own and they help to enforce a company's CAD standards. The nice part about reactors is that the code is portable between older and newer versions of AutoCAD and doesn't require undefining and redefining commands or doing things to the macros of the user interface. By eliminating the need to change the macros in the user interface, you can use the same reactors with the AutoCAD-based vertical products and achieve similar results. Working with reactors can be tricky at first—you must figure out the order in which they occur and understand their ins and outs—but with some practice you will be able to harness the power they possess.

Lee Ambrosius is the owner and operator of HyperPics, LLC an AutoCAD Consulting/Training company located in Wisconsin, USA. He specializes in AutoCAD Customization/Programming and uses AutoCAD 2004 through 2007, along with some of the AutoCAD-based vertical products. Lee can be reached via e-mail at lee_ambrosius@hyperpics.com; other contact information can be found on his Website at http://www.hyperpics.com or his Blog at http://hyperpics.blogs.com.

CAD-1

Call CAD-1 today for a free 30-day trial of Civil 3D 2007 or visit our website for our current class schedule and list of events.

CAD-1
12130 N. Pennsylvania St., Suite 101
Thornton, CO 80241
www.cad-1.com info@cad-1.com
Phone: 303•427•2231 Fax: 303•428•9720

Imagery acquired by Digital Globe. Autodesk and Revit are registered trademarks of Autodesk, Inc., in the USA and/or other countries. Autodesk reserves the right to alter product offerings and specifications at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document. © 2006 Autodesk, Inc. All rights reserved.

Managing Inventor Files

Or: Where is that Whip and Log Chain?

In today's ever-changing world, the whip and chain might be catchy, but not very "Politically Correct." Let's put a little perspective behind us. I was CAD Administrator of a mainframe CAD system, CADAM, for seven years, and was an administrator using AutoCAD® for seven years and Solidworks for two years. For the past two years, I have had responsibility over Autodesk Inventor® and AutoCAD at my company. There are two of us who use Inventor and share in the responsibilities.

Everything can be "managed" if everyone plays by the rules, but it seems that there is always a radical out there that just "has to do it his way." This is where the whip and chain comes in. The more advanced the system, the heavier the chain needed to keep those radicals in line.

For any system to work completely and to save all the users time and the company money, all must follow the procedures in place for your company. Okay, you think, just how do we get everyone to follow (without the whip and chain, or showing them the front door)? I find that it always helps to have some humor; it always makes the job more enjoyable. No one ever said that being a CAD administrator or manager was easy.

Take, for example, data files. How do we keep them accessible to those that need to use them? It can be as easy as using folders on the server, where all the production files are kept, with permissions for only a few to save files. The folders may be sequential for groups of part numbers, customer order numbers, customer names, and so on. It all depends upon what your company does and how it services its customers. There are ways to manage those files with document management systems (DMS) or project data management (PDM) software.

There are several that come to mind besides Autodesk Vault® software. I did an evaluation of several software products a few years back. An important part of the system is to make sure the system being chosen works with drawing or solid model files. Not all software management systems treat our models equally. If all you want to do is make sure the files are where they are supposed to be and that only certain users may access them, then most systems are fine. On the other hand, if you need file check-in and check-out capability as well as the ability for other departments such as purchasing and manufacturing to view your files, then you need to make sure you get the proper software. You need to make sure the committee choosing the software fully understands what is needed and why.

With Inventor there are four ways to manage files, other than DMS or PDM systems:

1. By the Windows Explorer folder method as described above.
2. By Single-user Projects
3. By Multi-user Projects, which may or may not use other DMS/PDM software.
4. Random (aka the "leave me alone, I'll do it my way" or "Radical" method).

I will go into more detail on the Single-use Projects and Multi-user projects with Inventor.

Single-user projects

After you open Inventor (version 9, 10, or 11), you will see a dialog box (Figures 1 and 2). The figures pictured here are from Inventor Pro 11. Standard Inventor 11 dialog boxes look very similar, though there are fewer paths listed.

It may even open with the Projects section visible. If not, look down the left side of the box for the Projects Icon, with the word "Projects" right below it. Click one time; this opens "Projects."

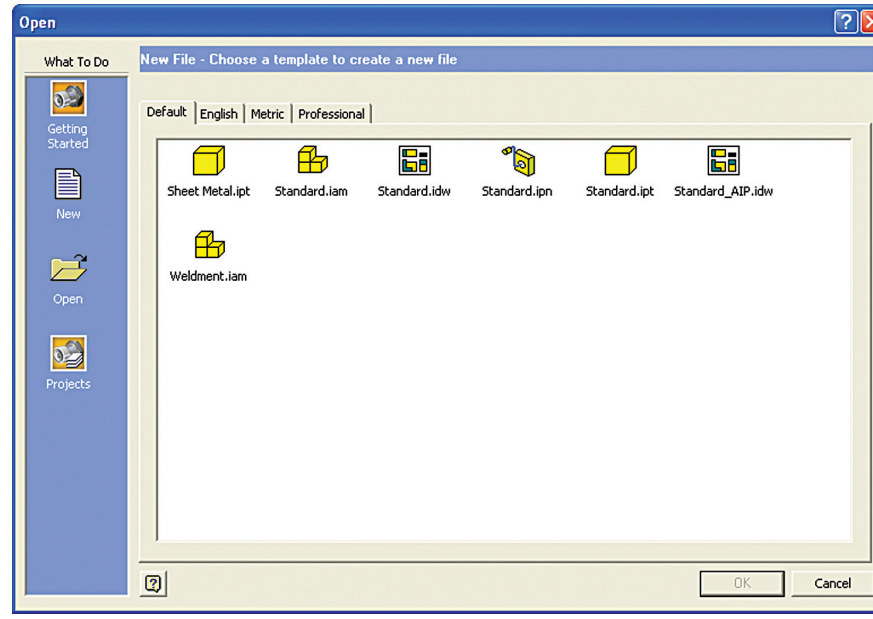


Figure 1 – Open Dialog box

If you already have Inventor open, you can click on File and, from the drop down, you may select New. This will open the Open Dialog Box (Figure 1). Or you may select Projects from the drop down, which will open the Open Dialog box with Projects (Figure 2).

This is all good, but just what is a Project?

Per Autodesk: "A project represents a logical grouping of a complete design or product, including its model files, draw-

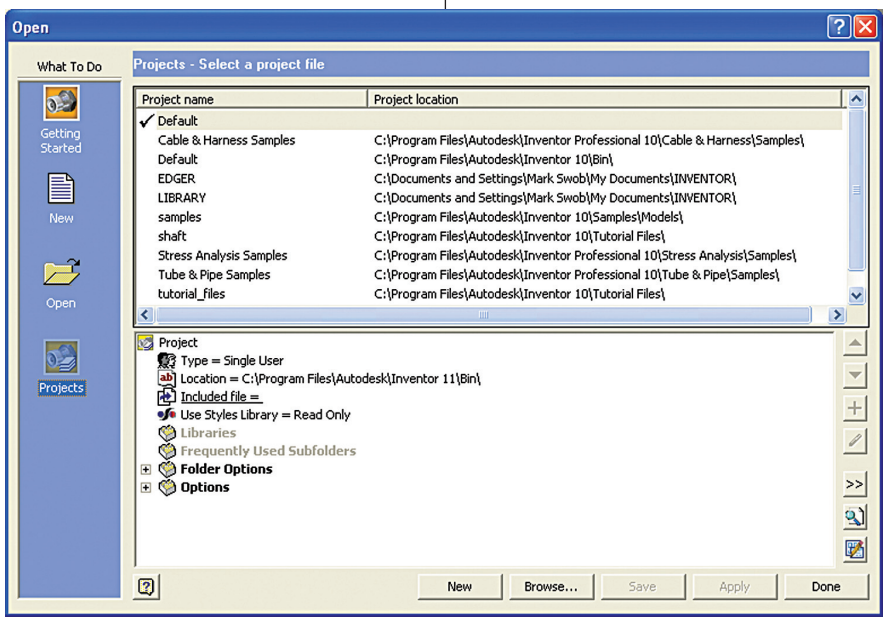


Figure 2 – Open Dialog Project

ings, presentations, and design notes." Also, "The project identifies the root folders where files are stored and the hierarchy of the product design. Data files can be stored directly in these folders or in their subfolders".

Basically, all files that you create in Inventor for a particular job or project can be saved together, which makes looking up and referencing information easier to find. One other feature is that each Project may use different sets of standard files or libraries. If you are doing a project for a specific customer, and that customer requires products manufactured by a specific company, those parts could be downloaded and put into a specific folder location and referenced with the library feature. This allows for a standard template to be set up for all common needs and revised as needed for specific projects as needed.

A few more words about libraries. A library may be a default set of the parts used throughout your company or maybe a commonly used sub-assembly on a specific end product. If you have a sub-assembly that uses a dozen parts more or less, and is common among a specific size or type of product, those product project files may have that folder with that sub-assembly listed under the library listing.

Important note: The part files that are accessed through the libraries feature are "read only." You will have to open each part file to edit that file. If you edit a part file that is located in the library, and you have used it in multiple assembly models, all of the assembly models will reflect the changed part in the library. This may affect constraints, mates, parts with associated features, and so on. Rather than change a part, it could be in everyone's best interest to add a new part to the library folder.

It is highly recommended that every part has a unique number or name, regardless of where that part is stored. Having common names or numbers, even if the parts are stored in different folders such as your project folder and a library folder, could cause a problem which could be difficult to identify, particularly if both parts are used on the same assembly. It is just good practice to avoid using common names or part numbers.

When a Project is created, a file .ipj (file extension) goes in the default folder location *my documents\inventor*. My project files are in *my documents*. Even though you use Projects, you still must create folders and subfolders for your part models and drawing files. Once you create the folders and open up the Project, it automatically knows where your models are located and you don't have to do extensive searching for those models.

These are the basics for creating and using a Project. More information is available in many resources including the manuals that come with Inventor, the online Inventor help, and other books that are available on the market.

Multi-user projects

When several users need access to the part files, you will, at some point, want to create a main assembly. You may create the assembly and as the team members update their respective files, you will do an update or refresh and your assembly will be updated.

If you have been avoiding using Autodesk Vault, you will now have to install and configure Vault. When I think of the word vault, I think of my bank with those safe deposit boxes. I suspect that many of you picture the same thing. Well, that's similar to what Vault does. If you have installed Inventor R11, Vault was installed for you. Inventor R11 uses Vault for storing information that it needs to assist you when making your assembly models. That doesn't mean you have to configure and delve into the details of what Vault is and how it works. It's just one more module that Inventor installs for its use.

Vault is a data management system that manages your files. According to Autodesk, with Vault your users never work on files while they are stored in the Vault system. Instead, Vault allows your users to check-out a file, make changes, and then check-in the file again. If multiple users check-out the same file, Vault keeps track of who has copies of all the files. If another user checks the part back into Vault, you will see what is new in the Vault after you refresh your part files.

Huh? What did I just say and is this a problem? If you are checking out the file to modify and not to be updated, you need to break the link. In other words, you want to copy the file from the Vault and not check it out. Otherwise, you check-out the file, modify it, check it back into the Vault, and all uses of that file are updated in all assemblies.

Again, this is just an overview of how multi-users for a common project works. The configuration for multi-users with libraries, etc, follows many of the same steps for single users.

There are advantages to using Projects, just as there are advantages to not using Projects. That is something that must be determined by each company. Where I work, Projects may or may not be used (sounds like the "radical" I identified earlier) and we need that log chain so that everyone follows the same path.

David Keener is a Design Engineer for SMT Industries in Sidney, Ohio, and also an Adjunct Professor at Edison Community College in Piqua, Ohio. He has been using AutoCAD for 10 years and Autodesk Inventor for more than two years. He can be reached at d_keener@smt-ind.com

ADT CAD Management – *Standards Implementation*

Why create CAD standards? They bring uniformity to a world that would otherwise be in chaos and therefore should be applied everywhere. While some CAD managers write their own standards, others use standards that are already available, such as AIA or NIBS. It is important in the Autodesk® Architectural Desktop (ADT) world to use CAD standards; otherwise the same floor plan could take on many different forms and be confusing for an end user.

Once you write your CAD standards and publish them via a "how-to" manual, on the Web, etc, how do you implement them into your drawings and ensure that they are being followed? Let's look at how to create and implement CAD standards files in ADT once you have your standards written using the CAD Manager toolbar.

Creating a CAD standard file

What's the first step in maintaining CAD standards? First, they must be created and you would begin this by opening a new drawing. Next, you need to establish the desired settings for layers, linetypes, text styles, and dimstyles. You may also have your standard Title Block included in this drawing. Finally, you must save it as a Drawing Standards file by changing the file type to *.dws. You can do this for each type of drawing you will be creating, for example, architectural, electrical, mechanical, etc.

Configuring CAD standards

Now that you've created your CAD standards file, you can associate that file with any drawing. I require my users to do this prior to beginning to draft a new drawing. Under the CAD Standards Menu, select Configure. A dialog box will open showing two tabs: Standards and Plug-ins. Select the Standards tab. Here you find displayed any information regarding the standards files associated with the current drawing, once they have been added.

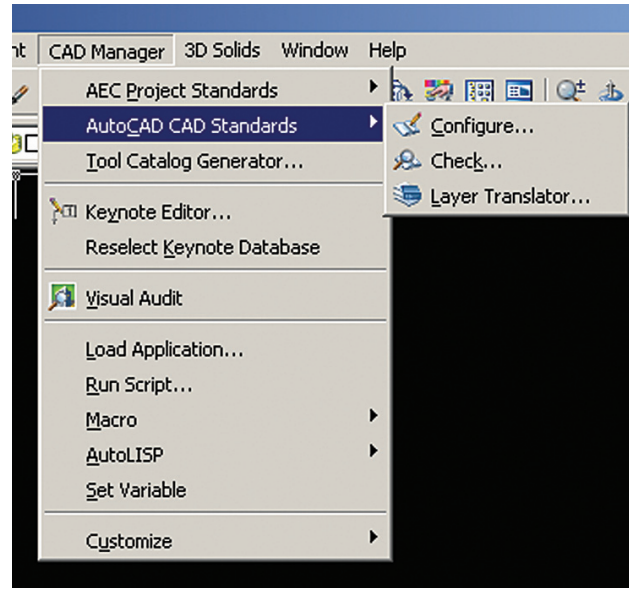


Figure 1

To add a standards drawing, click Add Standards. This will bring up the standard Windows dialog box for selecting a file. Find the file you wish to use, select it, and you will see that it's added to the list.

Multiple drawings can be added to the list; however, the order in which they appear is very important. If a conflict arises between multiple standard files in the list, the standards file listed first takes precedence. To rearrange the position of the standard files, highlight the file to be reordered and click Move Up or Move Down.

The Plug-ins tab will list and describe the standards plug-ins that are installed on the current system. One will be installed for each of the named objects where standards can be defined. You can specify which of the plug-ins you wish to use when you are auditing a drawing by selecting plug-ins from this list.

The Settings dialog box under Configure Standards gives you additional settings for your standards. You can choose to Automatically Fix Non-Standard Properties. When this item is checked, all of the properties of the objects with identical names will change to match the settings in the preferred file. You can also choose to Show Ignored Problems. When this is checked, it will show previously ignored problems when you perform subsequent standards checking. The login name of the person who previously checked it as ignored will be shown in the Check Standards dialog along with the problem associated with the item. There are a few notification settings you can choose from as well. I will not go in to those at this time, but I suggest that you review them. They are useful tools. (See Figure 2.)

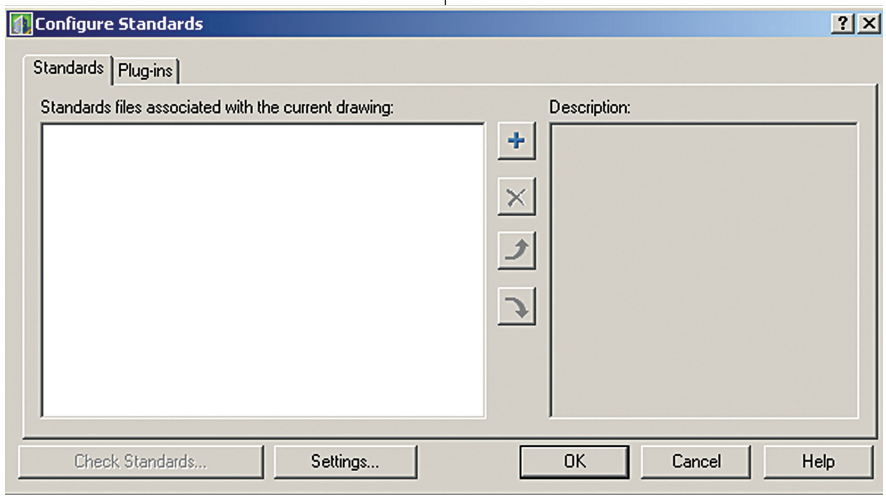


Figure 2

Checking CAD standards

Once a standards file has been associated with the current drawing, the process of auditing the drawing for standards violations can begin. This can be done immediately from the Configure Standards dialog box by clicking Check Standards. The Check Standards dialog box is divided into three main areas: Problem, Replace With, and Preview Of Changes. Each of these interacts with one another.

The Problem area of the dialog box will display a description of a non-standard object found in the current drawing. The Replace With area of the dialog box will list possible replacements for the current standards violation. If there is a recommended fix available, it will be preceded by a checkmark. If there is not a recommended fix available, no items will be highlighted in the Replace With list. The Preview Of Changes area of the dialog box will indicate the specific properties of the non-standard object that will be changed if the fix currently selected in the Replace With list is applied. You may also choose to check the box Mark This Problem As Ignored. When you do this, the login name of the user will be recorded with the fact that the problem has been ignored.

In some instances, you may want to move on to the next problem without applying a fix to the current problem. To do this, you simply need to click Next. In this case, the problem will be shown in subsequent standards checks if it is not marked ignored. (See Figure 3.)

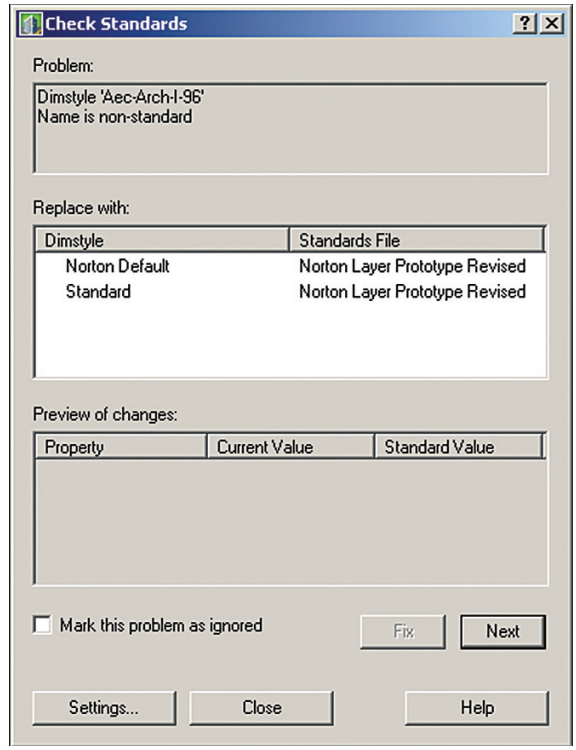


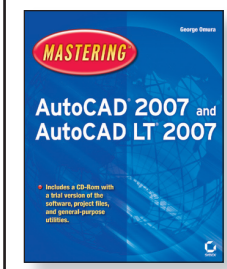
Figure 3

The Layer Translator

The Layer Translator is another tool that enables you to manage your drawings by allowing you to manage your layer scheme. With this tool, you can specify the layers in the current drawing that you wish to translate as well as the layers to which they are to be translated. I have found this to be extremely useful in incorporating as-built drawings from architects into my drawings.

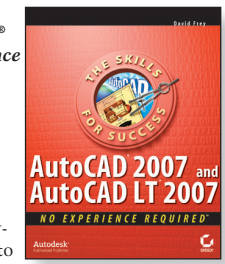
Master AutoCAD® 2007

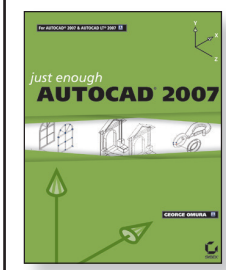
with the latest books and expert authors from Sybex.



Mastering™ AutoCAD® 2007 and AutoCAD LT® 2007
GEORGE OMURA
Serious skills for professional growth from AutoCAD master George Omura. Over a half-million previous copies in print.

AutoCAD® 2007 and AutoCAD LT® 2007: No Experience Required®
DAVID FREY
The leading AutoCAD book for beginners and a perennial topseller—this is the perfect step-by-step introduction to AutoCAD 2007.





Just Enough AutoCAD® 2007
GEORGE OMURA
Build practical skills with this straightforward guide to the basics from bestselling AutoCAD author George Omura.

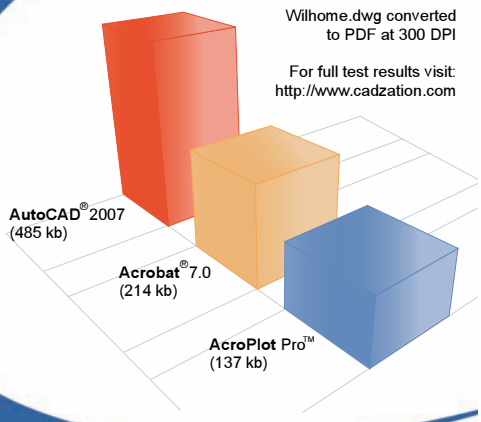
Visit www.sybex.com

SYBEX
An Imprint of WILEY
Now you know.

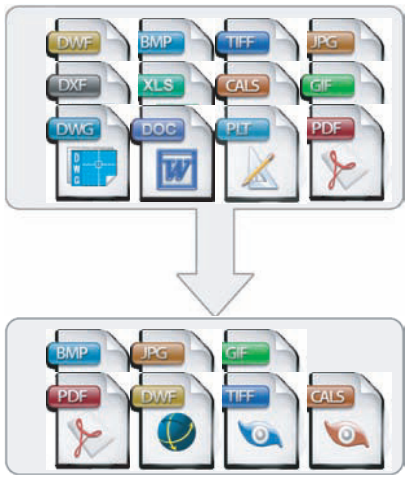
Wiley, the Wiley logo, and the Sybex logo are registered trademarks of John Wiley & Sons, Inc. and/or its affiliates. AutoCAD and AutoCAD LT are registered trademarks of Autodesk, Inc. All other trademarks are the property of their respective owners.

AcroPlot pro

Not all PDF and DWF Files are Created Equal



AcroPlot Pro™ consistently creates higher quality and smaller size PDF files.



AutoCAD 2000 - 2007 Compatible •
Batch Creation of PDF, DWF, or Images •
Automatic Bookmark Creation •
Custom File Naming Options •
Create a PDF from any Windows Application •

Try it free for 30 days.

CADzation

www.CADzation.com

Corporate Headquarters USA
518 South Route 31 Suite 200
McHenry, IL 60050
847.973.9460 Main
866.845.6881 US Toll Free

AcroPlot Pro is a trademark of CADzation. All other band names, product names, or trademarks are property of their respective owners. Copyright © 2006 CADzation. All rights reserved.

I can translate their layers into the layers I'm familiar with and vice versa.

The Layer Translator can be found under the CAD Standards menu. Once it has been selected, a dialog box will appear that has the current drawing's layer scheme shown.

The Load tool allows you to load layers in the Translate To list using any drawing file, CAD Standards file, or drawing template file. You can also create a layering scheme from scratch in which you can enter a new layer name and assign a color, linetype, and line weight to the layer by clicking New.

Transfer From will specify the layers that are to be translated in the current drawing. Layers can be specified through selection in the Translate From list or by supplying a selection filter. You will see a layer icon to the left of each layer name. If the icon is white, then the layer has not yet been referenced in the drawing. If the icon is dark, then it is referenced in the drawing. The Translate To list box will show you all the layers that are available for translating to and can be created from more than one drawing or from scratch.

Creating CAD standards gives you control over your design environment and allows you to gain more consistency in your design projects.

ed and the properties associated with each layer conversion. Here, you can select layers and edit properties by clicking Edit.

Once all the mappings have been set up, click Translate to finish translation of the layers you have mapped. The mapped new layers and their properties will replace the old layer names and their properties. If you have not mapped some of your old layers to new layers, they will be left as they were (see Figure 4).

Good for you, good for all

Creating CAD standards gives you control over your design environment and allows you to gain more consistency in your design projects. They make it easier for others to interpret drawings and are particularly useful in collaborative environments, where you have many individuals

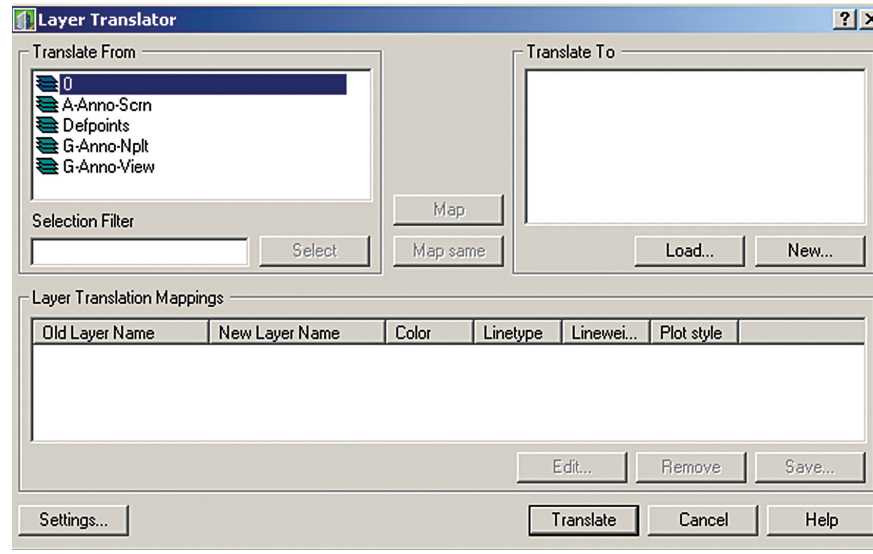
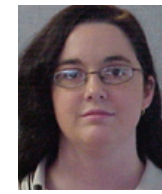


Figure 4

Map is a handy tool in that it maps the layers that are selected in the Translate From list box to the layer selected in the Translate To list box. Multiple layers can be selected with this feature. With the Map Same button, however, no selection is needed. It will allow you to map all the layers that have the same name in the two lists and update them to the same properties of the layer listed in the Translate To list. The Layer Translator Mappings list box shows each layer that is to be translat-

contributing to the creation of a drawing. Productivity will improve because standards can streamline common operations in your work area.



Melinda Heavrin is a CAD Coordinator for Norton Healthcare in Louisville, Kentucky. She can be reached for comments and questions at melinda-heavrin@alltel.net.

Reader Service Information

Fast...Easy...Efficient

Welcome to a new, easier way to get more information about the companies, products, and services featured in this issue of ***AUGI**World*. Here's all you need to do:

Go to **www.augi.com/adinfo**. Here, you can:

- send personal emails to the companies found in this issue or previous issues
- visit the websites of the companies featured in ***AUGI**World*
- send a general email requesting more information from any of the companies mentioned in this and other issues of ***AUGI**World*

Communicating with software developers has never been easier! At **www.augi.com/adinfo**, you're a click away from any company featured in ***AUGI**World*.

Advertising Index

Company	Web Address	Page#
Advanced Solutions	www.advsolinc.com/augi.jsp	Back Cover
AUGI CAD Camp	www.cadcamp.com	13
AUGI Training Program	www.augi.com/education	7
Autodesk	www.autodesk.com/bestchoice	16,17
Autodesk ATC	www.autodesk.comATC4	27
CAD-1	www.cad-1.com	21
CADzation	www.cadzation.com	26
COADE, Inc.	www.coade.com	3
IMAGINiT Technologies	www.rand.com/imaginit	Inside Back Cover
PI Integrated Systems	www.flexplant.com	5
The CAD Store	www.thecadstore.com	1
Transoft Solutions	www.transoftsolutions.com	Inside Front Cover, 19
Wiley Publishing	www.sybex.com	25

Know more. Work better.

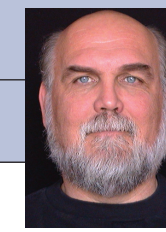
Improve your skills at an Autodesk Authorized Training Center.

Autodesk® Authorized Training Centers offer a full range of classes to help you boost your career, meet industry requirements, increase your productivity, and stay on top of the latest technology. With over 1,000 convenient locations worldwide, they're the only training facilities authorized by Autodesk. And the best place to go to get ahead—and stay ahead—in your career. For details, go to www.autodesk.com/atc4 or call 1-800-964-6432.

Autodesk®

© 2005 Autodesk, Inc. All rights reserved. Autodesk is a registered trademark of Autodesk, Inc., in the USA and/or other countries.

On The Back Page



David Kingsley

3D or Not 3D? There Is No Question!

By now you are probably aware that one of the key new feature sets in AutoCAD® 2007 surrounds the major overhaul in the area of 3D modeling. If you are a long-time reader of this column, you may remember that I started using 3D CAD in 1981. I've seen a lot of 3D modeling software come and go since then.

This column may sound a bit critical of AutoCAD 2007's 3D upgrade, but it is not intended to be. At the close of a couple of whiz-bang AutoCAD demos, I have already heard folks ask, "Why do we need Inventor?" Well, I'm going to tell you, and so will the Autodesk sales crew.

TriSpectives

I first learned the fundamentals of the "push-pull" 3D modeling concept in 1995 using a product named "TriSpectives," which was an eye-popping vision of the future. It required Windows 95, which was the big thing at that time. People camped out overnight to buy a copy of Win 95 at midnight on the official release day. Yours truly was NOT one of those people. The Stones "Start Me Up" was the official theme song. We were in the new graphical user interface la-la land. I wish I'd kept the old TriSpectives manual, because just looking at it reminded me of a truly inspirational era. TriSpectives evolved into IronCAD, which is still on the market today.

Google SketchUp

A current incarnation of push-pull 3D is an amazing product called "SketchUp." It is so good that Google purchased the company just a few months ago. If you are familiar with Google Earth (the latest eye-popping vision of the future), turn on the 3D buildings and you will see SketchUp models. Or you can download the new free Google SketchUp plug-in and create new buildings. SketchUp's front man, Brad Schell, is a former Autodesk employee and now holds a firm position on my personal CAD Visionaries list. Their offices are a block from my number one favorite coffee shop, the Trident Café, in Boulder, Colorado. I've had caffeine-induced visions with Brad and his posse watching SketchUp evolve over the years. AutoCAD's 3D upgrade may be a little bit of "catch-up" at this point.

What is bi-directional associativity, Mrs. Olsen?

If you are an AutoCAD 2D user in the manufacturing field and find yourself awed by the new 3D features in 2007, you may be considering a 3D upgrade. You should not consider AutoCAD 2007 for production 3D. That may sound harsh, but Autodesk Inventor® is simply in an entirely different league and should be your clear choice. AutoCAD 2007 3D doesn't come close to Inventor, and frankly, that is the intent.

I can answer the question "Why do we need Inventor?" with two terms: drawings and bi-directional associativity. Once you make an Inventor model, drawings are almost a byproduct. They fall out so fast that I avoid letting my clients watch me work. You dimension only once, at the modeling stage. The same dimensions that control the model appear on the drawing. You can edit a dimension on the model and the 2D drawing is automatically updated, AND you can edit a dimension on the 2D drawing and Inventor reaches back and changes the 3D model, thus, bi-directional associativity. Letting the machine instantly manage these details for you is the reason computers were invented.

From my cold, dead fingers

We all know AutoCAD users who will give up their "right click to enter" menu when we pry their cold, dead fingers from the mouse. Does Inventor have a serious learning curve? Yes, it does. But learning is a good thing! It builds your self-esteem and gives you hope for the future, which for many is in short supply these days. I have been consulting on AutoCAD and Inventor for years, and teaching is easily my most rewarding activity.

I recently contracted on a project where we made the master 3D model in Mechanical Desktop 5 and spit out 2D blocks into AutoCAD 2000 for drawings (clearly not my choice). The design was constantly changing and we chased our tails to maintain the drawing package. The margin for error was enormous. Being a guy with Inventor 11 at home, it was extremely laborious, senseless, and frustrating for me. Even the clients, who were marketing types with little CAD knowledge, knew that things were not moving forward fast enough. Simply put, the real world now expects more productivity than 2D AutoCAD can deliver.

Life at 80

On another job, we joked that I was bringing the company from the 19th century to the 21st, entirely skipping the 20th. The company still sells products it designed in the 1950s with designers who were then in their '60s. I transcribed those drawings into Inventor. Walt was the manufacturing guy with 30 years of the company's secrets documented in his notebook and stored in his brain, and was soon to retire. After a 15-minute demo of Inventor, Walt summed it up like this: "So with that thing, you could build your prototype right on the screen and never build a bad part!" I can only hope my brain works that well when I'm 80.

David Kingsley served from 1999-2004 on the AUGI Board of Directors and is the Director of Electrons at CADPlayer Web Courseware. He can be reached at djkingsley@cad-tv.com

Beyond Software. **A Solutions Provider.**

At IMAGINiT, we are more than software solutions…we are a solutions provider. That's why highly successful companies like yours can increase the return on their investment by calling on our knowledge and experience to link design technology, and new possibilities, all to boost your productivity... and your competitive edge.

IMAGINiT is your trusted solution provider for:

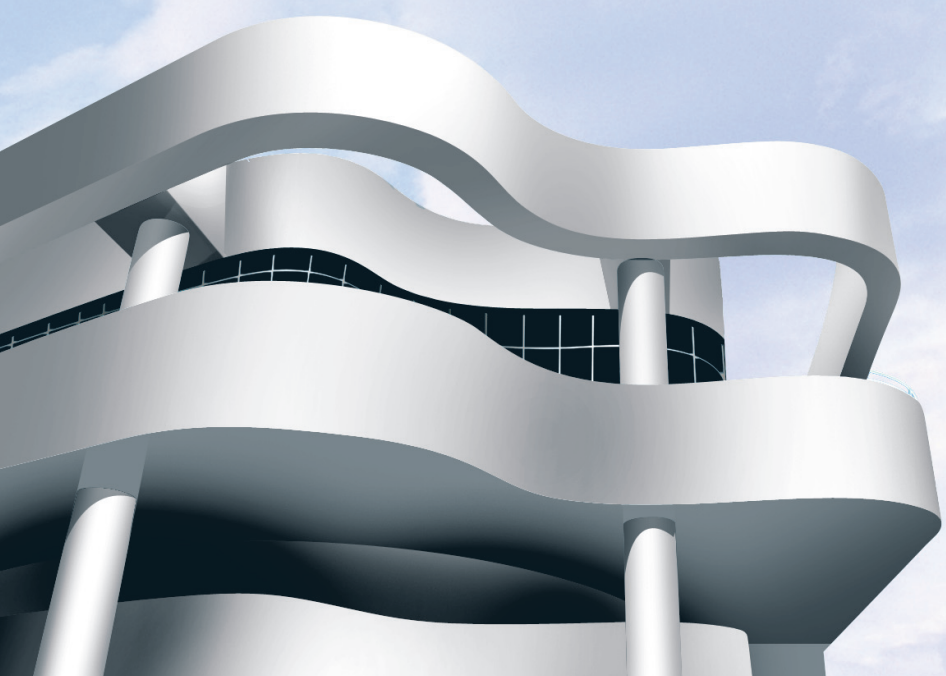
- Technical training
- Implementation of design-process
- Software development
- Consulting on business-critical requirements
- Data and document management
- Asset management to increase revenue potential

With a complete line of design and engineering solutions—including the Autodesk family of products — and a global reach of more than 30 branches, IMAGINiT is your engineering solutions partner providing the essential link between design, technology & new possibilities.

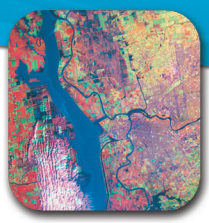
IMAGINiT
TECHNOLOGIES
A RAND Worldwide Company

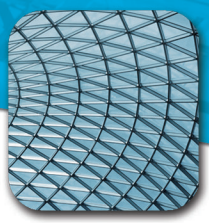
United States: 800-356-9050
Canada: 800-461-9939

www.rand.com/imaginit



Autodesk
Authorized Value Added Reseller





Beyond the Box...

Since 1987, **Advanced Solutions, Inc.** has focused its business model on delivering and supporting Autodesk software solutions. As a full service authorized reseller, **ASI** offers software sales, training, implementation, customization and local support to ensure a successful investment with the Autodesk products. **Advanced Solutions** has developed a rich understanding and capability on how to deliver solutions that meet customer needs.

We are authorized to support Manufacturing, Building, Infrastructure, Media & Entertainment. We specialize in the Federal, and Local Government Solutions.

Advanced Solutions provides a wide array of software engineering services:

- CAD/CAM Automation
- Autodesk AutoCAD Plug-ins
- Design Verification
- Simulation
- Facility Location Analysis
- Facility Layout Design
- Material Flow Analysis
- Computer Simulation modeling
- Supply Chain Analysis & Optimization
- Quality Control Systems Design
- Process Simplification/ Re-engineering
- Warehouse Management Systems Specifications
- Automated Material Handling Systems design
- Inventory Control Design
- Ergonomics Program
- Product Slotting and Profiling
- CADD and 3D Rendering Services
- Bid Management

Custom software - If you have a problem that can be solved with software, let us know. Our team of experienced developers can build nearly any type of application or utility including: plug-ins, file-format converters, filters, importers, exporters, database, forms, web applets, client/server, and more. If you are dreaming of the perfect software application, let us turn it into reality.

Visit www.advsolinc.com/augi.jsp for a free quote

AUGI Member Special: Join our CAD Club and get Unlimited Training and Phone Support for 1 full year just $1595.*
Visit www.advsolinc.com for available classes and facility schedule
* Price per user for scheduled classes only.

Autodesk®
Authorized Value Added Reseller

Advanced SOLUTIONS
Since 1987

www.advsolinc.com 1-877-GETASI-1
Louisville, KY Lexington, KY Elizabethtown, KY Cincinnati, OH Columbus, OH Fort Wayne, IN Evansville, IN