



## President's Greeting

I would personally like to welcome you to our quarterly e-newsletter. We hope that you will find this both interesting and informative, while enhancing your overall IronCAD experience.

We at IronCAD believe in listening closely to our customer feedback and using this to help define the way we move forward. This enables us to develop and deliver leading edge solutions that closely match the needs of our ever growing customer base. Ultimately, we strive to deliver solutions that will enable you to become ever more successful.

Since its inception over 15 years ago, IRONCAD™ has continued to steadily grow and evolve to become a leading design solution. Sales have increased year on year even throughout last year's economic recession while many of our competitors incurred heavy losses. We believe this clearly shows that our unique approach to delivering real productivity is vital in helping our customers remain productive and profitable.

IRONCAD Next Generation "XG" is a clear example of our commitment to achieve our goals. We have built on our traditional strength of providing true design flexibility that enables our customers to achieve their design goals quickly and efficiently. In addition, we have been able

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to incorporate a significant portion of our customer requested functionality that will significantly increase your overall design productivity. If you have not experienced IRONCAD XG, we would welcome the opportunity to introduce the key capabilities that can increase your design productivity.

I would like to take this opportunity to thank every one of our customers for your continued support and patronage. As we move forward, the team here is busy building on your valuable feedback so that we can continue to improve the product further and to identify ways we can better serve you in the future.

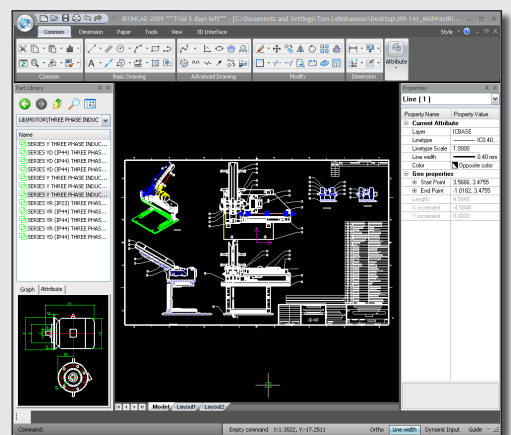
Best Regards,  
Dr. Tao-Yang Han

## Announcing "IRONCAD DRAFT"

Following the success of the recent launch of the integrate and standalone CAXA 2D technology, IronCAD will be expanding our product portfolio with "IRONCAD DRAFT". This product offering is targeted for customers who need a low-cost 2D design environment that is highly compatible with the AutoCAD® interface and DWG/DXF file formats.

IRONCAD DRAFT is built on the combination of IRONCAD 3D and CAXA 2D technologies that have thousands of existing users and a wealth of experience in their respective areas which immediately bypasses this as a newcomer to the market.

Unlike other 2D applications, IRONCAD DRAFT is built on the IRONCAD foundation allowing users to import/export industry standard 3D formats to assemble, interrogate, analyze, communicate realistic renderings/animations, and leverage the 3D in the detailing process. In the detailing process, a "3D Interface" ribbon tab is available that allows the ability to detail 3D designs using standard views, section views, detail views, and many others useful to layout the design data while having full association to the 3D data. In addition, users can easily share native IRONCAD data between the applications and have similar environment to expand into IRONCAD when their needs for 3D Design arise.



Visit <http://www.ironcad.com> in the May/June timeframe for addition information on IRONCAD DRAFT launch later this year.

## IRONCAD, LLC Releases Product Update #1 for IronCAD Next Generation "XG"

### IRONCAD XG 2009 PU1 Delivers Extended Functionality and Significant Quality Improvements

This latest offering enhances the capabilities of IRONCAD Next Generation, IronCAD's award winning 3D design solution, which brings unrivaled productivity and functionality to designers. By combining the flexibility and creativity of innovative modeling with the parametric power of structured design into a single modeling environment, IRONCAD Next Generation gives designers and engineers greater design freedom and flexibility to get products to market faster with better quality. IRONCAD XG Product Update #1 extends productivity by providing many additional user requested features to streamline the design process.

A sampling of the improvements includes:

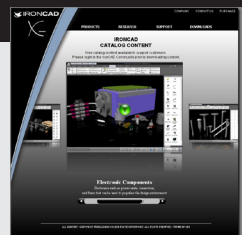
- Double-Click Middle Mouse to Automatically "Fit Scene"
- Hot-Key Assignment for "Edit Sketch" and "Edit Feature" Support
- Command Preview Highlight Improvements
- Command Right-Click Action Options To Streamline the Design Process
- Options to Perform Statistics on Imported Data After Import
- Large Assembly "Import as Reference" for Improved Memory Consumption
- Use Scene Name for Drawing Name as Default Streamlining Standards Tasks
- Default Template Locations for Images and Catalogs for Ease of Access
- Copy and Paste Support in Property Browser Fields to Support Reuse of Values
- Multiple Part/Assembly Drag & Drop in Scene Browser for Easier Organization
- Display Performance Improvements Using Hide-by-Size Options
- 3D Measurement Tools to Help Determine Clearance and Size Information
- Official Support for the Window 7 OS
- For a full detailed list of new features and quality improvements, visit <http://www.ironcad.com/support/updates/ironcadxgpu1/XGPU1Readme.htm>

IRONCAD Next Generation Product Update #1 is available for immediate download to all active maintenance customers from [www.ironcad.com/support](http://www.ironcad.com/support) An evaluation copy of the IRONCAD Next Generation product that includes quality updates is available for download from <http://www.ironcad.com>.

### Free IRONCAD™ Catalog Content Now Available

Content used to populate the design environments has been exclusively made available to IronCAD active support users.

Visit: <http://ironcad.com/catalogcontent>



### IronCAD Signs New Reseller in Russia

#### "3D Industry" is the latest company to join IronCAD's growing reseller network

IronCAD, LLC, is happy to announce the signing of their latest premier reseller, "3D Industry" based in Russia. 3D Industry is a company with professionals whose primary focus is on 3D design within various industries. The company is excited to join the reseller network team and has launched the first Russian website ([www.3din.ru](http://www.3din.ru)), dedicated to the IRONCAD and INOVATE product offerings from IronCAD, LLC.

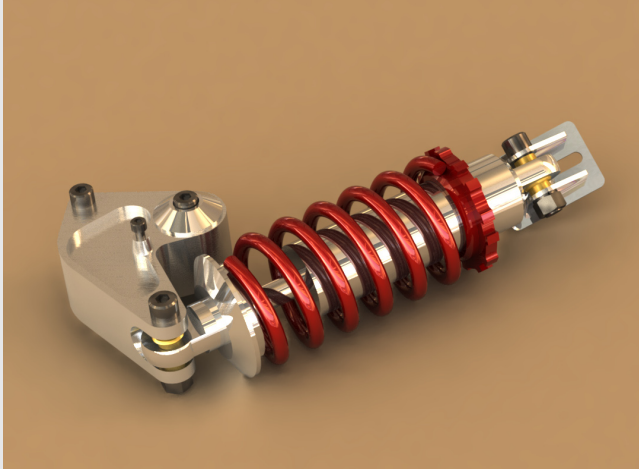
"We are familiar with many CAD systems which we have applied in our previous design tasks. Of course each software has its advantages and disadvantages. However IRONCAD, with the help of the unique and simple TriBall® utility, provides more freedom and flexibility in the modeling process. The TriBall is not a classical command tool, but more of an instrument that successfully allows users to work with virtual objects as you would with a physical object in your hand which drastically reduces time and complexity of the modeling process. It combines the capabilities of displacement, rotation, alignment, copy, and many others into a single tool to eliminate the need to worry about each step of modeling process. Using this tool along with IRONCAD's design flexibility, you will have more time and freedom to design the boldest and most challenging projects.", stated Yaroslav Sinitsyn, President of 3D Industry.

"IRONCAD 2009 Next Generation "XG", is a powerful system that can be used in any industry. This version allows users the ability to quickly and efficiently create 3D models, visualize projects, and has a powerful industry standard 2D design system for detailing designs or even designing 2D elements from scratch. This unique offering is not only available in the Russian market, but also throughout the world." he added.

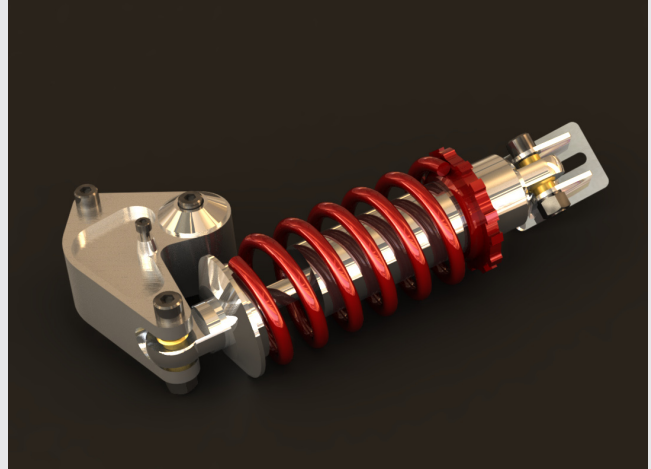
## IronCAD Signs New Reseller in Russia (continued)

"We are excited to establish partnership with 3D Industry in Russia. Their background and design experience will be a valuable offering to customer in the Russian market. We are confident that 3D Industry will help grow the IRONCAD product and will be able to develop strong customer relationships that use IRONCAD as the foundation to excel users design capabilities and quality while reducing their design to market time." stated Richard Serna, IronCAD's Director of Channel Sales.

### Rendering of the Quarter; Hi-Performance Racing Shock



IRONCAD "XG" offers a wide variety of realistic rendering capabilities as well as common material catalogs. Enable the material catalogs by turning on the "Rendering" catalog set which includes glass, wood, plastic, paints, and other materials. Keep in mind when rendering, the use of 3D Environments enhances the rendering with more realism that is less taxing on the system compared to many light sources and effects.



Which of these renderings do you think is the better rendering? Visit the [IronCAD Rendering Forum](#) to post your comments.

Submit your rendering work in the the [IronCAD Rendering Community](#).

### IronCAD Reseller Launches "JRIV" - Encompassed Design Engineering Solution

Magnacad Design Inc. delivers IronCAD with FEA, PDM , and more in a single solution.



Magnacad Design Inc. a leading provider of CAD, CAE and PLM solutions has announced the launch of their new encompassed design engineering solution bundle - JRIV. Developed to fill many needs, JRIV can reduce time and overhead of manufacturing companies that require total design, engineering, and data management solutions. JRIV addresses this need and surpasses it by incorporating the most productive solutions with the most cost-effectiveness. And, in addition, provide technical abilities beyond any other solution currently on the market.

The components of JRIV were selected based on ease of use, advanced technology, and cost of ownership. "We have created a solution that has met these objectives and more." says Tom Lehnhaeuser, president of MDI, and he adds, "We successfully created a bundled solution using IronCAD 3D design application as the core foundation upon which the other applications would integrate."

The three primary applications powering JRIV are IronCAD from IronCAD, LLC, Element from Range Software, and DesignDataManager™ from CSI, Ltd. These three formulate a single integrated solution for:

- Design/Engineering
- Analysis
- Product Data Management and Workflow

Also, additional modules can be implemented as needed for Cable and Wire Harness design and 3D PCB design. MDI has provided additional features through the use of freeware and open-source applications all at no extra cost! "The free and open-source applications included obviously can be retrieved independently by users worldwide, hence the reason no costs were applied to the JRIV product. "We took the liberty of doing the research and providing the ancillary applications with JRIV simply because it saves the customer time from this task themselves. Aside, we have created custom integrated toolbars and menus to use with these applications so as the installation and user experience is fully seamless to the end user." states Tom.

Some Open-Source or Freeware integrated functions included are:

- Web Conferencing (up to 10 attendees) with Screen Sharing
- Vector-based Desktop Publishing
- Screen Video/Audio Capture
- Unit Conversions Tool and more

You can view a more comprehensive list at: [www.magnacad.com/JRIV/JRIVCompChart.html](http://www.magnacad.com/JRIV/JRIVCompChart.html)



There has been a significant amount of press concerning the feasibility and usefulness of CAD running on the Cloud. Cloud computing in the simplest terms is delivering hosted application to end-users over the internet without the need for the end-users to install products on the client's machine. Significant innovations in virtualization and distributed computing, as well as improved access to high-speed Internet, have accelerated interest in cloud computing (read more).

A cloud service can operate as a Public or a Private cloud. A public cloud sells services to anyone on the Internet. (Currently, Amazon Web Services is the largest public cloud provider.) A private cloud is a proprietary network or a data center that supplies hosted services to a selected group of people. Typically, larger enterprise organizations will

implement private clouds and small to medium organizations will utilize a public cloud.

For enterprise users, the cloud can offer a significant savings by allowing data to be shared through the company on an on-demand need while potentially allowing the IT department the ability to lower the need for high-end workstations for CAD data. In addition, the cloud based service provides a simple mechanism to upgrade users to the latest version of the software throughout the company which can save IT time both on installation and troubleshooting client machines. However, enterprise users usually have high requirements on the access downtime, security aspects of the data, and where this data is stored for IP rights. Due to this, enterprise users may end up hosting the service internally as a private cloud which will increase the IT staff and computing requirements within the IT server usage. Private clouds may negate some of the savings due to the IT expense and hardware initial cost and upgrades. Overall, savings could be realized but it may require long-term project planning and commitments to achieve the goal.

For small to medium business users, the public cloud can potentially offer savings by allowing users the ability to rent the software as needed (on-demand service). Of course this depends on the rental fee and the amount of instances the software is rented. This can work well if the users are experienced users of the software and projects are well defined for the amount of software usage needed or limited time is needed for the software. In addition, using the public cloud can reduce the cost on high-end workstations to operate the software due to the computing being performed in the cloud. However for CAD users that spend a great deal of time designing, they usually prefer the above average performing workstations along with screen real estate (usually requiring multiple monitor displays) which normally requires a system with a decent graphics card. Due to this and with internet bandwidth potential issues with 3D CAD display performance, the savings that could be made with the public cloud on hardware may not actually be realized if the users are not willing to part from their traditional usage. Also if the requirements are heavy on the software usage, the renting cost could end up higher than the cost of an annual subscription (which also normally includes community access and support services that may be additional charges for the cloud renting).

For the CAD medium to heavy usage user, the cloud presents potential strengths but it is yet to verify if it can really deliver on these. For example, one of the potential strengths is the ability to have extensive computing to perform intense calculations faster. However, workstations are making strides in this area along with the application providers to where this benefit may not increase the usage of the cloud. CAD users in general are accustomed to workstations with decent graphics cards along with instant access to files. Running over the internet for the access of larger CAD files may prove to be a hindrance especially when there are high graphical display requirements for visualization. In reality, will CAD users be willing to run on simplified machines running over an internet connection?

IronCAD, LLC has followed this trend since its early stages and will continue to follow the needs of our customer to offer the best overall solutions and savings. The cloud in many ways offers advantages to us as a vendor by means upgrade maintenance and accessibility, but our priority is on our customers' needs. Many of the advantages offered by the cloud can be solved by other means while maintaining the current infrastructure companies have in place which allows our core focus to be on development of productivity solutions. We welcome your feedback and needs on this subject to gauge our involvement on this capability in the future. Please visit <http://www.ironcad.com> to contribute to the discussion.



**Abstract.** A Bridge Maintenance Frame required a FEA (Finite Element Analysis) for a client with the objective of reducing the lateral deflection of the frame from 7" to 3/4". I produced the solution within 10 hours using a combination of Mathcad™, IronCAD, FEMAP™ and NEi Nastran™ FEA software.

This study was required to understand the structural adequacy of a mobile frame and catwalk designed to be used for bridge maintenance and repair by a crew of maximum two occupants. Its design needed to meet Occupational Safety and Health Administration (OSHA) requirements. The FEA showed that the lateral deflection was reduced from 7" to 3/4" as desired.

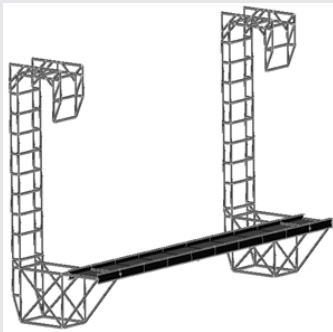


Figure 1

### Description of the Problem

A bridge maintenance frame was arbitrarily modified by the fabricator. The base of the frame was doubled in width. This is a typical example where no thought was given to the response of the platform such as lateral deflection due to the increase in width of the platform. The original fabricator maintained the single 2x2x0.124 HSS made from steel. During the modification study, the shop proposed the use of double the original 2x2x0.124 HSS without any offset. I promptly demonstrated that a 6" minimum offset would be required to take advantage of the parallel-axis theorem use of the square-influence of the offset dimension multiplying the cross sectional area of the HSS (See Figure 1)

### Proposed Solution

Manual calculations using Mathcad indicated that the solution was to offset the vertical members from the bottom of the platform to the top and around the C-shape of the lateral portions of the frame at minimum, six inches. The final geometry is shown in Figure 1.

### Method of Solution

The solution was made most effective by the use of the combined application of Mathcad (for manual calculations), IronCAD (for solids modeling), FEMAP (for FEA Pre- and Post-processing) and NEi Nastran (for FEA solution) for the structural deflections and stresses. I have used Mathcad, IronCAD, FEMAP and NEi Nastran for over twelve continuous years and find such combination of analytical tools to be the most cost-effective method of solution especially for solo-consultants.

### Mathcad Manual Analyses

The first step in a structural analysis is to determine, at a global level, the geometry and material to be used for a given set of loads. Mathcad is the best cost-effective means of achieving cost-effective and prompt solutions. Once the most promising design candidates are selected, then the generation of detail geometry proceeds to be performed using IronCAD solids modeling.

### IronCAD Solid Modeling

IronCAD, which I believe is the best solid modeling software, easily allows me to create a full 3D solid model of the frame. Additionally, IronCAD is especially useful for analyst engineers since it allows the "slicing" of 3D surfaces and solids to accommodate the FE (Finite Elements) entities (nodes and elements). With its short learning curve and ease of use, I can shorten the project time by spending more time on the analysis versus the design aspects.

### NEi Nastran Finite Element Analyses (FEA)

In order to effectively ensure the requirements mentioned in the abstract above, I used NEi Nastran FEA software to run a structural analysis. The mesh consisted of plate and beam elements for the walking surfaces and tubular elements for the supporting structure. A steady-state gravity load was applied, in accordance with OSHA requirements, to represent the weight of the occupants. Lastly, fixed constraints were placed on the supporting structure to represent real world conditions. The FEA model shown in Figure 1 was created using IronCAD and Figure 2 shows the FEA solution.

The model was analyzed with the objective of reducing the lateral deflection of the frame from 7" to 3/4". By using the NEi Nastran FEA software, I was able to adjust localized structural properties (such as moment of inertia by offsetting a new HSS member) to produce reactions at the supports, as well as beam and plate stresses and deflections. With these tools in hand, both the customer's and OSHA's specifications were met before any prototypes had to be manufactured.

Having used the software for over 14 years, I believe that NEi Nastran is truly reliable software allowing me to make a commitment to my consulting client and deliver without any delays.

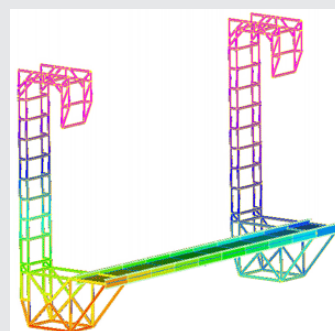


Figure 2

## Bridge Maintenance Case Study (continued)

### Conclusion

This case can serve as a cautionary case due to the ease of use of current FEA software at affordable prices. It is recommended that, at a minimum, companies should have their design reviewed by either in-house consultant or independent consultants to ensure that a FEA user has not made critical errors during the FEA modeling and interpretation of results. This warning is especially of greatest importance if the design is mass produced such as consumer products with potential harm to the users in the event of a structural failure.

### About Julio Banks

Julio C. Banks, MSME, PE & CGC is the owner of J. C. Banks Construction, LLC established in 1993. Julio has had direct experience in the analysis and design of thermo fluids

(incompressible & compressible) flow as well as structural engineering consulting. He has worked in diverse industries such as Fossil and Nuclear (Stone & Webster), Military-grade Weapons (General Electric), Turbojet (Pratt & Whitney) and Turboshift (Pratt & Whitney and Siemens-Westinghouse), Airframes (Northrop Grumman, and Piper Aircraft), as well as commercial and residential construction including General Contracting. Numerical Analysis and Solution Methods is his passion and he considers the subject of computational algorithms a hobby.

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### Andy's Passion for Racing

Back in the early 1990's, we saw the end of the Cold War that brought an end to decades of political uncertainty and unrest.

For Andy Robinson, a hard working engineer with a young family to support, it also brought to an end his promising career as a design engineer with Marconi, one of the UKs' leading defence contractors. In a heartbeat, Andy took the brave decision to take his long standing hobby of drag racing and to turn it into a business that would go on to support him and his family. Operating from little more than a shed at the end of their garden, Andy started up his own business, designing and building race car chassis.



Today, operating out of 4500 sq ft of purpose built workshop just outside Basingstoke employing 8 full time staff and 3 part time, Andy Robinson Race Cars (ARRC) build chassis and roll cages for the motorsport marketplace and while they tend to focus on the drag race cars, they have also branched out and now regularly build chassis and cages for historic races cars, rally, and even historic Formula 1 cars.



Andy really has been able to make the change and to take this from a hobby to a professional business, but this has not been without its challenges. "We are able to deliver a truly professional level of service to amateur racers." Andy explains. In the drag racing field where he is already very well known, this is fairly simple. However when branching out into other areas of racing, it is essential that he can demonstrate the quality of his work and establish credibility if he is to succeed.

Seeing Andy's work, it is obvious that he has brought the structure and dedicated approach to race car design that one would normally associate with his previous life as a Marconi engineer. To develop and design chassis and roll cages, they would obviously need a CAD tool. As an experienced CADD5 and Unigraphics user, Andy certainly knew his CAD. But he needed something simple to use so that anybody in his team could sit down and design. More importantly, he wanted an environment where they could manipulate, change, and alter designs in 3D easily and on the fly. For ARRC, 3D is the only way to design. They can work through the design model with customers to ensure they are happy, and where necessary, send 3D models out to suppliers for quotes. Only when the product is defined and the customer has actually placed the order will they worry about producing 2D drawings.... If at all!

*In 2006 ARRC looked at the major CAD products on the market and IronCAD stood out, clearly thinking the way that they did:*

- **Enabling them to work dynamically in 3D**
- **Flexible and extremely easy to use**
- **Able to produce 3D HTML content for their website**
- **Plug in FEA application to enable designs to be checked and analysed in house.**

*At the time, they initially purchased 1 copy of IronCAD and have now expanded and taken on a second. IronCAD is now their primary design tool and is used for all development work and for creating 3D content for their website.*

## Andy's Passion for Racing (continued)

The use of CAD has allowed Andy to become far more competitive by effectively taking single deals and turning them into a multiple business opportunity.



Today, many of the ex works touring cars are now in the hands of private clubman racers. These cars still get bent and broken most weekends, but without the support of a factory works team and parts available off the shelf makes it a real challenge keeping these cars running. Recently, one such racer came to ARRC with a broken suspension upright from a SEAT race car to be repaired and rewelded. A common problem and one that possibly dozens of drivers were dealing with across Europe. Using IronCAD, Andy was able to reverse engineer the part, create a 3D model for evaluation, from which he was able to understand the structure of the upright that

allowed him to look for weaknesses in the original design. He was then able to go out to a number of machine shops for proposals. Having created the part, Andy was then able to show it on his website and approach other SEAT race teams to offer them replacement uprights as well. Using CAD had enabled Andy to take a single welding repair and use it to develop a standard part, which he could stock and sell to all in the industry.

In addition to the custom development of chassis and roll cages, ARRC now offer a range of off the shelf parts for the racing industry including brake components and specialized fuel distribution units. All designed and developed in-house, and sold via their website to racers throughout the UK.

Business is booming for Andy and the company is going from strength to strength. A walk through his workshop, you will see dozens of cars begin developed and prepared. But in the far corner, behind the TVR race chassis being built from scratch, the Shelby Cobra in for a FIA spec roll cage, the various ProMod and drift cars, lies Andy's own car, a 230mph ProMod Studebaker. A stunning car that he has campaigned for 6 years and one in which he has won many events and was able to win the 2009 MSA British Drag Racing championship.

Now in 2010, while Eastern Europe is starting to wake up to Drag racing and as the abandoned airfields across Poland, Croatia, and the Russian CIS states are now being converted into 1/4 mile drag strips, ARRC will be on hand to provide parts and advice to help develop the sport.



Andy is now one of the driving forces behind the sport which is now bringing the old Russian airstrips back to life; a fitting tribute to Andy who once was made redundant by the end of the Cold War.

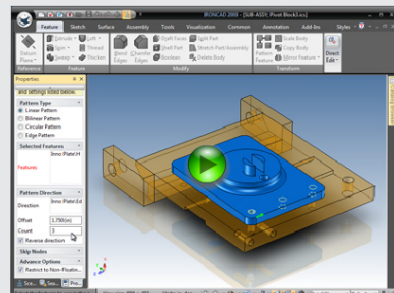
## IronCAD News Tidbits

- IRONCAD "XG" Product Update #1 Officially Supports Window 7®
- IronCAD Exhibited at Euro Expo in Tromsø, Norway
- East Valley Institute of Technology Educates Students On IRONCAD
- Subscribe to the [2010 Announcement Forum](#) for All the Latest News!

## IronCAD Learning Center Video Highlight

In IRONCAD "XG", you may have noticed the new "Pattern Feature" command and wondered how is this any different than the existing TriBall pattern capabilities. The "Pattern Feature" Learning Center Videos will demonstrate the new capabilities to help incorporate this useful utility into your designs.

Click the following link to view this video set:  
<http://www.ironcad.com/learningcenter/patternfeature/>



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