

# FEA Information

## WORLDWIDE NEWS



December 2004

<b>Participant's Articles, Information, Product Announcements</b>	
03	FEA Information: Letter To The Engineering Community
04	What is Series: JRI's JMAG –
06	What is Series: Interfacing & Porting – Software, Hardware, OS
07	Oasys – Primer Update
08	AMD – Bell Helicopter Soars to New Heights
10	December's Internet Resources
12	Asia Pacific News – December News brought to you by ANSYS-CHINA, LTD
14	Publication: OOP-Simulation – A Tool to Design Airbags? Current Capabilities in Numerical Simulation
<b>Directories</b>	
15	Hardware & Computing and Communication Products
16	Software Distributors
18	Consulting Services
19	Educational Participants
20	Informational Websites
<b>FEA News/Newswire /Publications/Events &amp; Announcements</b>	
21	News Page
22	Events
<b>FEA Information Inc.</b>	
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**FEA Information Inc.  
Trent Eggleston & Marsha Victory**

**December 2004 – Announcements**

**Participant: We welcome CRAY – [www.cray.com](http://www.cray.com)**



**A global leader in supercomputers, purpose-built for high-performance computing (HPC), Cray Inc. provides innovative computing platforms that enable scientists and engineers in academia, government, and industry to meet both existing and future computational challenges. Cray delivers a portfolio of supercomputers that combine fast processors with high-bandwidth, low-latency interconnect technologies.**

**“What is” Series: *Interfacing, Porting, OS***

**This month we have the introduction to a new resource section that will be officially launched with our January 2005 edition.**

- 1) Participant’s software that interface to LS-DYNA**
- 2) Participant’s hardware and OS that run LS-DYNA**

**If you’re interested in contributing to the news please contact [mv@feainformation.com](mailto:mv@feainformation.com)**

**Sincerely,**

***Trent Eggleston & Marsha Victory***

**What is JMAG Studio?**  
<http://www.jri.co.jp/pro-eng/jmag/e/jmg/index.html>

**JMAG-Studio is an electromagnetic field analysis software package developed by The Japan Research Institute, Limited (JRI)** that supports the design and development of motors, actuators, circuit components, antennas and other electric and electronic products. It has been supported and used by many companies and universities since 1983.

JMAG has a long track record of use for analyzing motors and other rotating devices. It is designed not only for analysis experts but also to facilitate analysis by designers. In addition, the automatic mesh function makes it possible to realize analysis without awareness of the mesh. This offers the ability to conduct analyses with a high level of precision even by personnel performing analysis for the first time

Analysis is implemented using the same shape data that is used in design. JMAG-Studio is compatible with DXF, Universal File, SAT, IGES (3D) and CATIA (v.4&5). Once loaded, the CAD data is ready for the immediate automatic generation of the mesh.

It is also easy to set the conditions necessary for the various types of analyses. For materials, it is possible to use digital data provided by industry-leading materials producers.

Once the analysis is completed, the analysis results can be reviewed from various angles through the highly flexible display of graphs with vectors, contours or sections. JMAG-Studio can create animations (AVI) and graphic bitmaps (BMP, JPEG, PNG) which can be used in the production of reports and other documents. The flow to design operations of feedback regarding the evaluation of analysis results obtained using the multifaceted results display capabilities is an easy task for JMAG-Studio.

JMAG-Studio has a powerful automatic mesh creation function including a high-precision optimal mesh generation (adaptive) function. This allows the execution of analyses without having to generate the mesh manually. The solver, characterized by stable algorithms, high-precision high-speed computations and small memory is fully capable of dealing with large-scale problems even on a PC.

**Applicable Magnetic Field Analysis:** Motors, inductors, generators, transformers, actuators, solenoids, magnetic recordings, magnetic heads, sensors, magnetization, eddy-current tests, speakers, etc.

**Applicable Electric Field Analysis:** Displays, electron guns, printers, electro photography, sputtering, crossing gates, electrical transmission cable, insulators, switchgear, transformers, current-limiting devices

**Applicable Electro Magnetic Wave Analysis:**

Antennas, PCB, strip lines, EMC, waveguides, resonators, plasma, optical pickups, microwave ovens, mobile telephones, magneto-optical recording, electromagnetic shields

Other Functions:

- Optimized calculation
- Analysis data check function
- Analysis results report output
- Vector, contour, graph, table display
- Animation

- Parametric analysis tool
- Script compatibility
- CAD interface : DXF, Universal File, Nastran  
Optional : SAT, IGES (3D), CATIA (ver.4&5)
- Flexible network license management by FlexLm
- Remote UNIX analysis solver execution function
- Remote function between PCs

JMAG-Studio is linked to the popular mid-range CAD product SolidWorks through a powerful link function. Shape modifications are implemented with SolidWorks while material and condition settings are maintained in JMAG-Studio. The ability to implement simulation calculation immediately after design revision facilitates design assessments on a more rapid cycle.

\*SolidWorks 2004 compatibility

JMAG-Studio's magnetic field analysis function can also be used as a control circuit simulator component. In addition, direct linked analysis can be realized through the total linkage of models created in JMAG-Studio with circuits defined in the control circuit simulator. Besides linked analysis, voltage and current table data extracted from the control circuit simulator can be loaded intact as JMAG data.

Linkable control circuit simulators: PSIM, MATLAB/Simulink, PSpice(anticipated), etc

With a feel much like a desktop calculator, analysis can be carried out on the spot while confirming the shape by entering the number of poles, number of slots, tooth width, and other shape data as parameters. The torque, inductance, iron loss and various other properties that are readily obtainable with high precision are beyond the ability of a magnetic circuit model. Brushless motors, brush motors, and reluctance motors as well as various other types of motors and inductors are supported.

The parametric analysis function allows automatic calculation of multiple patterns by defining numerical shape and condition parameters in the special parametric analysis dialog box.

It is now possible to execute sound field analysis with JMAG-Studio. Since sound field analysis is conducted linked with electromagnetic field and vibration analysis, a comprehensive approach to low-noise motor design that takes the effects of the electromagnetic field and vibration into account becomes a reality.

**For Complete Information please visit:**

**<http://www.jri.co.jp/pro-eng/jmag/e/jmg/index.html>**

## **What is an Interface – Porting – OS?**

**Trent Eggleston**

**January 2005 we will have an Interface/Hardware/OS resource listing participant's software/hardware/OS relating to LS-DYNA**

### **Interface:**

In Finite Element Analysis software we use “interface” to describe the boundary across which two software analysis programs, or two parts of the same program communicate. One program “interfaces” to the other program. The one software program does not need to interface to every component of the other. Each software program can interface to all, or a very specific and limited segment of the other software program.

**Preliminary list of software interfacing to LS-DYNA. This will be a monthly resource with product names and URL for complete information. (alpha order)**

**ANSYS:** <http://www.ansys.com/products/lsdyna.asp>

**ETA:** <http://www.eta.com/Products/Dynaform/index.htm>

**JRI:** <http://www.jri.co.jp/pro-eng/struct/jstamp/index.html>

**MSC.Software:**

[http://www.mscsoftware.com/products/products\\_detail.cfm?PI=612](http://www.mscsoftware.com/products/products_detail.cfm?PI=612)

**OASYS:** <http://www.arup.com/dyna/>

### **What is Porting?**

**Porting** is the adaptation of a piece of software so that it will function in a different computing environment.

**FEA Information Inc. Participant's Hardware and OS that run LS-DYNA: This will be a monthly resource with updated information. (alpha order)**

**AMD Opteron – Linux**  
**CRAY XD1 - Linux**  
**FUJITSU Prime Power – SUN OS 5.8**  
**FUJITSU VPP – Unix\_System\_V**  
**HP PA8000 – HPUX**  
**HPIA64 – HPUX or Linux**  
**HP Alpha – True64**  
**IBM Power 4/5 – AIX 5.1**  
**INTEL IA32 Linux, Windows**  
**INTEL IA64 – Linux**  
**INTEL Xeon EMT64 - Linux**  
**NEC SX6 – Super-UX**  
**SGI Mips – IRIX6.5**  
**SGI IA64 - Altix**

**Oasys PRIMER 9.1: New release offers faster creation of error-free LS-DYNA models**  
**This article with graphics is available**  
**at [www.feapublications.com](http://www.feapublications.com) - side link News - Month Dec. 2004**

Oasys are pleased to announce the release of version 9.1 of Primer, the software tool purpose-written for preparing, checking and manipulating LS-DYNA models. This version features an improved user interface giving quick and easy access to the most commonly used functions and data. For example, the properties of parts, such as thickness, element formulation, etc, may be viewed or edited with a single click. A new tree view of the model shows the parts structured by INCLUDE file (or by user-defined assemblies); this menu may be used for blanking and access to other functions.

A new Part Table menu offers viewing and editing of part properties in tabular format, including the possibility to make the same change to multiple parts in one command. Time and effort are further reduced by the new short-cut keys (letters on the keyboard) that invoke view and drawing commands, autoscaling, entity visibility, etc. The graphics are faster and better, with user-definable colours, transparency and mixed plotting modes.

**Among the other new features in Version 9.1 are:**

- An improved “Find Attached” function that finds connections through tied contacts, and has an iterative mode to continue searching until all connected items are found
- Now over 2500 LS-DYNA-specific error checks plus many specialist tools for finding and fixing mistakes in the input data, allowing rapid debugging of models
- Simple meshing and element splitting
- A “cross-references” viewer to navigate through the complex relationships between data items, such as node-element-part-set-contact, including indirect references such as SET...\_GENERATE
- A Rigidify function that not only makes selected elements rigid, but also automatically corrects any resulting multiple-constraint problems such as Nodal Rigid Bodies connected to the elements that are now rigid.
- Spotwelding between selected parts with no need to define the weld positions – Primer automatically finds suitable points (useful if no spotweld file exists)
- 64-bit versions of all Oasys software are available for pre and post-processing very large models

As in previous versions of Primer, version 9.1 provides an environment in which large teams can work efficiently on the same model or series of models. For example:

- The INCLUDE file organisation of the model is fully supported, can be created and modified from within Primer, and is preserved when writing out the model. Each team member can be responsible for specific components or INCLUDE files.
- The INCLUDE file system permits a complex series of analyses where the loading conditions and list of components may be different for each analysis – this is achieved simply by swapping INCLUDE files, and can be managed by Primer’s Database system for automatic model assembly.
- INCLUDE\_TRANSFORM is fully supported, allowing standard barrier and impactor models to be positioned for each analysis without needing to copy and alter the standard data set.
- Contacts, initial conditions, etc may be created in a way that eliminates the need for maintenance when the mesh is altered or new components added: SET...\_GENERATE and SET...\_GENERAL are fully supported, together with contacts defined by excluded part sets. Thus the contact definitions can refer only to ranges of part IDs that are included or excluded from the contact.

Primer is available from Oasys ([www.arup.com/dyna](http://www.arup.com/dyna)), ERAB, Dynamore, CADFEM, CRIL Technologies, Japan Research Institute, Theme Engineering, Korea Simulation Technologies and Ansys China.

**AMD – Bell Helicopter Soars to New Performance Heights  
After Selecting the AMD Opteron™ Processor –  
Excerpt from Success Stories – [www.amd.com](http://www.amd.com)**

**Company Profile – Bell Helicopter - the pioneer of the revolutionary tiltrotor aircraft:**

With more than 50 years experience of testing and flight innovation, Bell Helicopter, a Textron company, is a \$1.6 billion, leading producer of vertical lift aircraft for commercial and military customers. Headquartered in Fort Worth, Texas, Bell has built some 35,000 helicopters since 1946 when the Bell 47 became the world's first helicopter certificated for commercial use. A wholly owned subsidiary of Fortune 500 Company Textron Inc., Bell Helicopter is globally recognized for customer service, innovation and superior quality. Bell's global workforce of more than 7,500 employees serves customers flying Bell aircraft in over 120 countries.

**A world aviation leader in advanced technology, Bell is also the pioneer of the revolutionary tiltrotor aircraft. Teamed with Boeing, Bell is producing the V-22 Osprey tiltrotor for the U.S. Marine Corps and Air Force Special Operations Command. The tiltrotor can takeoff, hover and land like a helicopter and by rotating its nacelles forward can fly with the high-speed range and speed of a turboprop airplane. In a joint venture known as the Bell/Agusta Aerospace Company (BAAC), Bell and Agusta are developing a nine passenger commercial tiltrotor called the BA609, which made its first flight April 2003.**

Textron Inc. is a \$10 billion multi-industry company with more than 43,000 employees in 40 countries. The company leverages its global network of aircraft, industrial and finance businesses to provide customers with innovative solutions and services. Textron is known around the world for its powerful brands such as Bell Helicopter, Cessna Aircraft, Kautex, Lycoming, E-Z-GO and Greenlee, among others. More information is available at [www.textron.com](http://www.textron.com).

**Challenge**

Bell Helicopter, which is an established design pioneer, is recognized for taking strategic risks in order to lead the competition. Bell Helicopter's IT team was faced with expiring workstation leases on close to 250 workstations that serve the company's critical CAD/CAM/CAE engineering and product design teams. Rather than maintain the status quo by renewing the leases with the same technology, Bell's IT leaders wanted to leverage the opportunity to implement a competitive design and time-to-market performance advantage in order to gain long-term strategic benefit. "We wanted to replace our existing systems with a higher performing platform that would empower our engineers and product designers with the ability to optimize the CAD/CAM/CAE applications that are used to design Bell's most advanced helicopter designs," said Nick Miller, IT services manager, CAD/CAM/CAE Group, Bell Helicopter, a Textron company.

As part of the decision-making process, Miller and his team also incorporated Bell Helicopter's strategic goal of migrating several of Bell's suite of CAD/CAM/CAE applications from UNIX to a mix of Linux and Windows®;-based PC's. "We can't have designers waiting for server time to model their designs, and so we needed systems that would ensure high performance at the workstation in combination with server-based applications," reports Miller. "Additionally, because the CAD/CAM/CAE application demands are so rigorous, we have to be constantly forward-looking, and we know that the applications we rely on will ultimately be compiled for 64-bit computing."

**Solution**

After surveying the landscape of workstations available on the market, Bell selected an IBM platform based on the AMD Opteron™ processor with Direct Connect Architecture. Miller describes the decision to implement AMD Opteron processor-based workstations as a straightforward one. "The idea of a seamless migration from 32-bit computing to 64-bit computing made the selection of AMD

Opteron processor-based systems a ‘no-brainer’ for us,” reports Miller. “The risk was minimal, and it made a lot of sense in my mind to ensure a seamless migration path from 32-bit to 64-bit computing - only the AMD Opteron processor was proven to provide that capability.

Bell selected the AMD Opteron processor-based IBM IntelliStation A Pro series workstations running Microsoft®; Windows®; XP Professional and Red Hat Enterprise Linux WS 3 to replace their existing workstation systems. “When we factored in the performance gains with the competitive pricing of the AMD Opteron processor-based IBM IntelliStation A Pro series, the decision was clear from both a performance and cost perspective,” said Miller.

Miller reports that the real-time performance gains made possible by the AMD Opteron-processor based IBM systems helped him evangelize the benefits of AMD64 technology to his engineering and product design teams. “Once our designers experienced the performance gains made possible by the AMD Opteron processor, particularly with regard to improved performance on 32-bit graphics applications, they were immediately impressed,” said Miller.

### **Impact**

Miller describes the AMD Opteron processor-based IBM platform as an ideal solution, given Bell’s strategic business goal of empowering engineering and design teams with the ability to advance the design process. Miller expects that not only will Bell’s overall design process become more effective, but also that Bell’s designers will become more efficient, using the AMD Opteron processor-based workstations. “Graphics performance is a critical component of the design process, and now our designers can model and simulate on their PC’s without losing any performance. This enables them to do on their workstations what before they could only do on a server,” reports Miller.

Now deployed, the new AMD Opteron processor-based IBM workstations are delivering impressive results. Comments ranging from “we’re elated,” to “our guys love them,” “graphic performance is great,” and “we’re saving time on projects thanks to the dramatic performance improvements,” have been reported by Bell’s team of designers and engineers.

Miller also reports expected time-to-market benefits. “Since our designers can simulate new designs more readily using the AMD Opteron processor-based workstations, this has allowed us to improve the design process, which will accelerate time-to-market for advanced designs. This in turn will allow us to streamline the process of bringing new designs to market, not only helping to lower costs but also helping to keep Bell competitive.”

“There’s no doubt that we made the right decision - and it’s evident by our productivity gains,” reports Miller.

**Quote:** *“The AMD Opteron™ processor with AMD64 technology was very compelling for us, because it allows us to boost the performance of our current 32-bit applications and simultaneously prepare to migrate to 64-bit technology when we are ready. This is a very alluring aspect of AMD64 technology.”* – Nick Miller, IT services manager, CAD/CAM/CAE Group, Bell Helicopter, a Textron company.

**About AMD:** AMD (NYSE:AMD) designs and produces innovative microprocessors, Flash memory devices and low-power processor solutions for the computer, communications and consumer electronics industries. AMD is dedicated to delivering standards-based, customer-focused solutions for technology users, ranging from enterprises and governments to individual consumers. For more information, visit [www.amd.com](http://www.amd.com).

## December's Internet Resources

**CRAY** THE SUPERCOMPUTER COMPANY

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WHAT DOES A HEALTHY CELL KNOW ABOUT CANCER THAT WE DON'T?

products solutions service & support about cray investors

**Featured Product**  
The Cray XT3™  
The Cray XT3™ system brings

**SC04 Conference Highlights**  
SC2004, themed "Bridging Communities," took place this November in Pittsburgh, PA. The

**News & Events**  
12.16.04  
Germany's Research Center Juelich Selects Cray XD1 Supercomputer For

<http://www.cray.com>

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▶ Brazil	▶ France	▶ Italy	▶ New Zealand	▶ Spain	▶ United States
▶ Canada	▶ Germany	▶ Japan	▶ Norway	▶ Sweden	▶ Vietnam
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<http://www.fujitsu.com/global/>



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- > Music
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- > Fax, Copiers & Scanners
- > Digital Photography
- > Software Products
- > Supplies & Accessories
- > Servers
- > Storage
- > Networking
- > Management Software
- > Business & IT Services
- > Solutions

- » Online Shopping
- » Support & Drivers

<http://www.hp.com/>

The screenshot shows the NEC website homepage. At the top left is the NEC logo with the tagline "Empowered by Innovation". On the right, there is a search bar with "The Global Gateway" and "www.nec.com" above it, and a "Search by Google" button. Below the search bar are links for "Advanced Search" and "Site Guide". A navigation menu includes "Products", "Service & Support", "NEC Worldwide", "About NEC", "FAQ", and "Contact Us". The main content area is divided into "Products & Solutions" (with sub-links for "by Category", "by User", "A to Z", "Downloads", "Support") and "NEC Worldwide" (with a world map and regional links for North America, Latin America, Europe, Africa, Asia, and Oceania). There are sections for "What's New" (with a link to "Season's Greetings from NEC") and "Press Releases" (with a link to "December 17 NEC and ITOCHU to Offer Fixed Point-to-point PDH System PASOLINK to Maxis Mobile Network Infrastructure in Malaysia"). On the right side, there is a promotional banner for "NEC's e-Greeting Cards" featuring various holiday-themed cards.

<http://www.nec.com/>

**Asia Pacific News – China**  
**December News brought to you by ANSYS-CHINA, LTD**

**ANSYS Vehicle Simulation Technology Seminar**  
**Chinese Voice coming from Ansys-China**  
**ANSYS-CHINA, LTD.**  
**china@ansys.com.cn**  
**[www.ansys.com.cn](http://www.ansys.com.cn)**

**Along with the jubilant moment signing the strategic agreement between Ansys-China and ETA, ANSYS Vehicle Simulation Technology Seminar was successfully held on 8<sup>th</sup>, Nov. 2004 in Chongqing, China.** More than 50 peoples from the vehicle industry took part in this seminar's event. They are the witnesses of the moment when ANSYS introduced the concept of 'Free Full Vehicle Simulation' which would help vehicle R&D People to realize their long-term aim of the simulation of full vehicle. From that day, Ansys-China, accompanied by ETA, would commit itself to promote and exploit the market of vehicle simulation.



**Jason Wang , LSTC –**  
**The Development of LS-DYNA Parallel Solving Technology**

The experts from vehicle field attended this seminar and gave presentations. The senior CAE expert, Jason Wang from LSTC, gave a lecture titled 'The Development of LS-DYNA Parallel Solving Technology' that caught professionals' eyes; while Martin Ma, the manager of Shanghai office of ETA, made a speech to introduce the VPG technology (Virtual Proving Ground, that is a CAE environment specially developed for integrated simulation of vehicle); professors, who worked for State Key Laboratory of Vehicle Impact in Tsinghua University and Mechanical Engineering College of Chongqing University, discussed status quo of Chinese auto development and simulation technology and shared their valuable working experience with attendees.

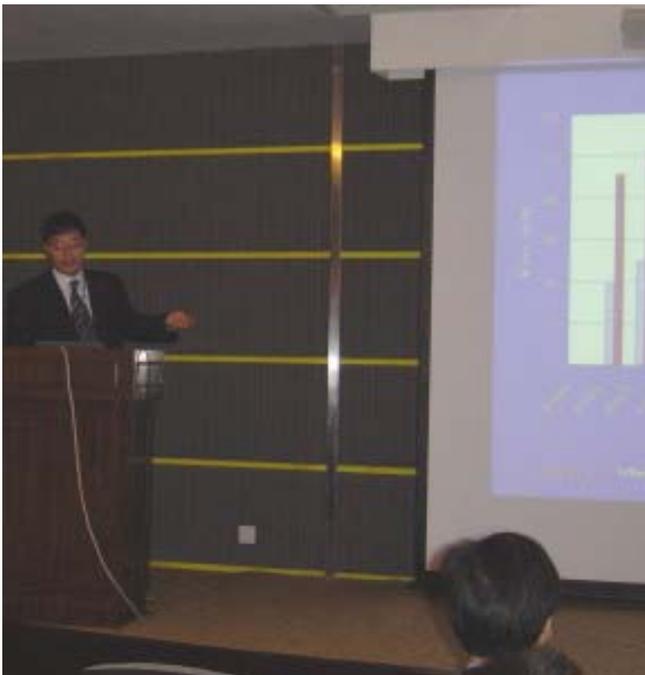


**Martin Ma, the manager of Shanghai office of ETA**

Some known auto manufacturers, such as DONG FENG AUTO, CHANGAN SUZUKI, SANY, CHONGQING ZONG SHENG, and others talked with ANSYS's engineers and above experts deeply and showed their huge interest to VPG and LS-DYNA.

This meeting also attracted attention from the media. Several newspapers and magazines, for example CHINA AVIATE NEWS, CAD/CAE AND MANUFACTURE INFORMATION, DESIGN NEWS, GUANGZHOU AUTO, made in-depth reports on this seminar

**Other two seminars on this topic are going to be held by Ansys-China in December in Beijing and Shanghai. There will be more highlights and attention; Ansys-China together with the Chinese vehicle industry will realize their dream**



**Dr. Xichan Zhu, China Automotive Technology & Technology Research Center**



**Ivan Shi, ANSYS China**

**The Full 1.12MB publication is available at:**  
**[www.feapublications.com](http://www.feapublications.com)**  
**Link on Menu – Featured**

**OOP Simulation**  
**A Tool to Design Airbags?**  
**Current Capabilities in Numerical Simulation**

**Benno Beesten, Volkswagen, Wolfsburg**  
**Andreas Hirth, DaimlerChrysler, Sindelfingen**  
**Robert Reilink, Volkswagen, Wolfsburg**  
**Doris Rieger, BMW, Munich**  
**Gunther Seer, Audi, Ingolstadt**

**Abstract**

This contribution presents some results of a working group of the German automobile industry, and provides an overview of the current capabilities for the most important crash and occupant simulation programmes, taking into account gas dynamics. Here, the focus is on studies of the FMVSS208 “Out of Position” load cases.

For this purpose, simulations using different codes (*PAMCRASH*, *MADYMO*, *LS-DYNA*) which use different approaches to solve the Euler-equations (finite difference procedures, finite point-set method) are compared with test results. The studies begin with simple airbag inflation simulations, covering impact tests with hemispheres through to impact tests with dummies. The entire chain of influence is clarified, whether it be the gas generator outflow, folding and unfolding, flow in a folded and unfolded airbag or the behaviour of the dummy models.

This study reviews the capabilities and limitations and will describe individual differences between the approaches. With this knowledge, the development of codes has been (and will for the future) driven to a significant degree, thus enabling the simulations shown to be made possible in the first place.

With the status of the codes today, active support of airbag design with regard to OoP load cases is possible for the first time.

Hardware  
&  
Computing and Communication Products  
(Listed in Alphabetical Order)



[www.amd.com](http://www.amd.com)



[www.fujitsu.com](http://www.fujitsu.com)



[www.hp.com](http://www.hp.com)



[www-1.ibm.com/servers/deepcomputing](http://www-1.ibm.com/servers/deepcomputing)



[www.intel.com](http://www.intel.com)



[www.nec.com](http://www.nec.com)



[www.sgi.com](http://www.sgi.com)



[www.cray.com](http://www.cray.com)

# Software Distributors

Alphabetical order by Country

<b>Australia</b>	<b>Leading Engineering Analysis Providers</b> <b><a href="http://www.leapaust.au">www.leapaust.au</a></b>
<b>Canada</b>	<b>Metal Forming Analysis Corporation</b> <b><a href="http://www.mfac.com">www.mfac.com</a></b>
<b>China</b>	<b>ANSYS China</b> <b><a href="http://www.ansys.cn">www.ansys.cn</a></b>
<b>China</b>	<b>MSC. Software – China</b> <b><a href="http://www.mssoftware.com.cn">www.mssoftware.com.cn</a></b>
<b>Germany</b>	<b>CAD-FEM</b> <b><a href="http://www.cadfem.de">www.cadfem.de</a></b>
<b>Germany</b>	<b>DynaMore</b> <b><a href="http://www.dynamore.de">www.dynamore.de</a></b>
<b>India</b>	<b>GissETA</b> <b><a href="http://www.gisseta.com">www.gisseta.com</a></b>
<b>India</b>	<b>Altair Engineering India</b> <b><a href="http://www.altair.com">www.altair.com</a></b>
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<b>Japan</b>	<b>Fujitsu Limited</b> <b><a href="http://www.fujitsu.com">www.fujitsu.com</a></b>
<b>Japan</b>	<b>The Japan Research Institute</b> <b><a href="http://www.jri.co.jp">www.jri.co.jp</a></b>
<b>Korea</b>	<b>Korean Simulation Technologies</b> <b><a href="http://www.kostech.co.kr">www.kostech.co.kr</a></b>
<b>Korea</b>	<b>Theme Engineering</b> <b><a href="http://www.lsdyna.co.kr">www.lsdyna.co.kr</a></b>

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<b>Taiwan</b>	<b>Flotrend</b> <b><a href="http://www.flotrend.com.tw">www.flotrend.com.tw</a></b>
<b>Turkey</b>	<b>FIGES</b> <b><a href="http://www.figes.com.tr">www.figes.com.tr</a></b>
<b>USA</b>	<b>Altair Western Region</b> <b><a href="http://www.altair.com">www.altair.com</a></b>
<b>USA</b>	<b>Engineering Technology Associates</b> <b><a href="http://www.eta.com">www.eta.com</a></b>
<b>USA</b>	<b>Dynamax</b> <b><a href="http://www.dynamax-inc.com">www.dynamax-inc.com</a></b>
<b>USA</b>	<b>Livermore Software Technology Corp.</b> <b><a href="http://www.lstc.com">www.lstc.com</a></b>
<b>USA</b>	<b>ANSYS Inc.</b> <b><a href="http://www.ansys.com">www.ansys.com</a></b>
<b>UK</b>	<b>Oasys, LTC</b> <b><a href="http://www.arup.com/dyna/">www.arup.com/dyna/</a></b>

## Consulting Services Alphabetical Order By Country

<b>Australia</b> Manly, NSW <a href="http://www.leapaust.com.au">www.leapaust.com.au</a>	<b>Leading Engineering Analysis Providers</b> Greg Horner <a href="mailto:info@leapaust.com.au">info@leapaust.com.au</a> 02 8966 7888
<b>Canada</b> Kingston, Ontario <a href="http://www.mfac.com">www.mfac.com</a>	<b>Metal Forming Analysis Corporation</b> Chris Galbraith <a href="mailto:galb@mfac.com">galb@mfac.com</a> (613) 547-5395
<b>India</b> Bangalore <a href="http://www.altair.com">www.altair.com</a>	<b>Altair Engineering India</b> Nelson Dias <a href="mailto:info-in@altair.com">info-in@altair.com</a> 91 (0)80 2658-8540
<b>Italy</b> Torino <a href="http://www.altairtorino.it">www.altairtorino.it</a>	<b>Altair Engineering Italy</b> <a href="mailto:sales@altairtorino.it">sales@altairtorino.it</a>
<b>Italy</b> Firenze <a href="http://www.numerica-srl.it">www.numerica-srl.it</a>	<b>Numerica SRL</b> <a href="mailto:info@numerica-srl.it">info@numerica-srl.it</a> 39 055 432010
<b>UK</b> Solihull, West Midlands <a href="http://www.arup.com">www.arup.com</a>	<b>ARUP</b> Brian Walker <a href="mailto:brian.walker@arup.com">brian.walker@arup.com</a> 44 (0) 121 213 3317
<b>USA</b> Irvine, CA <a href="http://www.altair.com">www.altair.com</a>	<b>Altair Engineering Inc. Western Region</b> Harold Thomas <a href="mailto:info-ca@altair.com">info-ca@altair.com</a>
<b>USA</b> Windsor, CA <a href="http://www.schwer.net/SECS">www.schwer.net/SECS</a>	<b>SE&amp;CS</b> Len Schwer <a href="mailto:len@schwer.net">len@schwer.net</a> (707) 837-0559

## Educational & Contributing Participants Alphabetical Order By Country

<b>China</b>	<b>Dr. Quing Zhou</b>	<b>Tsinghua University</b>
<b>India</b>	<b>Dr. Anindya Deb</b>	<b>Indian Institute of Science</b>
<b>Italy</b>	<b>Professor Gennaro Monacelli</b>	<b>Prode – Elasis &amp; Univ. of Napoli, Federico II</b>
<b>Russia</b>	<b>Dr. Alexey I. Borovkov</b>	<b>St. Petersburg State Tech. University</b>
<b>USA</b>	<b>Dr. Ted Belytschko</b>	<b>Northwestern University</b>
<b>USA</b>	<b>Dr. David Benson</b>	<b>University of California – San Diego</b>
<b>USA</b>	<b>Dr. Bhavin V. Mehta</b>	<b>Ohio University</b>
<b>USA</b>	<b>Dr. Taylan Altan</b>	<b>The Ohio State U – ERC/NSM</b>
<b>USA</b>	<b>Prof. Ala Tabiei</b>	<b>University of Cincinnati</b>
<b>USA</b>	<b>Tony Taylor</b>	<b>Irvin Aerospace Inc.</b>

## Informational Websites

<b>FEA Informational websites</b>	<b><a href="http://www.feainformation.com">www.feainformation.com</a></b>
<b>TopCrunch – Benchmarks</b>	<b><a href="http://www.topcrunch.org">www.topcrunch.org</a></b>
<b>LS-DYNA Examples (more than 100 Examples)</b>	<b><a href="http://www.dynaexamples.com">www.dynaexamples.com</a></b>
<b>LS-DYNA Conference Site</b>	<b><a href="http://www.ls-dynaconferences.com">www.ls-dynaconferences.com</a></b>
<b>LS-DYNA Publications to Download On Line</b>	<b><a href="http://www.dynalook.com">www.dynalook.com</a></b>
<b>LS-DYNA Publications Index</b>	<b><a href="http://www.feapublications.com">www.feapublications.com</a></b>
<b>LS-DYNA Forum</b>	<b><a href="http://portal.ecadfem.com/Forum.1372.0.html">http://portal.ecadfem.com/Forum.1372.0.html</a></b>
<b>LS-DYNA CADFEM Portal</b>	<b><a href="http://www.lsdyna-portal.com">http://www.lsdyna-portal.com</a></b>

Previous FEA Information Site News

Archived on the Weekly News Page

<b>Nov 01</b>	<b>AVI Library</b>	<b>Added Disk Brake AVI #609 to the Library by Dr. Arthur Shapiro, LSTC</b>
	<b>FIGES</b>	<b>New Participant – Only LSTC Direct Distributor in Turkey</b>
	<b>IBM</b>	<b>Announcement IBM BlueGene/L</b>
	<b>ANSYS</b>	<b>ANSYS® LS-DYNA™ 8.1</b>
	<b>Numerica</b>	<b>Distributor in Italy</b>
<b>08</b>	<b>MSC.Software</b>	<b>How do you know if the aircraft you are building now will last 50 years?</b>
	<b>LSTC</b>	<b>Release SMP Version ls970.5434.</b>
	<b>ARUP</b>	<b>5th European LS-DYNA User's Conference</b>
	<b>CAD-FEM</b>	<b>Distributor in Germany</b>
<b>15</b>	<b>JRI</b>	<b>JRI develops J-STAMP - JMAG-STUDIO</b>
	<b>SGI</b>	<b>The Altix 3700 Bx2 system</b>
	<b>LEAP</b>	<b>Distributor in Australia</b>
<b>22</b>	<b>ETA</b>	<b>DYNAFORM</b>
	<b>OASYS</b>	<b>Oasys LS-Dyna Environment</b>
	<b>DYNAMAX</b>	<b>Distributor in US</b>
<b>29</b>	<b>HP</b>	<b>The HP 9000 server family</b>
	<b>Intel</b>	<b>The Intel® Pentium® 4</b>
	<b>MFAC</b>	<b>Distributor in Canada</b>

## EVENTS

If you know of an event you would like posted send it to [mv@feainformation.com](mailto:mv@feainformation.com)  
You do not need to be a participant to post events.

<b>2005</b>	
Jan 10-13	<b>AIAA Aerospace Sciences Meeting &amp; Exhibit, Reno, Nevada</b>
Jan 30-Feb 01	<b>1<sup>st</sup> Space Exploration Conference: Continuing the Voyage of Discovery – Orlando, FL</b>
May 17-20	<b>NAFEMS World Congress – Malta</b>
May 25-26	<b>5th European LS-DYNA Conference - The ICC, Birmingham UK</b>
July 25-27	<b>8th U.S. National Congress on Computational Mechanics, Austin, TX</b>
<b>2006</b>	
June	<b>9th International LS-DYNA Users Conference - Dearborn, MI</b>
July	<b>Seventh WCCM - Los Angeles, CA</b>