

# fixer

For engineering model exchange professionals

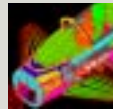


#### Worldwide events guide inside

Dates for your diary – conferences, exhibitions and meetings for model exchangers

#### CADfix takes off at BAE SYSTEMS

How CADfix has become the perfect platform for the aviation experts – plane and simple



#### Our Chairman and CEO...

Having had 38 years in the business, Geoff Butlin puts engineering computation in perspective



## FEGS is reborn as TranscenData Europe

New structure opens new opportunities for engineering data interoperability across Europe

The restructuring process at FEGS's parent company, International TechneGroup Inc. (ITI), has been completed with the formal rebranding of the Product Data Interoperability (PDI) group as a new business unit called TranscenData. The move means that after 23 years FEGS has now been renamed TranscenData Europe Limited, and the Oakington office has become the European headquarters for the new organisation. As a result, TranscenData Europe's customers will have access to a wider range of data interoperability tools, complementing the core CADfix solution.

The formation of TranscenData was designed to enable ITI to refocus its range of data interoperability products – including CADfix – into a series of three solution lines, each incorporating products, services and strategic partnerships.

CADfix, the product data translation, healing and repair tool that has been the main focus of FEGS's business since it was developed in the mid 1990s, will now form part of TranscenData's CAD/CAM/CAE (C3) Systems Integration unit. It will be offered in parallel with ITI's other solutions, including CADIQ (for model data integrity and quality testing), IGESworks (for 2D and 3D IGES file editing), DEXcenter (automated interoperability processes), PDElib (translator developer toolkit) and CADscript (providing software developers with access to multiple APIs).

TranscenData will be offering these products not only as packaged, stand-alone tools, but also as components in more

comprehensive tailor-made solutions. Using the power of DEXcenter, TranscenData will work with its customers to deliver automated solutions to common interoperability problems and to promote best practice data exchange methods and management across enterprises and into the supply chain. This consultancy-based offering will form the core of TranscenData's new Engineering Supply Chain Integration unit.

In addition, TranscenData will continue to forge partnerships with other software vendors to enable more and more customers to take advantage of its powerful interoperability technology. This will mean more OEM deals with CAD/CAM/CAE and PDM software suppliers who need data import and export tools: although many of the users may not know it, TranscenData's technology is already in use in a huge and growing number of software installations.

For TranscenData Europe, its customers, prospects, friends and partners, this marks the beginning of a new and exciting era. The

success that FEGS has seen over the past 23 years and the impact that CADfix continues to have on the CAD/CAM/CAE industry both point to interesting times ahead for TranscenData Europe.

*To find out what the changes will mean for you, email [euinfo@transcendata.com](mailto:euinfo@transcendata.com) now.*



### CADfix at BAE SYSTEMS inside



## C3SI Solutions

Complementing the familiar CADfix solution is a range of new interoperability solutions from the TranscenData stable. There will be plenty more to say about the CAD/CAM/CAE Systems Integration solution line in the future but for the time being, here's just a taster.

**CADIQ™** CADIQ is an upstream CAD model quality testing and assessment tool used to enable the effective exchange and sharing of model data among upstream and downstream users. Used stand-alone or embedded in a CAD system, CADIQ can detect, display and report hidden errors or anomalies that may render a model unusable in other applications or simply not manufacturable. CADIQ can be configured to conform to any company standards and then deployed across an entire enterprise. Detecting and flagging model quality problems at an early stage enables businesses to operate a more effective concurrent engineering process with improved time-to-market and cost reductions.

**IGESworks™** IGESworks allows the user to display, analyse, edit, adapt and more effectively transfer IGES files. IGESworks operates on both two and three dimensional model data. Full support for geometric and non-geometric data such as text fonts, colours and dimensioning means that complete annotated and dimensioned 2D engineering drawings can be converted between different systems.

**CADscript™** CADscript allows software developers live access to native CAD data and functionality directly from the application they are writing. It provides platform independent access to multiple CAD systems and their functions from a single common scripting environment. CADscript reduces the time and effort needed to develop and maintain multiple CAD interfaces. Once written, a CADscript code can be used with any API so that the application will not 'care' where the geometry started life.

**PDElib™** PDElib provides a toolkit for software system developers and is in use by leading CAD/CAM/CAE vendors throughout the world, as their primary translation tool. PDElib is divided between PDElib Core and PDElib programming interfaces. PDElib Core contains utilities common to all data exchange applications while programming interfaces are available for all common standards and formats, with links to the core functionality. Through PDElib, suppliers of software that depend upon effective connections to different CAD systems can have full control of their CAD interfacing programs.

# CADfix® helps BAE SYSTEMS fight the electronic enemy

**Aviation has benefited more than most industries from the information revolution. The systems that keep aircraft in the air and guide them safely to their destinations are increasingly reliant on electronics, both onboard the aircraft themselves and elsewhere, be it on the ground or, increasingly, orbiting the planet. Ensuring that these systems work in harmony with each other and with natural electro-magnetic phenomena such as lightning is a vital part of the aircraft manufacturer's job.**

### BAE SYSTEMS

Responsibility for BAE SYSTEMS whole vehicle electromagnetic testing and analysis falls under the auspices of the Electromagnetic Engineering and Test department based at Warton, Lancashire, a department which reflects the planned change of remit from just aircraft to a broader base of land, sea and air vehicles.

"Our product portfolio already includes Nimrod and Eurofighter," says Chris Jones, Technologist Consultant in the Electromagnetic Engineering department. "Each vehicle we deal with has probably been designed in a number of different locations and possibly with a number of different design systems. But the analyses we perform demand a single, accurate geometric representation and the generation of this geometry is often the single biggest challenge."

### Multiple modellers – multiple solvers

When it comes to defining geometry for computational analysis, there is a daunting

diversity of CAD software in use at BAE SYSTEMS.

"Eurofighter is a classic example: the complete geometry comes from four different countries, Germany, Italy, Spain and the UK," says Chris. "We have to bring all this data into a neutral environment, clean it up where necessary, assign material properties, generate a mesh and then format this so that it can be used in our analysis packages."

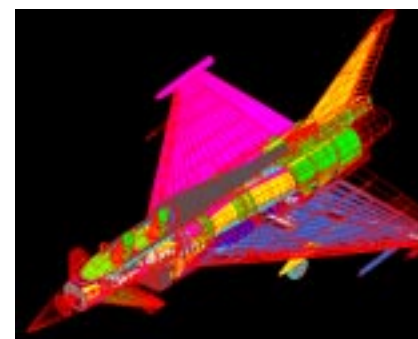
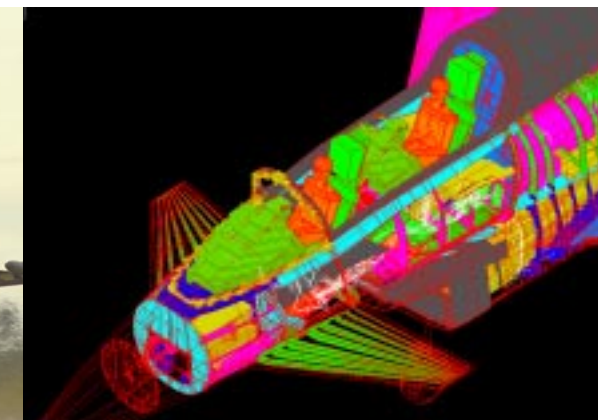
Even if there was just a single analysis package this would be problematical enough, but the electromagnetic simulations performed at BAE SYSTEMS all demand different codes and different ways of defining mesh geometry.

"In effect, we go from a set of CAD systems to a set of numerical analysis codes," says Chris. "Fortunately, we have found a way to avoid a separate data processing nightmare for every combination."

### Enter CADfix

BAE SYSTEMS EE&T uses CADfix as a central resource of geometric data. Because it offers a reliable link – either directly or via IGES – to every major CAD system on the market, CADfix provides the perfect platform for such a diverse range of data.

"CADfix is at the heart of everything we do," says Paul Baker, a BAE SYSTEMS Computational Electromagnetics specialist. "In effect we use it as the hub of our operation. Whatever kind of analysis we need to perform, whatever mesh we need, the starting point is always the clean geometry that's been assembled inside CADfix."



BAE SYSTEMS uses CADfix as its primary CAD/CAM/CAE data hub. This has enabled rapid, in-depth analyses to be performed and played a vital role in the design of the Eurofighter.

months previously; a whole plane can now be meshed in just three or four hours. "Even with the powerful computers we use, an analysis of a complete aircraft can take about ten days," says Paul. "So the last thing we need is to spend ages building meshes. With CADfix we can generate new meshes in just a few hours so we are not restricted when it comes to trying a different kind of analysis."

### Spark out

CADfix came into its own when looking at the effects of a lightning strike on the cockpit of the Eurofighter.

"Our initial analysis confirmed that a modified design performed just as well as the original, but it also revealed a slight anomaly that would have been impossible to spot through physical testing," says Paul. "It showed that, during a lightning strike, there was a very small chance that a spark could have formed at one of the 'strake's fasteners'. Such sparking is the last thing you want in a jet fighter."

Chris Jones explains, "Without the depth of analysis we get from using CADfix it could have taken us years to spot something so subtle."

### Meshing at speed

CADfix has also improved BAE SYSTEMS's meshing capabilities. Meshes are generated directly within CADfix and the time savings are enormous: a single wing could take six to nine

## CADfix Bureau success continues within TranscenData

Data translation issues continue to be a challenge for CAD users, however experienced. This has been reflected in the growing success of the CADfix Bureau, which continues to help frustrated designers solve their translation problems.

Since the bureau's introduction it has successfully fixed files for a range of customers, from large OEMs using it as a test bed prior to purchasing CADfix, to those organisations who cannot necessarily justify buying a licence of CADfix, but still have trouble with poor CAD data.

The good news for designers is that TranscenData will continue to offer its CAD

Data Exchange Bureau to meet the requirements of the expanding CAD user base. By offering this service, all organisations – regardless of their size, or data exchange requirements – can benefit from the CADfix solution. Importantly, they can call on a team of CADfix engineers to help with any modelling problems encountered. *Anyone with a data translation challenge for the CADfix experts should email their file(s) for a quote to eudex@transcendata.com, including details of the required file formats and destination systems or call +44 (0) 1223 237111. The minimum charge is £200 (€320) which includes two hours of analyst time.*

## Engineering Supply Chain Integration with DEXcenter™

Engineering supply chain integration (ESCI) is essential for the sharing of product data. With this in mind, ITI has worked with leading organisations to install Data Exchange (DEX) centres to manage, control and centralise the flow of product data between departments, customers and suppliers. Such centres are based on DEXcenter, TranscenData's interoperability management solution.

DEXcenter is a server based system providing convenient and reliable exchange of data via the Internet/intranets. Exchanged data is chronicled, stored and managed, providing enterprises with a complete audit trail for engineering data being transferred between customers and suppliers.

DEXcenter controls the data movement by employing best practices and optimum

translation paths, automatically launching CAD systems, external translators and tools (e.g. CADfix). Data is inspected, repaired, and prepared for specific target systems and much of the process is automated to the push of a button.

Users are set up in the DEXcenter to have profiles that determine the type of files they require and any preferred translation routes, formats or transmission methods.

DEXcenter utilises the TranscenData arsenal of product data interoperability tools (including CADfix and CADIQ) and over twenty years of expertise to deliver unmatched translation results.

To find out more information on DEXcenter e-mail [euinfo@transcendata.com](mailto:euinfo@transcendata.com) or phone +44 (0) 1223 237111.

## forthcoming events

**SIAM Conference Geom. Design and Computing**  
4 November 2001, California, USA

**NAFEMS FENET Meeting and AGM**  
11 to 14 Nov 2001, Wiesbaden, Germany

**Euromold Exhibition**  
28 Nov to 1 Dec 2001, Frankfurt, Germany

**SolidWorks World Conference**  
17 to 20 Feb 2002, USA

**Daratech Summit**  
25 to 27 February 2002, Boston, USA

**Solid Modelling**  
13 to 14 March 2002, Birmingham, UK

**Micad Exhibition**  
26 to 28 March 2002, Paris, France

**Reseller Conference**  
16 April 2002, Cambridge, UK

**User Conference**  
17 April 2002, Cambridge, UK

# Geoff Butlin, Chairman and CEO



It is 38 years since I began my career in the fledgling field of FEA, and in that time I have seen a great deal of change. The power of computers has, of course, increased unimaginably and some of the early ambitions have been realised. FEA has graduated into the extraordinarily broad field of engineering computation, now known as CAE. However, despite much overselling, the ultimate goal of real-time engineering analysis remains elusive.

Today's generation of designers and engineers – whose careers have known only slick solid modelling systems – will probably give you a funny look if you try to tell them that CAE has been around a lot longer than CAD. Too often these days engineering analysis is used only as an afterthought to check that a finely honed design is not going to fall apart the minute it's put into use. But engineering problems have been around for hundreds of years; solid modelling less than thirty. So it is perhaps no surprise that one of the first applications for programmable computers, was a new method of reducing intractable structural engineering problems to a matrix of finite approximations that could be solved as an array of simultaneous equations. So although CAD terminology

and software only really began to surface in the mid to late seventies, the term 'finite element' was first coined as long ago as 1960.

As both CAD and CAE technologies evolved, the question inevitably arose of using the same geometry for both disciplines. In the early days, FE meshes were built from the bottom up – there was simply no alternative – but it soon became vital that the finished mesh should accurately mirror the geometry generated by the designer in his new CAD system. This was the bedrock on which FEGS was founded in 1978: our early success was in mesh generating tools – like FAM – which provided an associative link between CAD geometry and CAE data.

Huge demand for engineering simulation and the continued impotence of universal neutral file formats for solid modelling data both contributed to a steady evolution in FEGS's business. Then in the mid 90s, we made a quantum step forward, when we recognised and repackaged a key component of our technology and expertise into the new data exchange product, CADfix. CADfix has been a great success – with a reputation for uniqueness and robustness and, to date, around 2,500 seats worldwide – everything we could have hoped for – but we could not have done this without the backing of local business angel investors,

our new parent/partner ITI, and our own sales team in Cambridge. The business angels funded the productisation of CADfix, the sale to ITI in 1998 connected CADfix into global sales channels and John Meaney joining us in 1999 brought us the vital ingredient of European sales and marketing expertise. For getting us to where we are today – the European arm of a new dedicated, global interoperability business – thanks must go to the strong team we have assembled in Oakington: the technical staff behind our world-class CADfix product, and our sales and marketing staff led by John Meaney, whose considerable experience in marketing CAD and CAE solutions across Europe, has played such an important part in our success.

Data exchange problems and the wider interoperability issues are a consequence of the inevitable, continuing existence of disparate CAD/CAM/CAE systems. Market analysts tells us that this is currently a \$1b problem and growing. The TranscenData challenge is to continue to develop and deliver solutions to mitigate these problems. And I can believe the next 38 years will be even more interesting.

## TranscenData partners with NAFEMS in FENET project

TranscenData is pleased to announce its partnership with NAFEMS in FENET, an EC 'Thematic Network' project to develop and expand finite element and related technology across Europe.

FENET kicked off in August 2001 and will run for an initial period of four years. Currently there is a consortium of 110 international partners in the project, drawn from various industry sectors using and developing finite element technology. The first Annual FENET Industry Workshop will be held from 13th to 14th November 2001, in Wiesbaden, Germany.

The project aims to increase the use and knowledge of finite element technology throughout the industry through various means including broadcasting latest research results and developing best practice.

FENET will address FE related technology

issues in eight industry sectors: aerospace, land transport, bio-medical, civil construction, consumer goods, marine and offshore, power and pressure systems and process and manufacturing.

Technology issues will also be grouped into four broad themes: durability and life extension, product and system optimisation, multi-physics and analysis technology and education and dissemination.

Participating organisations include: European Space Agency, Siemens AG, New Technology Engineering Ltd, Netherlands Organisation for Applied Scientific Research, Ministry of Defence, National Nuclear Corporation Ltd, SKF Engineering & Research Centre BV and Nokia Mobile Phones Ltd.

For more information, see [www.nafems.org/FENET/intro](http://www.nafems.org/FENET/intro).


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