

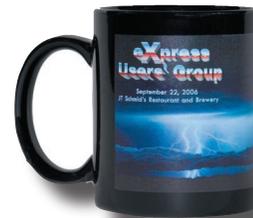


2006 eXpress Users' Group Meeting Recap

Another great **eXpress** Users Group has been logged in the history books! Fortunately, everyone got mugged, and was able to bring home a commemorative coffee mug highlighting all of the Presentations. DSI gives a very special warm appreciation to all of our guest presenters:

- Larry Butler - Raytheon Corp.
- Vern Fox - BAE Systems
- Rob Schwarzberg - Raytheon Corp.
- Jack Amsell - The Boeing Company
- Pat Kalgren - Impact Technologies
- Michel Schieber - EADS Test and Services
- Dave Tyler - AAC Corp.
- Brian Lennox - EADS Test and Services

The Presentations from EUG 2006 can be found on the DSI website (www.dsiintl.com), or by sending your request for a CD to daguinaga@dsiintl.com.



When Money Not Spent is Money Not Saved

Although **eXpress** analyses can be used to assess the diagnostic capability of a fixed system design, **eXpress** really comes into its own when the results are used to *improve* a design's diagnostic capability. Unlike spreadsheet-based approaches, **eXpress** has been specifically designed to facilitate both early and iterative analysis; in fact, it can be effectively employed throughout the product development cycle, beginning in the earliest phases of system design. The value of this early design feedback cannot be over-estimated—if diagnostic analysis is postponed until later phases of the design process, it becomes much less cost-effective to implement the recommended changes. Additional costs can result not only from duplicated effort as the design is re-engineered, but also from situations where existing funds have already been allocated and therefore "new" funds must be found for the design changes. Unfortunately, when postponed analyses provide unattractive assessments of a system's diagnostic capability, there is a temptation either to sweep the results under the metaphorical rug or to somehow develop positive "spin" on the "negative" numbers.

When diagnostic analysis is performed using **eXpress**, the design can be optimized early on, when modifications still fit within the expected cost profile for design development. **eXpress** offers the ability to not only perform, but also easily share assessments of

a system's projected diagnostic behavior. In addition to text reports, **eXpress** data can be exported using other formats (such as spreadsheets or XML files) that can be easily read by other processes. Because the **eXpress** design can be set up to resemble engineering schematics or management diagrams, the graphical representation of the design becomes an important aide when sharing the results of diagnostic analysis. Furthermore, within a study, the Diagnostic Flow Diagram can be examined interactively to demonstrate the reasoning performed by the diagnostics.

When the design changes (as is inevitable when diagnostic engineering is employed concurrent to the design process), the **eXpress** model can be updated and analyses re-generated with a minimum of effort. This is all very simple for **eXpress**, since the model itself both contains and maintains definitions of the interrelationships between the various components that comprise the system. This is a major advantage over the use of spreadsheets as the sole method of performing a diagnostic assessment, since the spreadsheets are typically not linked to a model and are therefore cumbersome to update as a design matures. Spreadsheets also lack a standard form—the equations themselves often needing to be updated each time that the data fields are updated—so there are additional costs associated with ensuring that the updated spreadsheet is still valid.

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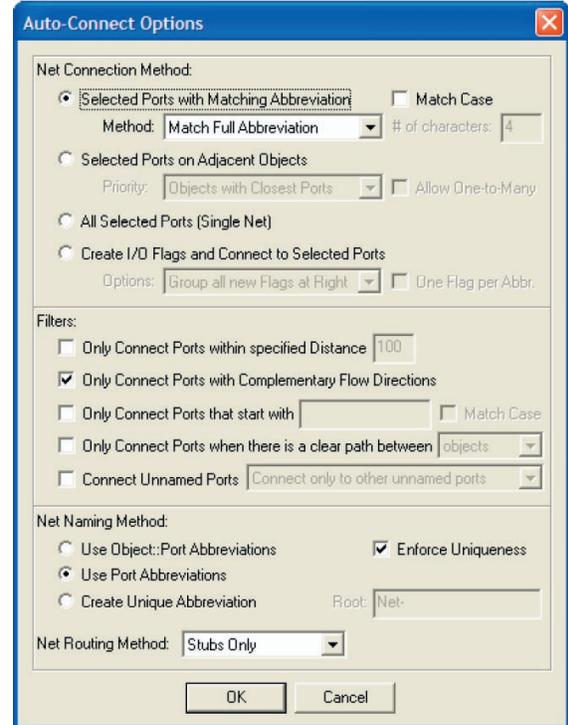
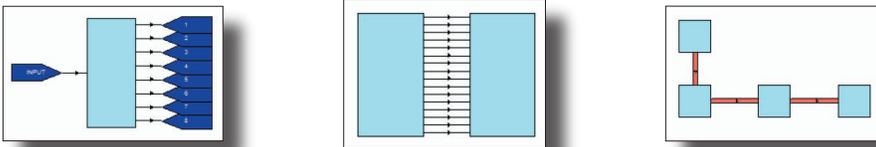


What's New in eXpress 5.10.3?

DSI is proud to introduce **eXpress 5.10.3**. This new version includes many new time saving capabilities as well as many optimizations. Here we will cover just a few of the more significant enhancements. Please visit our website and checkout the release notes for a full description or better yet, download the latest version and try them for yourself. We know you'll like what you see!

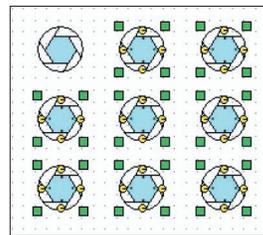
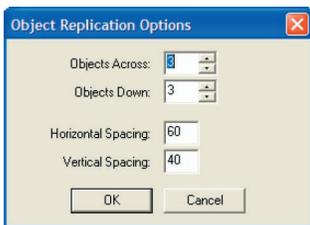
Auto-Connect:

A new Auto-Connect operation has been added to reduce the amount of time needed to create large numbers of nets. This operation can be invoked by selecting "Auto-Connect..." from the context menu that appears when the analyst right-clicks on the design with one or more ports selected. When this operation is invoked, the dialog to the right will appear. Although there are a large number of settings on this dialog, this operation has been designed so that the majority of applications can be set up with a single click (selection of the desired Net Connection Method). All of the special options (which are explained thoroughly in the **eXpress** On-Line Help) exist so that the Auto-Connect operation can be used to reduce net creation time in a greater variety of situations.



Replicate Object Operation:

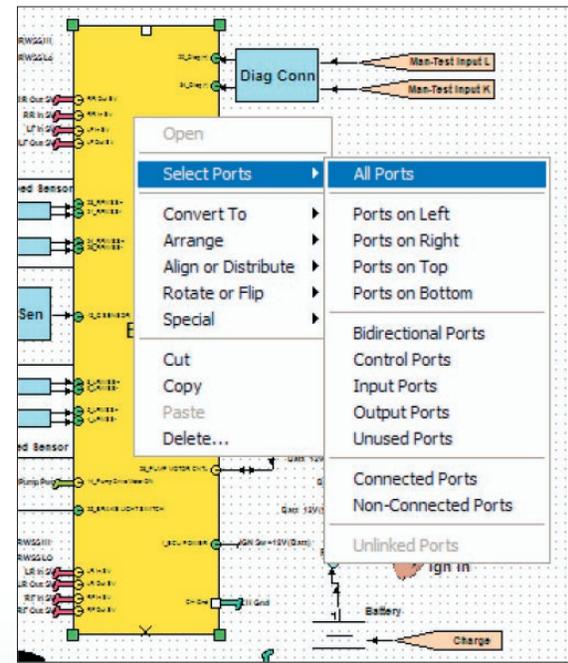
A new Replicate Object operation allows an existing object to be repeated across and/or down the design diagram. Although this operation can be used to create a few automatically-spaced and aligned copies of the specified object, it can also be used to create a large number of copies lined up in a grid pattern. This operation is invoked by selecting "Replicate Object..." from the Special submenu in the object context menu (the option dialog depicted below will then appear).



Talk about creating models quickly, this will help you do it especially where models include many duplicate items.

Port Selection Operations / Port Context Menus:

To facilitate the selection of ports in large designs, new port selection operations have been added both to the object and port context menus. In the object context menu, the Select Ports submenu (shown to the right) contains operations that allow for the quick selection of all ports on the selected object(s), all ports on a given side of the selected object(s), all ports with a given flow direction, all ports connected or not connected to nets, and (for assemblies) all ports for which the lower-level design does not contain a corresponding I/O flag. In the port context menu, the Sub-Select Ports submenu contains operations that can be used to down-select the set of currently selected ports to only ports on a specified side of an object, with a given flow direction, that are connected or not connected to nets, or (for assemblies) for which there is no corresponding I/O flag in the linked lower-level design.



Boundary Scan in eXpress – Technique from a pro



Cyber Storm CD Available NOW!



See Page 4 for Information!

Training Schedule

| Course Number | Pre-requisite | Course Description | Dates | Location | POC |
|---------------|---------------|--|--------------|------------|-----------------------|
| 100 | | System Diagnostics Concepts and Applications | 8 Jan, 2007 | Orange, CA | Denise Aguinaga , DSI |
| 110 | 100 | Basic Modeling & Introduction to Testing | 8 Jan, 2007 | Orange, CA | Denise Aguinaga , DSI |
| 120 | 110 | Introduction to Testing & Analysis | 11 Jan, 2007 | Orange, CA | Denise Aguinaga , DSI |
| 200 | 120 | Advanced Diagnostic Development & Assessment | 22 Jan, 2007 | Orange, CA | Denise Aguinaga , DSI |
| 205 | 200 | Advanced Test Development & Importing | 24 Jan, 2007 | Orange, CA | Denise Aguinaga , DSI |
| 210 | 205 | Advanced FMECA Development & Assessment | 26 Jan, 2007 | Orange, CA | Denise Aguinaga , DSI |

“Testability Urgency”

Now is the time to diffuse the “old school” Testability Reactionary stereotypes!

The Technology used within eXpress exposes vastly more Design Influence capability, impact & value than ever before

In the brief, high-level information provided below, we have elaborated a bit to help better align any ideas concerning the focus and purpose of DSI's **eXpress** – resulting from more than 30 years of pioneering and evolving the (Model-Based) Testability and Diagnostic Engineering industry. Still, and by far and away, **eXpress** remains the most widely used and trusted Diagnostic Engineering tool throughout the United States and overseas.

eXpress is a very sophisticated and mature Diagnostic Engineering tool that can certainly perform every imaginable aspect of any of the Testability analyses that could possibly be required by any customer. However, the core strength of **eXpress** and the “process” that it uniquely facilitates, is that of influencing a much more diagnosable and supportable design in the initial phase of the design. The greater the degree of complexity, the greater the degree of value that will be gained through the use of **eXpress**. DSI is currently supplying the Diagnostic Engineering tool for the US Army's Future Combat System (FCS), among other rather notable applications.

The philosophy and primary core capability uniquely leveraged within the **eXpress** technology, is its use for diagnostic design influence. It exposes the evolving design, but at the same time, it addresses the impact of design alternatives prior to the selection of components or parts. Traditionally, such information gleaned from an analysis (“analysis” to DSI, means that one is attempting to conduct a belated and compromised concern toward diagnostic prowess) can only provide you with the optimum answers; **GIVEN** a frozen design. Great. The analysis will never help make the design of the board (assembly, sub-system or system) any more diagnostically sound. Therefore, with a design that was not able to be economically changed and reworked to take advantage of diagnostic forethought, then the best one can do is “fine tune a compromised design”. On the other hand, if the design was able to be influenced by alternative and variable concerns that the systems integrator may have (during the concept, production and/or support), then we can “fine tune a supportable & optimized design”.

DSI is the only diagnostic software manufacturer in the world that has and sells a commercial product that is concerned with the influencing of a design to achieve a much more diagnostically savvy approach – Feel encouraged to re-read this sentence again and again. This is

accomplished by **eXpress** being able to assist in the development of “functional” dependency models, that can evolve into hybrid functional/failure models (when the component become selected and integrated with the system design structure). **eXpress** easily allows the diagnostic capability of the design to be seen and viewed at any and all points desired along the way. As failure information becomes available and is included into the evolving **eXpress** functional model, **eXpress** will easily be able to support any possible whim about reporting on functional failures – on the part, board, sub-assembly, component, assembly, box, system, etc.)

eXpress can take advantage of nearly any available design data along the way. It has many inherent interoperability mechanisms, and can also output the (or any desired/variable) diagnostic strategy to most any (embedded or web-based using) Reasoning tool/process. Creating the (variable) diagnostic strategies for the system or board, based upon any set of variable diagnostic criteria, is a major strength of **eXpress**. Most Reasoning (back-end and non-design influence) still need design and diagnostic strategy information. A tool that can automatically produce any (an infinite) number of diagnostic strategy/ies (i.e. **eXpress**), will be much more valuable, accurate and consistent. However, because **eXpress** is fully usable as a “systems engineering” tool, it will easily allow many/any/all changes to the design (even of the system, or environment) to be included into the diagnostic reconfiguration of the board/system to be automatically included in the generation of any new diagnostic calculations or strategies (which can then be fed to embedded Reasoner(s), Health Management System(s), IETM(s), etc.).

This is just a little background on **eXpress**, but the key to make note of, is that Design Influence can only be achieved if PERFORMED far earlier in the Diagnostic Engineering process, than ever thought before. Secondly, the Diagnostic Engineering process must be completely workable as an on-going, living, breathing entity that welcomes iterative development, assessment criteria, and evolution. Welcome to the world of **eXpress!**

Critical -- Empower the Engineering Process – must begin Diagnostic Engineering **“RIGHT FROM THE START”**.

When Money Not Spent is Money Not Saved - (Continued from page 1)

Because of all this, spreadsheet-based approaches to diagnostic assessment are typically postponed until the design is relatively mature (to cut down on the time spent re-populating and re-validating the spreadsheet each time the design changes). This is a situation, however, where money not spent is not money saved. By eliminating iterative analysis, the "wait-until-the-design-matures" approach typically results in additional costs. This can happen, when design modifications are introduced after the window of "cost-effectiveness" has already passed or, worse yet, when costs arise from not updating the design at all. Furthermore, because the spreadsheets are not integrated with graphic representations of either the design or the diagnostics, attempts to use spreadsheets as the foundation for communication between different specialists may result in less-than-optimal communication (which, of course, also increases upgrade costs).

Because the system's complex interrelationships have been fully incorporated into its set of linked models, **eXpress** can reveal when an analyst's projection of the overall diagnostic capability of a system may have been overly optimistic. This is because **eXpress** is able to easily determine the impact of each test across multiple levels of design hierarchy—something that is difficult for even the most seasoned Subject Matter Expert (SME).

For example, **eXpress** calculations accurately take into consideration

situations in which one or more tests have overlapping coverage at lower-levels of the design hierarchy. Because the definition of each test's coverage is part of the **eXpress** model, **eXpress** is able to accurately calculate BIT coverage or detection coverage, regardless of the complexity of the design. This differs greatly from spreadsheet-based calculations, where it is difficult to account for overlapping coverage in equations or macros. Moreover, for non-trivial designs, the SME who must populate the spreadsheet may even have difficulty determining the precise diagnostic usefulness of certain tests.

Another major drawback of spreadsheet-based approaches is that it is difficult to translate analysis results into recommendations. The spreadsheet equations may indicate that the fault isolation levels do not meet system requirements, but they do not point out why. In **eXpress**, all calculations are backed up with reports that can easily be used to determine the problem areas of the design.

There are thus many drawbacks to using spreadsheets as the primary method of diagnostic assessment. It is difficult to re-populate the spreadsheets as the design changes, to ensure the validity of equations as the spreadsheet is modified, to determine the best actions to remedy diagnostic inadequacies and to communicate the results with other SMEs. It comes as no surprise, then, that analysts who use spreadsheet-based approaches are tempted to resort to creative means of getting the appropriately "attractive" numbers.

Experience **eXpress** Expertise Explained

Boundry Scan in eXpress - The techniques from a pro!

Thanks to David Cole and Matra BAE in England, you can employ a very hip technique that allows for the rapid creation of a model in **eXpress** that emulates the boundry scan technology. This technique is being shared with the **eXpress** modeling industry as a courtesy from one of the most premier and long-time **eXpress** experts.

Cyber-Storm CD Available NOW!

Witness the "Storm" as shown at this year's Autotestcon and the **eXpress** Users Group in Anaheim! This CD is a virtual Tutorial of special features in **eXpress** and provides an artistic "bolt" to the showing of special features and capabilities in **eXpress**.

For your copy of either of these essential items, please contact Denise Aguinaga (daguinaga@dsiintl.com) for information on obtaining your copy today!



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