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Corelis Boundary-Scan Tools Help Streamline Production Throughput while Reducing Development Cost at Navman NZ Ltd.

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Navman is a leading manufacturer of world-class marine electronics and Global Positioning System (GPS) technology. Established in 1988, the New Zealand based company provides a diverse range of navigation technologies across wide ranging industries.

Terry Dagnin is the lead Test Engineer at Navman and is responsible for Inspection, Test, and Test Engineering. Terry came to Corelis looking for test solutions that are capable of probing areas of printed circuit board assemblies that are difficult to access due to fine pitch components such as Ball Grid Array (BGA) devices.

The design and test engineers at Navman were under a deadline to introduce their iCN 630 portable in-vehicle navigation product to market and announce it at the 2003 International Consumer Electronics Show. Navman's first pilot production run was 1,000 units. Testing and very fast in-system programming were critical for on-schedule delivery.

Navman's existing test strategies for other products used a combination of functional testing and traditional probing. Central to this approach is the fact that the target CPU must be capable of booting properly and executing the functional test software correctly. If the CPU fails to boot, or the functional test software fails to execute in its entirety, the complete test scenario can quickly be ground to a halt. When the CPU is implemented in a BGA package type, the ability to identify the underlying fault which is preventing the CPU from correctly booting or executing the functional test program can become an exhausting and time consuming effort. This was precisely the situation faced at Navman.

In minimal time, Corelis provided a turn-key solution that included the ScanPlus boundary-scan test system and a custom test procedure.

Corelis engineers quickly produced a detailed test plan that provided complete coverage of the communication path between the target CPU and Flash, SRAM and SDRAM memories. Boundary-scan Test Vectors were automatically created by the ScanPlus system and provided excellent test coverage, capable of detecting assembly faults right down to the net and pin level. These faults included bridge faults and opens under the BGA which were inaccessible to traditional probing. The advanced memory diagnostics provided by the ScanPlus system allowed Navman engineers to pin-point faults between the CPU and target memory, allowing us to quickly bring these units up into functionality.

The test engineers at Navman were pleasantly surprised by the ease in which they could accomplish this by simply linking the Corelis ScanPlus DLL interface to their Delphi based software package.

"Our boards are designed with a mixture of digital and analog components and require fast programming of Flash memories in-system," said Dagnin. "We initially had a certain level of skepticism as to whether boundary-scan would be beneficial for our particular design. We were delighted to find that the boards which passed the boundary-scan testing were directly seen to boot properly and run the functional test programs in their entirety, getting us past the largest bottleneck in our testing process. We were also pleased to see that we could program our flash devices in-circuit very fast by simply including the programming step within the total test plan.

"We were very impressed with the technical support that we received from Corelis engineers," added Dagnin. "Even though we were thousands of miles away, with our site in New Zealand and Corelis in the USA, the direct access that we were given to their engineering staff and the promptness of their feedback made it seem as though Corelis was right here at our facility."

Navman was so pleased with the added value of boundary-scan and Corelis' ScanPlus boundary-scan test tools that they decided to incorporate the ScanPlus system into their complete factory-based test software platform to be used for all new product designs.

About Corelis

Corelis, Inc., a subsidiary of Electronic Warfare Associates, Inc., offers bus analysis tools, embedded test tools, and the industry's broadest line of JTAG/boundary-scan software and hardware products combining exceptional ease-of-use with advanced technical innovation and unmatched customer service. Corelis' development and test tools are used by companies such as Agilent, Dell, IBM, Intel, Microsoft, Lockheed Martin, Rockwell Collins, Hewlett-Packard, Motorola, Qualcomm, Nokia, Panasonic, TI, Ford, Broadcom, Ericsson, and many others. Corelis products are found globally in every industry developing or manufacturing electronic products.

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