



Experience Solves Legacy Test Problems

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The test function has always been among the most challenging processes in electronics manufacturing. How can test equipment keep ahead of the sub-assemblies it needs to validate? In theory, it should be easier when testing legacy products, but successfully developing futureproof solutions requires not only knowledge of the new, but also experience of the old.

During the past three decades, the test industry has changed dramatically. There are fewer test equipment manufacturers and fewer test solution providers. And yet, an increasing number of legacy test systems remain in service, despite test sector and board technology evolution. That reality continues to present opportunities for Lees and his team of problem-solving test engineers at ATE Solutions.

“Problem-solving expertise, based on almost thirty years of test experience, is a significant differentiator for us,” Lees claims, citing an example of test technology for braking system control boards on London Underground trains. “This is legacy test equipment in its truest form and has been operating virtually unaltered for twenty-five years,” he explains. “Now TfL wants the engineering contractor that supports those sub-assemblies to keep everything running for a further twenty years! Now that’s a test challenge – so the company came to us for a solution that will deliver the test confidence required for another two decades, while remaining fully compatible with the existing test procedures.”

Choosing the ATE Solutions team came as no surprise to Lees, since he and his team had worked on this project since its inception in the nineties. He draws parallels with other legacy test system users: “We still support some Marconi test systems, and many are going strong – notably the sturdy Marconi 511 benchtop testers.” But ATE Solutions is continuing to convert its legacy customers to its [Flex range of test systems](#) for a variety of compelling reasons: “A modern, modular ATE system can be configured to replicate the functions of the existing legacy tester, so familiarity is maintained. But new test systems are easier to operate, with contemporary software and user interfaces, and can feature the latest instrumentation to expand or speed up the test process.” In addition, legacy testers can take a long time to fault-find, and the replacement parts, even if still available, can be exorbitantly priced: “The market price for an eight-inch floppy drive can be up to £3,000!” reports Lees.



Legacy benchtop ATE system

In the London Underground braking board application, ATE Solutions replaced the customer's legacy Marconi 511 test system with its PXI-based Flex 40 tester: a two-bay, floor-standing chassis that offers a huge amount of space for instrumentation. The Flex 40 was configured with new versions of the same hardware and new test programs to replicate and emulate the original functions. "It's easier to calibrate, it's supported by our engineers, and it's an opportunity for the customer to finally be able to integrate the test function into its Factory Management System. But mostly it's about delivering confidence to the customer going forward," Lees concludes.

The braking system control boards need to be tested, and ageing parts, such as capacitors, replaced. These refurbished boards are returned to the London Underground trains, with a view to having them operate safely for another twenty years. This entails having a rigorous test and maintenance programme that the legacy Marconi testers simply would not be capable of. "That test equipment had really been obsolete for ten years," says Steve. "It was still running MS-DOS! What we are doing is replacing 1990s test equipment with 2017 test equipment, which we can guarantee will still be supportable in twenty years' time."

Over a period of about nine months, all the trains will have their boards refurbished and tested. The ATE Solutions team has replicated the original test sequences from the original test specifications, and significantly improved the diagnostic capabilities of the test equipment, using modern test operator systems, such as TestStand and FlexStand.



Modern, modular PXI-based test system

Lees also addresses an application that includes test hardware and software solutions to support a company that manufactures a wide range of infrared beam fire detectors used in large internal spaces. “The business had lots of models and product variants, so chose to consolidate its range into one common set of electronics to optimise production,” he explains.

That streamlining programme demanded new test fixturing for the consolidated product – but every legacy product featured custom hardware in each fixture.

“We moved all that hardware – PSUs, relay cards, DAC modules and breakout boards – into a Flex 10 tester. Now, to calibrate a DAC, you simply take it from the ATE system, rather than undertake the tedious task of removing lots of DAC modules from different fixtures. It simplifies the

fixturing: an optimised fixture should ideally contain only wires,” adds Steve. It’s an example highlighting that even the company’s entry-level ATE systems are truly configurable platforms.

Another example is contract manufacturer STI, who had deployed Marconi 511s, which it recognised were becoming obsolete. “We spent some time programming for them, for the best part of ten years,” Lees comments, “and they approached us looking for a platform they could confidently move forward with. We put in a large generic Flex 40 test system that will test everything that they make.” His team have been involved in transferring over test programs to this high-spec machine, and finally the old Marconi machines are being retired.

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