

Dedicated to Quality

Innovative Businesses Turn to DIT-MCO to Fuel Their Growth

Over and over, young businesses draw praise for their impact on the economy, garnering attention for job creation and innovation. Regardless of their size, many growing companies dedicated to outstanding performance of their electrical products rely on DIT-MCO to get their products to market on time, with the highest quality.

“DIT-MCO is the industry standard,” says Rick Thompson, DIT-MCO’s President and CEO. “One reason is that we’re there for every single customer, regardless of industry, market, or the size of their orders. Their success is our success. We’re the standard – and that standard is available to anyone committed to quality.”

Here is how three growing businesses put DIT-MCO systems to work in their operations.

End To End

In August of 1996 the Naval Aviation Depot (NADEP) in Norfolk, VA, took delivery of the first CASS interface device (ID) and associated cabling built by End To End, a minority-owned company. CASS – the U.S. Navy’s standard, automated test system used to evaluate avionics and electrical components – has saved the Navy about \$1 billion to date. Today, the IDs built by End To End facilitate the maintenance of hundreds of Naval Avionics assets deployed around the world.

Initially, Sandra Hart, End To End Production Manager, lobbied to use DIT-MCO test systems. Hart, a former NADEP Norfolk employee, was familiar with the ID, knew the complexities of its wiring, and that it required hours and hours of hand-testing. She used DIT-MCO systems at NADEP Norfolk and knew their capabilities. Hart’s lobbying was

put to the test when the company delivered its first CASS ID – tested on a DIT-MCO Model 2000.

“That first run on the CASS station was basically a trial run before the official production sell-off, and no one – including me – was sure how well our first ID would run,” says Bill Saville, Test Engineering Manager for End To End. The ID self-test ran “end to end” the first time – and Hart’s lobbying paid off. “There were no failures! Everyone was definitely impressed,” Saville admitted. Next, they ran the test programs for each of the WRAs – black boxes related to weapons assemblies. Again, they ran end to end the first time without failures.

“I’ve seen my fair share of test program sets (TPSs) both on CASS and other testers,” says Saville. “In my ten years, I had never seen a new production ID run all TPSs the first time with no failures, let alone one from a new manufacturing company.

“To say our DIT-MCO tester played a significant role in the quality of our product is probably an understatement. Our incredible, early success gave us a huge boost of confidence. We were able to accelerate our production schedule and complete our first NAVY production contract ahead of schedule.”

In setting up their automatic test processes, Saville worked with what is now Lockheed Information Systems in Orlando, FL (through a DOD Mentor-Protégé agreement between End To End and Lockheed Martin and sponsored by the NAVAIR CASS program office, PMA-260). He observed how they wrote DIT-MCO test programs and implemented test procedures. DIT-MCO’s Special Products Group built End To End’s custom test solution, which integrates a Model 2000 system with a Virginia Panel interface designed exclusively for the Navy’s CASS test program.

A new wiring verification service has developed from End To End's proficiency with DIT-MCO testing, which has spawned several new test and rework contracts with other companies requiring high integrity in their wired assemblies.

The young firm's performance continues to generate additional contracts with the Navy and referrals to other customers opportunities that come from its responsiveness and commitment to quality. Investing in its DIT-MCO system was a strategic move that helped End To End grow its business from day one.

InterConnect Wiring

"Fast turnaround" defines much of the work undertaken by InterConnect Wiring, LP, located in Ft. Worth, TX.

"In addition to supporting the F16 production line, we do a significant amount of custom wiring and prototype development," says Marc Piloian, InterConnect Vice President. Piloian described the company's highly customized products. "Most of our products are built for the aerospace industry, so reliability is critical." Fast turnaround and reliability – two key reasons InterConnect chose a DIT-MCO Model 2115 to the test wire harnesses, panel assemblies and a host of other electrical assemblies it builds for the F-16, F-22, and other military aircraft. Products fabricated and tested by the six-year-old company include:

- Wire harnesses, ranging from coaxial harnesses to complex trunk and pylon harnesses with many connectors and hundreds of wire terminations.
- Multiplex (MUX) matrix assemblies that provide electrical protection for on-board components.

- Cockpit panels for avionics, communications, control, and lighting panels.
- Relay panels destined for arm and release operations, engine status controls, A/C controls, and low altitude warning.
- Circuit breaker panels that control AC and DC power distribution throughout an aircraft.

InterConnect's customers recognize the company's high quality. Even as a young corporation, InterConnect Wiring received a commendation from Lockheed Martin for supplying harnesses for the F-16 Mid-Life Update. InterConnect, which recently earned its ISO 9002 registration, is designated as a Lockheed Martin STAR Supplier, a Blue Ribbon Contractor to the U.S. Air Force and an approved supplier for Boeing, Raytheon and Bell Helicopter.

InterConnect uses its Model 2115 to perform continuity and insulation resistance testing of harnesses, as well as full functional tests of assembled panels and other components. The test system includes an expansion switching unit (ESU) to provide external energization for functional tests, and is equipped to run AC dielectric (hipot) testing.

"We test at several stages during production, depending on the complexity of the product itself," says Piloian. "Prior to final inspection, we perform a complete functional test."

InterConnect's test operation was streamlined once DIT-MCO's automated testing was incorporated into its procedures, including low volume, custom work. "Troubleshooting is easier with the DIT-MCO, and testing goes faster," Piloian says. "A complicated harness that once took two people three to four hours to test manually – six to eight hours total –

now takes one technician less than an hour.” In addition, he likes the programming language and the Model 2115’s dependability.

Piloian is also pleased with DIT-MCO’s customer service and attention to customer relationships. “When you call, you talk to a real person, and they’ll ship parts overnight,” he says. “I also like the customer technology exchanges they’re very informative. The development of their 2500.MBA, the multi-bus system, is a good example of DIT-MCO listening to customers and acting on what they heard.”

InterConnect knows what it means to value customers. “Most of our business directly supports our customers’ production lines,” says Piloian. “They’re trying to keep their work-in-process to a minimum, and they can count on InterConnect. DIT-MCO has given us a solid foundation to build our test program on.”

Flexible Circuits

“Our flex circuits are used in environments that demand high reliability, mostly in military and aerospace applications,” says Dale Smith, Engineering Manager for Flexible Circuits, Inc., Warrington, PA. “There is zero tolerance for failure. If a circuit fails out in the field, it could be catastrophic.”

Other applications benefit from the high reliability of Flexible Circuits’ products. For example, in a continuous operating environment, pick-and-place machines and robotics may require circuits to perform for 30 million cycles. Some environments such as satellites in outer space or missiles streaking toward their targets make it impossible to send out a service technician to repair a failure.

Founded in the early ‘60s, Flexible Circuits has used DIT-MCO test equipment for more than 15 years, putting a Model 9100 online in 1984. They’ve since replaced it with a

Model 2115 (plus a June '99 software upgrade) that supports two production shifts. According to Frank Vesel, Test Design Engineer for Flexible Circuits, the upgrade has produced numerous benefits. "The new software has improved our ability to create and edit test files," he says. "It's a lot easier for me to create the ACT [Address Correspondence Table] files than before. Also, we have to tailor the files to incorporate product nomenclature, and the new software makes that easier. Overall, we've improved programming time by about 20 percent."

Vesel also likes their new system because it takes up less floor space (about 25 percent less than the 9100) and because of the ease in switching between products under test. "Sometimes we have to quickly change between testing bare boards to cables," he explains. "With the 2115, it's very easy to change the UUT interfaces to the DIT-MCO."

The Model 2115 tackles a variety of challenges to ensure the electrical integrity of Flexible Circuits' products:

- High density of features in the circuit and the "pitch" (the distance between features on the circuit) make testing challenging.
- Flex circuits tend to change size during processing, requiring constant adjustments to accommodate variations. "We really like the fact that when we need to, we can bypass the fixturing and cable directly from the DIT-MCO to the product," says Vesel. "We test most of our assemblies this way."
- High-voltage, AC dielectric testing of 500 to 1000 volts presents a challenge to the type of materials used in flexible circuits. "We test every product at high voltage with the DIT-MCO," says Smith.

Given the demand for near-perfect reliability, Flexible Circuits must validate continuity by measuring resistances of less than 1 ohm. To do this, Vesel's team uses DIT-MCO's four-wire Kelvin bridging system. "That's one of the unique things about DIT-MCO that we especially like," observes Vesel.

Both DIT-MCO wiring analyzers used by Flexible Circuits over the years have been workhorses. "Our experience with DIT-MCO's customer service has been good," says Vesel. "However, because the testers have been so reliable, we rarely need to call them."

Delivering the quality that its customers expect requires a "combination of circuit design and validation of that design through testing," says Vesel. DIT-MCO's ability to compare the fabricated product to a point-to-point "NetList" (wire address list) generated from the original CAD data helps Flexible Circuits meet exacting customer demands in a production environment.

With its range of capabilities, user friendly programming, and powerful features, DIT-MCO gives Flexible Circuits the flexibility and reliability they need to meet their customers' demands year after year, circuit after circuit. Says Vesel, "We have been very, very pleased."

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The success of companies like End To End, InterConnect Wiring, and Flexible Circuits demonstrates DIT-MCO's commitment to help customers deliver high quality products. Whether they mass produce or create one-of-a-kind prototypes, these innovative companies rely on DIT-MCO test systems. Whether they manufacture two-wire coaxial cables, complex wiring harnesses or flex circuits, DIT-MCO provides the competitive advantage they need to exceed their customer's expectations and grow their businesses.