



ELECTRONIC MFG. SERVICES (EMS)

Better Together: Yamaha, Trans-Tec and ADCO Circuits

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There are few things as valuable to a growing business as an excellent partnership. The success story behind ADCO Circuits, Yamaha Motor Corporation, USA, and Trans-Tec Worldwide, Yamaha's global service and support partner, is one example of an EMS provider, an OEM and a service and support company working together to maximize each other's opportunities.

"We made it quite clear from the beginning that we were not merely buying equipment, but rather buying into a company," says Kevin Barrett, ADCO's manufacturing manager. "Our view was that when we purchased from Yamaha and Trans-Tec we were entering into a partnership."

ADCO Circuits, Inc., located in Rochester Hills, Michigan, provides electronic design and circuit board assembly services to a wide range of companies in the industrial, medical, automotive, telecommunications, aerospace, and military markets. As a full-service, turnkey supplier of custom electronics, ADCO provides support from design and prototyping to NPI and full-rate production. Through-hole, surface mount and flex assemblies are all manufactured, and system box builds make up a large percentage of sales.

As Barrett explains, the company's interest is in establishing long-term relationships in an open environment with customers who require advanced logistics, production, test, and quality capabilities. ADCO's 53,000 ft² (4,924m²) facility

is state-of-the-art and capable of low-to-medium volume assembly and test.

Humble Beginnings

The company began in 1981, back when interest rates were 20 percent. "I was seeking to start a business, and the top two growth markets in Michigan were dealing in hazardous waste, or electronics manufacturing," recalls Archie Damman, founder and president of ADCO. "Electronics became the right path. A friend introduced me to a local CM who was getting out of the business and we ended up hiring the general manager and the engineer to start ADCO. In the beginning, we were living dollar-to-dollar. We started out very labor-intensive, and then went through our 'auto-insertion' stage, as key customers were growing our business. Yamaha has become part of our fourth generation of growth from where we began."

ADCO has all the capabilities of its billion-dollar competitors, Barrett points out, with the same MRP systems in place, the same equipment, and with the same skilled engineers and technicians. However, it's the offshore corporate pricing of components that separates them from local contract manufacturers; in fact that is the lion's share of the cost to build products. "As a mid-market contract manufacturer, it's all about getting the sales," Barrett says.

"We cast our nets far, and our current customers are



ADCO's Archie Damman, founder and president (left) and Kevin Barrett, manufacturing manager (right), with their Yamaha pick-and-place systems.

located all around the country. We are not just considered a local supplier — more than 40 percent of our business is outside of Michigan. Focusing on the automotive industry really represents the future for any company located here. We are in the ‘Hollywood’ of automotive design; and since automotive designs are becoming increasingly wound around electronics, the business outlook for us is great.”

Left in the Lurch

When Barrett first started working at the company in 2012, ADCO had recently been notified that the pick-and-place equipment it had was no longer going to be serviced by the supplier. “This literally threw us ‘into the ditch,’ but by chance, this also happened just prior to the 2012 IPC APEX show in San Diego,” says Barrett. “Our strategy was to visit the show and see who the players in pick-and-place equipment were, gather information, and then return and formulate a plan to evaluate the equipment and find the equipment that would best serve our needs.”

The company needed machines designed for a low-volume/high-mix assembly environment. This required equipment with high flexibility, and a focus on handling high changeover rates and ease of programming. At the time, ADCO was running two shifts and averaging anywhere from 10 to 15 changeovers per day.

“At APEX, we were looking at all the big players, but we didn’t find any platforms matching our requirements,” Barrett says. “We were looking at a modular approach for the machine design, but found the offerings were not fast on changeover. We were looking for the flexibility of two smaller machines versus one larger one. A leading issue was feeder capacity. A modular approach would give us capacity and flexibility; on a single large machine, it provides speed, but would force me to buy an additional machine to meet feeder requirements.”

The ADCO engineers learned about Yamaha pick-and-place technology at the show. By chance, they happened to be socializing at a stand right in front of the Yamaha booth, so they decided to step in and had a demo on the machines. After an hour, Yamaha was a contender and the pricing was agreeable. It became clear that the equipment was advanced and that it would meet their needs.

They narrowed their search down to two vendors, including Yamaha. Both machines could meet the flexibility requirements. However, in the end, Yamaha offered everything that they needed and had the edge. “We want to grow our business, and like many things in life, it’s all about first impressions,” Barrett adds.

“We take great care in keeping our facility spotless. At the end of the day, the decision came down to one question: If I were a customer walking into our facility and both machines, Yamaha’s and the competition, were side-by-side, which one would impress me the most? The answer was Yamaha. The detailed construction, e.g., the covers over the leadscrews, and other obvious examples that showed the meticulous work that went into building this machine, contributed to what we realized would be an overall ‘wow’ factor that we wanted customers to see.”

In the beginning, ADCO’s engineers had more than 1,000 PCBs to program, and their biggest challenge was the creation of a comprehensive parts library. They pur-

chased machines for two lines and added a standalone machine whose sole purpose was to create the library in parallel to production. The Trans-Tec engineers wired up the machine to do this, and it worked superbly. One person working on the machine was able to keep up with as many as 10 changeovers per day. Four years later, the Yamaha machines have, without exception, exceeded their expectations in efficiency and performance.

Improved Performance

“We were running two shifts on our previous equipment to build our products,” Barrett says. “The immediate impact that the Yamaha equipment had was that we went from two shifts to one shift over a period of only a few months. The equipment ran so much better, more efficiently and changeovers occurred very quickly. The machines presented a wide range of options that allowed us to trim down our run rates. We could accommodate 10-15 changeovers in half the time, thus eliminating the need for an additional shift.”

The ADCO engineers did not realize the impact and benefit of many of the tools that the Yamaha machines offered until after they had installed and put them online. In one example Barrett cites, “We had a customer who had three different products. With our old equipment, this required three different setups.

Now, with the Yamaha placement system, we combine these different products in the software and have one common setup for all three products. Most importantly, if there is a change to any individual product, we can make these changes on the fly. We have separate teams, and we always try to have three jobs in the queue at any one time — one running, one tearing down, and one ready to go. The optimization software has been key to keeping this process flowing for us.”

The scan software linking the part to the feeder and its cart has allowed ADCO to perform one-step verification. He says that the company has not had a single issue with wrong parts in the four years since purchasing the Yamaha equipment. Every aspect of how they did things changed, including how they wrote the programs, loaded feeders, ran the machine, debugged the setup, implemented changeovers on the fly, and more. ADCO experienced improvements across the board.

Next-Level AOI

When ADCO looked at investing in AOI, they knew that they needed to go to the next level. The company looked at three vendors, but since they had partnered with Yamaha and Trans-Tec, they were not going anywhere else. “With our previous AOI equipment the main issue had been false calls,” Barrett says.

“We had components that the software could not figure out, and had to be inspected manually. Our initial problem was that the AOI was not failing every board. This was because our new Yamaha placement equipment was not producing many defects. As an experiment, we produced some defects manually to see if the AOI machine was working, and we discovered that indeed it was. It took us a while to get used to this!”

In one example, the company had a BGA component that was failing height inspection. Everything looked fine, but on closer examination they discovered that the BGA incorrectly had no-lead ball-leads and these were not



A production line at ADCO Circuits' facility in Rochester Hills, Michigan.

completely reflowing. The AOI picked up on this issue, which would have gone uncorrected otherwise. Due to their previous experiences with unpredictable AOI system performance, Barrett admits that they did not trust the AOI at first; but after some time, some testing and catching the BGA problem, they came to trust the machine.

"We found that Yamaha had really excelled in the software development, which was an area that we were focused on," Damman says. "We came to realize that the Yamaha machines were the best available, based on what we saw and how they had performed. We were on the learning curve for the technology of 3D inspection, which our new system has, and when we needed help, Trans-Tec and Yamaha came in and supported us. We learned that we could make 3D AOI work, and work perfectly."

Support – a Major Factor

"When we were getting started, we needed help getting the ball rolling," Barrett says. "I made a call to Trans-Tec and the next day we had support. We were asked what our plans were, and I replied that we were committed to Yamaha and that we needed to see the same commitment from Trans-Tec. The response that I received from Jason Yi at Trans-Tec was, 'I'm not leaving until you're happy, no matter if it takes a week, a month or a year.'"

"I'm pleased to say that the local Trans-Tec service engineer stops in every time he passes this way," says Barrett. "He spends a couple of hours on our floor and catches up with what we've been doing, because he may notice something that we were missing. The extra effort has not gone unnoticed."

In the end, both Damman and Barrett say that the key factor isn't the equipment, it's the partnership — companies working together for mutual benefit. "In our view, Trans-Tec has experienced tremendous growth in recent years. They have added some great people to their existing team, and we feel very comfortable with that," adds Damman.

Two Paths to EMS Growth

According to Barrett, growing an EMS business begins one of two ways; either you obtain the business from someone else, or you start at the ground floor. With NPI, there are always challenges in design and components, he says. "The Yamaha machines gives us the flexibility to adapt to new components — I put the part on the nozzle, scan the part, and it's in my library. It's as simple as that." Sometimes, he says, they only get a strip of a few inches of taped components, but the Yamaha feeders handle these with no problem. ADCO has steady customers, but a large part of their business is new product development.

"We see significant issues in this business, but we are positioned correctly to handle them," he says confidently. "A troubling trend that we are seeing is that many established companies will bring their product to us, but during discussion it becomes obvious that they don't understand how to manufacture the product. The intent of the design functions is correct, but we have to work with the designers to get it right and correct the manufacturability issues."

ADCO works in partnership with its customers to drive down manufacturing costs — a critical part of the relationship the company develops. Therefore, it is extremely important to be in front of the design so that it can address these many issues before the product goes into production. In any case, the company's technicians operate these machines every day and would not run anything else. They respect the machines because the equipment supports the company's goals. In turn, Yamaha and Trans-Tec have given ADCO everything it needs to be successful.

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