

Partnering for Success: YAMAHA, Trans-Tec and ADCO Circuits

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It has become increasingly important for equipment suppliers (OEMs), EMS providers, and especially service and support companies to work together to realize the maximum benefit from the partnership. That's the success story behind ADCO Circuits, Inc., YAMAHA Motor Corporation, USA and Trans-Tec Worldwide, YAMAHA's premier global service and support partner. "We made it quite clear from the beginning that we were not merely buying equipment, but rather were buying into a company," relates Kevin Barrett,



Archie Damman, Founder and President of ADCO (L) and Kevin Barrett, Manufacturing Manager.

Manufacturing Manager. "Our view was that when we purchased from Yamaha/Trans Tec, we were entering a partnership." And that's precisely how it all worked out.

ADCO Circuits, Inc., established in 1981, is in Rochester Hills, Michigan, and provides electronic design and circuit board assembly

services to a wide range of companies in the industrial, medical, automotive, telecommunications, and aerospace/military equipment markets. As a full service turnkey supplier of custom electronics, ADCO provides support from design and prototyping to new product introduction 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 Kevin explains, ADCO's interest is in establishing long-term relationships in an open environment with companies that require advanced logistics, production, test, and quality capabilities. ADCO's 53,000 square foot facility is state-of-the-art and capable of medium to low volume assembly and test.

ADCO began operations in 1981, back when interest rates were at 20%. "I was seeking to start a business, and the two top growth markets in Michigan then were dealing in hazardous waste, or electronics manufacturing," Archie Damman, Founder and President of ADCO recalls. "Electronics became the right path. A good 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 but time has a way to healing all ills. If you can hang in there and weather the peaks and valleys of our business, you can be successful. 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, Kevin Barrett points out, with the same MRP systems in place, the same equipment, and the engineers and technicians are all at the same skill level. However, it's the offshore corporate pricing on components that separates them from local contract manufacturers; in fact that's 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 located all around the country. We are not just considered a local supplier; more than 40% of our business is outside of Michigan. Focusing on the automotive industry really represents the future for a company located in Michigan. We are located 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 by Pick and Place OEM

"When I first started working here in 2012, we had recently been notified that the Pick and Place equipment we currently had was no longer going to be serviced by the supplier," Barrett recalls. "This literally threw us "into the ditch", but by chance, this also happened just prior to the 2012 IPC APEX show in San Diego. Our strategy now became 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 ADCO's needs." Since they are in the contract manufacturing business, they needed

machines designed for a low volume / high mix assembly environment. This required equipment with high flexibility, with special focus on handling high changeover rates and featuring ease of programming. At the time, ADCO was running two shifts and averaging



Kevin Barrett, Manufacturing Manager with one of his YAMAHA machines.

anywhere from 10 to 15 changeovers per day; the equipment really needed to excel in accommodating this environment.

"At APEX, we were looking at all the big players, but we did not 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 forces me to buy an additional machine to meet feeder requirements. We considered our options."

The ADCO engineers initially learned about Yamaha pick and place technology at APEX 2012. At the time, they did not know that Yamaha made this kind of equipment. By chance, they were socializing at a stand that

was right in front of the Yamaha booth, so they decided to step into the booth and had a demo on the machines. After an hour, Yamaha was now in contention and the pricing was agreeable with their budget. It became quickly clear that the equipment was advanced and that it would meet their needs.

They narrowed our 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 therefore 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, i.e., 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 purchased machines for two lines and added a stand-alone machine whose

sole purpose at the beginning was to create the library in parallel to production. The Trans-Tec engineers wired up the machine to do this, and it worked superbly, Barrett says. One person working on that 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 produce 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/teardowns. 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, i.e., 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 to the cart has allowed ADCO to perform one-step verification. He says that they have not had a single issue with wrong parts in the four years that they have had the Yamaha equipment. The improvement realized with the Yamaha equipment was overall change. Every aspect of how they did things changed, including how they wrote the program, loaded feeders, ran the machine, debugged the setup, implemented changeovers on the fly, and more. ADCO experienced improvements across the board.

AOI, the Next Level

When ADCO looked at investing in AOI, they knew that they needed to go to the next level. They looked at three vendors, but at the end of the day decided that since they had partnered with Yamaha /Trans-Tec, they were not going anywhere else. “With our previous AOI equipment the main issue had been false calls,” Barrett says. “Additionally, we had components that the software could not figure out, and which therefore 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, they 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 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, and some testing and catching the BGA problem, they came to trust the machine and the process.

“We found that Yamaha had really excelled in the software development, which was an area that we were really focused on,” Archie Damman says. “Keeping this in mind, we came to realize that the Yamaha machines were the best available based on what we saw and how they had performed for us. The AOI system has performed extremely well. We were on the learning curve for the technology of 3D inspection, which our new system featured, 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.”

Yamaha /Trans-Tec 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 Yamaha/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, month or a year.” This how they worked with us with the placement as well as the AOI systems. Trans-Tec consistently worked on getting answers and making things happen very quickly.” He adds, “I’m pleased to say that the local Trans-Tec service engineer stops in every time he passes this way. He spends a couple of hours on our floor and catches up with what we have been doing, because, he adds, he may notice something that we were missing. The extra effort has not gone unnoticed.”

In the end, both Archie and Kevin say, the key factor isn’t the equipment, it’s the partnership, about companies working together for mutual

benefit. "From 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," Damman adds.

Two Paths to Growing an EMS

According to Barrett, growing an EMS business begins either of two ways; either you obtain the business from someone else, or you start at the ground floor. With New Product introduction (NPI), you will meet challenges in design and components, he says. "The Yamaha machines gives us the flexibility to adapt to new components, e.g., 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 couple of 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. But – "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 are correct, but we must work with the designers to get it right and correct the manufacturability issues."

"Working in partnership with our customers to drive down manufacturing costs is a critical part of the relationship that we develop. Therefore, it is extremely important to be in front of the design so that we can address these many issues before the product goes into production. But in any case, my people operate these machines every day and would not run anything else. They respect the machines because the equipment supports what we are trying to do. In turn, Yamaha and Trans-Tec have given ADCO everything we need to be successful."

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