



ELECTRONIC MFG. SERVICES (EMS)

National Circuit Assembly: Doing What it Takes

By Kathryn Cramer

Central Texas has become a vibrant hub of technology. Industry giants Dell, Apple, and others have clustered there — and brought with them millions of dollars of investment. However, these large companies are not the only reason the area's technology sector continues to grow. Much of the success of the region



NCA operator Hoa Dao and VP of Program Management Cruz Alvarado inspect a memory card for voids and bridging.

depends on contract manufacturers servicing companies from start-ups to massive OEMs.

One such company is National Circuit Assembly (NCA), a contract manufacturer with facilities in Garland and Austin, Texas.

Many factors affect the success of a contract manufacturer. These include using the proper equipment to create a

quality product, building firm relationships with customers, and drawing from experience with design and manufacturing to accommodate both a start-up or an established business. Over the last decade, NCA has kept these crucial goals as its focus, and has welcomed projects from a variety of industries. The company has served customers in the aerospace, medical and life sciences, security and defense, as well as the consumer electronics and professional audio markets.

NCA began building products in 2007 with an in-car breathalyzer for a company which then installs them in vehicles. The company still produces 250 to 300 of these units a day, each one containing a camera to ensure that a substitute person is not doing the breathing, and two circuit boards that communicate with the car's computer system and prevent it from starting if the would-be driver's blood alcohol content is too high.

A Variety of Projects

Cruz Alvarado, Vice President of Program Management cites several board assemblies that came to the company at what he calls the "paper napkin stage." One is used in a controller for a commercial sprinkler system which monitors each individual sprinkler head; if one isn't working, a smartphone app enables the user to diagnose the problem. Another board is used in a system which keeps track of utility use in a

home, or commercial building. Again with a smartphone, users can access the gathered data in real-time.

"We installed a prototype in a nearby public library," Alvarado says. "We discovered that the library's seven-year-old control system was turning the



NCA operator Hoa Dao inspects a memory card containing 20 BGAs.

lights off at 10 p.m., but then turning them back on at midnight." The monitor has attracted the attention of a few large utility companies, and has proved successful enough to warrant the installation of another assembly line.

The new line will join three others in the company's 25,000 square foot Austin facility. One is dedicated to prototypes, one to mid-volume, and the newest to high-volume assembly — capable of placing 70,000 components per hour, and containing in-line automated optical inspection (AOI). Along with the five assembly lines in its

Garland facility, NCA can respond quickly to customers' needs for rapid turnaround. Cloud storage enables assembly files to be downloaded and run at either location, and delivered easily to customers.

While not all assemblies continue on to high-volume production, Alvarado does see a trend toward keeping this level of production in the US. "IP concerns about production in China are huge," he says. Also, he has heard some young entrepreneurs express that, with their fathers having lost their jobs to those in overseas facilities, they prefer to work with a US-based firm and try to keep production local.

Some high-volume production still migrates offshore. The company worked with a customer to develop small dome lights that would maintain a constant color, or be programmed from a smartphone for different settings. "Museums like the constant color," Alvarado explains. "A

Contract manufacturers serve as a critical link in the industry chain running from start-ups to OEMs.

department store might change settings to evoke a ski slope for a winter wear display, or a Hawaiian sunset during the summer."

Alvarado states that offering a variety of services is particularly useful when working with start-ups. The customers often have engineering skills, yet lack supply chain or manufacturing experience.

He first works with another company to help the customer develop a schematic, and works with other partners in sheet metal and plastic. Finally, NCA helps develop a good design for manufacturing. Not every start-up will succeed, but the company's goal for each customer is, "to give them confidence, and to go as far as possible with them," since forming a solid relationship can lead to further business.

The company has recently helped develop a sight aid, which attaches to the underside of a rifle barrel. It contains sensors that track the speed, drop angle, and direction of a bullet. NCA has been producing around 500 units a month, but with the customer having garnered a military contract, production is rising to 10 times the amount.

Another of the company's recent projects is a circuit board for a GPS locator system used in commercial aircraft. By 2017 the system will be required for all planes, and the market is expected to grow significantly.

The Right Tools for the Job

NCA has done a considerable amount of work with BGAs over the past decade. The arrays are included in many of the products the company manufactures.

In production, all assemblies containing BGAs undergo X-ray inspection. "The full array must be perfect," Alvarado says. For this process, NCA uses Glenbrook Technologies' Jewel Box 70T real-time X-ray system. With a 10 μ MicroTech™ X-ray source, the machine provides magnification from 7X to 2000X and a resolution of 100 line pairs/mm. The system's GTI-5000 software can export results directly to an Excel spreadsheet.

Each of NCA's facilities has a Jewel Box system, which Alvarado describes as "reliable and easy to use." He adds that the system is also popular with customers, who often bring their own products to the facility and rent time on the X-ray system.

Alvarado calls the X-ray system one of the company's three "differentiators," along with its in-line AOI and its selective soldering system. Used in conjunction with through-hole placement for products with components on both sides of a board, selective soldering eliminates the need for the masking required by wave soldering. "Customers have asked why our bid is so low," he says. "It's because selective soldering saves them time and money."

Emphasis on Relationships

However, Alvarado knows that the equipment is only a part of the story. "We have good relationships with our customers," he explains. With his own background as a manufacturing engineer for Apple, he understands the demands of OEMs. "To jump through hoops for a customer is just what we do," he says, "we have a good reputation for service and quick turnaround."

That attitude is important to the entire company. NCA has numerous certifications, including ISO 9001 and ITAR, and all its employees are IPC 610 and J Standard certified. The company has an on-staff trainer to keep workers up to date and welcomes customers' employees to join its training sessions.

What Alvarado believes sets the company apart, is its commitment to work closely with each customer in whatever capacity is needed. This approach has brought success to the company and it is expected to continue to grow.

Whether taking a start-up from a the paper napkin stage to a finished product, or helping develop a new concept for an experienced manufacturer, Alvarado concludes, "We know how to do what it takes to get the job done."

Contacts: National Circuit Assembly,
2908 National Drive, Suite 100, Garland, TX 75041
☎ 972-278-2009 E-mail: info@ncatx.com
Web: www.ncatx.com
Glenbrook Technologies, Inc., 11 Emery Avenue,
Randolph, NJ 07869 ☎ 973-361-8866 fax: 973-361-9286
Web: www.glenbrooktech.com □

