The Aerotropolis

The Piedmont Triad is a model for the Carolinas' aviation ambitions

MICHAEL MECHAM/GREENSBORO, N.C.

North and South Carolina see the major airframe manufacturers that have established bases within their borders as anchors for an expanding network of aerospace and defense suppliers that can provide a steady stream of jobs for skilled workers.

Both states have well-established aviation manufacturing operations—Goodrich and Turbomeca in Charlotte, N.C.; GE Aviation in Durham, N.C., and Greenville, S.C.; and Honeywell International in Greer, S.C. More recently, the establishment of a second Boeing 787 final assembly line in North Charleston, S.C., and Spirit AeroSystems' building of a factory to manufacture Airbus A350 center fuselage panels in Kinston, N.C., are making the most news. In return for state support in training and siting, both companies have committed to developing thousands of jobs in the coming decade (*AW&ST* Nov. 22, p. 50).

MICHAEL MECHAM/AW&ST

B/E Aerospace has four facilities in Winston-Salem manufacturing seating in four product ranges, but its greatest emphasis is on custom-designed seating for premium classes.

North and South Carolina compete with each other and other states for those jobs, but they also recognize that growth for one may lead to supplier opportunities that benefit the other, a pattern the South learned from automobile manufacturing.

"Gulfstream is an hour away from Charleston with the [new long-range] 650," says South Carolina Deputy Commerce Secretary Jack Ellenberg. "Lockheed Martin is in South Carolina and Georgia. We're ringed by major players in aerospace, so we see opportunities for companies that want to be in the middle of a growing aerospace region."

North Carolina Transportation Secretary Gene Conti says he thinks well beyond roads and infrastructure. "As a state, we market our research universities," he says. "North Carolina has strong aeronautics, aviation and science programs. Spirit wanted that linkage a lot" when it selected the state-backed Global TransPark business park in Kinston.

Here in Greensboro, Piedmont Triad International Airport—which serves a catchment area of 1.6 million people, including the cities of Winston-Salem and High Point—has been quietly positioning itself as an anchor for a diversified range of A&D activities for the past two decades.

Abutting the better known Raleigh-Durham Research Triangle region, the Piedmont Triad has done so well that University of North Carolina-Chapel Hill Prof. John Kasarda, the "father" of the Global TransPark concept, calls it an "Aerotropolis." Others think of it as "Wichita East," a complimentary reference to the city in Kansas that is home to so many manufacturers, including Boeing, Spirit, Hawker Beechcraft, Learjet and Cessna.

The three cities have aggressively pursued aviation for two decades. Piedmont Triad used bonds to finance a hangar to establish the Triad International Maintenance Co. in 1990, winning a three-way race with Raleigh-Durham and Lake Charles, La. Eight years later, Triad International evolved into Timco Aviation Services as part of acquisitions in Lake City, Fla., and Macon, Ga.

The Greensboro maintenance, repair and overhaul specialist now employs 1,600 people working on civil and military aircraft in 700,000 sq. ft.

Meanwhile, the company has expanded elsewhere into aircraft seating and line maintenance. Timco was an original member of Airbus's MRO network.

Timco holds contracts for DC-10 maintenance services for FedEx, which has located its mid-Atlantic hub at the airport, and a nine-year contract to overhaul the U.S. Air Force's 93 KC-10s.

Timco's maintenance operations include 14 lines and the company is emphasizing conversion work, focusing on interiors, lavatories and galley installations. United Airlines rotates aircraft through for carpet replacement, reaching back to North Carolina's roots in textiles using local products from Mohawk Industries. Timco President and Chief Operating Officer Ron Utrecht says the company has developed a "strong bond" with Piedmont Triad.

Size is not everything, but seizing opportunity can be. Atlantic Aero, a 39-year-old fixed-base operator and

MICHAEL MECHAM/AW&ST

Widebody services are a major part of the portfolio of Timco, which has recently begun installing Boeing 767 winglets.

former flight-training center with 150 employees, specializes in avionics and interior installations and performs full maintenance on a diverse line of business jets—Challengers, Citations, Lears, King Airs, Caravans and Falcons—plus Honeywell TFE731 and Pratt & Whitney PT6 and JT-15 engines. Flexjet is a customer.

In 1999, Honda sought Atlantic Aero's advice as a top maintenance provider for the executive jet it was planning. As that relationship grew, Atlantic Aero branched into engineering and machining, manufacturing the empennage, winglets and nacelles for Honda's proof-of-concept jet that first flew in 2004. Honda's initial operations were out of a 25,000-sq.-ft. facility Atlantic Aero built. The Piedmont company also drew on its flight-training experience to help Honda test that prototype aircraft, and it expects to support the flight-test program for the production HondaJet.

Besides Atlantic Aero, Honda is contracting with Timco, just as Timco contracts with B/E Aerospace, a pattern repeated throughout the Triad.

Curtiss-Wright: Training a Motivated Workforce

MICHAEL MECHAM/SAN FRANCISCO

In the 1980s, Curtiss-Wright Corp. began thinking of its home in the industrial Northeast as increasingly staid and the American South as "the place to go."

That trend—a pursuit of lower costs in areas eager for aerospace manufacturing—continues domestically and internationally. With its tobacco and textile industries waning, North Carolina has been looking for alternatives since those days. Curtiss-Wright's decision to headquarter its Control unit in Charlotte and to establish a flight systems manufacturing and overhaul plant west of there in Shelby and flight systems engineering nearby in Gastonia offers a microcosm study of a move south.

Pioneer aviators Glenn Curtiss and the Wright Brothers might not recognize the diversified company they founded 85 years ago, but they would understand the military and commercial airplane flight systems element that began shifting out of Fairfield, N.J., to Shelby in 1985.

"We moved the management team," recalls Chief Operating Officer David Adams. "Not that many [production] people from the Northeast moved down, [although] there has been migration over time and the engineering types did come down." Within a few years, the Fairfield plant closed.

Initial production centered on component manufacturing because it was easier to move and establish with a workforce transitioning into the precision of aviation.

Since then, the factory has expanded into developing new systems for a variety of military and commercial platforms, both fixed- and rotary-wing. Its Shelby/Gastonia customer base includes Saab, Lockheed Martin, Parker-Hannifin, Southwest Airlines, US Airways and all four U.S. military services.

"The workforce had come from textile mills. It was a very motivated workforce," says Adams. "That is one of the main reasons you see the migration, particularly in heavy industry like aerospace. Taxes, wage rates—the general climate in the Northeast in the '80s was not necessarily stimulating."

Like elsewhere in the region, North Carolina emphasizes training through its community college system. "No state has stronger aeronautics and aviation sciences education programs," says Gene Conti, the state's transportation secretary.

Curtiss-Wright tapped into that system. "They helped sponsor programs for industry like ours," Adams says of state and local worker training programs. "The economic development people are very responsive to our needs." Training largely takes place in local colleges, but classes that straddle shifts are also sponsored in the factory.

Shelby has 287 employees working in a 158,000-sq.-ft. facility, 13% of them engineers. The workforce is not unionized and Adams says unionization has been a "non-issue" for its North Carolina workers.

The factory produces actuators for Boeing 737 flaps and cargo bay doors. Military contract work includes actuators for weapons bay doors, bomb rack hoists and proximity sensors for door openings/closings. Curtiss-Wright serves primarily as a second-tier supplier and its facility also performs systems overhauls.

As the company worked through the 2009 downturn, Adams worried about the sector holding up but says the dip in orders he feared has not materialized.

CURTISS-WRIGHT

An overhaul of a horizontal stabilizer is completed at Curtiss-Wright's flight systems plant in Shelby, N.C.

In 2000, Honda Aircraft decided to make the Piedmont Triad home for its aircraft research facility. Nine years later, it broke ground on a 250,000-sq.-ft. assembly plant next to Timco that is scheduled to open in February. First flight of the 7-person jet powered by GE Honda HF120 engines is set for this month.

As positive as Atlantic Aero's connection with Honda has been, the 2008-09 recession hit the company's interiors and avionics upgrade work hard. "People quit flying," is President Jim Spinder's succinct assessment. "It's not just us, it's industry-wide."

MICHAEL MECHAM/AW&ST

Purolator designs and manufactures fluid filters, such as this hydraulic return filter, at its Greensboro plant.

Still, Spinder is recruiting four maintenance technicians for next year to handle mandatory maintenance work, even as interiors and avionics work has dropped by two-thirds as owners defer discretionary work. His computerized numerical control machine shop in nearby Kernersville holds contracts from B/E Aerospace, Pilatus and Purolator. He is getting his first government contracts and sees

UEC Electronics: 'A Local Resource'

MICHAEL MECHAM/HANAHAN, S.C.

When the husband-and-wife engineering team of Philip and Rebecca Ufkes decided to trade the snow of the U.S. Northeast for Charleston's charms, they had no way of knowing that Boeing would locate the biggest aviation opportunity in South Carolina's history in their new backyard.

Now they are pursuing contracts for their 120-employee company, UEC Electronics, with the city's big, new aviation manufacturer. They will play to their company's strengths in rapid prototyping and manufacturing of complex electrical boxes, test systems and components. Their resume includes work for the U.S. Navy's Space and Naval Systems Command (Spawar), Raytheon, Parker Hannifin, Hamilton Sundstrand and BAE Systems.

What started as pleasure trips south from Connecticut turned into a chance to establish UEC in this Charleston suburb in 1995. Phil Ufkes, whose background included work at Parker Hannifin and Hamilton Standard (now Hamilton Sundstrand), worked locally for Cummins Engine Co. (later a customer) before starting UEC. Rebecca, who had worked at Kaman Aerospace and Sikorsky Aircraft, did independent consulting for GE Aircraft Engines and Pratt & Whitney before making the transition to UEC. She is president and devoted to business development; he is vice president and runs engineering and production.

In the early days, UEC produced prototypes and small batches of electrical boxes. Spawar's Systems Center Atlantic's headquarters in Charleston has been a steady customer, most recently with an expanded contract from Raytheon for Skyfire high-frequency radios.

UEC's work is primarily with Tier 1 and 2 A&D suppliers on assignments that range from test stands for fly-by-wire upgrades for the CH-53 Sea Stallion to rapid prototyping of communications and improvised explosive device jamming equipment for the Marine Corps' Mine Resistant Ambush Protected vehicle program.

The company is in a three-year mentor/protege program with Raytheon through which it has gained help acquiring X-ray inspection equipment and creating an electrostatic discharge-free production plant.

"We try to keep [the business base] as diversified as possible, which is why we're here after 15 years," says Phil Ufkes. "We've grown steadily and managed to survive two recessions."

UEC expects revenues of $20 million this year, and its workforce has tripled in the past five years.

Phil Ufkes says that as aerospace manufacturers fight runaway costs, they are subcontracting systems development work. His goal is to be the lower-cost production partner for design and manufacturing of ancillary materials to meet their needs.

Meanwhile, Rebecca Ufkes is encouraged by UEC's reception as a small business supplier for the Boeing 787 and other commercial aviation programs.

Boeing has committed to creating 3,800 jobs in the state by 2016, far more than the 787 program itself is likely to generate directly (*AW&ST* Nov. 22, p. 50).

Her focus is on Boeing's Shared Services Group and in subassembly manufacturing. "We are a local resource to provide test equipment and maintenance for them," she says.

UEC ELECTRONICS

Phil Ufkes (standing) assists in a final functional test of an airborne radio frequency communications amplifier at UEC Electronics.

potential in branching into rotorcraft. "We're very optimistic about opportunities for machining," Spinder says.

B/E Aerospace has four facilities in Winston-Salem that manufacture seating in four product ranges. "Lean is very big in this building," says Liam O'Boyle, vice president for operations, providing a tour of the 90,000-sq.-ft. West Point facility that opened in 2008 and is run on visual control principles, just-in-time material delivery and a synchronized assembly line.

In fact, parts of the factory were being converted to lean processes when Aviation Week toured last spring. Manufacturing was done by cells and a "delegated authority" process is used for quality control to assure that Airbus and Boeing products are handled separately.

The company employs 700 in the region, and it is producing 5,000 coach and 6,000 business seats a year. Its material flow is 1.5 million parts a year.

Purolator is another old hand in Greensboro, having moved its aviation fluids filtration operations out of Michigan in 1984 after a strike. "We sell everything from rotorcraft to big iron," says Sales Manager Jacob Ward. Besides the filtration system itself, Purolator's plant here makes their housing elements, all in small lots covering thousands of parts numbers. "If we ship a hundred of something, that's a lot," Ward says.

Purolator had some layoffs last year, but it has called those workers back. Employment now stands at 220, higher than in 2008. "Things are picking up" for 2011, Ward says. "We're optimistic."

> **"Politically, we've demonstrated that private investment follows public investment."**

Officials in both states stress a willingness to link state-backed training programs with job creation. South Carolina tracks skill sets needed by manufacturers with its technical (community) college system and its research universities. "Companies go where they can be successful," says Ellenberg, who traces his state's interest to the early 1960s, when there was already an understanding that its traditional textile mill business base was dying in the face of cheaper foreign competition.

One outgrowth that Ellenberg expects to see play its way into the region's most recent additions in aerospace manufacturing is research in carbon fiber processing. Vought Aircraft tapped into advanced research on carbon fibers at Clemson University when it was developing its Boeing 787 aft fuselage manufacturing plant in North Charleston, he says. That plant is now owned by Boeing.

State officials also say they have learned how flexible they need to be to keep attracting aerospace manufacturing. North Carolina initially promoted Kinston's Global TransPark as a national logistics center and extended its runway to 11,500 ft. But officials learned that good roads were just as important as good airports when FedEx passed on using it for a new mid-Atlantic hub.

These days they present a "complete" package, says Conti.

Given a second chance to land FedEx in Greensboro, the state has worked closely to create good surface connections to the intrastate highway.

Conti says government's involvement passes muster with even the state's most conservative political elements. "Politically, we've demonstrated that private investment follows public investment," he says.

FedEx and the U.S. Air Force have become major clients for Timco at its headquarters at the Piedmont Triad International Airport.

MICHAEL MECHAM/AW&ST