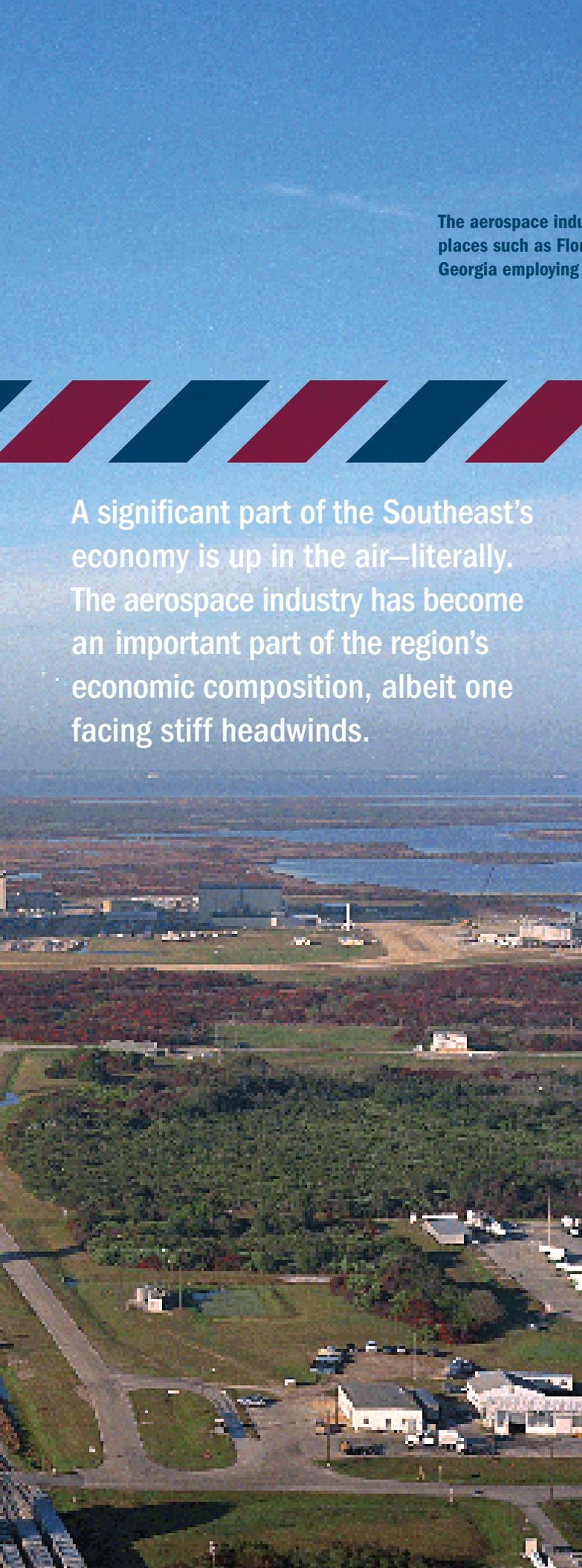




Despite Turbulence, Southern Aerospace Poised for Take-off



The aerospace industry is an integral part of the Southeast's economic composition, with places such as Florida's Kennedy Space Center (pictured at left) and Lockheed Martin in Georgia employing thousands of people and pumping millions of dollars into the economy.

A significant part of the Southeast's economy is up in the air—literally. The aerospace industry has become an important part of the region's economic composition, albeit one facing stiff headwinds.

About 15 miles north of downtown Atlanta, thousands of people and countless machines build airplanes inside a windowless, immaculate 70-year-old building so vast it could contain 25 Wal-Mart Supercenters. Men in jeans pedal bicycles on a concrete floor so polished it reflects overhead lights. Blue squares designate precise locations for tools, carts, and parts. And unfinished C-130 cargo planes' tails, like giant dorsal fins, rise 40 feet above a sea of equipment and scaffolding.

At a 912-acre, multibuilding complex in Marietta, Georgia, Lockheed Martin Aeronautics Company has produced military aircraft for 62 years. Lockheed Martin has sold so many of the squat C-130s—nearly 2,500—to so many countries that there is literally always one of the iconic transport vehicles in the air somewhere, according to the company.

Like much of the Southeast's aerospace industry, the roots of the Lockheed Martin plant date to World War II (see the sidebar on page 8). As the 1940s dawned and America girded for battle, the famously insular, agrarian South finally began courting outside capital and industry. Southern governors and economic development agencies "pushed hard for their 'fair share' of war contracts and industrial facilities, training camps and airfields," Stanford University economic historian Gavin Wright wrote in *Old South, New South: Revolutions in the Southern Economy since the Civil War*. "In substantial measure, they succeeded."

Their success birthed an economic mainstay. The Marietta plant, in particular, was a cornerstone in an aerospace sector that today employs tens of thousands of skilled workers in high-paying jobs throughout the Southeast. Overseas sales of aerospace products and parts have steadily grown, and by dollar volume rank among the leading exports from six Southeast states, totaling \$13 billion in 2011, according to the U.S. Department of Commerce. That total exceeded exports from the region's heralded automobile and auto parts industry.

Large as it is, though, aerospace manufacturing is inherently cyclical. Its lifeblood is contracts from the U.S. Department of Defense, NASA, and commercial airlines, customers that spend lavishly but erratically. Most military and space agency contracts expire. (For example, assembly of the F-22 Raptor stealth fighter jet—which cost more than \$100 million a plane—ceased

The Roots of Aerospace Production in the Southeast

The Southeast's attraction to the aerospace business began 70 years ago. Back then, it helped to have powerful friends in your corner. The director of materiel for the U.S. Army, General Lucius Clay, was a Marietta, Georgia, native. Partly at Clay's urging, President Franklin Roosevelt's military in 1943 built Air Force Plant 6 in then-rural Cobb County and contracted with the Bell Aircraft Company to operate it. At the time, the plant was the largest business facility ever built in the Deep South. The "Bell Bomber Plant" closed at the end of World War II, and then reopened amid the Korean conflict six years later as Lockheed Georgia. The U.S. government still owns the property and the adjacent Dobbins Air Reserve Base.

Bell's success was an economic watershed for Atlanta and the Southeast. Bell trained 28,000 local workers to build 668 B-29 bombers in just over two years. This feat "demonstrated the area's ability to successfully house a large technology-based manufacturing facility," Georgia Tech researcher Richard Combes wrote in the book *The Second Wave: Southern Industrialization from the 1940s to the 1970s*. Aerospace work also transformed Huntsville. The former cotton mill town's population exploded from 16,000 in 1950 to 72,000 in 1960 as the space program grew, according to census data. Kennedy Space Center's impact on Brevard County, Florida, was almost as dramatic.

No doubt federal megaprojects like Lockheed and Kennedy won't come again soon. Challenges abound in the aerospace industry, but all businesses face challenges. Even so, the opportunities in aerospace are plenty enough to keep southern states in pursuit.

Come a June night in Paris, there might not be a famous general at the party. But during the Paris Air Show, a boat hired by the Mississippi-based Aerospace Alliance will glide along the River Seine as the City of Light twinkles. On board, a stew of accents from the U.S. South to the south of France will mingle as economic developers vie for the hearts, minds, and pocketbooks of aerospace executives from all over the world. ■

Lockheed Martin has built C-130s at its Marietta, Georgia, plant since 1957. Last year, the company delivered 36 of the gargantuan aircraft to customers, but this year it will deliver only 24 of them.



in Marietta in 2011, resulting in layoffs.) Cycles in the industry have tended to last about a decade, according to a December 2009 report from the Congressional Research Service. Now, as the nation enters a time of federal budget cuts, a cycle looms that could severely test a southern aerospace sector that has weathered downturns before.

"Aerospace in the South has historically been heavily dependent on government spending," said Richard Aboulafia, a noted industry consultant with the Teal Group in Fairfax, Virginia. "The challenge now is to turn toward commercial sources of revenue."

Good news/bad news: Commercial plants arrive amid defense, space cuts

That turn might be under way. Over the past several years, the region has attracted several commercial aerospace operations. The world's largest makers of jet airliners, Boeing and Airbus, along with two makers of smaller jets, have recently opened or plan to open assembly plants in the South. (Boeing and Honda Jet facilities are outside the Atlanta Fed's District, in South Carolina and North Carolina, respectively.)

On the larger, defense-dependent side of the region's aerospace industry, the outlook is murkier. The federal Budget Control Act of 2011 calls for defense spending reductions totaling about \$487 billion over 10 years, starting in 2013, from a budget of roughly \$500 billion annually. Further cuts may result from sequestration, which took effect March 1. The cuts from sequestration, if fully implemented, would roughly double the amount of the 10-year, \$487 billion reduction in defense spending.

More than half of the Pentagon cuts will likely come through lower spending on contracts, according to Bloomberg Government, which analyzes federal spending. Lockheed Martin and virtually all other major defense contractors have operations in the Southeast. Those companies have warned of possible layoffs and lower revenue and profits should severe military budget cuts materialize. The Aerospace Industries Association (AIA), which represents large defense contractors, said in its 2012 annual report that sequestration could result in "thousands of layoffs and the loss of critical knowledge and expertise."

Some symptoms of federal spending cuts have already emerged. U.S. gross domestic product grew by just 0.1 percent in the fourth quarter of 2012, the worst quarterly performance since the first three months of 2011. This slowdown was widely attributed to reduced defense spending. The AIA says some layoffs occurred in 2012 related to defense cuts. Moreover, in guidance for investors, some major aerospace defense firms have projected slightly lower revenue and profits in 2013, but those projections assumed sequestration did not happen.



Huntsville, Alabama—home to a sprawling federal complex made up of Redstone Arsenal and Marshall Space Flight Center—could escape the worst of it, said Thomas Baumbach, president of Dynetics Inc., a Huntsville aerospace technology firm with 1,300 employees. The north Alabama city’s considerable collection of defense and space-related tech companies could fare comparatively well, Baumbach figured, because research, development, and testing programs—Huntsville’s specialty—could be relatively unscathed. In fact, one of Dynetics’ core businesses, military cybersecurity, could benefit from increased defense spending in that area, Baumbach said. Still, Dynetics early this year felt the “first pangs of sequestration,” Baumbach said, as a customer in the intelligence community notified the company of small cutbacks to come. Dynetics is also facing uncertainty surrounding the future funding for a NASA project on which it works.

Aerospace business no stranger to turbulence

Uncertainty is nothing new to the aerospace business. Consider the swings in employment at plants like Lockheed Martin in Marietta and at Florida’s Kennedy Space Center. The headcount at Marietta was 6,778 at the end of 2012, down several hundred from early 2011, when the F-22 fighter assembly line was active. Lockheed Martin’s Marietta employment peaked at more than 30,000 in the late 1960s. Some fluctuations in employment, of course, result from automation, as in any manufacturing operation. Meanwhile, on Florida’s Atlantic coast, NASA stopped space shuttle launches in 2011, prompting thousands of layoffs in and around Kennedy (see “Grassroots,” page 4).

Although defense and space contractors face uncertainty, the market has been healthy for airliners and high-end (yes,

there are lower-priced models, relatively speaking) corporate jets. For example, strong corporate profits and rising demand among individuals have buoyed demand for planes from Savannah, Georgia-based Gulfstream Aerospace Corporation, Aboulafia said. At the same time, persistently high fuel prices are leading airlines to acquire lighter, more fuel-efficient jets. That demand has kept a steady stream of orders flowing into the two major airliner manufacturers: Boeing, which opened an assembly plant in North Charleston, South Carolina, in 2011, and Europe’s Airbus, which plans to open an assembly plant in 2015 in Mobile, Alabama.

So-called commercial space is another promising area. But so far, other than the launching of communications satellites, Baumbach said, the industry has not generated a great deal of work for companies like his.

On Florida’s Space Coast, Frank DiBello has high hopes for the private-sector space business. The idea of launching civilians and all manner of satellites, research gear, and data-gathering and transmitting devices excites DiBello, president and CEO of the state economic development agency, Space Florida. A former venture capitalist, DiBello sees expansive opportunity in the integration of devices from smartphones to robots to automated teller machines. Satellites offer the best means of zapping vast quantities of data among vast numbers of such devices, he said. After all, he thinks there must be a good reason why several superstar entrepreneurs—including Amazon founder Jeff Bezos, PayPal founder Elon Musk, Richard Branson of Virgin Group, and Microsoft cofounder Paul Allen—have turned their attention to space.

“They see in this next 25-year period there’s going to be a dramatic increase in human activity in what I call ‘near Earth,’ ” DiBello said.

Not number 1, but the South is climbing

Aerospace is important throughout the Southeast (see the chart on page 11). But the region is not home to the largest aerospace hubs, which include Seattle; Dallas-Fort Worth; Wichita, Kansas; and the entire state of Connecticut. In fact, aerospace manufacturing has traditionally been concentrated in a handful of locales. As recently as 2009, 61 percent of the nation's aerospace industry jobs were located in six states: Washington, California, Texas, Kansas, Connecticut, and Arizona, according to the Congressional Research Service.

But the South is trending upward. The Congressional Research Service noted in a December 2009 report on aerospace that "smaller manufacturing clusters" exist in southern states, including Florida, Georgia, and Alabama. Moreover, aerospace centers are emerging in other southern states, the report said. Indeed, corporate jets, parts of unmanned drones, helicopters, rocket propulsion systems, jet engines, airplane wings, electronics, "airframes"—the main structure of an aircraft—and other components are manufactured and overhauled throughout the region. A few examples:

- Savannah, Georgia-based Gulfstream designs and manufactures corporate jets at its home base and in neighboring Brunswick, employing 8,000 people.
- Huntsville is home to the most aerospace engineers per employed person of any metro area in the country, according to the U.S. Bureau of Labor Statistics (BLS). The city boasts more than 90 aerospace companies that together employ about 11,000 people, according to the local chamber of commerce. Microsoft cofounder Allen's company, Stratolaunch, which aims to build and launch rockets from huge airplanes, established corporate headquarters in Huntsville in 2012.
- Northrop Grumman's Unmanned Systems Center in Moss Point, Mississippi, employs 70 people who design and build fuselages for Air Force and Navy drones.
- Boeing employs 500 people to make airplane wings, parts for Chinook helicopters, and other aircraft subcomponents near Robins Air Force Base in Macon, Georgia. The base is the home of Warner Robins Air Logistics Center, Georgia's largest industrial complex with a military and civilian workforce of more than 25,000, according to the base's website.

Aerospace clusters around the Southeast

Honda Aircraft Company, a subsidiary of Honda Motor Company, opened a plant in Greensboro, North Carolina, in 2011 to build business jets. In 2006, Honda also located the aircraft unit's corporate headquarters in Greensboro. Meanwhile, Melbourne, Florida, has begun attracting aircraft manufacturing and design facilities. To a small degree, the arrival of aviation firms has offset job losses from Kennedy Space Center. Embraer, the Brazilian maker of small commercial jets, opened an assembly operation in Melbourne in February 2011.



The shuttle program, which ended in 2011, was a mainstay of the Space Coast's economy for years. All of the space shuttles lifted off from Kennedy Space Center in Brevard County, Florida.

More is coming. Airbus, a unit of European Aeronautic Defense and Space, plans to finish its first jet in Mobile in 2016. Airbus, whose parent company is owned by the German, French, and Spanish governments along with private-sector investors, has an engineering center in Mobile that employs 200. The assembly plant will initially add another 300 people to Airbus's Mobile operations.

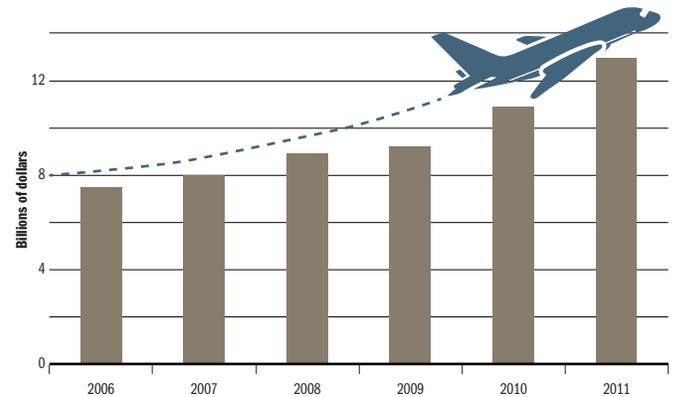
These "transplants" are critical to the region. That's because attracting foreign investment is essential to building an advanced manufacturing base, the Teal Group's Aboulafia explained. "The southern U.S. states have learned this lesson well, with aerospace and with automobiles," he said.

The Institute for Strategy and Competitiveness at Harvard Business School includes several southeastern locales in its online list of aerospace "clusters." The institute defines an industry cluster as a geographic concentration of "interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field."

Among the Southeast's 33 "economic areas," essentially supersized metropolitan areas, the institute lists seven as home to a cluster in aerospace vehicles and defense or aerospace engines: 1) Jacksonville, Florida; 2) Pensacola, Florida; 3) Mobile/Daphne, Alabama; 4) Huntsville/Decatur, Alabama; 5) Columbus, Georgia/Auburn-Opelika, Alabama; 6) Macon/Warner Robins/Fort Valley, Georgia; and 7) Savannah/Hinesville/Fort Stewart, Georgia. Many of those areas, not coincidentally, contain major military installations. Defense contractors tend to gather near their customers.



Southeast Aerospace Exports



Source: U.S. Department of Commerce, International Trade Administration

Nationally, aerospace employment at the end of 2012 was 629,000, according to the AIA. That number was 4,000 higher than a year earlier, despite layoffs in some facilities working on military programs, the AIA annual report said.

Regardless of their number, aerospace jobs pay well. Private-sector aerospace manufacturing workers in 2008 earned an average wage of \$79,700, about 47 percent more than the annual wage for all manufacturing workers, according to the Congressional Research Service. Aerospace engineers in Huntsville earned a mean average annual wage of \$117,430, according to May 2011 figures from the BLS, while the mean pay for Florida aerospace engineers was \$91,000. Nationally, aerospace engineers on average earn more than engineers in all but three of 18 engineering categories counted by the BLS. Only petroleum and nuclear engineers earn more. Meanwhile, aerospace engineering technicians are paid better than any other of the BLS's nine classifications of engineering technicians.

Another quick example of the considerable economic impact aerospace companies can have: Lockheed Martin's Marietta plant in 2012 paid the local power company \$17 million for electricity. Numbers like that explain why, despite the industry's challenges, aerospace remains attractive to Southern economic developers. ■

This article was written by Charles Davidson, a staff writer for EconSouth.

Among the top 20 metropolitan area aerospace vehicles and defense clusters ranked by 2010 employment, Atlanta is 10th on the Harvard institute's list, Savannah 13th, and Charleston, South Carolina, 19th. The Miami metropolitan area ranks 19th on the list of aerospace engine manufacturing clusters.

The numbers can be tricky

Counting just how many people work in aerospace in the South is not easy, in part because so many companies are involved, and some of them make parts and provide services that are used by customers outside the aerospace industry. Economic development agencies tend to cast a wide net in counting aerospace workers. Based on data from state economic development agencies, the six Southeast states combined have in the neighborhood of a quarter million aerospace jobs. Limiting the job count to aerospace manufacturing, design, and research lowers the number, though it still approaches or perhaps exceeds 100,000.

The Harvard cluster data for the Southeast in aerospace and defense vehicles and aerospace engines show total employment of 41,914 in the six states. Based on the institute's other data sources, the Harvard numbers exclude some service providers such as consulting engineers and other workers whom some agencies count as part of the aerospace industry. For example, the Huntsville chamber employment number of 11,000 aerospace jobs compares to the Harvard institute's 1,199 Huntsville jobs in aerospace and defense vehicles. Meanwhile, BLS data show nearly 3,000 aerospace engineers alone in Huntsville.