

OHIO'S AEROSPACE AND DEFENSE INDUSTRY

Ohio's aerospace product & parts manufacturing industry (NAICS 33641) includes establishments manufacturing aircraft, missiles, space vehicles, aerospace engines propulsion units and aircraft or propulsion system rebuilding.

In 1999, Ohio ranked sixth nationally in the aerospace product & parts manufacturing industry. Ohio employed 17,642 workers at 78 establishments. The top five states were Washington, Kansas, Connecticut, Arizona and Georgia.

Subsection of the Aerospace Industry

In 1999, Ohio's aircraft engine & engine parts manufacturing (NAICS 336412) sector ranked second in the U.S. with 11,225 employees at 27 establishments. This sector includes establishments that manufacture aircraft engines, develop prototypes of aircraft engines and rebuild aircraft propulsion systems.

Notable Companies

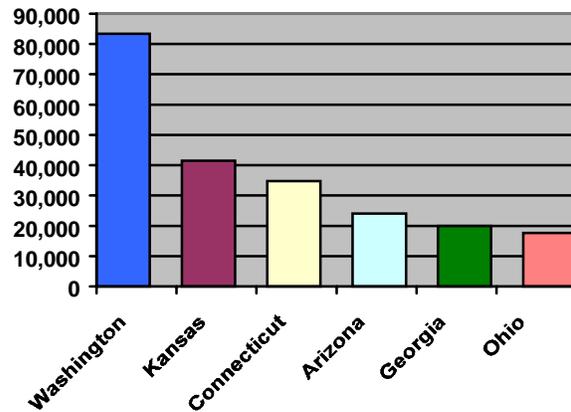
Ohio's major employers in the aerospace industry are Wright-Patterson Air Force Base, NASA Glenn, General Electric Company, Goodrich Company and Parker-Hannifin Corporation. (Table)

Out of the top 50 companies that have contracts with the Air Force, twelve of these companies have offices or home headquarters in Ohio in 1999. (Department of Defense, Defense Logistics Agency) Some of the companies include Boeing Company, TRW Incorporated, Lucent Technologies and Lockheed Martin Corporation.

During 1998, Ohio companies received \$2,471,715,000 in prime defense contracts. Ohio ranked eighth nationally in prime defense contracts.

Thirty-two Ohio counties contain companies that have defense contracts valued at more than \$1 million. The top five Ohio counties are Hamilton (\$762,342,000), Greene (\$570,452,000), Montgomery (\$251,751,000), Franklin (\$198,224,000) and Summit (\$163,848,000).

Aerospace Product & Parts Manufacturing Industry Employment, 1999



Source: U.S. Census Bureau

Companies with Ohio Operations Having Contracts with the Air Force, 1999

Lockheed Martin Corporation	Boeing Company	Northrop Grumman	TRW Incorp.
General Electric Corporation	Science Applications International	Allied Signal Incorp.	B.F. Goodrich Incorp.
Veridan Corporation	Lucent Technologies	Booz, Allen & Hamilton	General Dynamics

Source: Department of Defense

Top Five Ohio Counties That Had Defense Contracts Valued At More Than \$1 Million, Fiscal Year 1998

County Name	Contract Amount
Hamilton	\$762,342,000
Greene	\$570,452,000
Montgomery	\$251,751,000
Franklin	\$198,224,000
Summit	\$163,848,000

Source: Department of Defense

NASA GLENN

- NASA Glenn is the premier NASA facility for microgravity science, in-space transportation, aerospace communications and aer propulsion and interdisciplinary research for bioscience.
- Currently employs 3,900 workers, but in the past has experienced sharp job losses and funding cuts by one-third.
- Contributes over \$1 billion to Ohio's economy and directly or indirectly provides 12,000 jobs.

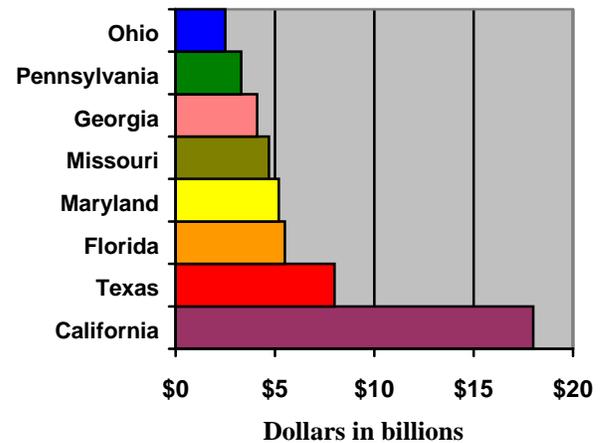
WRIGHT-PATTERSON AIR FORCE BASE

- Historic site of Wright Brothers Flight Tests
- Wright-Patterson AFB is Ohio's largest single-site employer, with a military and civilian workforce of 22,000.
- Wright-Patterson has over 10,000 support contractors.
- Air Force research, development and acquisition center for the last 50 years.
- Collaborates with NASA Glenn on turbine engines, space power propulsion, computational programming, materials and selected areas of hypersonics.
- The total economic impact of Wright-Patterson AFB was over \$2.7 billion in the 1999 fiscal year.
- During the 2000 fiscal year, Wright-Patterson generated over \$742 million for Ohio's economy.

NEWS

- In April 2001, President Bush recommended a \$52 million reduction in NASA Glenn's 2002 budget. In July 2001, the House of Representatives voted to restore \$40 million of the proposed budget cuts as part of a \$15 billion spending plan for NASA.

Top States Receiving Prime Defense Contracts (\$ billions), 1998



Source: Department of Defense

- In 2001, Governor Bob Taft signed House Bill 230, which creates the Ohio Aerospace and Defense Advisory Council to examine state and federal laws, rules and policies that affect the aerospace and defense industries and associated federal installations in Ohio.

OHIO AEROSPACE INSTITUTE (OAI)

- Established in 1989, OAI is a private, nonprofit consortium of university, industry, and government labs with more than 100 employees headquartered in Cleveland, Ohio.

Current Projects

- Federated Intelligent Product Environment (FIPER)--The \$21 million project is an advanced computer design manufacturing system with Web-based capabilities. The product will reduce the cost of product design and manufacturing by \$2.2 billion annually for the U.S. manufacturing sector.
- Photovoltaic Engineering Testbed (PET)--The \$3.1 million facility will be developed on the International Space Station. The facility will test advanced solar cell types in a space environment. The tests will reduce the cost of validating new technologies and bring them to spaceflight readiness by measuring them in a space environment.

- Propulsion Instrumentation Working Group (PIWG)--The group was formed by a collaboration between aircraft engine companies and the federal government. The group will help engine manufacturers reduce costs and focus technology by leveraging resources from the federal government and establishing common standards and criteria for instrumentation.

GE Aircraft Engines (GEAE)

- Headquarters in Cincinnati, Ohio
- Earnings of \$11.4 billion in 2001 and currently has worldwide employment of 28,000 workers. General Electric Company employs 19,860 workers.
- GEAE's product line includes 37 engine types that power 91 aircraft systems and 42 marine & industrial applications.
- GEAE technological innovations include first U.S. Jet Engine, first Turboprop Engine, first High Bypass Engine and first Mach 2 and 3 Engines.
- The world's leading manufacturer of jet engines for civil and military aircraft. The engine manufacturing includes engines produced by CFM International, which is a 50/50 joint company of Snecma Moteurs of France and GE.

Contracts

- In March 2002, GE Aircraft Engines offered to Boeing Company and its customers new versions of the CF6-80C2 engine. The engine will be used for the quieter, longer-range 747-400XLR wide-body aircraft, which begins service in 2004.
- The Royal Air Force of Oman (RAFO) has selected GE's F110 fighter engine to power its new fleet of 12 Lockheed Martin F-16 aircraft. The engine contract is valued at more than \$50 million. Since 1984, more than 2,500 F110 engines have been ordered worldwide. GE will begin delivery of the engines in 2004.

OHIO STATE AEROSPACE INSTITUTE (OSAI)

- Programs include theoretical and experimental efforts and been sponsored by NASA Lewis Research Center, the Air Force Office of Scientific Research and USAF Phillips Laboratory.
- Departmental facilities for advanced space propulsion research include the world's largest quasi-steady pulse line (known as *The Godzilla Pulsar*), which is designed to provide plasma source operation at one gigawatt for 1.6 milliseconds.

DAYTON AREA GRADUATE STUDIES INSTITUTE (DAGSI)

- Collaborative effort between the Air Force Institute of Technology, the Air Force Research Laboratory, University of Dayton, Ohio State University, University of Cincinnati and Wright State University. The Ohio Board of Regents supports DAGSI with scholarships and research grants.
- Currently has 48 research projects funded at \$4000,000 each for a total of \$19.2 million.

Collaborative Project

- Self-Evolving Adaptive Interfaces--This project focuses on the increasing affordability of USAF weapons. The project aims to develop and test operator system interfaces that can adapt to the operator's state in real-time. This would provide the operator with the right information at the right time.

BATTELLE

- Battelle's headquarters is located in Columbus, Ohio.
- Battelle has a staff of 7,500 scientists, engineers and support specialists.
- Battelle performs projects for more than 2,000 companies and government agencies. These projects result in between 50-100 patented inventions each year.
- Battelle's business volume is around \$1 billion a year.
- Battelle is the manager of the Great Lakes Industrial Technology Center (GLITeC) and helps bring NASA technology to companies outside the "traditional" aerospace industry.
- GLITeC assists over 1,000 companies a year and helps companies identify, acquire, adapt and use federal technologies and capabilities.

LIMA ARMY TANK PLANT (LATP)

- The plant is a government-owned, contractor-operated facility that employs over 500 General Dynamics and U.S. Government workers.
- The facility manufactures and assembles the U.S. Army's M1A2 Abrams tank, its major product. The production of the M1A2 tank is eighteen months from delivery of the material to final test and acceptance.

Contracts

- In November 2000, the Army decided to enter into a contract with the plant to build the Interim Brigade Combat Vehicle. The six-year contract will provide for vehicles, training and fielding support. The total value of the contract will be nearly \$4 billion. The estimated contract completion date is September 30, 2008.
- In April 2001, the U.S. Army began a \$741 million dollar, three-year tank contract to upgrade 307 Abrams tanks with high-tech systems. The U.S. Army will fund the project through December 2004. Eighty percent of the work will be at the Lima plant.