INTERNATIONAL TRADE—A STRONG NATION, A STRONG AEROSPACE INDUSTRY
Aerospace is literally a global industry. Our products orbit the earth and fly across the skies. Roughly a third of the aerospace products produced in this country are for export, meaning that more than 250,000 aerospace workers depend on foreign markets for their livelihood. The challenge today is to educate our children and retrain our adults for the jobs of tomorrow. We want to leave the next generation with a robust and competitive economy — one that thrives on new challenges and is world-class.

Don Fuqua,
President, AIA,
October 1996

AIA is the nonprofit trade association representing the nation’s manufacturers of commercial, military, and business aircraft, helicopters, aircraft engines, missiles, spacecraft, and related components and equipment.
Contents

JOINT MESSAGE FROM AIA'S CHAIRMAN AND PRESIDENT 2

1996 BOARD OF GOVERNORS 3

OFFICE OF THE PRESIDENT 4

POLICY AND PLANNING 4

LEGISLATIVE AFFAIRS 5

AEROSPACE RESEARCH CENTER 6

COMMUNICATIONS 8

ADMINISTRATION AND MEMBERSHIP 9

CIVIL AVIATION DIVISION 10

GOVERNMENT DIVISION 13

PROCUREMENT AND FINANCE 13

TECHNICAL OPERATIONS 16

ENVIRONMENTAL, SAFETY, AND HEALTH 19

INTERNATIONAL DIVISION 20

1996 YEAR-END REVIEW AND FORECAST 22

AEROSPACE HIGHLIGHTS 1996 25

DEFENSE 27

CIVIL AVIATION 32

SPACE 37
For the Aerospace Industries Association (AIA) and the industry it serves, 1996 was a time of revitalization, a year in which the business activity curve turned upward after three consecutive years of sharp decline. The industry's overall activity, reflected by total sales statistics, increased by a modest but welcome six percent over the previous year's level. Earnings were up, as were exports and trade balance, new orders, and backlog. For the first time since 1989, the industry's employment level edged upward.

However, the year was not positive everywhere. The gains were entirely in the commercial arena; sales to the U.S. Government continued to decline, as they have in every year of the 1990s.

For 1997, AIA projects an accelerating rise in overall income, sparked by a 30 percent gain in civil aircraft sales that will more than offset the continued decline in government workload.

The industry's long-term outlook is clouded by the uncertainties related to the administration's planned but long-deferred defense equipment modernization program. A Quadrennial Defense Review (QDR) in progress at year-end was taking a new look at defense strategies and appropriate force levels.

The outcome of the QDR and subsequent debate could result in acceleration or further slowdown in the modernization procurement schedule, and planned improvement production levels could be revised either upward or downward. Whatever the outcome, it is apparent that the period of industry adjustment to changing defense requirements, now in its twelfth year, will continue well into the new century.

The outlook for the industry's commercial business is considerably brighter. The backlog for commercial jetliners topped $100 billion at yearend 1996. AIA projects that the flow of new orders will continue to increase and that the industry will be setting annual commercial sales records for many years to come.

This promising projection assumes that our industry can retain — or increase — its current share of the expanding global aerospace market. That is a significant challenge, especially as international competition continues to intensify.

However, the fact that our companies have, for more than a decade, improved their efficiencies in every aspect of aerospace manufacturing has enhanced our position in world markets.

Although very helpful in the past, further cooperation of the government is needed. The first Clinton Administration worked with industry to remove a number of administrative barriers to export sales, but some barriers remain. We need renewed support from the government in such areas as relaxation of export controls, export financing, continued government export-promotional activities, and further action toward refining the international trading system to discourage subsidies that allow unfair product pricing. Given such cooperation, we are confident that our industry can rise to new heights of competitiveness and maintain our world leadership.
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* William F. Hayes served on the 1996 Executive Committee until his retirement from
Texas Instruments on July 31, 1996. David Welp, President, Systems Group, Texas
Instruments Incorporated, succeeded Hayes as a member of the Board of Governors.
AIA's professional staff assist and support their members by monitoring administrative and technical development and relaying that information through regular and special meetings, workshops, seminars, reports, and publications. In addition, every year AIA identifies the aerospace industry's top ten issues of importance, which encompass the broad objectives of AIA's Board of Governors. Following are the top ten issues for 1996, which are not arranged in any order of priority.

**Aircraft Noise and Emissions** ★ Noise and emissions standards must have a sound technical, scientific, and economic basis. Near-term actions should focus on improvements in air traffic control procedures to reduce total emissions and proper land-use planning to minimize impact on local communities.

**Privatization and Outsourcing** ★ Privatization and outsourcing of non-core defense functions will allow the Department of Defense (DoD) to focus on its warfighting mission while ensuring a responsive, affordable private-sector industrial base capability. DoD and industry must develop ways to overcome legislative, environmental, work force, and contractual impediments to ensure an effective transition of military work to the private sector.

**FAA Reform and Funding** ★ AIA supports increased independence for the Federal Aviation Administration (FAA), along with personnel and procurement reform. AIA supports efforts to develop alternative means of funding the FAA, but believes that some level of funding should come from the general revenues. Funding reform must be accompanied by further improvements in FAA efficiency.

**Implementation of Non-Government Standards Integrated Process Team (NGS-IPT)** ★ AIA will help implement NGS-IPT results by making DoD aware of implementation problems, by continuing an NGS-IPT relationship with the Joint Aeronautical Commanders Group and the Defense Contract Management Command, and by developing guiding principles on how to flow the benefits of the IPT through the aeronautical supplier base.

**Small Disadvantaged Businesses and Women-Owned Businesses** ★ The industry will continue to bring these businesses into the aerospace mainstream by surpassing the subcontracting award goals set by NASA and DoD.

**Export Credit Guarantee Facility for Defense Products** ★ AIA will work to obtain legislation and the actual establishment of an export credit guarantee facility that will provide defense exporters the same kind of support that the Export-Import Bank currently makes available to all other U.S. exporters of industrial products.

**Financial Disclosure** ★ AIA is working with the National Security Council to develop a single, simple form to comply with a government requirement for annual financial disclosure by all persons who have access to certain sensitive information. This mandate could affect hundreds of thousands of people and generate unimaginable problems for storing and safeguarding data.

**Industry Compensation** ★ The 1996 DoD Appropriations Act caps allowable executive compensation at $200,000 unless the Office of Federal Procurement Policy (OFPP) provides regulatory guidelines to determine reasonableness. AIA will work with OFPP to ensure timely promulgation of these regulations.

**Acquisition Reform** ★ Acquisition reform will continue in 1996 and for the foreseeable future along two lines: First, to make maximum use of the flexibility provided by the 1994 statute, and, second, to seek repeal or revision of the remaining statutes that adversely affect the government/industry buyer-seller relationship.

**Progress Payments** ★ Congress refrained from legislating higher progress payments in 1995, assuming that DoD would direct the increase administratively. DoD did not follow through and does not appear to be inclined to make any changes. AIA will continue to work with Congress and DoD to achieve an increase in 1996.
We need to maintain and strengthen a liberal, but disciplined, trading system that ensures access to a truly global marketplace. If we can achieve that, the nations of the world will have laid the foundation for both peace and economic growth for decades to come.

— Philip M. Condit, President, The Boeing Company

AIA’s Legislative Affairs Office monitors important policy matters that affect the aerospace industry and prepares testimony that clearly and effectively communicates industry’s viewpoint to Congress. * The second session of the 104th Congress started out at an aggressive pace as the Republican majority became more comfortable in its leadership role. Once again, Congress focused on reducing federal spending and so-called “corporate welfare” programs. With this mindset, AIA faced many hurdles and was successful in overcoming some. Legislative issues addressed by AIA and its member companies included executive compensation, defense restructuring, depot maintenance, mentor-protégé, export financing, recoupment, and “Buy American” provisions.

Industry Compensation ★ While compensation issues in the aerospace industry are broader than the focus in recent years on executive compensation, once again this issue was at the forefront of both Department of Defense (DoD) bills. AIA worked with DoD and congressional staff and members to oppose caps on executive compensation. Although the 1997 Defense Authorization Bill included a $250,000 cap, which covers both DoD and civilian agency procurements, it further calls for a study to determine and define appropriate compensation levels. The president is to submit a legislative proposal by March 1, 1997, for a statutory standard. The Defense Appropriations Bill also included a $250,000 cap that is specifically aimed at defense contractors. AIA intends to be involved with all cognizant parties during this study period to assure a fair and equitable resolution.

Defense Restructuring Costs ★ Much confusion and misunderstanding has surrounded the issue of defense restructuring costs. The misconception that reimbursements are subsidies for corporate mergers has gained many champions in Congress. Legislation was introduced to eliminate the provision that allows DoD to reimburse companies for certified cost savings when corporate mergers and restructuring take place. AIA was successful in having this onerous language replaced with a provision that says no funds can be expended for restructuring unless 1) a cost savings by a factor of at least two to one is achieved or 2) the savings for DoD will exceed the costs allowed and the Secretary of Defense determines that the preservation of a critical capability is at stake. The continuation of this provision is vital to industry and AIA will continue to work to maintain it.

Depot Maintenance ★ AIA, along with other members of the Industry Depot Maintenance Coalition, worked closely with DoD and congressional staff and members to have language included in the DoD Authorization Bill that eliminates the $3M threshold for public/private competition and the 60/40 rule for workload allocation. While unsuccessful in having these barriers removed, AIA did succeed in removing oppressive language that
would have included work previously excluded from the 60/40 ratio. AIA sees this as a priority issue and has committed to continue efforts to remove these arbitrary restraints.

**Mentor-Protege Program** ★ AIA supports this program, which brings together Small Disadvantaged Businesses (SDBs) and larger aerospace firms to develop capabilities that are needed to produce aerospace hardware. AIA succeeded in extending the period during which mentor firms can recover the costs of furnishing developmental assistance to SDBs from September 30, 1996, to September 30, 1999. The provision also extends the period for entering into new agreements from September 30, 1995, to September 30, 1998. AIA is committed to this important program and will continue to work this issue in the future.

**Defense Export Loan Guarantee** ★ Last year the export loan guarantee facility was established in order to make the U.S. defense industry more competitive in the international market. Our competitors already have attractive loan guarantee packages, and with this financing facility now available to our customers, it can make a positive difference to them in deciding whether or not to buy U.S. products. The export loan facility was continued for FY 1997. Currently, the program must be renewed annually; AIA will attempt to make this a multi-year provision.

**Recoupment** ★ AIA has worked this issue for nearly 10 years. In 1995 AIA was instrumental in having language adopted that eliminates R&D recoupment charges on Foreign Military Sales with the caveat that appropriate offsets be identified before implementation. These offsets were identified this year with the selling of certain national strategic stockpiles (for example, platinum and diamonds) and the funds being applied to the deficit imposed by waiving the recoupment fee. AIA will continue to monitor this issue to ensure that there are no attempts to recoup recoupment charges in the next Congress.

**Buy American** ★ AIA was confronted with three separate but similar initiatives known as "Buy American" provisions. One would have required that DoD purchase only U.S. landing gear components. Another would have required a certain level of U.S. content in items purchased by DoD. A third initiative would have undermined current procurement agreements with our friends and allies. AIA was successful in ensuring that the industry was not negatively affected by these initiatives.

AIA was also closely involved in such issues as Research and Development tax credits, contractor bonus payments, acquisition reform, MANTECH program, NASA funding, FAA reauthorization, China Most-Favored-Nation trade issues, economic espionage, and the Export Administration Act.

**AIA's Aerospace Research Center (ARC)** conducts research, provides analyses, and prepares studies to bring perspective and a better understanding to the issues, problems, and policies of the aerospace industry.

**Facts & Perspective** ★ The Research Center published two "Facts & Perspective" supplements in 1996. "Executive Compensation: Why Single Out The Defense Industry?" (April/May 1996 AIA Newsletter) examined the $200,000 cap on defense executive compensation that took effect July 2, 1996. The article presented arguments on why the cap is inappropriate and discussed the adverse consequences and potential impact it would have on defense companies and the U.S. defense industrial base.

"Tools Of The Trade: Why Offsets, Outsourcing, And Joint Ventures Are Crucial To U.S. Aerospace" (July/August 1996 AIAUPDATE) highlighted the growing importance of global trade to U.S. aerospace manufacturers. The article clarified the concepts of foreign direct investment, offsets, outsourcing, and joint ventures and explained why U.S. aerospace companies must use these approaches to remain competitive. The article also refuted criticisms that these approaches hurt U.S. payrolls and create future competitors. Instead, the article showed that over the long-term, offsets, outsourcing, and joint ventures have been beneficial to U.S. interests.

**Compensation Practices Committee** ★ A major focus of the committee is the exchange of "best practices" information on compensation in the aerospace industry. This occurs through the exchange of surveys and follow-up roundtable discussions.

The Compensation Practices Committee also stays in communication with and provides input to the Cost Principles Committee. Recent issues of mutual interest include the cap on executive compensation and the final rule of the Federal Acquisition Regulation dealing with employee compensation and offsets.
Committee members supported the Summit Survey, a respected study of executive compensation in high-technology defense and commercial companies. The Defense Contract Audit Agency, Congress, and government agencies acknowledge the survey's credibility and usefulness.

**Year-End Review and Forecast** ★ In December, AIA released the Research Center's "1996 Year-End Review and Forecast." ARC staff estimated 1996 and 1997 sales, employment, and other key indicators of industry activity. Aerospace sales rose from $106 billion in 1995 to $112 billion in 1996. Sales for 1997 are projected to be $125 billion. The industry work force finally began to expand, climbing from 786,000 in 1995 up to 806,000 in 1996. This employment rise is expected to continue next year, reaching 825,000.


**Special Projects** ★ In support of renewing China's Most Favored Nation trading status, ARC staff provided AIA's International Division with data on U.S./China trade and employment. Research staff have also been involved in a fact finding effort with other AIA staff aimed at improving public awareness about the impact of trade on U.S. suppliers.

**Statistical and Information Services** ★ The Research Center's database supports the publication of 22 statistical series grouped by general statistics, employment, production, and foreign trade. The Research staff drafted AIA news releases for the media covering quarterly commercial transport jet (orders, shipments, and backlog), helicopter (orders, shipments, and backlog), and aerospace foreign trade. Research staff also provided articles for the *AIA Newsletter: Aerospace Indicators* (March, August), Commercial Transport Updates (June, September), Industry Orders and Shipments (October), and Commercial Aircraft Orders (November/December).

The Research Center continues to investigate new ways to distribute AIA data. This summer AIA signed up with a CD library distribution group called Investext. Investext has a worldwide marketing network and is setting up a trade association CD library for its clients. AIA will place selected data releases with Investext and will receive royalties when users access those data pages. The Research Center is also placing selected information on AIA's Home Page on the Internet.

The Research Center is exploring the possibility of revising its employment reporting to include state-by-state employment breakouts.

A growing problem is the lack of data available on space commerce. AIA's Space Committee approved a Research Center survey of their companies to identify common data requirements within industry and establish corporate contacts for providing and using the data. An initial survey showed that certain data needs are common. A broader survey is now underway. The next step is to determine if this data can be collected on a regular basis and who would fund this effort.

Due to data collection problems, the Bureau of Labor Statistics (BLS) is reviewing its aircraft average hourly earnings with lump-sum series and may terminate the series. The Research Center notified member companies about this and conducted a survey to determine the importance of the series to member companies. Survey results indicated that while alternative data series do exist, some companies do rely on the lump-sum data for contract pricing. These results were forwarded to the Bureau. Based on these efforts and ongoing discussions between AIA and the BLS, it appears that the series might be continued although the method of data collection will be changed.

BLS announced that its engine average hourly earnings series has been inaccurately reported since March 1995. The Research Center has worked closely with the Bureau and the engine companies to resolve this problem. The BLS expected to report corrected data dating back to March 1995 in December 1996.
AIA's Communications Council supports the activities of the association's president and staff and conveys industry goals, accomplishments, and concerns to AIA member companies, Congress, the news media, and the general public. ★ AIA President Don Fuqua is a leading spokesperson for the aerospace industry, delivering industry's messages through numerous speeches, news media interviews, and participation in aerospace-related conferences, panels, and seminars. At the 32nd Annual Year-End Aerospace Review and Forecast Luncheon on December 11, Fuqua delivered the state of the industry address. More than 240 representatives from the news media, government, and industry attended the function.

Media Relations ★ Communications is an important information source for the aerospace industry. News media interest in 1996 focused on international trade issues and financial issues, such as executive compensation and defense restructuring. In July, the St. Louis Post-Dispatch published an op-ed by Don Fuqua on outsourcing; a leading trade publication carried a commentary on defense restructuring by Fuqua in October. Defense restructuring was also the focus of a 60 Minutes interview with Mr. Fuqua in October, which aired on December 22. Numerous press releases from Communications on industry statistics, Capitol Hill testimony, and other association activities kept AIA in the forefront as a credible voice for key industry issues and activities.

Communications Council ★ Public affairs representatives from government, including the assistant secretary of defense for public affairs and the U.S. Air Force chief of public affairs, spoke at the annual spring meeting of the Communications Council in May. A panel discussing aviation safety reporting was also on the program. The guest speakers at the monthly meetings of the Washington Public Relations Representatives were the head of public affairs for the U.S. Marine Corps, the editor-in-chief of Aviation Week and Space Technology, and a correspondent from Business Week.

The Communications Council is coordinating more activities with EIA's Government Division Public Relations Committee, including meetings in conjunction with the Air Force Association symposium in September and AIA's Annual Aerospace Review and Forecast Luncheon. An AIA-EIA seminar on The Business Roundtable's "Trade & Investment Communication Initiative," held on the morning of the year-end review, included a panel of industry communicators and the director of legislation from the Roundtable. Their experience in taking the initiative to their companies was the focus of the program.

Editorial Products ★ Entering its ninth year of publication, the AIA Newsletter was redesigned to a more concise format and renamed AIAUPDATE. In-depth articles on critical issues appear as special inserts to the UPDATE. Five UPDATES, beginning with the June issue, were published in 1996. Topics covered as inserts were facts and figures on U.S. aerospace trade with China; the importance of offsets, outsourcing, and joint ventures; and aviation noise and emissions issues. Published 10 times yearly, the AIAUPDATE is the association's primary communications vehicle to members, the government, Congress, news media, academia, industry, and the financial community.

In 1996, AIA Communications published two editions of the AIA Washington Aerospace Media and Public Affairs Directory. The directory is highly regarded as a valuable resource tool for the communications representatives of AIA's member companies.

AIA Goes Online ★ The June issue of the AIAUPDATE announced the association's home page on the internet. Managed by Communications, AIA's Web site is available to members and others at http://www.access.digex.net/~aia. The latest and most important information about the association and the aerospace industry is posted there, for example, AIA news releases, Aerospace Indicators (the most recent figures for aerospace employment, sales, profits, orders, and exports), and special reports and white papers on domestic and international issues, such as information on U.S. military specifications targeted for cancellation, AIA's submission to the White House Commission on Aviation Safety and Security, and the industry's annual review and forecast. A list of AIA member companies with links to those with home pages and links to other aerospace-related home pages, such as the Aircraft News section of the Equipment Leasing Association and the aviation, environmental, and legislative sections of the Government Information Xchange, are also available at AIA's Web site.
The commercial aerospace market is inherently global. We fly our aircraft in common airspace and must have systems on board that are interoperable with air traffic management systems all over the world. We use common languages, common specifications, and share common objectives for our customers and industry. International trade for us is an everyday reality — an essential fact of our business.

— Don Schwartz, President, Space and Aviation Control, Honeywell Inc.

AIA's Administrative Office guides and manages the association's daily business operations and activities of all program areas and keeps member companies informed of key membership issues. ★ The association's general administrative functions include financial management and accounting, personnel management, data information systems, purchasing, mail operations, telecommunications, industrial security, corporate records, and office management.

★ In conjunction with the Office of Policy and Planning, the Administrative Office assists with preparing the program agenda, complete with background material, for AIA's semiannual Board of Governors meetings and two membership meetings.

★ AIA's general counsel consults with the secretary-treasurer to review and revise the association's bylaws. Staff members are responsible for incorporating any changes approved by the Board of Governors and communicating those changes to the membership.

★ Another important function of the Administrative Office is industrial security. Under its contract with the U.S. Air Force, AIA provides various statistical analyses and reports relating to security. In addition, the Administrative Office conducts staff briefings on clearance procedures and conducts periodic reviews, briefings, and debriefings when staff members travel to various sites and countries.

★ The secretary-treasurer serves as liaison to two standing Board of Governors committees: Finance and Nominating. The staff meets with the Finance Committee to review AIA's investments, budget, and other financial matters. Regarding the Nominating Committee, the staff is responsible for informing committee members of their responsibilities, developing criteria for selecting nominees to the Executive Board, and answering questions about the selection process. The staff prepares reports for both committees and communicates the results to AIA's members. The staff is also responsible for processing membership applications and expediting the appointments of new member representatives to AIA's councils and committees.
The international marketplace is important to virtually all firms, but future success will depend to a great extent on whether or not people build trade walls around the U.S. and other parts of the world. History tells us such walls have never worked, in part because those protected inside the walls tend to form very bad habits that make them non-competitive everywhere else in the world outside the wall.

— Norman R. Augustine, Vice Chairman and CEO, Lockheed Martin Corporation

AIA’s Civil Aviation Council works with domestic and international agencies, the U.S. Congress, and others in the aviation community concerning the design, manufacture, and operation of rotorcraft, fixed-wing aircraft, engines, and systems. Again this year, the Civil Aviation Council and its various committees and subcommittees undertook numerous and complex issues to support AIA in reaching its goals. The council’s efforts led to renewed emphasis on aviation safety, significant progress in the harmonization of U.S. and European airworthiness regulations, and a continuation of activity regarding environmental issues.

Aviation Safety ★ Recent events have put aviation safety under intense scrutiny. Over the years, AIA has consistently emphasized the need to focus on accident prevention. In August, the Clinton Administration established the White House Commission on Aviation Safety and Security and on September 4 the commission issued its initial recommendations on aviation security. On October 15, AIA responded to the commission’s request to identify the top three safety issues and recommended focusing on 1) the process for prioritizing safety issues, 2) human factors related to flight crew performance, and 3) human factors related to maintenance. AIA also provided input on Air Traffic Control issues and established a working relationship with the commission in anticipation of its final recommendations in February 1997.

Federal Aviation Administration Organization ★ In 1996, the Federal Aviation Administration (FAA) reviewed the organization and function of offices under the Associate Administrator for Regulation and Certification and issued preliminary proposals for a far-reaching restructuring. AIA and member input to FAA recommended greater flexibility so that the agency is better able to handle the growing and rapid changes in the industry. This exercise was expected to continue into 1997.

Thirteenth Annual Harmonization Conference ★ At the thirteenth annual meeting between the FAA, the European Joint Aviation Authorities (JAA), and industry in early June, the FAA and JAA agreed, at industry’s urging, to reduce the harmonization work program to a “critical few” regulations with all others to be declared equivalent. In the area of certification of transport category airplanes, this will reduce the number of projects from more than 200 to less than 50. Similar reductions were achieved for rotorcraft, engines, and general aviation airplanes. The FAA and JAA also acknowledged that agreement is needed on how much involvement authorities in the importing country should have, the idea being to reduce the burden that redundant and unnecessary oversight imposes on companies. The FAA and JAA agreed to an ambitious schedule to implement major changes by yearend 1996.
Suspected Unapproved Parts ★ The issue of Suspected Unapproved Parts (SUPs) continued to consume a large portion of FAA and industry time in 1996. The FAA created a National SUPs Program Office to focus on SUPs issues and to coordinate FAA enforcement efforts. Industry worked through the SUPs Steering Group and FAA's Aviation Rulemaking Advisory Committee (ARAC) to support the FAA program. Key initiatives also included development of a required document trail to close existing loopholes in the parts approval process, revisions to the Federal Aviation Regulations that will require using FAA documents to accompany parts distribution, and a program to register the quality assurance systems of parts distributors to ensure approved procedures.

Airplane Noise Control Committee (ANCC) ★ The ANCC revised its charter to include aircraft emissions as well as noise.

In conjunction with the International Civil Aviation Organization (ICAO) Committee on Aviation Environmental Protection, the Airplane Noise Subcommittee (ANS) focused on noise and airport operations. ANS supported:

★ Improving the tools necessary for assessing airport noise for use in effective land-use planning.
★ Harmonizing noise requirements so that U.S. Federal Aviation Regulations (FAR) and European Joint Aviation Requirements (JAR) are identical to ICAO standards.

A growing belief in a correlation between human activity and observed climate change increased the pressure on the aviation industry to reduce greenhouse gases. The Aircraft Emissions Subcommittee (AES) was active in the full range of climate change policy issues.

★ AIA agreed with the International Climate Change Partnership’s position supporting the U.S. Government’s call for a long-term focus on climate change issues.
★ AIA maintained that efforts to control greenhouse emissions must be based on a clear understanding of economic costs, scientific evidence, and necessary reduction levels.
★ Pending completion of studies to provide empirical data, AIA supported accelerating the implementation of less costly and more environmentally beneficial fuel-saving proposals advanced by the United States, including improved air traffic management and better land-use planning.

Commercial Customer Support Committee (CCSC) ★ The CCSC continued to focus on three areas: aftermarket product support systems, the development of regulations affecting product support, and strengthened relations with airline associations. The committee met with corresponding committees in the Air Transport Association and through CCSC standing committees addressed specific product support disciplines. Major activities in 1996 included: 1) issues related to automated data interchange between airlines and suppliers, particularly the material acquisition and tracking processes, 2) development of a process for maintaining the recently established X.12 Electronic Data Interchange Implementation Guide, 3) initiating the development of “Working Together Guidelines for Training,” and 4) continued oversight on the unapproved parts issue.

Manufacturing, Maintenance & Repair Committee (MMRC) ★ The MMRC focused on production certification procedures and regulations covering maintenance, overhaul, and repair and supported ARAC working groups on production certification and parts. Major issues included: 1) production approvals, including guidance on consortia, 2) airworthiness approvals, and 3) definitions of commercial and standard parts. Other areas of MMRC support and involvement were:

★ SUPs, particularly the paper trail process.
★ Development of the FAA Aircraft Certification System Evaluation Program (ACSEP) Resource Targeting Plan for managing FAA workload and prioritizing activities.
★ Working with the FAA Designee Management Team to improve the effectiveness of the FAA’s designee management oversight.
★ Providing comments to an FAA Advisory Circular on statistical quality control.

Propulsion Committee (PC) ★ The PC continued its work on FAR/JAR, liaison with the Association of European Aerospace Industries, and improved relations with the FAA. The committee’s rulemaking initiatives for engines involved rain and hail ingestion, bird ingestion, rotor integrity, and in-flight restarting;
final rules on windmilling, vibration, and one-engine inoperative ratings were published. The committee also led the establishment of a project on conformity assessment and completed the Joint Services General Engine Specification, a four-year coordination effort between the PC and the Tri-Service Working Group. A reactivated project group addressed icing issues related to large, supercooled liquid droplets.

**Rotorcraft Committee (RC)** ★ The RC concentrated on FAR/JAR harmonization in 1996. In June, an AIA member company representative, with CAC and RC support, worked with the FAA to resolve an impasse between FAA and JAA over procedures for JAA validation of a new model helicopter. The JAA issued a Letter of Recommendation to issue Type Certificates for the aircraft on July 11, 1996. The JAA Helicopter Airworthiness Study Group also elevated AIA to full voting member rather than observer status. AIA hopes this achievement will establish a precedent for other JAA study groups.

**Transport Committee (TC)** ★ Establishing FAA organizational delegation and instituting FAA oversight systems were part of the TC’s focus in 1996. The committee also sought to reduce any overreaching and sudden regulatory requirements that would be better met through less obtrusive means and to harmonize FAR/JAR transport airplane category certification requirements to minimize the compliance cost for existing, equivalent levels of safety. The TC opened 33 projects and closed 23. New initiatives included: cabin air quality, catastrophic failure prevention program, cabin fire safety, and engine failure indication system guidelines. The TC submitted comments on 11 proposed FAA, JAA, or FAA/JAA harmonization rules, completed review of two FAA policy statements, and conducted reviews of 10 additional FAA, JAA, ICAO, or harmonization rules.

**Civil Aviation Council And Committees** ★ Andrew Brindisi, Pratt & Whitney, Chairman, Manufacturing, Maintenance & Repair Committee ★ Tony Freck, General Electric Aircraft Engines, Chairman, Propulsion Committee ★ Marty Guthrie, Parker Hannifin Corporation, Chairman, Civil Aviation Council ★ Edgars Kupcis, The Boeing Company, Chairman, Transport Committee ★ Darce Lamb, The Boeing Company, Chairman, Commercial Customer Support Committee ★ Jack Mitchell, AlliedSignal Aerospace, Chairman, Airplane Noise Control Committee ★ Larry Plaster, McDonnell Douglas Helicopter Company, Chairman, Rotorcraft Committee

AIA, FAA, and JAA agreed on the revised FAA/JAA Harmonization Work Program for rotorcraft. Major issues include: high intensity radiated fields, critical parts, elevated helipad landing distance, aircraft fatigue, and uncoordinated advisory circular material. They also concurred on nine additional topics where joint FAR/JAR changes are needed. Mexico’s published draft of a new rotorcraft operating regulation that incorporates most of the ICAO Annex 6 restrictions prohibiting effective use of single engine rotorcraft underscored AIA concerns about ICAO member countries independently beginning to adopt Annex 6 as their national code. The RC has been urging the ICAO to ease these restrictions.
The world is globalizing, whether we like it or not. And we should like it because we are positioned to be big winners if only we embrace these forces and shape them to benefit both others and ourselves. But we must alter the character of our corporations and their employees as this transformation occurs... the immediate answer is a significant investment in education for the millions of Americans already in the workplace.

— George David, President and CEO, United Technologies Corporation
**Executive Compensation.** CPC helped to limit the congressional cap to one year rather than make it permanent and Congress has returned the issue to OFPP for resolution.

**Economic Advisory Task Group** The task group maintained a dialogue throughout the year with the DoD Comptroller and the Defense Finance and Accounting Service (DFAS) on three issues which affect timeliness of payments: 1) reconciliation of invoices with Accounting Classification Reference Numbers (ACRNs) and reducing the number of ACRNs, 2) electronic payment of progress payments without ACO approval, and 3) more timely payments by DFAS.

**Facilities and Property Committee** As the only association with a standing committee on government property management, AIA continued its active participation in the rewrite of FAR Part 45. The committee's efforts resulted in significant changes to the rewrite, simplifying: 1) rental for commercial use, 2) data required at time of disposal of special tooling, and 3) disposal of production scrap. In addition, DoD has agreed to publish another draft for public comment rather than issue the rewrite as an interim rule and has waived the General Services Administration screening requirements for excess special tooling prior to disposal.

**Industrial Security Committee** The Industrial Security Committee (ISC) still devotes considerable resources to tying up loose ends in the National Industrial Security Program (NISP), particularly completing the last two chapters of the Operating Manual (NISPOM). However, with the NISP now in place almost two years, the ISC has been able to turn to other pressing matters such as: 1) information security, 2) threat analysis, 3) financial disclosure, 4) economic espionage, and 5) best practices in use of resources. The ISC works closely with the Security Policy Board (under the National Security Council), the Defense Investigative Service, the Central Intelligence Agency, and numerous other intelligence and security organizations.

**Intellectual Property Committee** It is now more than one year since the Intellectual Property Committee (IPC) completed its decade-long effort to help develop final DoD regulations covering Rights in Technical Data. While not a perfect regulation, no major problems have been encountered in putting it into practice. Meanwhile, the committee has been able to turn its attention to several other potential problem areas. Chief among these are: 1) information security, 2) patent indemnification, 3) foreign patent costs, 4) protection of copyright on computer software, 5) extending patent term to 20 years, and 6) implementation of the National Information Infrastructure Act of 1996.

**Legal Committee** The Legal Committee (LC) has been very active both in advising the other standing committees and in taking the initiative on key legal issues affecting the aerospace industry. It supported the Cost Principles Committee in getting DCMA to withdraw its guidance on allowability of severance costs and helped prepare comments on the regulatory implementation of environmental costs, bid protests, title under progress payments, and reporting of agent's fees under ITAR Part 130. The LC supported several requests for amicus briefs in cases which could have a significant impact on the industry, participated in a panel discussion on the future of the Government Contractor Defense, and supported a series of seminars on Alternative Dispute Resolution.
Procurement Techniques Committee ★ As the focal point for all matters of contract policy, the Procurement Techniques Committee (PTC) has been heavily involved in the voluminous regulatory implementation of the acquisition reform statutes. At the same time, it has continued to work with DoD and NASA on their procurement initiatives, for example, NASA’s regulations on Cooperative Agreements and a new Shared Savings Clause. Regarding acquisition reform, the PTC reviewed and critiqued all proposed and interim regulations implementing FASA and FAR and took the lead in many cases to prepare industry positions for submission by the Council of Defense and Space Industry Associations. Committee members participated in the DoD Standdown Day activities and also provided comments to the Air Force Materiel Command on its Best Value Request For Proposal Preparation Guide and its Award Fee Guide. The PTC prepared an extensive analysis of certifications required by both the FAR and the Defense Federal Acquisition Regulation Supplement and recommendations for elimination of all non-statutory certifications and representations. The PTC also continued its support of the Joint Logistics Commanders Joint Pollution Prevention Advisory Board initiatives and reviewed and commented on the latest Environmental Guidance chapter in DLA’s One Book. PTC members have joined an ad hoc team effort to align National Aerospace Standard (NAS) 410 on Hazardous Material Management with DoD 5000 (“Acquisition Management”) and with International Organization for Standardization (ISO) 14001 (“Environmental Management”). Another ad hoc group of PTC members is preparing an industry assessment of past performance as a source selection criteria in support of the increased emphasis on past performance.

Tax Matters Task Group ★ This group’s major activity during 1996 was to support and coordinate efforts to obtain federal income tax credits for research expenditures related to government fixed-price development contracts. The Internal Revenue Service (IRS) opposes such credits, notwithstanding the favorable court decision in the Fairchild case; so the group is still working to develop arguments to overcome the IRS position. Another issue this group also continues to pursue is a flat 5% Research and Development (R&D) tax credit, applicable to all R&D and not limited to incremental increases.

Washington Procurement Committee ★ Most of the issues which would have normally been agenda items for the Washington Procurement Committee (WPC) were considered by the Acquisition Reform Working Group (ARWG), a multi-association group including AIA. AIA actively participated in ARWG and developed numerous industry positions on legislative issues, including legislation industry is proposing and provisions in authorization and appropriations bills and other statutory vehicles.

The current trend in the aerospace industry for large aircraft builders to seek cost sharing partners on a global basis has a ripple effect on the sources of new business for companies such as ours. The design/procurement responsibility for systems utilizing our products may now rest in the hands of a foreign company, making it imperative that we market our products on a global basis.

— Rick Berg, President, Dowty Aerospace Los Angeles.

AIA's Technical Operations Council (TOC) focuses on all aspects of technological, operational, and engineering efforts to advance all aspects of program management, development, engineering, testing, manufacturing, quality, materiel management, standards development, and product support to better address the issues stemming from the production of aircraft, missiles, and space vehicles.

Product Support ★ The Product Support Committee (PSC) interfaces with DoD customers on joint projects involving logistics policy and processes. Major 1996 activities concerned privatization and outsourcing, public-private depot competition, and flexible sustainment, with additional joint efforts in supply support, product improvement, provisioning/cataloging, and interactive technical manuals.

Privatization and Outsourcing ★ The PSC completed four years of a coordinated effort to increase private sector work-shares within the defense industrial base for the operation and support of defense weapons systems. Active projects are: 1) providing industry views on DoD's actions to privatize/privatize-in-place facilities (maintenance depots) directed for closure by the 1995 Base Closure and Realignment Commission, 2) participating in a DoD Integrated Process Team (IPT) on Materiel Management Privatization, 3) exploring "direct vendor delivery" options for outsourcing DoD component maintenance and management, and 4) representing industry in DoD forums evaluating other possibilities for privatization-outsourcing, such as provisioning and cataloging.

Public-Private Depot Competition ★ The Product Support Committee is the cornerstone for an industry working group addressing the public-private depot competition issue and working with DoD to achieve as fair a process as possible for competitions. The working group has developed and promulgated a series of issue papers that describe industry positions on actions needed in several areas: acquisition strategy, cost, source selection, statement of objectives, and performance accountability to assure fair and equitable competitions.

Flexible Sustainment ★ The DoD logistics community, through the Joint Aviation Logistics Board, is developing a guide to help government managers implement acquisition reform measures for the ongoing support of fielded weapon systems. The envisioned process is to reduce DoD cost of ownership while maintaining or increasing system readiness. It would rely on trigger-based inventory management and the introduction of new technology into fielded systems with emphasis on reliability-based support concepts. The PSC is providing industry input to this effort.
**Other Joint Projects** ★ Through PSC involvement in several other joint projects with DoD, the potential exists to optimize industry roles and eliminate non-value-added operations for industry. The committee
★ Participates in U.S. Air Force IPTs charged with improving their existing supply support and product improvement processes.
★ Is exploring a “direct vendor delivery” concept for contractor management and performance of component repair and inventory management.
★ Continues to work with the Office of the Secretary of Defense and the military services on both a Provisioning and Cataloging Team and a Materiel Management Privatization IPT.
★ Is addressing issues on digital and interactive electronic technical manuals and processes as part of an AIA/Tri-Service Working Group.

**Government-Industry Quality Liaison Panel (GIQLP)** ★ The Quality Assurance Committee (QAC) has focused its efforts on a multi-association (AIA, EIA, NSIA) venture with several government agencies known as the GIQLP. Their purpose is to construct a vision for quality in the 21st century and a strategy to guide government and industry efforts to achieve this vision. GIQLP goals are to attain: 1) a single quality management system within a contractor’s facility capable of meeting each customer’s requirements, 2) government and industry recognition, sharing, and use of advanced quality concepts in requirements definition, design, manufacture, and acceptance of products, and 3) establishment and implementation of effective and efficient oversight methods.

During 1996, GIQLP completed the development and planning phase of the project and received the Hammer Award from Vice President Al Gore’s National Performance Review on November 29 for its efforts. In 1997, the GIQLP will concentrate on the execution of the proposed plan.

**Aerospace Basic Quality System Standard** ★ The QAC and the TOC are developing a method to flowdown basic quality system requirements to suppliers. They have endorsed a practice of promoting single, basic quality systems on a facility-wide basis and minimizing the proliferation of sector-specific supplements to the standards of the International Organization for Standardization (ISO). Where needed, they recommend that sector- or company-unique requirements be imposed on a contract-by-contract basis.

**NAS Standard 410, NAS Certification and Qualification of Nondestructive Test Personnel** ★ DoD’s cancellation of MIL-STD-410 highlighted the need for a commercial standard on certification and qualification of nondestructive test personnel. The QAC established a project group to write and staff an appropriate standard. NAS 410 was approved and published in May 1996.

**Flowdown of Single Process Facility Through Block Change to Supplier Base** ★ The commander of the Defense Contract Management Command (DCMC) requested that AIA’s Manufacturing and Materiel Management Committee (M³C) and DCMC representatives form an IPT to address “block change” for a single process facility when a company is both a prime contractor and a subcontractor in the same facility.

The IPT recommended that concurrent with submitting concept papers to the contractor’s government management council for approval, the contractor should also have them reviewed and approved by military prime contractors who are customers. Once approved, the military services would flowdown contractual relief so that military prime contractors can implement the concept papers on their subcontracts.

**Small, Small Disadvantaged, and Women-Owned Small Business** ★ The NASA Administrator formally congratulated AIA and its member companies for more than doubling subcontract dollars to Small Disadvantaged Business (SDBs) from FY 1991 to FY 1995 and for supporting full integration of SDBs into NASA’s core procurement programs.

**Support for the National Center for Advanced Technologies (NCAT)** ★ The M³C has placed high priority on supporting NCAT in communicating with government officials about manufacturing. M³C representatives are members of the executive committee of the Multi-Association Industry Affordability Task Force that is interfacing with the Defense Manufacturing Council. As part of NCAT activities, M³C members reviewed DoD Technology Area Plans on manufacturing and materials and participated on the planning committees for the Manufacturing Technology Program.

**Reducing the Burden of Doing Business Through Electronic Data Interchange (EDI) for the Supplier Base** ★ Meeting with aerospace materiel management executives, Mr. Noel Longuemare, principal deputy undersecretary of defense for acquisition and technology, expressed concern about the aerospace industry using EDI with smaller suppliers. Apparently each company adds requirements so that a
small supplier has to have a unique system for each cus-
tomer even though there is a national standard.

An AIA company steering group and a working group have
been established to define and solicit solutions to the prob-
lem. To date, working group representatives have inter-
viewed 51 small businesses doing EDI transactions with at
least three AIA member companies. The working group has
developed a trading partner agreement format for industry
to adopt and is currently defining a consistent process
model and implementation plan.

AIA Position on Ada Programming Language ★ DoD asked
the National Research Council (NRC) to review the use of
Ada programming language and the current policy mandate-
ing Ada DoD-wide. In turn, the NRC requested an AIA
position on the Ada programming language. The
Engineering Management Committee (EMC) developed a
position which it submitted to the
NRC. In summary, AIA recom-
mends changing the current DoD
decision to eliminate the exclusive
mandate for Ada. Ada should be
used where it makes both engi-
neering and business sense based
on a trade study.

Standards and Specifications
Review ★ A major EMC respon-
sibility is reviewing new and
updated government and military
standards and specifications to
ensure that performance-based
specifications become a reality.
The EMC has reviewed specifi-
cations and standards in the areas of
statement-of-work, technical data packages, systems safety,
parts control, human engineering, and engineering
drawing packages.

Performance-Based Business Environment ★ Industry
attendees at the Aeronautical Systems Center President's
Day supported establishing, through AIA’s TOC, a group of
chief engineers from AIA member companies. The Chief
Engineers Working Group would regularly interface with the
Joint Aeronautical Commanders Group (JACG) and its
boards to review progress implementing the results of the
Non-Government Standards Integrated Process Team. The
working group appointed industry co-chairmen and company
participation for each of the five committees organized by
the JACG Board. Review of three JACG products is
completed. The focus is now on the capstone document that
directs how the JACG products will be used.

Technical Operations Council and Committees ★
Carl Amato, Northrop Grumman,
Chairman, Product Support Committee ★
William Dunlop, Texas Instruments,
Chairman, Manufacturing & Material
Management Committee ★ Brian Mosdale,
Rockwell, Chairman, National Aerospace
Standards Committee ★ James Parrish,
Sundstrand, Chairman, Quality Assurance
Committee ★ Oren Phillips, Thiokol,
Chairman, Space Committee ★ Robert J.
Polutchko, Lockheed Martin Corporation,
Chairman, Technical Operations Council ★
Allen Swanson, Raytheon, Chairman,
Engineering Management Committee

National Aerospace Standards ★ The National Aerospace
Standards Committee (NASC) maintains the current body
of more than 3,000 NAS standards and develops new stan-
dards as needed by the aerospace industry. During 1996, the
NASC continued to publish and revise standards as required;
the need to update and maintain standards is becoming
more and more important with the increased attention on
parts inspection resulting from the Fastener Quality Act.
The NASC is also exploring ways of replacing materials in its
standards that are potential environmental hazards.

Standards Go Commercial ★ The Early Warning Project
group is ensuring that AIA members have the standards
needed to function effectively during defense downsizing.
MIL-SPECs are aggressively being canceled because of
DoD directives to use commercial specifications. However,
AIA committees are converting many of them to AIA
National Aerospace Standards. The Defense Logistics
Agency is also converting many military parts standards to NAS. AIA is
coordinating industry positions on
cancellation of military and federal
parts and material specifications
and assuring their proper superses-
sion by industry standards.

Space Advocacy ★ AIA’s Space
Committee provides a forum for
industry to present its views on
aspects of National Space Policy to
government agencies. During 1995,
the committee met with representa-
tives from the White House
Office of Science and Technology
Policy, NASA, Congress, and the
departments of Defense and
Commerce. Government officials expressed appreciation
for having one place to go for broad-based reactions from
aerospace manufacturers on anticipated space initiatives.

International Standardization ★ The Aerospace Technical
Committee (TC 20) of the International Organization for
Standardization is the management body for 11 subcom-
mittes and five working groups addressing an extensive
work program covering all aspects of aerospace standardiza-
tion. AIA President Don Fuqua serves as chairman and AIA,
the committee secretariat. Approximately 39 delegates rep-
resenting nine countries have been focusing on recognition
of de facto international standards, the division of work
between TC 20 and other committees, and ways to harmo-
nize part certification programs between nations.

Aerospace Industries Association
AIA’s Environmental, Safety, and Health (ES&H) Committee is concerned with environmental and occupational safety and health issues affecting the aerospace industry. The ES&H Committee bears primary responsibility for coordinating AIA efforts relating to ES&H issues.

**Aerospace Air Regulations** ★ In October 1996, the Environmental Protection Agency (EPA) published the revised Aerospace National Emission Standards for Air Pollutants (NESHAPs) and an Aerospace Control Techniques Guideline. These documents govern the emissions of hazardous air pollutants and volatile organic compounds used in the manufacture and maintenance of aerospace products. Publication of these two documents caps a five-year effort by AIA’s Clean Air Task Group to coordinate industry input to this rulemaking. Emphasizing pollution prevention over technology controls, the documents minimize cost and maximize flexibility for aerospace operations while meeting the intent of the Clean Air Act. The next challenges for the task group include other proposed EPA NESHAPs which will examine hazardous air pollutants from aircraft engine test cells and from rocket launches.

**DoD Contracting** ★ An industry/DoD task group created National Aerospace Standard (NAS)-411 in 1993; AIA’s ES&H Committee and the Procurement and Finance Council represents industry. In 1995, Dr. Paul Kaminski, under secretary of defense, required using the tenets of NAS-411 on all DoD contracts. Due to the many new developments related to environmental management, DoD asked AIA to reformulate a task group to work with DoD on a review of NAS-411 to make it a more useful document. That task began in the fall of this year.

**Aerospace Wastewater Discharge Regulations** ★ During 1995, EPA proposed stringent new limits on wastewater discharges for several industries, including aerospace. AIA, with the help of a contractor, analyzed the proposed new limits and met with EPA to discuss industry concerns. As EPA continues to work on a new rule, an AIA Task Group is monitoring its development and coordinating with other affected industries.

**Monitoring** ★ AIA’s ES&H Committee is monitoring and commenting on several new regulatory developments, including expansion of EPA’s Toxic Release Inventory, a publicly accessible database on chemical releases by manufacturers. EPA is broadening reporting requirements to include new information on chemical use and chemical accounting requirements. AIA is concerned with the cost and burden of these new requirements.

AIA continues to evaluate the impact of ISO 14001, the new international standard on environmental management systems. Though voluntary, it is possible that foreign countries will require importers to comply with the standard. In addition, U.S. federal agencies are encouraging suppliers to adopt the standard.

International treaties could also significantly impact the ability to manufacture and export aerospace products. Energy prices will likely be affected if the United Nation’s Framework Convention on Climate Change is able to produce binding commitments on parties to reduce carbon dioxide and other emissions permanently from their present level. A comprehensive study of aviation’s effect on the atmosphere will be part of this work. ES&H works with AIA’s Civil Aviation Council Emissions Working Group on this important issue.
Free trade is one of the most important drivers for growth into the 21st Century. People often ask “What’s in it for me?” We talk about what is good for TI or what is good for my company, but we don’t stop to think about putting this in words that the people who work in our companies and the men and women in the streets understand. We have a responsibility to do a better job. To be successful, our message must do just that. On a personal basis we must tell people how they fit in the new global economy. We must show people how they can benefit from open markets and how trade affects their everyday lives.

— Jim Adams, Chairman of the Board, Texas Instruments Incorporated

AIA’s International Council encourages policies that assist AIA member companies to compete and, where appropriate, to cooperate in the international marketplace. * International sales now account for about one-third of all U.S. aerospace production. In turn, the United States remains the dominant player in aerospace with roughly 70% of the world commercial aircraft market, 80% of communications satellites, and more than 50% of all defense sales. The International Council is concerned with obtaining government policies that will help ensure that the U.S. industry can continue its strong performance in the global marketplace.

In 1996 AIA made major progress on several long-standing issues, For example, final legislative approval now allows the U.S. President to waive recoupment charges on government to government sales of defense equipment. Such charges were initially intended to recover some share of the original research and development costs related to the equipment being sold. However, as the U.S. defense budget has decreased, so have production runs of new systems. This has meant that calculations for recoupment charges produced such high percentages that the fees threatened to price U.S. products out of the market. The waiver authority can reduce the price of U.S. defense equipment and ensure that U.S. products will remain competitive.

Congress also provided the authority to extend the export loan guarantee mechanism that was authorized in 1995. This allows the facility to guarantee several hundred million dollars in new defense sales each year at no cost to the taxpayer. This facility was needed because the Export-Import Bank is not allowed to finance sales of defense equipment. Many countries require some form of financing for their defense acquisitions just as they do for purchases of commercial capital equipment. The new facility got underway at the end of 1996.

President Clinton agreed to shift communications satellites and commercial jet engines and related technology from control under the Arms Export Control Act to the Export Administration Act, thereby moving administration of controls from the State Department to the Commerce Department. This change will facilitate sales of U.S. commercial satellites, particularly when foreign launchers are involved, and encourage international joint ventures on commercial engines. Industry had sought this decision for nearly a decade.

Finally, Most Favored Nation status for China was extended for one year (through 1997) with prospects improving for eliminating this annual debate. Several “Buy American” provisions attached to defense appropriations bills did not become law,
and the Secretary of Defense was given new waiver authority for existing Buy American provisions. These actions improve the prospects of continued purchases of U.S. defense products by European countries and avoids giving new ammunition to advocates of “buy European” policies.

These legislative and administrative actions resulted from several years of presenting industry’s case to the executive branch of our government, the Congress, and the press. In 1997 the challenge will be to hold onto these gains and head off new attempts to reduce our ability to compete in the international arena. Given the critical importance to industry of being able to compete in foreign markets, we must continue explaining to the public and government the need for an open and fair trading system.

**Defense Trade Committee** ★ This committee worked to bring about the changes in recoupment charges, loan guarantees, and export control jurisdiction noted earlier. It also pressed the administration to review its policy of denying new U.S. defense technology to Latin American countries. Because of this policy, the U.S. holds less than a 25% share of the defense market in that region compared to more than 50% for the rest of the world. After the election, the Clinton Administration finally indicated that it would move away from a policy of near automatic denial of marketing and export licenses and examine specific requests on a case by case basis. Finally, the committee, in cooperation with the Defense Industry Offset Association, provided advice on offset practices and policies to the executive branch.

**Commercial Trade Committee** ★ This committee was the focal point for AIA’s work on extending MFN treatment for China and on pressing the commodity jurisdiction issue with respect to commercial satellites and jet engines. It also provided the White House with a paper on revamping the legislative framework and administration of export controls, which will hopefully help stimulate new initiatives early in the administration’s second term.

**International Exhibitions Committee** ★ DoD and AIA worked closely together at four major air shows in 1996: Singapore, FIDAE (Chile), Farnborough, and Seoul. At each show DoD brought 15 or more aircraft; the U.S. presence dominated the military portion of the show. AIA supported an operations center at each show for DoD personnel and provided air crews with housing, meals, and local transportation. By working together, DoD was able to demonstrate symbolically its commitment to the security of friendly countries in the region, while simultaneously giving AIA members access to aircraft and other equipment to show to potential customers.

**International Council and Committees**
- Lisa Barry, The Boeing Company, Chairman, Commercial Trade Committee
- James Burrows, Northrop Grumman, Chairman, Defense Trade Committee
- Raymond García, Rockwell International, Vice Chairman, International Council
- William Pollard, United Technologies Corporation, Chairman, International Exhibitions Committee
- Michael A. Smith, Lockheed Martin Corporation, Chairman International Council
The 1990s have been difficult for U.S. aerospace companies. Declining defense spending and a protracted airline recession caused U.S. aerospace sales to plummet, resulting in the industry's worst downturn in 40 years. Yet as 1996 draws to a close, the U.S. aerospace industry finally appears to be on the road to recovery — at least in some of its business segments. Total industry sales, net profit, orders, and employment are all expected to show improvement this year. The prospects look even better for 1997, as commercial transport sales offset potential declines in other industry segments.

Sales By Product Group ★ The Aerospace Industries Association (AIA) estimates that aerospace sales for 1996 will rise for the first time in five years, climbing from $106.3 billion in 1995 to $112.4 billion (Table 1). Military aircraft sector sales will also be higher, by $1.7 billion. Exports account for the improvement in this industry segment. Sales of related products and services (which include defense electronics and air traffic control equipment) are expected to rise by $1 billion and space sector sales will edge up by $300 million. The one product group that continues to suffer is missiles. AIA expects missile sales to fall to $5.6 billion by the end of the year. This represents a 61% drop in sales since 1990.

Sales By Customer ★ Changes in aerospace product sales are driven by the dynamics of industry's customer base. During the 1980s, the Cold War environment set the tone for increased U.S. defense spending and aerospace companies responded accordingly. In 1987, industry sales to the Department of Defense (DoD) accounted for 56% of total aerospace business. Yet federal spending priorities have gradually changed. The end of the Cold War and pressures to balance the federal budget have led to spending cuts in defense programs. As a result, aerospace sales to DoD have been falling since 1987.

AIA expects this downward trend to continue in 1996. AIA estimates that sales to DoD will total $38.3 billion, a $3 billion drop from 1995. While DoD remains a very important industry customer, aerospace sales to DoD now account for only 34% of total industry business. The Procurement and the Research, Development, Test and Evaluation accounts are the two budget areas that impact aerospace companies the most. In Fiscal Year (FY) 1996, the combined outlays from these two accounts dropped 4% to $85.5 billion. Lower procurement spending has reduced the amount of money allocated by Congress for the U.S. military to purchase aircraft and missiles. Over the last three fiscal years the number of aircraft that could be purchased declined from 324 (FY 1994) to 184 (FY 1995) to 181 (FY 1996). Planned missile procurements also fell from 8,331 (FY 1994) to 5,610 (FY 1995) to 4,548 (FY 1996).

While DoD purchases continue to slide, aerospace sales to other customers are improving, and this is accelerating industry's shift from military to civil products. The most significant change is the growing demand for commercial transports coming from a resurgent airline industry. Freight traffic carried by airlines has been rising since 1991. Airline passenger traffic has been climbing since 1993. Passenger load factor, which measures capacity utilization for the airline industry, has also been climbing since 1993. Airlines had a profitable 1995 and they are on track for another profitable year in 1996. In short, airline carriers are gaining strength and they are ordering aircraft again. As a result, aerospace sales to other customers (which include airlines and foreign governments) are expected to rise 20% to $43 billion.

Sales to NASA and other U.S. government agencies should also improve, climbing 9% to $12.3 billion. NASA spending in Science, Aeronautics and Technology, Human Space Flight, and Mission Support are all moving up in 1996. Sales to customers buying related products and services will also be higher.

**Table 1**

Aerospace Sales by Product Group (Billions of Current Dollars)

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<td>Related Products</td>
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Civil Aircraft Shipments ★ A closer look at civil aircraft production indicates that the industry is expected to deliver 1,648 civil aircraft worth $22 billion during 1996. Sales in all three civil aircraft segments — commercial transports, general aviation aircraft, and civil helicopters — will be higher.

General aviation aircraft manufacturers will ship the highest number of aircraft. Deliveries are expected to reach 1,104 in 1996, representing a 3% increase over last year. General aviation aircraft manufacturers are also expected to realize record sales of $2.9 billion. Through the third quarter of 1996, turboprop-powered aircraft deliveries are up, piston-engine aircraft are unchanged, and jet deliveries are lower. Commercial transport deliveries will also be higher during 1996, climbing from 256 to 271. Shipments value will rise 21% to $18.9 billion. Civil helicopter shipments will fall to 273, but the delivery of large turbine rotorcraft will push the overall value of deliveries up from $194 million to $203 million.

Trade Balance ★ Aerospace exports and imports will both be higher this year. Exports will total $37.4 billion and imports are estimated to reach $13.3 billion; both had been falling in recent years as global demand for aerospace products slumped. The industry's positive trade balance should widen to $24 billion from $21.6 billion (Table 2).

Shipments of commercial transports and fighter aircraft will account for most of the export gain, while an increase in civil aircraft and engine parts deliveries will be the biggest factor behind the rise in imports.

Currently foreign orders account for 63% of the U.S. commercial transport backlog. This suggests that exports should remain strong next year. On the military side, this will be the first year that military exports will exceed $10 billion. The rise in foreign deliveries comes from a surge in orders that occurred between 1991-1993 following the Gulf War. Foreign orders for U.S. military products have since fallen back to more traditional levels.

Profits ★ The aerospace industry is also expected to post higher profits this year. In fact, net profits after taxes are estimated to reach a record $7.6 billion, up from last year's $4.6 billion. This jump is the result of a number of factors: 1) in 1996 there were no major write-offs which could dampen profits in either civil or defense programs; 2) the upturn in the civil aircraft market is occurring after many manufacturers have already gone to great lengths to improve their operating efficiencies; consequently they are benefiting from increased demand and higher margins; 3) on the defense side, mature programs in fighter aircraft, transports, and helicopters are helping returns, whereas for several years fixed-price development contracts were adversely affecting profitability; and, 4) the wave of mergers and acquisitions that have swept through the industry have shown no signs of abating and this has helped companies realize greater margins.

As a result, net profits after taxes as a percent of sales, assets, and equity are all expected to be higher in 1996. The return on sales will rise from 3.8% to 5.9%; the return on assets will move from 3.5% to 5.3%; and return on equity will increase from 11.1% to 17.2%. While two ratios come close to historic highs for the aerospace industry, and one (return on sales) represents a record, all three fall short of similar ratios recorded during the year by a composite average for all manufacturing industries.

Employment ★ Two indicators that set the stage for future aerospace activity are employment and orders. Both improved in 1996, which suggests that the industry is heading in a positive direction.

Between 1989 and 1995, deteriorating business conditions forced aerospace companies to reduce their work force by 41% (Table 3).

In 1996, AIA expects this downward spiral to finally come to an end. AIA estimates that aerospace employment will rise from 786,000 in 1995 to 806,000 in 1996. Civil aircraft manufacturers are expected to hire 27,000 workers this year and employment in other
related products will rise modestly. At the same time, employment on military aircraft programs will continue to decline. The size of the labor force engaged on space and missile programs will remain unchanged. The employment of production workers and scientists and engineers is expected to rise in 1996. Employment in other job categories will remain static. Since 1993, production workers' share of the total work force has risen slightly from 42% to 44%.

The average number of hours worked per week by industry production workers through August 1996 is slightly higher than was recorded during the same period last year, edging up from 42.3 to 42.4. The increase is due to greater activity in the aircraft segment; hours within the guided missiles and space vehicles sector is down. The total cost of employee compensation in the airframe business climbed 11% to $34.09 per hour (March 1996). Increases during the previous two years averaged 3.5%. The rise came mostly in white-collar occupations.

Orders and Backlog ★ Orders for aerospace products have been climbing for three years. Last year they increased by 15%; this year orders are growing at an even faster 18%. By the end of 1996, orders are expected to reach $129 billion. The recent surge in orders is due largely to the rise in demand for commercial transport aircraft. Through the third quarter of 1996, net orders for transports seating fewer than 240 passengers are running 34% higher than last year; net orders for larger transports are running 129% above 1995 levels. As a result, the transport backlog (as of September 30, 1996) stood at $96.1 billion — a 35% gain since last September. Total aerospace industry backlog of unfilled orders will rise from $191 billion to $215.6 billion — the fifth highest level recorded by aerospace companies.

1997 Forecast ★ AIA projects that U.S. aerospace industry sales will jump 11% in 1997 up to $125 billion. This increase will be due to the projected rise in civil aircraft deliveries, mostly commercial transports. Civil aircraft sector sales will increase by $12.9 billion. The rise in this product group will offset sales declines in the industry’s other product sectors that include military aircraft, missiles, and space. These declines will be caused by a reduction in spending at DoD and NASA. Sales to DoD will decline 6% to $36 billion. After rising in 1996, sales to NASA and other agencies will head downward.

Aerospace manufacturers will again be hiring next year, but not all industry segments will participate in the expansion. Total aerospace employment will rise 2% up to 825,000. Civil aircraft producers will add 17,000 jobs and companies producing other related products will add 3,000 jobs. Military aircraft manufacturers will keep looking for ways to cut costs in line with shrinking business prospects and payrolls are expected to be further reduced by 2,000 employees. Missile and space employment will be flat in 1997. There will be gains in all occupational groups, but particularly in production-type jobs.

Table 3
Total Aerospace Employment
As of December 1989–1997
(In Thousands)
In 1996, the aerospace industry recorded overall sales of $112.4 billion, a figure that, adjusted for inflation, represents approximately the activity level of 1985, the year that marked the beginning of U.S. defense restructuring and the attendant industry consolidation. However, the real significance of the 1996 sales figure was that it was higher — by more than $6 billion — than the previous year’s total. It marked the first overall sales gain since 1991 and it was accomplished despite the fact that government-sponsored aerospace sales declined for the sixth straight year.

This welcome upturn is not a statistical anomaly; that it is the start of a long term upswing in the industry’s overall activity is evidenced by a big surge of new orders during the year. Orders, as reported by the Bureau of the Census, amounted to $129 billion, a gain of almost $20 billion over the previous year. It produced a very solid backlog of $215.6 billion.

Key to the encouraging accomplishments of 1996 was the resurgence of activity in the civil aircraft manufacturing segment of the industry. After three years of declining sales, civil aircraft shipments rebounded with a gain of 18 percent in dollar value. AIA projects a much larger gain — 47 percent or more than $10 billion — for 1997.

Of particular note is the industry’s performance in international trade, an area that is central to the industry’s future viability. Aerospace has long been America’s largest and most consistent contributor to the U.S. trade balance among manufacturing industries. It is important to the nation’s economy that the industry maintain its leadership status, but that is becoming more and more difficult as international competition continues to intensify and the number of foreign competitors broadens.

Although U.S. exports and trade balance declined over the previous three years, the declines were due to a generally depressed global market rather than reduced U.S. competitiveness. In 1996, when the global market began a new expansion, U.S. exports ($37 billion) and trade balance ($24 billion) similarly expanded. Of special note was the 1996 export sales volume of $12.1 billion in commercial jetliners and a year-end backlog of more than $60 billion in foreign orders. All the indicators lend confidence that the U.S. aerospace industry will be able to maintain or increase its share of the global market.
The Boeing Company/Lockheed Martin Corporation ★ In November, Boeing and Lockheed were selected to conduct four-year concept definition phases of the DoD Joint Strike Fighter Program. In photo, a Boeing conception of a U.S. Marine Corps/U.K. Royal Navy version, one of three types to be developed.

McDonnell Douglas Corporation ★ Among several military aircraft types deployed to Bosnia in 1996 was the McDonnell Douglas/USAF C-17 Globemaster III.

The Boeing Company/Lockheed Martin Corporation ★ The USAF F-22 air superiority fighter development program reached an October milestone with the mating of the first F-22 mid-fuselage with the wings and fuselage.

Northrop Grumman Corporation ★ At year-end, the Combat Engagement Capability upgrade of the Navy E-2C Airborne Early Warning/Command and Control aircraft was being readied for first flight early in 1997.

Northrop Grumman Corporation ★ First production model of the USAF/Army E-8C Joint STARS (Joint Surveillance Target and Attack Radar System) was delivered in March. The aircraft also completed a three-month deployment to Bosnia in March.
A highlight of the aerospace year 1996 was the November selection by the Department of Defense (DoD) of The Boeing Company and Lockheed Martin Corporation to advance to the concept definition phase of the Joint Strike Fighter (JSF) program. Boeing and Lockheed Martin will continue to compete over four years, developing and building three separate versions of the JSF: a USAF aircraft, a U.S. Navy version, and a third version to be operated by the U.S. Marine Corps and the United Kingdom's Royal Navy. In 2001, DoD will select a contractor for further development and production of the JSF. Production could involve as many as 3,000 aircraft in the U.S./U.K. program and additional numbers if other nations become partners in the venture; Canada, Denmark, The Netherlands, and Norway are participating as "informed customers" who might eventually become full partners.

In other aircraft developments,

* The F-22 air superiority fighter, in joint development by Lockheed Martin and Boeing, reached a milestone in October with the mating — at Lockheed Martin Aeronautical Systems — of the first F-22 mid-fuselage with the wings and aft fuselage. LM Tactical Aircraft Systems (Fort Worth) produced the mid-fuselage, Boeing the wings and aft fuselage. At yearend, USAF plans called for production of 442 F-22s after completion of the EMD (engineering and manufacturing development) phase in 2000. Initial flight of the prototype was slated for May 1997.

* In December, the Navy resumed flight testing of the McDonnell Douglas F/A-18E/F after a brief hiatus for modification of the GE F414 engine. Initial carrier trials were planned for early 1997.

* In September, McDonnell Douglas successfully completed a demonstration series of test flights of an F-15 fighter that would be employed in air defense suppression missions. Key to the aircraft's capability is a Precision Direction Finding (PDF) system jointly developed by McDonnell Douglas, Litton Amecom, and TRW Inc.

* Upgraded after their participation in Desert Storm, eight USAF/Lockheed Martin F-117A stealth fighters were deployed to Kuwait in September as a response to an Iraqi missile firing on U.S. aircraft.

* At yearend, the Navy was planning January flight tests of a lightweight CEC (Cooperative Engagement Capability) mission computer for the Northrop Grumman E-2C airborne early warning aircraft. Built by Raytheon, the CEC flight computer is part of the Hawkeye 2000 upgrade suite, which includes new displays and an AlliedSignal Aerospace cooling system. An additional upgrade involves installation of an advanced radar.
Lockheed Martin Corporation ★ The first of 25 C-130J-30 new generation Hercules transports ordered by the U.K. Royal Air Force made its initial flight in April.

McDonnell Douglas Corporation ★ In production at McDonnell Douglas Helicopter Systems is the Army's AH-64D Apache, an advanced version of the combat-proven AH-64A. The first remanufactured fuselage entered the final assembly line in August and the first completed AH-64D was slated for delivery in March 1997.

Boeing/Sikorsky ★ In test flight status during 1996 was the Army's RAH-66 Comanche, which features exceptional maneuverability, reduced radar/infrared signature, advanced targeting electronics, and digital communications.

Texas Instruments Incorporated ★ The Navy/Air Force JSOW (Joint StandOff Weapon) made a first fully-integrated flight from an F-16 in July, successfully dispensing its payload of bomblets on target.

The Boeing Company/Lockheed Martin Corporation/TRW Inc. ★ In November, the Air Force selected a Boeing Defense and Space Group/Lockheed Martin/TRW team for advanced development of a 747-based high energy Airborne Laser (ABL) capable of destroying theater ballistic missiles at distances up to 600 kilometers.
In August, the Air Force selected a McDonnell Douglas-led team to conduct an avionics upgrade program for the USAF's T-38 trainer.

In November, the USAF awarded Lockheed Martin Aeronautical Systems a contract for two C-130J transports and spares, with options for additional aircraft, training, and support. It was the first major weapon system procurement under a commercial practices contract.

Japan's Boeing 767-AWACS (Airborne Warning and Control System) made its initial test flight on August 9. Boeing plans to start deliveries to Japan, the launch customer, in 1998.

In August, the Army resumed flight tests of the Boeing-Sikorsky RAH-66 Comanche helicopter after a seven-month suspension.

In June, Bell Helicopter Textron and Boeing Helicopters received a Navy Air Systems Command the first production contract for the V-22 Osprey tiltrotor aircraft. The award was a LRIP (low rate initial production) agreement covering a first lot of four aircraft plus options for additional lots. Assembly will start in 1997 and first deliveries to the Marine Corps are slated for 1999.

A highlight of the year's missile development activity was the December selection by the Navy of Hughes Missile Systems Company as winner of the AIM-9X competition. Hughes won a contract for engineering and manufacturing development (EMD) over a six-year period through 2002. Production for the Navy and the Air Force of 9X missiles to replace the older AIM-9 missiles was to begin on completion of the EMD phase; production could go as high as 10,000 units over a 20-year span.

Another major competition resulted in June selection by the Air Force of Lockheed Martin and McDonnell Douglas as contractors for the pre-engineering and manufacturing development phase of the Joint Air-to-Surface Standoff Missile (JASSM) program. The companies will compete over a 24-month, pre-EMD effort leading to a 32-month EMD program. To be used by both the USAF and Navy on several types of aircraft, JASSM missiles will be produced in thousands of units.

A third major competition was decided in November with the Air Force's selection of a Boeing-led team to develop an Airborne Laser (ABL) system capable of shooting down a theater-type ballistic missile. The team consists of Boeing Defense and Space Group, Lockheed Martin, and TRW Inc. The chemical oxygen-iodine laser, mounted on a Boeing 747-400, will have a range of 100 to 600 kilometers, depending on weather conditions. The initial contract launched a six-year development effort expected to culminate in a 2002 destruction of a ballistic missile in the boost phase of its flight.
Textron Inc.  Developed by Textron Systems Division, the Mobile Microwave Landing System (MMLS) is in operational Air Force service. A three-person team can deploy and activate an MMLS site in less than 60 minutes.

Rockwell International Corporation  In July, Rockwell's Collins Avionics and Communications Division rolled out the first aircraft in the USAF's C/KC-135 PACER CRAG program. This avionics upgrade includes integration and installation of an advanced flight management system, displays, a new weather radar, and a new embedded Inertial Navigational System/Global Positioning System to replace the compass.

General Dynamics Corporation  The U.S. Navy's SSN21 Seawolf, built by Electric Boat Corporation, underwent Alpha sea trials in July.

In other missile activity,
- Two Army Patriot missile battalions at Fort Bliss, Texas, received the first units of an advanced Configuration 2 version of the Raytheon-built Patriot. This is the second upgrade of the antimissile Patriot since its use in Desert Storm; in 1995, the Army fielded an approved accuracy “guidance-enhanced” Patriot. Configuration 2 features improved communications and software for the missile's ground equipment. Another advancement — Configuration 3 — is in development for 1999 fielding.
- In November, the McDonnell Douglas/Air Force JDAM (Joint Direct Attack Munition) achieved its first successful “full-up” flight test with Global Positioning System-aided guidance. Dropped from an F-16 flying at 20,000 feet, JDAM achieved a nine-meter target accuracy, well within the required capability.
- In November, the Army Missile Command took delivery of its first Longbow Hellfire missile produced by Longbow Limited Liability Company, a Lockheed Martin/Northrop Grumman joint venture.
- In July, the Navy/Air Force JSOW (Joint StandOff Weapon) made its first successful flight integrated with an F-16 fighter. Launched 11 miles from its target, the JSOW flew a precise preplanned course and dispensed 145 “bomblet” submunitions. Texas Instruments is JSOW prime contractor.
- In December, McDonnell Douglas delivered the first SLAM-ER (Standoff Land Attack Missile — Expanded Response) to the Navy for initiation of a 13-flight test program. Low rate initial production was to begin in April 1997; production potential is 700 missiles through 2004.
- The venerable Navy/Northrop Grumman A-6 Intruder completed 33 years of operational life in December: the last squadron of A-6Es was removed from service and the airplane retired. The versatile Intruder provided night and all-weather attack capability and additionally served as a tanker.
Litton Industries, Inc. • In production at Litton Guidance Control Systems division are laser gyroscopes for a combined Inertial Navigation/Global Positioning System.

DuPont Company • DuPont-Advanced Material Systems, in cooperation with Cincinnati Milacron and the University of Delaware, completed a DoD demonstration of a cost effective automated ribbon and tape placement system for fabrication of thermoplastic aircraft components.

Lucas Aerospace Inc. • In production at Lucas Aerospace Cargo Systems are hydraulically-powered, externally-mounted rescue hoists for Army helicopters.

HEICO Aerospace Corporation • HEICO's TriElectron Industries subsidiary developed an innovative combined ground power unit/air conditioning unit for military aircraft.

Kaman Aerospace Corporation • Under contract in the Navy Military Sealift Command, two Kaman K-MAX helicopters conducted a six-month Vertical Replenishment demonstration, operating from the USNS Niagara Falls.

Northrop Grumman Corporation • Featuring advanced miniaturization technology, these circuit boards make up the heart of the Northrop Grumman AN/ALQ-35 airborne electronic countermeasures system used in F-15Es of the USAF and the Royal Saudi Air Force.

UNC Incorporated • The May acquisition of Garrett Aviation Services made UNC the world's largest independent aviation aftermarket services provider. In photo, UNC technicians service a Royal Saudi Air Force T-38.
Although full-year figures were not available, all indicators pointed to substantial 1996 increases in passenger/cargo traffic and airline revenues among the world’s carriers. Monthly and quarterly reports, plus analysts’ estimates, suggested that passenger traffic revenues would increase by something close to the consensus projection of seven percent. * As for airline profits, the International Air Transport Association issued a November forecast that earnings would reach a record $5.5 billion, up six percent over 1995, despite increased jet fuel prices and higher taxes. The air transportation industry appeared to be headed toward a third straight year of profitability and new financial solidity in the wake of the devastating losses of 1990-93.

The airlines’ improved financial health was reflected in the flow of new orders for jetliners. Through the end of the 1996 third quarter, net orders for large commercial transports ran 129 percent above the 1995 level; orders for airliners seating fewer than 240 passengers were 34 percent higher.

The commercial aircraft manufacturing segment of the industry delivered 271 jetliners valued at $18.9 billion in 1996. The latter figure represented 86 percent of all U.S. civil aircraft production.

Among commercial aircraft developments of 1996, Boeing Commercial Airplane Group launched a new version of the single-aisle 757 in September. The 757-300, ordered by launch customer Condor Flugdienst of Germany, is a stretched version of the 757-200 seating up to 289 passengers. First delivery is slated for January 1999.

In December, Boeing rolled out a 737-700 jetliner, the first member of a Next Generation 737 family, the company’s leading production type. The new family includes the 737-600, -700, and -800, which are updated versions of the 737-500, -300, and -400 respectively. First delivery (the 737-700) is scheduled for October 1997.

Among other Boeing developments was the October 1 flight of an IGW (increased gross weight) version of the 777, the initial model of which was to be delivered to British Airways in February 1997.
**Dowty Aerospace** ★ In production at Dowty Aerospace Yakima are thrust reversers for the Boeing 737-300, 757-200, and 777 aircraft.

**HEICO Aerospace Corporation** ★ HEICO's Trilectron Industries subsidiary developed a super-low-noise, low emission Ground Power Unit.

**The BF Goodrich Company** ★ BF Goodrich Aerospace developed a Surface Mount Component Placement System (fuel quantity indicator). In photo, a technician inspects a system circuit board.

**AlliedSignal Aerospace** ★ Among the company's new systems is the AlliedSignal 331-500 Auxiliary Power Unit, introduced to service with the Boeing 777.

**Honeywell Inc.** ★ In development at Honeywell's Air Transport Systems is an advanced Versatile Integrated Avionics computer for Boeing's 737 Next Generation series.

**Lucas Aerospace Inc.** ★ Lucas Aerospace Power Systems developed a microcontroller DC generator control unit for general aviation aircraft.
In production at McDonnell Douglas Corporation’s Douglas Aircraft Company during 1996 were the MD-11 trijet in both passenger and cargo versions and several versions of the MD-80/90 twinjet airliners. The MD-90, in service with China Northern Airlines, is also being built in China; delivery of the first China-built MD-90 is planned for mid-1998.

In development is the MD-95 100-passenger short-to-medium range jetliner. First deliveries are planned for 1999. Additionally, McDonnell Douglas was planning an MD-17, a civil cargo derivative of the Air Force C-17A Globemaster III. Formal launch of the project awaited Department of Defense approval and transfer of rights to the C-17 design.

Among propulsion developments for large commercial aircraft, GE Aircraft Engines received Federal Aviation Administration (FAA) certification in July for the GE90-92B, a growth version of the GE90, one of three power plants for the Boeing 777. At 92,000 pounds thrust, the GE90-92B became the most powerful engine ever certified by the FAA. It is the propulsion system for the 777-200 (IGW) jetliners destined for 1997 service with British Airways.

In a related development, the Pratt & Whitney 4090, one of the P&W family of 777 engines, was certified by the FAA in June. It was to go into service in 1997 aboard Boeing’s 777-200 (IGW).

General Electric and Pratt & Whitney embarked on a joint venture known as the GE-P&W Engine Alliance, a group formed to develop a family of high thrust (70-85,000 pounds) engines for extra high capacity jetliners. The Engine Alliance plans to start testing the first of the family by mid-1998 and to certify the engine by the end of 1999.

Among the year’s highlights in the very active business aircraft segment of the industry was the May certification of the Citation X mid-size business jet, built by Textron Inc.’s Cessna Aircraft Company. Cessna delivered the first five Citation X planes in 1996 and planned deliveries of almost 30 in 1997. In test flight status was the new Citation Excel, slated for certification and initial deliveries early in 1997. In production were five other models of the Cessna business jet family.
Gulfstream Aerospace Corporation ★ Provisional certification of the Gulfstream V long-range corporate jet was completed in December 1996; first deliveries began in December as well.

Loral Space and Communications Ltd. ★ Loral developed a series of NVX Active Systems for aircraft noise and vibration control; the series includes systems for active noise control (components shown), active isolation control, and active structural control.

Parker Hannifin Corporation ★ Shown undergoing test is a line of advanced liquid crystal display systems developed by Parker Hannifin Aerospace.

Digital Equipment Corporation ★ Shown undergoing clean room testing is the company's SA-110 StrongARM microprocessor, which combines supercomputer performance with very low power dissipation.

Raytheon Company ★ In development for initial service in 1998 is the Raytheon Premier I light business jet.

Rohr, Inc. ★ In development at Rohr is a thrust reverser for the BR715 engines of the MD-95 jetliner; in photo, a design engineer studies a computerized model of the system.
In November, Raytheon Aircraft Company announced launch of a new mid-size Model 4000 Hawker Horizon. The 12-passenger craft was targeted for initial flight in May 1999 and initial deliveries in the spring of 2001.

Also in development by Raytheon is the composite-body Premier I advanced technology corporate jet, slated for first flight in the fall of 1997 and first deliveries in the latter part of 1998. In production at Raytheon are several models of the Beech and Hawker lines of general aviation aircraft.

Gulfstream Aerospace Corporation started deliveries of the Gulfstream V long-range business jet in December after receiving provisional certification. Gulfstream expected to produce almost 50 of the Gulfstream Vs and the predecessor Gulfstream G-7VSPs in 1997, a 60 percent increase over 1996 production.

**In other civil aviation developments:**

**STARs**

In November, Bell Helicopter Textron and The Boeing Company announced launch of a development program for the Bell Boeing 609, a 6-9 passenger civil tiltrotor aircraft derived from the military V-22 Osprey. Bell and Boeing see a market for 1,000 of the twin-turboshift 609s, which will cruise at 275 knots and have a 750 nautical mile range.

In October, Raytheon Company announced that Hughes Aircraft Company would team (as major subcontractor) with Raytheon Electronic Systems to build the FAA's Standard Terminal Automation Replacement System (STARS). The STARS program involves modernization and upgrading of Terminal Automation Systems at up to 371 FAA and Department of Defense facilities.

In October, NASA announced selection of Williams International and Teledyne Continental Motors for multiyear contracts involving development of new general aviation aircraft engines, with focus on reduced environmental impact and lower manufacturing costs.

**United Technologies Corporation**

Sikorsky Aircraft received FAA certification in June and began deliveries of the latest S-76 variant, the S-76CT.

**Rockwell International Corporation**

Collins General Aviation Division of Rockwell Avionics supplied sensors, data links, and displays for field testing of a new Differential Global Positioning System. The six-month test got underway in December.
A highlight of the year in space was the July selection of Lockheed Martin Corporation for development of an experimental space booster that could become the prototype of a 21st century operational reusable launch vehicle (RLV). The vehicle is the X-33 Advanced Technology Demonstrator, a half-scale version of Lockheed Martin's proposed VentureStar operational system, which would be capable of delivering 40,000 pounds of payload to low Earth orbit at a small fraction of the current cost of launching payloads. In November, Lockheed Martin's Skunk Works team completed a preliminary design review for the single, stage-to-orbit X-33; first flight of the test vehicle was planned for spring 1999. Lockheed Martin's industry partners include Rocketdyne Division of Boeing North American, Inc. (formerly Rockwell Defense & Space Group), Rohr, Inc. and Alliant Techsystems Inc.

In June, NASA announced a revamped program for the X-34 technology demonstrator, a smaller, air-launched RLV. Prime contractor is Orbital Sciences Corporation; AlliedSignal Aerospace is a major subcontractor.

Space operations in 1996 were highlighted by seven Space Shuttle flights, three of them Shuttle/Mir docking flights dedicated to activities related to assembly and operation of the International Space Station. Among other flights were STS-72, a January mission involving a number of space station experiments and the retrieval of a Japanese satellite that had spent 10 months in orbit; a second test of the U.S./Italian Tethered Satellite System and the third flight of the U.S. Microgravity Payload aboard STS-75 in February; a May mission, STS-77, dedicated to a broad range of commercial space product development payloads; and
shown in pre-delivery checkout at Lockheed Martin Astronautics is the Mars Global Surveyor, launched by NASA in November.

In development at Lockheed Martin Manned Space Systems is the Super Lightweight Tank (SLWT) for the Space Shuttle. In photo, the partially-built liquid hydrogen tank for External Tank-96, the first SLWT.

One of a family of deployable antennas developed by Harris Corporation is this 50-foot-diameter antenna for a commercial satellite that will provide communications throughout Asia.

a November mission, STS-80, featuring the third flight of the Wake Shield Facility, a disk-like space system intended to create an “ultravacuum” environment for growing high-quality electronics materials.

Principal Shuttle contractors are Boeing North American, Inc., Thiokol Corporation, and Lockheed Martin Corporation. On October 1, NASA initiated the process of turning over responsibility for most Shuttle operations to United Space Alliance, a joint venture of Lockheed Martin and Rockwell International; the turnover was to be accomplished in several phases over a four-year span.

Deliveries of hardware for the International Space Station accelerated in 1996 and the program remained on schedule for late 1997 launch of the first elements. In August, two major segments passed critical milestones: the Boeing-built U.S. Laboratory Module and the Node 1 connector module both passed pressure tests at 1 1/2 times on-orbit operating pressure. In mid-summer, the first station crew began training; Boeing is station prime contractor and McDonnell Douglas and Rocketdyne are the principal subcontractors.

In other space activity,
- NASA initiated a decade-long advanced study of the planet Mars with the November launch of the Global Surveyor, built by Lockheed Martin Astronautics for a systematic mapping of Mars and study of the planet’s geophysical/climatological history. A second Mars Probe, called Pathfinder, was launched in December on a seven-month journey to the Red Planet; the craft was targeted for a July 4, 1997, landing on Mars and deployment of a 22-pound rover for surface imaging and study of rock composition.
- A major planetary mission in development advanced with the November start of a two month acoustic/vibration/thermal test program of the Cassini spacecraft in flight configuration. Cassini is scheduled for October 1997 launch to a rendezvous with Saturn in 2001.
- In December, NASA awarded a contract to a team led by Universities Space Research Association (USRA) to develop a Boeing 747SP-based Stratospheric Observatory for Infrared Astronomy (SOFIA). Flying above 99 percent of the water vapor in Earth’s atmosphere at 45,000 feet, SOFIA will offer minimally distorted views of celestial sources through a 98-inch telescope. Science flights are expected to begin in 2001. Raytheon Company is USRA’s principal industry subcontractor; Raytheon E-Systems (Waco) will modify the 747SP, install and integrate the telescope, conduct flight tests, and support the science instrument for the life of SOFIA.
- At yearend, the first three Iridium low Earth orbit (LEO) communications satellites were undergoing final test at Motorola Satellite Communications Division and at a
**Loral Space and Communications Ltd.**  
In development at Space Systems/Loral is the Globalstar satellite telecommunications system slated for 1997 launch. In photo, a test engineer inspects the Globalstar's nickel-hydrogen battery.

**Thiokol Corporation**  
Thiokol developed the 93-inch diameter Castor 120 rocket motor, used as the first stage of the Lockheed Martin Launch Vehicle and in other applications. The photo shows the aft end before nozzle installation.

**Hughes Electronics Corporation**  
Being developed by Hughes Space and Communications Company for delivery in 1998 is Morelos III, an advanced, high-power communications satellite for Mexico's Secretariat of Communications.

**TRW Inc.**  
Technicians calibrate the hyperspectral imager for NASA's Lewis satellite, an advanced remote sensing imaging system that will significantly broaden the range of Earth features that can be analyzed.

**Honeywell Inc.**  
In October, NASA awarded a contract to Honeywell Space Systems for development of a SIGI system that will integrate GPS position determination capability with an advanced inertial navigation system.

**Loral Space and Communications Ltd.**  
In photo, final assembly of Space Systems/Loral's PanAmSat-6, which was to be launched early in 1997 to provide direct-to-home broadcast TV for Central and South America.
Lockheed Martin facility prior to launch aboard a McDonnell Douglas Delta II booster early in 1997. In December, the international Globalstar partnership headed by Loral Space and Communications Ltd. was granted FCC approval for a 48-satellite LEO constellation; first launches were planned for the latter half of 1997.

In military space activity, the Department of Defense took a major step toward development of its next generation launch vehicle with the December selection of McDonnell Douglas Corporation and Lockheed Martin Corporation to continue development of the Evolved Expendable Launch Vehicle program (EELV). The companies were awarded pre-EMD (engineering and manufacturing development) contracts to refine their proposals through May 1998, at which time one contractor will be selected for a six-year EMD contract.

The program includes development of a medium-sized launched vehicle for operational services in 2002 and a heavy launch vehicle targeted for first operational flight in 2003. The McDonnell Douglas team includes Boeing North American Inc., GenCorp.'s Aerojet, Pratt & Whitney, and AlliedSignal Aerospace. Pratt & Whitney and Aerojet are also on the Lockheed Martin team, along with Honeywell Inc.

In November, Lockheed Martin won the Air Force competition for development of a 21st century Space-Based Infrared System (SBIRS), a space surveillance system. The development team includes Lockheed Martin Missiles & Space, GenCorp.'s Aerojet, Northrop Grumman, Honeywell Inc., and Lockheed Martin Federal Systems.

McDonnell Douglas Corporation ★ In photo, a July launch of a replacement satellite for the NAVSTAR Global Positioning System (GPS) by the Delta II launch vehicle. The Delta II launched all of the original GPS satellites (1989-94) and will launch replacements as needed through 2002.

Loral Space and Communications Ltd. ★ In photo, a technician prepares the GOES-L satellite for vacuum chamber testing. GOES-L is the fourth of five advanced meteorological satellites being built by Space Systems/Loral.

Hughes Electronics Corporation ★ Technicians at Hughes Space and Communications Company conduct final tests of the UF Follow-On F-7 satellite launched in July. The satellite is the seventh of a 10-satellite system Hughes is building for the Department of Defense.

Hughes Electronics Corporation ★ Scheduled to be the first spacecraft orbited by the Sea Launch system in June 1998 is the Galaxy X1, the initial member of an advanced communications satellite family developed by Hughes Telecommunications and Space Company.
AIA Member Companies

Year-End 1996

AAI Corporation
Aerojet, a Segment of GenCorp.
Allegheny Teledyne Inc.
Teledyne Controls
Teledyne Electronic Technologies
Alliant Techsystems Inc.
AlliedSignal Aerospace
American Pacific Corporation
Argo-Tech Corporation
B.H. Aircraft Company, Inc.
The Boeing Company
Calspan SRL Corporation
CMS, Inc.
Coltec Industries Inc
   Chandler Evans
   Delavan Gas Turbine
   Menasco Aerospace
   Walbar
Computing Devices International
Digital Equipment Corporation
Dowty Aerospace
   Yakima
DuPont Company
FMC Corporation
GEC-Marconi Electronic Systems Corporation
General Dynamics Corporation
General Electric Company
The BFGoodrich Company
   Landing Systems
   Maintenance, Repair and Overhaul
   Safety Systems
   Sensors and Integrated Systems
Gulfstream Aerospace Corporation
Harris Corporation
HEICO Aerospace Corporation
Hexcel Corporation
Honeywell Inc.

Hughes Electronics Corporation
   Defea Electronics Corporation
   Hughes Aircraft Company
   Hughes Telecommunications
   and Space Company
DIRECTV, Inc.
Hughes Network Systems, Inc.
Interturbine Corporation
ITT Defense and Electronics Inc.
Kaman Aerospace Corporation
Lisson Industries, Inc.
Lockheed Martin Corporation
Local Space and Communications Ltd.
Lord Corporation
Lucas Aerospace Inc.
McDonnell Douglas Corporation
Northrop Grumman Corporation
Northrop Grumman Corporation
   Electronic Systems & Sensors Division
Parker Hannifin Corporation
Raytheon Company
Rockwell International Corporation
Rohr, Inc.
Rolls-Royce North America Inc.
Sundstrand Corporation
Teleflex, Inc./TFX Aerospace Group
   Mal Tool & Engineering
Texas Instruments Incorporated
   Defense Systems & Electronics Group
Textron Inc.
Thiokol Corporation
Triumph Controls, Inc.
TRW Inc.
UNC Incorporated
United Technologies Corporation
   Aerospace/Defense:
   Pratt & Whitney
   Sikorsky
   Hamilton Standard
Williams International