

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.



1987 ANNUAL REPORT



The aerospace industry shall continually foster the advancement of those aeronautical, astronautical and related sciences, arts, technologies and industries which shall be consistent with and contribute to the public and private welfare of local communities, this nation, and the international community of which this nation is a part.

Specifically, the continuing goal of the industry shall be to fulfill its responsibility for the development and improvement of those deterrent and defense capabilities deemed by the government to be requisite for our continued national security; to promote those technological achievements necessary to assure the peaceful conquest of space for the benefit of all mankind; to foster the advancement of economic commercial and private air transport; and to press for and contribute to significant improvements in those scientific, management and manufacturing skills and techniques that will benefit the social, cultural and economic well being of the nation. In pursuing this goal, the industry shall maintain a commitment to high standards of excellence, integrity and reliability.

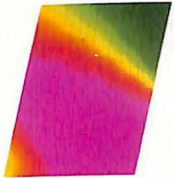
Fulfillment of these responsibilities imposes requirements on this industry for far-ranging and innovative contributions in science and technology. To this end, the industry shall relentlessly explore those horizons of science most likely to hold the key to future advances, and shall vigorously and efficiently improve the foundations of this nation's industrial creativity, productivity, technology and facilities.

Attainment of such goals requires the most effective possible use of all of the resources of a pioneering and progressive industry, directed by experienced, flexible and imaginative management, and incorporating:

- The highest levels of scientific investigation
- Technological facilities adequate to provide continuity in advanced research, development and production
- Coordinated teams of managers, scientists, technicians and skilled labor
- Economic stability to assure the fullest contributions by each element to national security, prosperity and progress
- Adherence to high quality and reliability in services provided and products delivered
- Commitment to truth, accuracy, fairness and compliance with law in all matters and in all communications with the public, customers, suppliers and employees.

The aerospace industry pledges the fullest application of its resources and abilities to the task of accomplishing these goals.

<i>1987 AIA OFFICERS AND BOARD</i>	<i>4</i>
<i>AIA CHAIRMAN'S MESSAGE</i>	<i>5</i>
<i>AIA ORGANIZATION AND FUNCTIONS</i>	<i>6</i>
<i>AIA PRESIDENT'S MESSAGE</i>	<i>8</i>
<i>AEROSPACE HIGHLIGHTS 1987</i>	
<i>DEFENSE</i>	<i>10</i>
<i>SPACE</i>	<i>16</i>
<i>CIVIL AVIATION</i>	<i>22</i>
<i>ASSOCIATION ACTIVITIES</i>	
<i>AEROSPACE OPERATIONS SERVICE</i>	<i>26</i>
<i>AEROSPACE PROCUREMENT SERVICE</i>	<i>33</i>
<i>AEROSPACE RESEARCH CENTER</i>	<i>38</i>
<i>AEROSPACE TECHNICAL COUNCIL</i>	<i>40</i>
<i>HUMAN RESOURCES COUNCIL</i>	<i>44</i>
<i>INTERNATIONAL COUNCIL</i>	<i>46</i>
<i>OFFICE OF CIVIL AVIATION</i>	<i>48</i>
<i>OFFICE OF LEGISLATIVE AFFAIRS</i>	<i>49</i>
<i>OFFICE OF COMMUNICATIONS</i>	<i>50</i>
<i>1988 AIA OFFICERS AND BOARD</i>	<i>52</i>



On the cover: A computer simulation of a hypersonic vehicle flying at six times the speed of sound. The colors provide designers important information on the varying pressures acting upon the vehicle. Courtesy Lockheed Aeronautical Systems Company-Georgia.



William C. Purple
Allied-Signal Aerospace
Company



Don Fuqua
Aerospace Industries
Association



Robert L. Kirk
Allied-Signal Aerospace
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Edward E. Hood, Jr.
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Company



Henry A. Schowengerdt
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Caleb B. Hurtt
Martin Marietta
Corporation



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General Dynamics
Corporation

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Don Fuqua, *President*
George F. Copsy, *Secretary-Treasurer*

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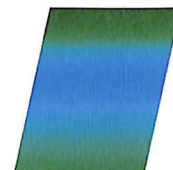
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Don Fuqua, *President, Aerospace Industries Association*



1987: A New Era for AIA

It has been a privilege to serve Aerospace Industries Association as chairman of the board of governors during 1987. I think all involved with the association will agree the year marked a new era for the industry and AIA.

1987 was a year of transition for the association, as Dr. Karl G. Harr, Jr. retired in January, after nearly 24 years of dedicated service as president. His leadership was inspirational and he will be missed by us all.

To succeed Dr. Harr, the Board selected Don Fuqua, the retired Florida congressman who served as chairman of the House Science & Technology Committee. Don's leadership has set the stage for the association's transition and allowed us to move forward on a number of key programs.

Don's extensive experience and first-hand understanding of our most pressing issues has allowed AIA to take a pro-active approach in dealing with the avalanche of legislative and regulatory proposals that threaten to stifle the industry.

Don testified on Capitol Hill on numerous occasions during the past year to support issues of direct interest to the aerospace industry. He also established an innovative program to address our concerns through informal meetings with the media and informative speeches to influential audiences.

AIA has taken firm, thoughtful and constructive positions to counteract legislative and regulatory actions which it believed to be counterproductive or deleterious to the procurement process. Through the association's efforts, many of these actions are being re-examined—and some have already been changed.

To assist Don in vigorous implementation of our pro-active program, the association staff has been strengthened with the addition of experienced and seasoned executives. Although requiring an increase in our operating budget, the enhancement of the staff, including bringing in Herb Hetu as Vice President, Communications—and Tom Tate as Vice President, Legislative Affairs—has been a positive force.

As 1987 was a year of transition, we can expect 1988 to be a year of challenge. Challenge to carry forward the work already begun and successfully re-establish the perception of our industry as a vital national asset of unsurpassed integrity. I thank you all for your support and ask that you continue the same level of hard work and dedication in the coming year.



Donald R. Beall
Rockwell International
Corporation

Donald R. Beall
Chairman, Board of Governors
Aerospace Industries Association



Robert P. Schmermund,
Assistant Vice
President, Planning



George F. Copey,
Secretary-Treasurer



Celia M. Sherbeck,
Vice President,
Civil Aviation



Herbert E. Hetu,
Vice President,
Communications



Emery Peter Smith,
Vice President,
International



Thomas N. Tate,
Vice President,
Legislative Affairs



Stan Siegel,
Vice President,
Operations

Aerospace Industries Association of America, Inc. (AIA) represents U.S. companies engaged in research, development and manufacture of such aerospace systems as aircraft, missiles, spacecraft and space launch vehicles, and propulsion, guidance, control and accessory systems for the flight vehicles. A secondary area of industry effort embraces a variety of airborne and ground-based equipment essential to the development, manufacture or operation of the flight vehicles, plus a broad range of non-aerospace products generally derived from the industry's aerospace technological expertise but intended for applications other than flight.

Functioning on national and international levels, AIA serves as a medium for presenting—to the U.S. government, the public and to international forums—the consensus views and positions of member companies on non-competitive matters related to business operations and prospects.

At the national level, AIA coordinates its efforts with those of the Council of Defense and Space Industry Associations (CODSIA), a communications medium for eight associations with mutual interests related to government systems acquisition in the aerospace, electronics, automotive and shipbuilding fields. In international activities, AIA cooperates as practical with aerospace interests in other free world countries, individually and through the International Coordinating Council of Aerospace Industry Associations (ICCAIA), an organization that includes AIA and trade associations representing aerospace industries in Europe, Japan and Canada.

The association's policies are determined by a Board of Governors composed of 30 senior executives of member companies and the AIA president. An Executive Committee—made up of eight governors—exercises the powers of the Board when the Board is not in session.

AIA's activities are directed by the association president, who also serves as the general manager. He is supported by an Administrative Service and by a senior professional staff that includes vice presidents for civil aviation, communications, operations, procurement and finance, research and technology, legislative affairs, and international matters; the secretary-treasurer; the general counsel; and the directors of two other staff units.

AIA's primary services to its membership are provided by a structure of nine working elements—variously known as services, councils and offices—backed by an array of subcommittees, task groups and *ad hoc* groups. These elements maintain liaison with Congressional and executive agencies of the government and promulgate to those agencies and to the public-industry's views and positions on a broad spectrum of matters. Additionally, the AIA units stay abreast of administrative and technical developments in their particular fields and provide current awareness services to the membership. These are the working elements:

Office of Civil Aviation coordinates AIA efforts related to problems that have significant effect on the civil aviation community. It works closely with domestic and international agencies and other elements of the aviation community on issues of common interest and serves as a focal point for matters pertaining to manufacture of civil aircraft, including commercial transports, business jets and helicopters.

Office of Communications is responsible for informing the public of the goals and accomplishments of the aerospace industry. In fulfilling these responsibilities, the Office provides support for the public activities of the AIA president and staff and the Communications Council, which is composed of public affairs executives of AIA member companies. The Office also maintains liaison with public affairs offices of government agencies and trade associations.

International Council provides guidance, coordination and policy recommendations on international issues affecting the commercial and military product segments of the industry, in particular the exporting segment. The Council's activities are divided into three programmatic areas: day-to-day issues, education, and expanded contacts with foreign counterparts.

Office of Legislative Affairs is responsible for communicating to AIA members the status of legislative matters directly affecting the industry, while at the same time appropriately communicating the aerospace industry's views on such matters to members of Congress.

Aerospace Operations Service represents the functional and management areas reflected in the charters of the Manufacturing, Quality Assurance, Product Support and Materiel Manage-

ment Committees, their working committees, subcommittees, liaison panels and Manufacturing Technology Advisory Groups (MTAGs). Primary areas of activity include advanced manufacturing technology; improvement of production processes and management; plant modernization; advanced quality assurance technology and management systems; logistics planning and technology; spare parts acquisition and management; post-delivery product support and services; technical publications and training; competition advocacy; materiel management; customs procedures; transport of hazardous material; business travel and commercial airline activities.

Aerospace Procurement Service supports the business management activities of member companies in the fields of procurement law, policy and regulations, accounting and financial management, contract administration, property management, patents, and proprietary information. The Procurement and Finance Council and the Intellectual Property Committee, each composed of senior executives of member companies, provide experts to initiate actions seeking to improve business relationships or to resolve problems of mutual concern to government and industry.

Aerospace Technical Council is the industry's senior technical policy body and spokesman for all technical and program management issues. Its responsibility covers the research, engineering, development, test and safety aspects of aerospace products, and includes regular interaction with key government officials on technical policy matters. In addition, the National Aerospace Standards series is developed and maintained under the Council's direction.

Human Resources Council supports the business management activities of member companies in industrial/labor relations, industrial security, employee compensation and benefits, equal employment opportunity/affirmative action planning, occupational safety and health and environmental affairs. The Council, through its Industrial Security, Compensation Practices, Occupational Safety and Health and Environmental Affairs Committees, each composed of senior executives of member companies, provides expert advice and assistance by initiating actions that will improve business relationships and resolve issues of mutual concern to government and industry.

Aerospace Research Center conducts research, analyses and studies designed to bring perspective to the issues, problems and policies that affect the industry and the nation. Its studies and position papers contribute to a broader understanding of the complex issues that bear on the industry's and the nation's technological and economic success. AIA statistical research and publication activities are centered in the Center's Economic Data Service (EDS), which collects and distributes data on the aerospace industry and its relationship to the national economy.



*LeRoy J. Haugh,
Vice President,
Procurement and
Finance*



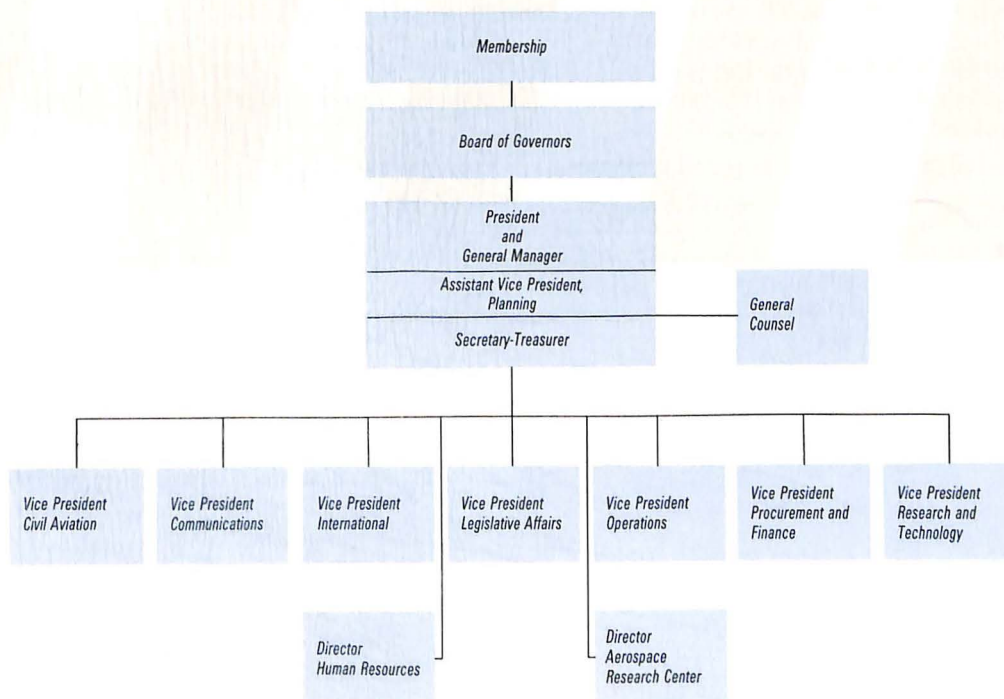
*C. Ronald Lowry,
Vice President,
Research and
Technology*



*Daniel J. Nauer,
Director, Human
Resources*



*Virginia C. Lopez,
Director, Research
Center*





For Aerospace Industries Association, 1987 was a year of heightened activity, a period of management transition, agenda planning and the initial steps in a more extensive, more assertive program of industry representation.

For our industry, it was a year of solid accomplishment in development and manufacture of products for defense, space and civil aviation.

According to preliminary data, the industry recorded total sales of \$112 billion, an all-time high and a figure that represents real, inflation-adjusted growth of almost four percent.

The backlog of orders on the industry's books at yearend 1987 topped \$143 billion, also a record. However, at less than four percent, the backlog growth rate was lower than in earlier years of the 1980s.

We are particularly gratified by the industry's performance in international trade. In this critical area of the U.S. economy, record levels of aerospace exports and aerospace balance of trade significantly offset American deficits in other fields of trade. Aerospace exports rose by 19 percent over the previous year's level to \$25 billion. The aerospace balance of trade increased by 33 percent to \$17 billion. This outstanding performance underscores once again the importance to the U.S. economy of high value, high technology aerospace exports.


Aerospace industry earnings increased in 1987, consistent with the trend for all manufacturing industries, but remained well below the average profit level for all U.S. manufacturing corporations. Expressed as a percentage of sales, the aerospace profit was 3.7 percent, up from 2.8 percent in 1986; it marked the industry's first earnings increase since 1984. The aerospace profit on sales compared with an average of 4.8 percent for all U.S. manufacturing industries. Aerospace similarly trailed the all-industry average in profit expressed as a percentage of assets and was approximately level with the U.S. average for profit expressed as a percentage of equity.

By and large, 1987 was an excellent year for the aerospace industry. There were, however, a few disquieting indicators that suggest less propitious results in coming years. The rate of increase in new orders slowed sharply in 1987, reflecting the impact of the no-growth or negative growth defense budgets of recent years. From all indications, aerospace backlog growth peaked in 1987. AIA is therefore projecting a downturn in the real-term sales level for 1988. We also anticipate a resumption of the declining trend in industry earnings that was momentarily interrupted in 1987.

Among the first steps of the new AIA administration in 1987 was a strengthening of the staff structure to reflect planned association activity emphasis in the areas of communications, legislation and procurement. This was part of a broader effort, ongoing throughout the year, to develop an organizational structure that most effectively supports and implements the association's mission and strategic goals.

To focus the direction of the association's activities, AIA identified a series of specific issues of primary concern to the aerospace industry and targeted them for special attention. They include:

- The financial health of the industry and the potentially negative impacts of recent changes in the policies and rules governing defense procurement;
- The legislative/regulatory overkill that is unreasonably hampering many segments of the industry's operation;
- The need for improving industry/government relationships;

- 
- The often misunderstood process of Independent Research and Development (IR&D), wherein government procedures and Congressionally-imposed ceilings are forcing industry companies to absorb increasing amounts of their IR&D expenses;
- The declining U.S. posture in space;
- The lack of recognition and appreciation for the fact that U.S. industry makes the highest quality aerospace products in the world;
- Misunderstandings that have developed relative to alleged deficiencies in the industry's automated inventory management system known as MRP;
- The need for broader recognition of the industry's self-governance efforts and its advancement of ethics programs;
- The handicaps the U.S. aerospace industry faces in world competition; and
- The need for a bold, innovative national technology development effort to enhance U.S. international competitiveness through focus on what AIA calls "Key Technologies for the 1990s."

In the second half of the year, AIA concentrated much of its activity on bringing these issues to public attention and initiating corrective action. For example, the association published a brochure that describes in detail the benefits to the nation, the government and industry of Independent Research and Development and planned follow-up personal presentations to cognizant officials.

With regard to MRP, AIA worked closely with the Department of Defense officials, presented industry's views on this complex technical issue and succeeded in effecting a new DoD guidance that defines and clarifies acceptable MRP systems. We hope that the spirit of cooperation that prevailed in MRP discussions will set a pattern for future industry/government resolution of issues.

The Key Technologies for the 1990s plan was announced in December at an annual media luncheon in Washington, D.C. AIA identified the eight technologies that merit immediate and special attention and proposed a national cooperative effort among industry, government and academia to focus on development of these technologies in the interest of spurring U.S. international competitiveness.

In summary, the year 1987 was characterized by efforts to build a firm foundation for an aggressive program that seeks constructive modification of the defense acquisition process and an effort to promote an informed and fair attitude toward the aerospace industry on the part of the Congress, the media and the public. In that regard, AIA has developed a strategic plan and has taken the initial steps toward its accomplishment.

I feel that our initial actions have met with a gratifying degree of success and I am encouraged to believe that the association's strategic plan can indeed effect productive change in the aerospace industry's posture and image.

What success we have achieved in surmounting the difficulties of transition to new management and embarking on an ambitious new agenda is due in great measure to the strong support provided by the Chairman, the Executive Committee and the Board of Governors, for which I am deeply grateful.



Don Fuqua
President, Aerospace Industries Association

DEFENSE

The year's most significant event affecting defense systems was the December 8 signing of a U.S./Soviet treaty that would ban intermediate nuclear forces (INF). According to the accompanying memorandum of understanding, INF weapons are those in the short and medium range categories with range capabilities of 300 to 3,000 miles.

If the Senate ratifies the treaty, the U.S. weapons to be withdrawn from operational service in Europe include 429 medium range missiles, Army Martin Marietta Pershing IBs and Pershing 2s, and Air Force General Dynamics/McDonnell Douglas Ground Launch Cruise Missiles and their launchers. In addition, the U.S. would destroy 260 medium range missiles that had not been deployed, plus 170 older Pershing IAs, short range weapons earlier withdrawn from service and stored in the U.S.

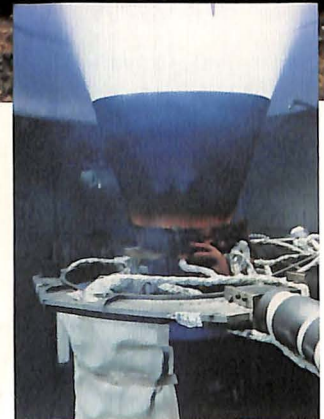
The agreement does not affect production of other types of cruise missiles. Still in large scale production at yearend was the Navy's Tomahawk Sea Launched Cruise Missile; General Dynamics-Convair is primary manufacturer, McDonnell Douglas Astronautics the second source. In development was the Air Force's Advanced Cruise Missile (ACM), a longer-range follow-on to the Boeing-built Air Launched Cruise Missile. General Dynamics-Convair is development contractor and first source manufacturer; in November, the USAF named McDonnell Douglas Astronautics as second source producer. Also in development was a submunitions dispenser version of the Tomahawk designed to drop conventional "bomblets" on multiple targets. On November 3, the new Tomahawk successfully completed its first flight with live munitions. The dispenser version was targeted for initial operational capability in September 1988.

Among other strategic missile programs, the USAF continued deployment of the Peacekeeper ICBM. By yearend, 30 of the missiles had been emplaced; 18 of them were operationally ready. The Air Force reported that it was on schedule in the program to reconfigure Minuteman silos for Peacekeeper installations. Major



In June, Westinghouse Airship Industries was awarded a Navy contract to build a prototype to determine the feasibility of using airships with fleet groups for surveillance, early warning and communications.

The Hard Mobile Launcher, developed by Boeing Aerospace and Loral Defense Systems for hauling and launching the USAF's Small ICBM, passed initial mobility tests in the summer.



In April, GenCorp's Aerojet General successfully conducted the first test firing of its full scale development second stage small ICBM motor.



Machining of the first part for the USAF/McDonnell Douglas C-17 airlifter began in November.



Peacemaker contractors include Martin Marietta Aerospace (assembly and test); Rockwell Autonetics (guidance and computers); Northrop (inertial guidance system); Morton Thiokol (first stage); Aerojet General (second stage); Hercules Aerospace (third stage); Rockwell Rocketdyne (fourth stage); Avco and General Electric (re-entry systems); Westinghouse (missile canister); Boeing Aerospace (support equipment); TRW Inc. (engineering and technical support); and Honeywell Inc. (guidance and control elements).

Development and preliminary testing of the USAF's Small ICBM (SICBM) continued. Mobility tests of the hard mobile launcher, being developed by Boeing Aerospace and Loral Defense Systems Division-Arizona, were conducted during the spring and early summer. In September, Hercules Aerospace announced completion of a full-scale development static test of an advanced solid propellant motor for SICBM's third stage. Some 20 additional flight qualification tests were planned. Propulsion contractors, in addition to Hercules, include Morton Thiokol (first stage) and Aerojet General (second stage). The development program was oriented toward a 1992 operational date.

The Navy Trident 2 advanced fleet ballistic missile was in full-scale development in 1987 and undergoing developmental flight testing. The initial flight was successfully conducted on January 17; there were seven additional flights during the year with



This modified Boeing 707 houses the airborne portion of the Joint STARS system being developed by a Grumman-led industry team for the Air Force and Army; it is a battle management system designed to detect, locate, classify and track large numbers of targets.



Boeing Aerospace started work in August on its P-3 Update IV contract to provide more than 200 Navy/Lockheed P-3 aircraft an improved avionics system for more effective submarine detection.



In April, General Dynamics delivered the first of 26 F-16N adversary aircraft, modified to simulate such threats as the Soviet MiG-29.

about 20 more planned in 1988-89. First launch from a submerged Trident submarine was targeted for mid-year 1989 and operational service for late 1989. Major Trident 2 contractors include Lockheed (prime), Westinghouse (launcher) and General Electric (fire control system).

Among major military aircraft programs, the Navy announced in December selection of the team of General Dynamics and McDonnell Douglas for development of the Advanced Tactical Aircraft; General Electric will supply the engines. The program will involve more than 40 subcontractors in 35 states.

The Air Force's Advanced Tactical Fighter completed—in December—its first year of development as teams led by Lockheed Corporation and Northrop Corporation began developing ground and flight prototypes in a 50-month demonstration/validation phase. Lockheed is teamed with Boeing and General Dynamics, Northrop with McDonnell Douglas. One team will be chosen for full-scale development after the demo phase.

Also in development was the USAF/Northrop Advanced Technology Bomber, a highly classified program about which little has been released.

Among other 1987 developments on the defense scene:

■ The Air Force AMRAAM (Advanced Medium Range Air-to-Air Missile) completed another series of test flights, bringing the total number to more than 40 with a high rate of success. In October, the USAF announced award of an initial production contract; the missile is being developed by the Missile Systems Group of Hughes Aircraft, a unit of GM Hughes Electronics.

■ In November, an Army/Raytheon Patriot missile with a modified fuze and warhead successfully intercepted another Patriot on a ballistic trajectory, a demonstration of Patriot's potential as an anti-tactical-missile system in addition to its anti-aircraft capability. A series of such tests was planned.

■ In May, the Burbank Division of Lockheed Aeronautical Systems Company was selected to manufacture wing components of the Air Force/McDonnell Douglas C-17 airlifter. In August, McDonnell Douglas dedicated a new Long Beach C-17 assembly building. Production will begin in 1989 and the C-17 is scheduled for operational service in 1992.

■ In November, Rockwell-Columbus delivered the 100th shipset of engine nacelles for the USAF/Rockwell International B-1B bomber and aircraft No.100, the last of the production order, began final assembly.

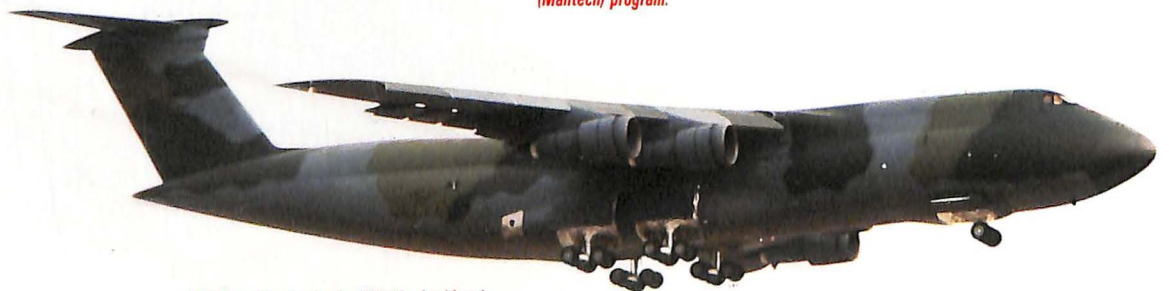
In August, Grumman introduced the first development aircraft of the Navy's A-6F all-weather attack series planned for initial operational service in 1990.



In November, Allison shipped the first T406 engines for the Bell-Boeing V-22 Osprey.



Rockwell-Tulsa fabricated a 50-foot layup tool as part of the Air Force/Rockwell Large Aircraft Composite Wing Structures (Mantech) program.



Introduced to service in 1966, the Lockheed C-5B passed the 10,000 hour service milestone in August 1987.



Colt Industries' Menasco Inc. teamed with Grumman Corporation to develop the JumpStrut advanced landing gear designed to reduce takeoff roll by up to 60 percent.



Interlake Corporation's Automated Guided Vehicle System is incorporated in an advanced flexible machining system at a McDonnell Douglas C-17 production facility.



In December, Boeing Helicopter Company completed the fuselage for the first flight test V-22 Osprey and prepared it for shipment to Bell Helicopter Textron for wing mating; first flight was targeted for June 1988.



A Westinghouse/ITT joint venture was awarded a production verification contract for the AN/ALQ-165 Airborne Self Protection Jammer intended for use on several USAF/USN aircraft.

■ In August, the USAF/Lockheed C-5B passed the 10,000 service hour mark in operation with Military Airlift Command and airplane No.16 was delivered. A contract for 50 aircraft was scheduled for completion in the first quarter of 1989. The Georgia Division of Lockheed Aeronautical Systems Company also completed—in July—a re-wing modification program on 77 C-5As.

■ At yearend, LTV Missiles and Electronics group was readying the Army TACMS (Tactical Missile System) for a first quarter 1988 start on a 35-flight developmental test program.

■ In November, Northrop Corporation completed the first flight-ready, production-configured AGM-136A Tacit Rainbow loitering anti-radar missile. Tacit Rainbow is designed to clear a path for USAF/Navy tactical aircraft by disabling hostile radars.

■ In October, the Navy announced a contract award to Raytheon Missile Systems Division for full-scale development of a new version of the Navy Sparrow missile that will have increased capability against low-altitude antiship missiles.

■ Hughes Aircraft began deliveries of the TOW-2A tandem warhead antiarmor missile in October. TOW-2A is an Army/Marine Corp. weapon; earlier TOWs continued in production for foreign military customers.

■ A new AGM-65G Air Force version of the Hughes-built infrared Maverick air-to-surface missile made a successful first flight test in November.

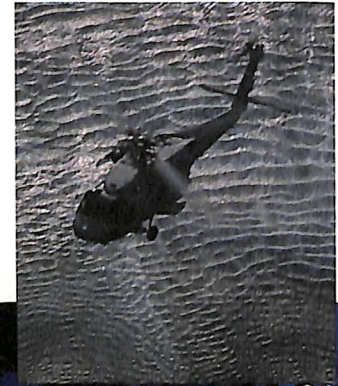
■ McDonnell Douglas Astronautics, prime contractor for the Dragon 2 antitank weapon, was awarded in July a three-year development contract for an advanced Dragon 3.

■ In September, the first production model Navy/McDonnell Douglas F/A-18C, first version to use the Airborne Self Protection Jammer, successfully completed its first flight. Production plans called for more than 700 F/A-18Cs and two-seat F/A-18Ds.

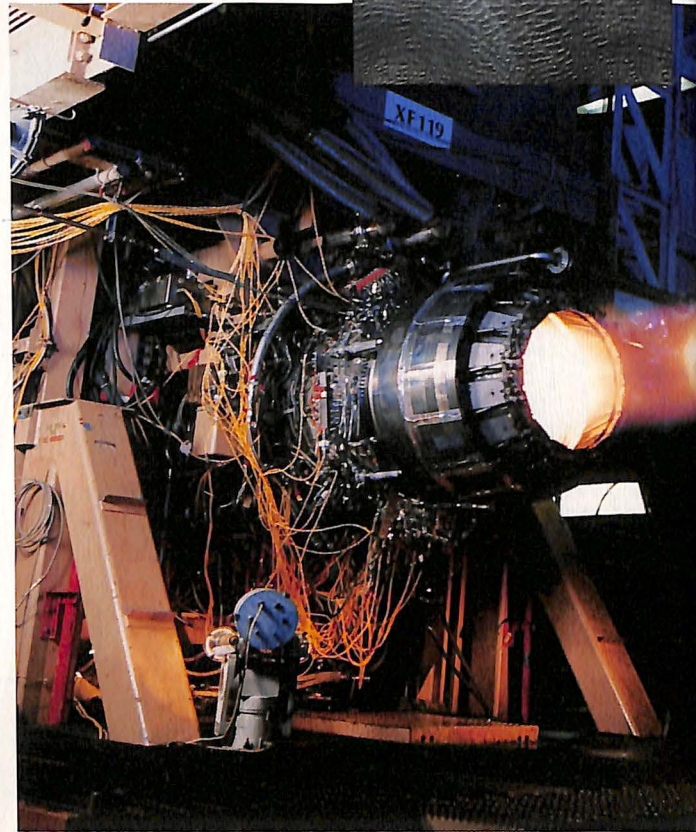


The Hughes Aircraft/Raytheon AMRAAM received an October contract for initial production for the Air Force.

The Navy/Sikorsky SH-60F CV-Helo, with advanced equipment for defense against submarine attacks, made its first flight on March 19.

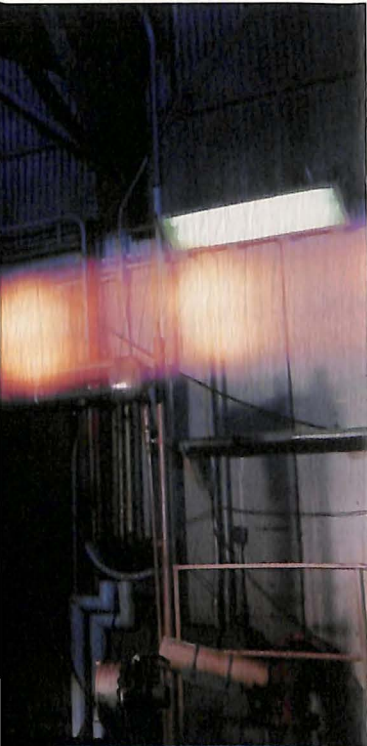
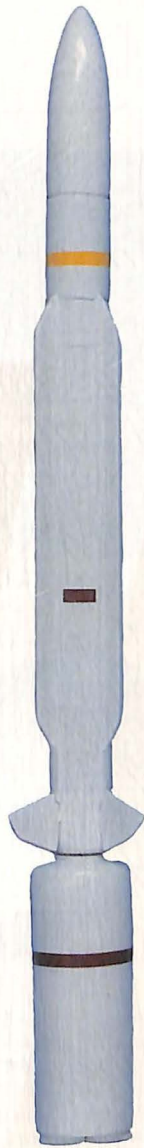


Pratt & Whitney's F119, designed to power the USAF Advanced Tactical Fighter, began sea level testing.



Testing of the General Electric-built East Coast AN/FPS-118 Over-the-Horizon Backscatter radar continued and construction of the West Coast system was initiated.

Raytheon Corporation was awarded a Navy contract for development of a new version of the Standard fleet air defense missile known as AEGIS Extended Range Standard 2.



The Navy/Boeing Aerospace E-6A TACAMO communications aircraft, an airborne link between command authorities and the Navy's ballistic missile submarine force, made a successful first flight on June 1.

█ In October, Grumman installed the General Electric F110-GE-404 engines in the first production model of the new F-14A + and later initiated deliveries to the Navy.

█ In August, Grumman introduced the first full-scale development A-6F Intruder all-weather attack aircraft for the Navy. The A-6F was slated for initial operational service in 1990.

█ A new version of the McDonnell Douglas AV-8B Harrier II equipped for night attack made its first flight on June 26; deliveries to the Marine Corps were scheduled to begin in September 1989. In July, McDonnell Douglas flight tested the first of 328 production TAV-8B Harrier IIs, two-seat trainer versions for the Marines.

█ In December, Boeing Helicopter Company completed assembly of the fuselage for the first V-22 Osprey test aircraft, targeted for flight test in June 1988. It was shipped to Bell Helicopter Textron for wing/fuselage mating. Procurement plans called for production of 913 V-22 tiltrotors for all-service use, with first deliveries to the Marine Corps in 1991.

█ In development as a joint U.S./Federal Republic of Germany project was the X-31A advanced, highly maneuverable fighter. Rockwell International and Messerschmitt-Boelkow-Blohm were teamed in Phase 2 of the project, which involved production of two flight demonstration vehicles.

█ In October, the Georgia Division of Lockheed Aeronautical Systems Company won a contract to modify a C-141A transport as part of a new Air Force airborne radar laboratory program.

█ In December, Boeing/Helicopter Company began development of an MH-47E prototype to qualify the modified Army Chinook helicopter for Special Operations Forces duty.

█ In September, Grumman Aircraft Systems Division joined the Westinghouse Airship Industries team in a development/test program to determine the feasibility of using airships in the airborne early warning role. Grumman will put an E-2C target detection and tracking system into the prototype airship.



Boeing Helicopter was awarded an Army contract for development of a prototype MH-47E for all-weather, clandestine, deep penetration operations.

SPACE

On December 1, NASA made a formal start on development and fabrication of the U.S./International Space Station with contract awards of four "work packages" to industry teams:

Package One, Boeing Aerospace Company for habitat and laboratory modules. Boeing's team includes Lockheed Missiles & Space, Teledyne-Brown Engineering, United Technologies' Hamilton Standard, Fairchild-Weston Systems, Garrett AiResearch, Grumman Aerospace and ILC Systems.

Package Two, McDonnell Douglas Astronautics for construction of the structural framework. Team members are IBM, Lockheed Missiles & Space, General Electric's RCA Government Communications Division, Honeywell, and Astro Aerospace Corporation.

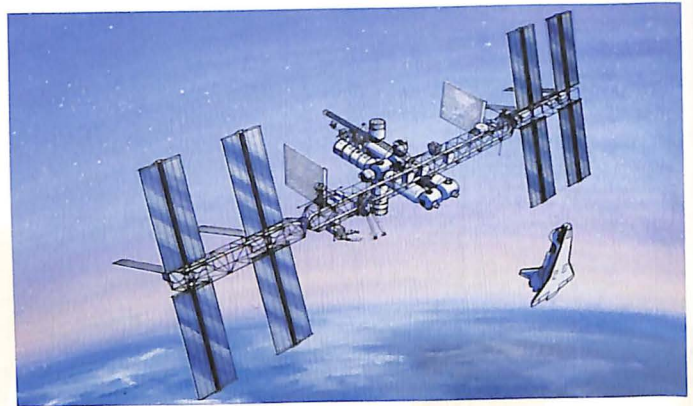
Package Three, free floating platforms, GE Astro Space Division working with TRW Inc.

Package Four, Rockwell International's Rocketdyne Division, Space Station electrical systems, with teammates Ford Aerospace, Harris Corporation, Garrett-Tempe, General Dynamics and Lockheed.

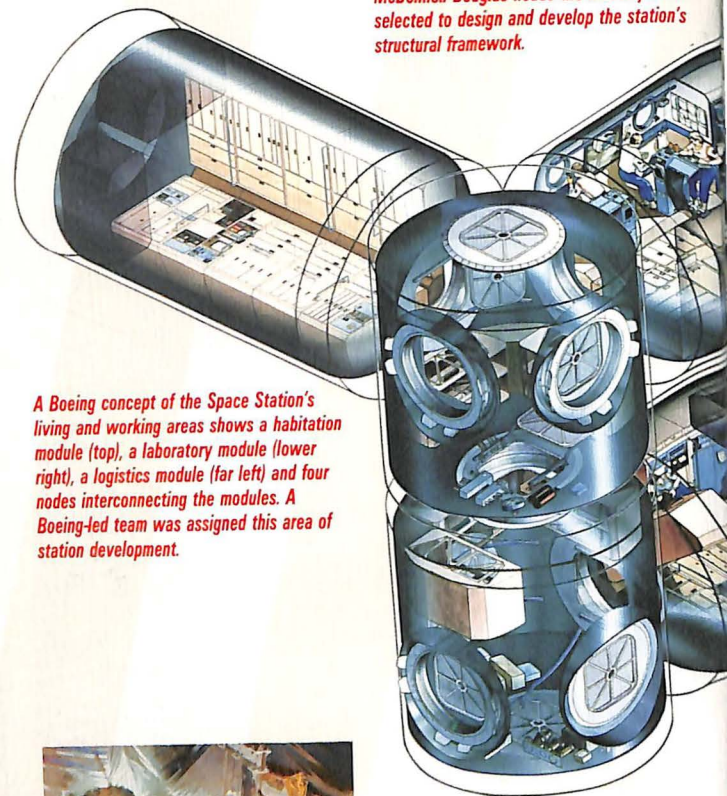
Earlier in the year—in July—NASA had contracted with a Grumman-led team for support of design and development of the Space Station. The Grumman team, which includes Ford Aerospace, Booz, Allen & Hamilton and Wyle Laboratories, will function as NASA's assistant in integrating and managing the work of the four construction teams.

At the time of the awards, NASA was working on a schedule that called for a 19-flight Space Station assembly plan with first components Shuttle-delivered in March 1994, initial permanent occupancy for four astronauts early in 1996 and full crew capability (eight astronauts) late in 1996. Two weeks later, however, Congress completed action on NASA's FY 1988 appropriation and provided only \$425 million of the \$767 million requested for the Space Station. NASA was directed to report, before March 1, 1988, a plan for "rescoping and rescheduling" the Space Station. A schedule slippage of at least a year was indicated.

NASA's effort to ready the Space Shuttle for service remained on schedule for most of the year. In May, August and December, NASA conducted component and full-scale ground tests of Morton Thiokol's redesigned solid rocket motor. Modifications were made to the Space Shuttle's Rocketdyne main engines and qualification tests for the three engines that will power flight STS-26—the next Shuttle mission—neared completion at year-end. NASA also initiated STS-26 mission simulations and started the lengthy preflight processing procedure on the Orbiter Discovery. Late in the year, NASA found that during the apparently successful third firing of the solid rocket motor, a problem had developed in the nozzle joint—not the field joint that was the



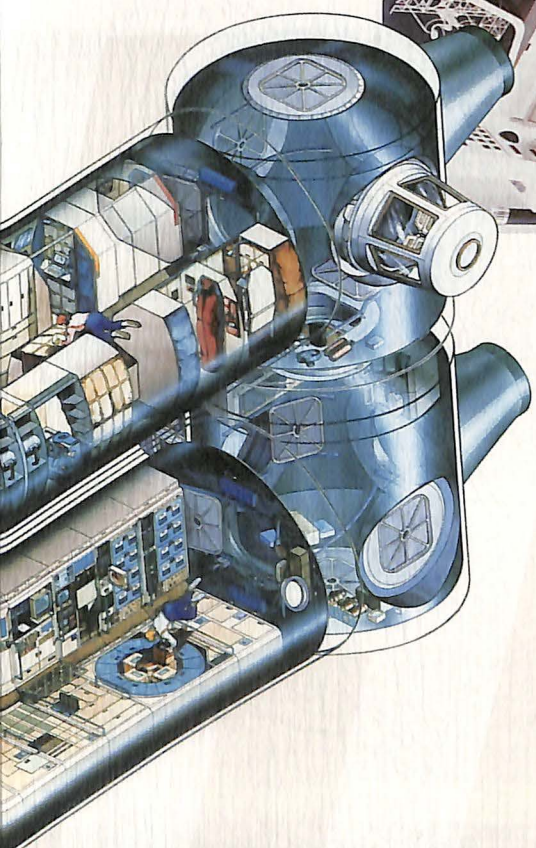
A McDonnell Douglas Astronautics concept of the U.S./International Space Station. McDonnell Douglas heads the industry team selected to design and develop the station's structural framework.



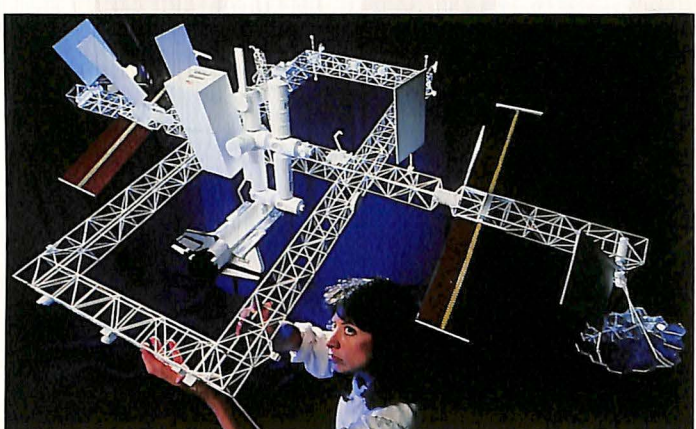
A Boeing concept of the Space Station's living and working areas shows a habitation module (top), a laboratory module (lower right), a logistics module (far left) and four nodes interconnecting the modules. A Boeing-led team was assigned this area of station development.



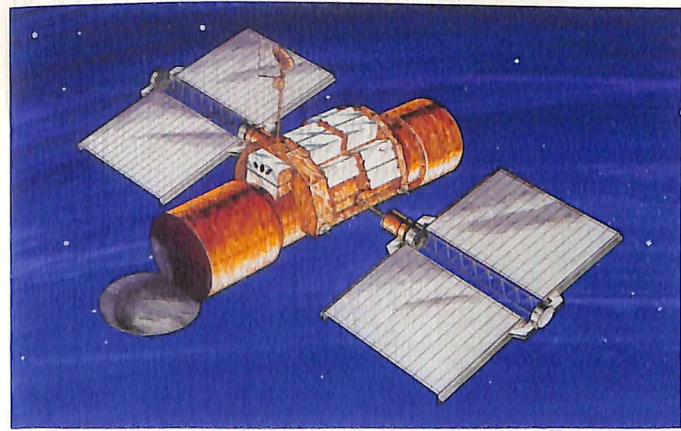
Shown being readied for test in a thermal-vacuum chamber is the GE Astro-Space GSTAR-III communications satellite, to be launched in 1988.



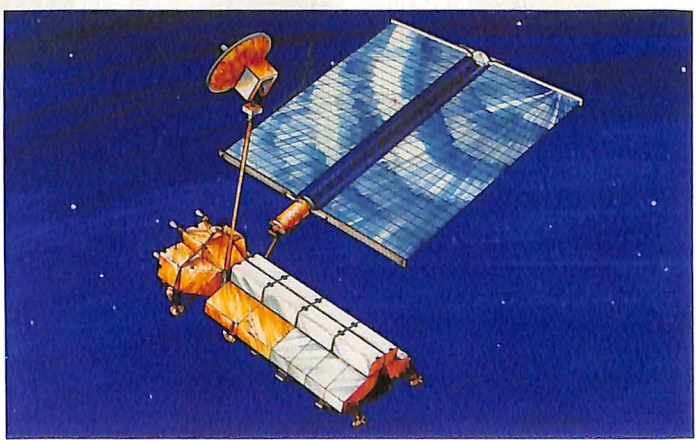
Space Station astronauts will have clear view of their surroundings in one of two observation cupolas, one facing Earthward, the other spaceward; in the photo, a cupola mockup built by McDonnell Douglas.



A team headed by Rockwell International's Rocketdyne Division won the NASA assignment for development and installation of Space Station electrical systems. In the photo is a Rockwell conceptual model of the planned Block II expanded station.



The Space Station will be accompanied by a co-orbiting experiment platform (left) and a second platform will operate in polar orbit (right). A team headed by GE Astro-Space is developing both platforms.



focal point of the test. The fix would delay resumption of Shuttle flights from June 1988 until July-August, according to an early NASA estimate.

In a parallel Shuttle development, NASA completed negotiations with Rockwell International and let a contract on August 1 for development and construction of the replacement Orbiter, to be delivered in midyear 1991.

The main military space development effort was centered in the Strategic Defense Initiative, which involves research and technology development for ground-based as well as space-based systems for defense against ballistic missiles. Late in the year, when Congress completed work on the FY 1988 defense budget, SDI was sharply cut to \$3.7 billion from the \$5.2 billion requested. At yearend, the Strategic Defense Initiative Organization was studying changes in the program to meet the reduced funding level and there was no word as to which projects would be affected. SDIO, however, was continuing on a basic plan, initiated earlier in the year, to advance six technologies to demonstration/validation status, in effect moving from research to systems development, a major milestone. The six technologies included space-based surveillance and tracking of a hostile missile launch during its boost phase; both space-based and ground-based surveillance and tracking systems for the mid-course phase; a space-based interceptor weapon, a ground-based interception missile system; and a battle management system to coordinate all elements.

Both the Department of Defense and NASA were working on development of new heavy-lift unmanned launch vehicles. Under Air Force cognizance was the Advanced Launch System program designed to produce a highly reliable heavy lift booster capable of delivering up to 100,000 pounds to low orbit at significantly lower launch costs by the end of the century. NASA initiated a study of a heavy lift booster that would use elements of the Space Shuttle system (Shuttle C) but would be unmanned and used only for hauling cargo to orbit. In a separate program, NASA awarded design study contracts for an advanced Shuttle solid rocket motor; the contractors include Aerojet General, Morton Thiokol, United Technologies' Chemical Systems Division, Hercules Aerospace and Atlantic Research.

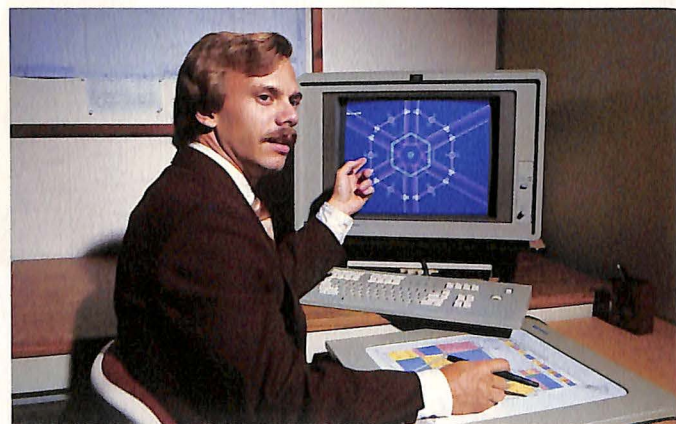


In development by TRW for NASA service in the 1990s was the Gamma Ray Observatory.



Among military space systems in development was General Electric's Defense Satellite Communications System (DSCS); here a DSCS III satellite is readied for solar simulator testing.

IBM Federal Systems' concept of a workstation from which crew members can control Space Station operations.



Computer design techniques aid development—by Harris Corporation's Government Aerospace Systems Division—of a concentrator for a solar thermal dynamic system being considered for Space Station use.



In early development status was the National Aerospace Plane (NASP) program, a joint DoD-NASA effort to develop technologies for a class of airbreathing vehicles capable of horizontal takeoff from standard runways, hypersonic cruise and attainment of orbital velocity. The technology development was expected to lead to single-stage-to-orbit vehicles with reduced launch costs for service in either military or civil space operations; in addition, the technology might later be adapted to a civil-use supersonic or hypersonic transport. DoD and NASA were working toward a decision, expected in 1989, to develop an X-30 NASP demonstrator that could be ready for flight testing in the early 1990s. Airframe contractors working on NASP during 1987 included Boeing, General Dynamics, Lockheed, McDonnell Douglas and Rockwell International; propulsion contractors included General Electric, Pratt & Whitney and Rocketdyne. Contracts were awarded to Marquardt and GenCorp's Aerojet TechSystems for test facilities capable of testing hypersonic propulsion systems up to Mach 8.

The U.S. commercial launch industry gained momentum as each of the three large manufacturers of expendable launch vehicles—Martin Marietta, McDonnell Douglas and General Dynamics—scored successes in obtaining contracts for commercial launch services. The same contractors were developing and producing ELVs for DoD and NASA use. In June, General Dynamics announced that its Space Systems Division would build 18 Atlas/Centaur vehicles under a company-funded program. In September, McDonnell Douglas Astronautics rolled out the first Delta assembled at its new Pueblo, Colorado facility; the company was also building the Delta II Air Force Medium Launch Vehicle and had options and orders for some 30 vehicles of both types.

Martin Marietta rolled out the first Titan II launch vehicle in August at its Denver facility, a conversion from a decommissioned Titan 2 missile; the company was converting eight Titan IIs un-



Launched in March was Indonesia's Palapa B2P communications satellite, built by Hughes Aircraft's Space and Communications Group.



Allied Signal Aerospace Company's Bendix Field Engineering Corporation continued to operate and maintain NASA's Deep Space Network.



In August, Martin Marietta rolled out the first of its Titan II space launch vehicles, conversions from decommissioned Air Force Titan II missiles.

der USAF contract. Martin Marietta was also developing a Titan IV with greater payload lifting capability; the first vehicle was virtually complete at yearend and slated for early 1988 delivery to the Air Force.

Martin Marietta was also developing a commercial service Titan III with dual launch capability. For relatively small payloads, LTV Missiles and Electronics Group was planning to develop—in a joint venture with Italy's SNIA—an Improved Scout vehicle intended primarily for delivery to orbit of moderate-size microgravity experiments. General Electric's Re-entry Systems Department would provide an experiment recovery vehicle—called SERVICE—for Improved Scout payloads.

In 1987 launch activity, NASA used a Delta to launch the Hughes GOES-7 weather/environment data reporting satellite for the National Oceanic and Atmospheric Administration on February 26. On March 20, NASA Delta-launched the Hughes-built Palapa B2P communications satellite for Indonesia's state-owned telecommunications company. On June 19, the Air Force launched a replacement satellite for the Defense Meteorological System Program; the DMSP satellites are built by GE Astro-Space. On October 26, the Air Force successfully launched a Titan 34D vehicle carrying a classified payload.

Among major NASA systems in development during 1987, or completed and awaiting resumption of Shuttle operations, were:

- The Hubble Space Telescope, a long duration astronomical observatory, planned as one of the first payloads for the Shuttle; Lockheed Missiles & Space is prime contractor, Perkin-Elmer Corporation the telescope assembly contractor.

- Galileo, a joint U.S./West Germany Jupiter orbiter/probe, planned for 1989 launch. Hughes Aircraft, a subsidiary of GM Hughes Electronics, and General Electric teamed on probe development.

- Magellan, a Venus radar mapping spacecraft, also targeted for 1989 launch; contractors included Hughes and Martin Marietta Aerospace.

- Gamma Ray Observatory, being developed by TRW for 1990 launch.

- Advanced X-ray Astrophysics Laboratory, another of the long-duration "Great Observatories" (with the Gamma Ray Observatory and Hubble Space Telescope). Contractors include Lockheed and TRW.

- Mars Observer, under development by GE Astro-Space for launch to Mars in 1992.

Among unclassified DoD space programs in development were:

- Milstar, an Air Force program for an extra-secure, highly survivable military communications satellite system; Lockheed is prime contractor

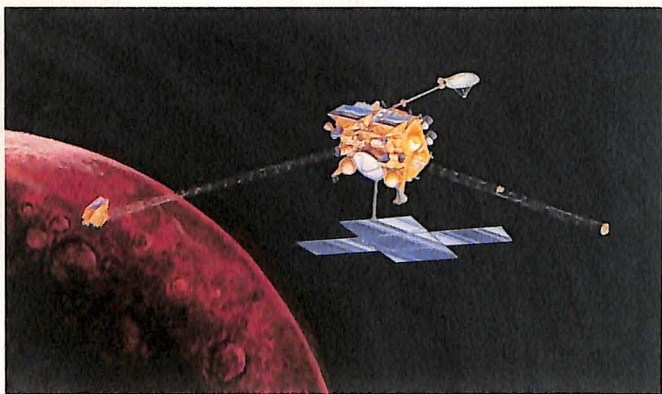
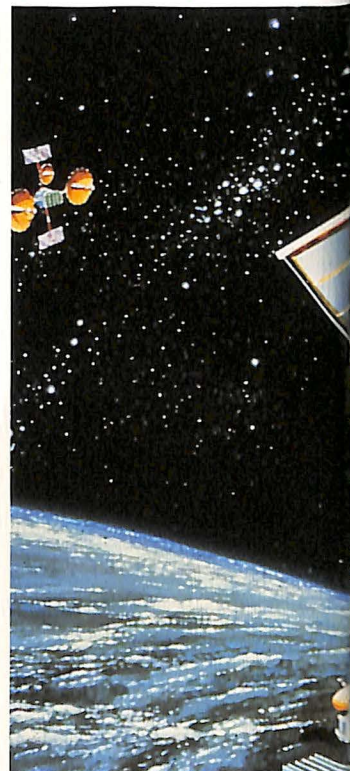
- Navstar Global Positioning System, being developed by Rockwell International for precise location of air, sea and land vehicles, to be fully operational in the early 1990s.

- Defense Satellite Communications System, a continuing series being developed in advanced versions by GE Astro-Space under USAF contract.

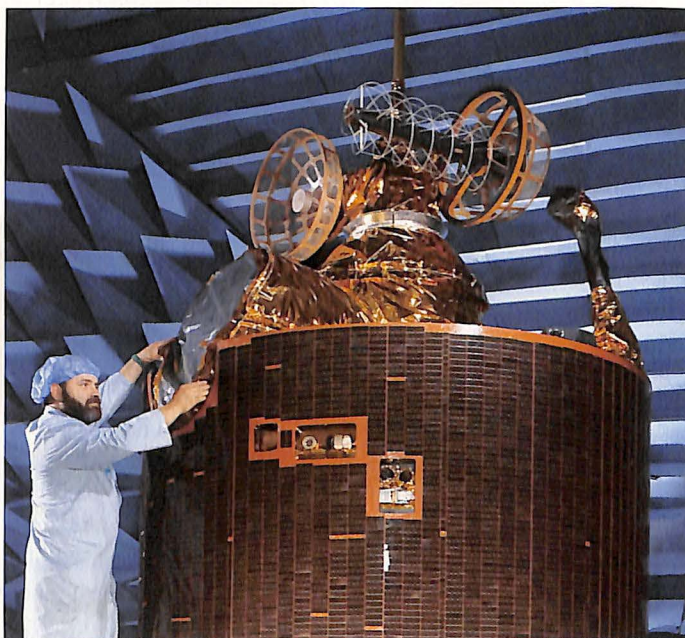
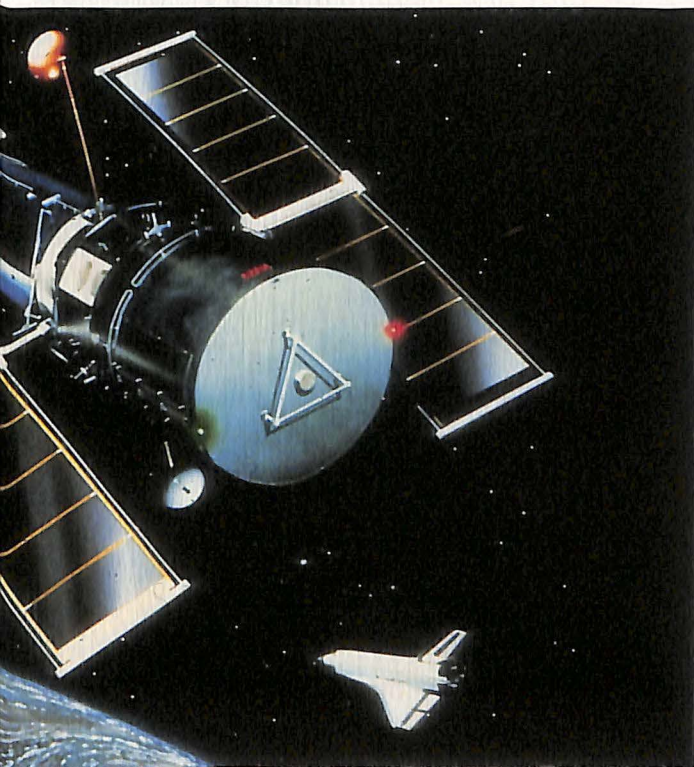


In June, General Dynamics moved into the commercial launch vehicle competition with a commitment to build 18 company-funded Atlas/Centaurs.

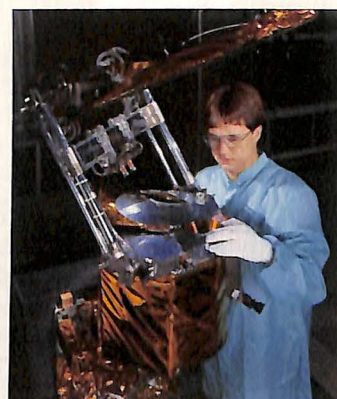
Among the earliest major payloads to go into orbit when Space Shuttle flights resume is NASA's Hubble Space Telescope, developed by Lockheed Missiles & Space.



Being developed for launch to Mars in 1992 is NASA's Mars Observer; contractor is GE Astro-Space.



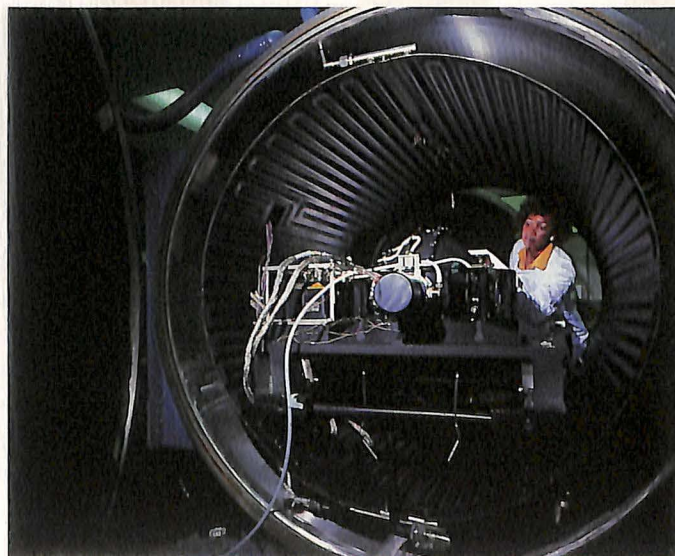
Shown undergoing pre-launch testing is the Hughes-built GOES-7 weather satellite, launched in February 1987.



A Hughes Aircraft technician adjusts the feed horn of a special microwave energy sensor that made its debut on board a Defense Meteorological System Program satellite launched in June; the sensor determines the intensity of a storm, thereby providing earlier storm warnings.



Launched in September was the Hughes-built Aussat 3 communications satellite designed for service to Australia, New Zealand and South Pacific islands.



In a thermal vacuum chamber, an inspector prepared for a test of a gyrosopic system being developed by Honeywell Satellite Systems Division for positioning and controlling space vehicles.

CIVIL AVIATION

For the U.S. airlines, 1987 was a banner year, according to preliminary estimates by the Air Transport Association (ATA). The airlines operated more than 6.6 million flights during the year, boarded some 450 million passengers and flew approximately 400 million revenue miles. All three figures represented record levels; it was, in fact, the fifth straight year of new traffic records.

Traffic growth resulted in addition of 30,000 people to the U.S. airline labor force, bringing total employment at yearend to 450,000. Predicting another year of record traffic in 1988, ATA estimated traffic growth at about five percent for the year.

Although ATA provided no full-year estimates of profit levels, it appeared that 1987 was also a good year in terms of earnings. Operating profits for the first nine months of 1987 were about \$2 billion, compared with \$800 million during the same period of 1986.

For U.S. manufacturers, 1987 was a year of increased civil aircraft sales, but the gain was entirely in the commercial transport segment, according to preliminary data compiled by AIA. Overall sales of civil aircraft, including spare engines and parts, amounted to \$16.5 billion, a five percent increase over the previous year, but a growth rate less than one-third that of 1986. The industry delivered 363 commercial transports (up from 330 in 1986) valued at \$10.6 billion, an all-time high. Transport sales more than offset declines in general aviation and helicopter sales.

For 1988, AIA projected moderate gains in helicopter sales and a major boost in sales of commercial transports—almost 20 percent in dollar volume. As of September 30, 1987, the backlog of orders for commercial transports was a record high \$26.5 billion, 58 percent of it in foreign orders.

In 1987, U.S. transport manufacturers were producing seven basic commercial airline models with variants of each model. Among new aircraft, Boeing Commercial Airplane Company launched another version of its highly successful 737 twinjet

In October, Boeing mated the wing and fuselage of the first 737-400, scheduled for initial flight in 1988.



In July, a NASA/FAA study report concluded that there is a large market for commercial tiltrotor aircraft; in photo, a civil tiltrotor based on the Bell-Boeing military V-22.



The Sikorsky-built X-wing research craft made its first flight—minus the rotor—on December 2.



In June, Boeing Helicopter began a flight test program with its Model 360 Advanced Technology Demonstrator.



Gates Learjet introduced two new business jet models, the Learjet 55C pictured and the Learjet 31C.



McDonnell Douglas' new MD-87 twinjet received FAA certification in October and went into airline service in November.

series when four airlines agreed to order up to 73 units of the 737-500, an advanced technology airplane intended for lower density, short-to-medium range routes. First delivery was slated for March 1990.

In other Boeing activities, the company began flight testing in January of the 767-300 Extended Range version and continued production of the 747-400, first model of which was targeted for initial flight early in 1988. The latest model of the 737 series, the 737-400, was similarly scheduled for early 1988 flight.

McDonnell Douglas continued production of the MD-11 trijet, a 250-400 passenger follow-on to the DC-10 planned for initial deliveries in 1990. The company was also granted Federal Aviation Administration certification for two new models of the twinjet MD-80 series. The 130-passenger MD-87 was certified in October and it went into service with Austrian Airlines and Finnair in November. In December, the FAA certified the companion MD-88.

In the area of transport development, both Boeing and McDonnell Douglas were contemplating 1990s introduction of propfan-powered airliners with high fuel efficiency. Both companies conducted flight tests of General Electric's Unducted Fan (UDF) engine. A second U.S. propfan, the Model 578-DX was being developed by an industry team composed of Allison Gas Turbine Division, Pratt & Whitney, Hamilton Standard and Rohr Industries.

McDonnell Douglas planned—assuming receipt of sufficient orders for a formal start—development of a 130-seat propfan-powered MD-91 and a larger MD-92 for airline service in the 1990s. Boeing delayed a formal go-ahead on its 150-passenger propfan 7J7 while consolidating its product development activities in a new Advanced Programs Organization; the company said the 7J7 could be ready for service five years after go-ahead.

Among business aircraft, Gates Learjet Corporation introduced two new models; the Learjet 31, with a takeoff weight of



McDonnell Douglas flight tested an MD-80 transport powered by a General Electric UDF propfan. The company planned early 1990s introduction of propfan-powered airliners.

15,500 pounds and a maximum range of 1,875 statute miles; and the Learjet 55C, with a 21,000 pound takeoff weight and maximum range of 2,588 statute miles. Cessna Aircraft Company, a subsidiary of General Dynamics Corporation, introduced the Citation V, latest of its business jet line. The 15,900-pound Citation V made its first flight in August; initial delivery was targeted for February 1989.

In rotary wing activity, a NASA/FAA/DoD forum, held in July in Washington, D.C., detailed the results of studies on the potential of tiltrotor aircraft in short-haul commercial service. Industry participants in the studies included Boeing Commercial Airplane Company, Boeing Helicopter Company and Bell Helicopter Textron. The study group saw potential for up to 1,400 tiltrotors of 36-45 passenger capacity serving high density markets such as the Northeast Corridor. Assuming construction of a system of STOLports, the aircraft could be operational by 1995.

In September, the producers of the military V-22 Osprey—Bell Helicopter Textron and Boeing Helicopter—announced a plan for joint marketing of tiltrotors to international customers.

In civil aviation research, NASA was conducting the Propfan Test Assessment (PTA) program involving tests of a tractor-type propfan (as opposed to the pusher-type systems employed in both U.S. commercial projects). Industry participants include prime contractor Lockheed Aeronautical Systems Company-Georgia, Allison, Hamilton Standard, Rohr Industries and Gulfstream Aerospace. The highlight of the year was completion of noise testing by the Burbank Division of Lockheed Aeronautical Systems Company, NASA and the FAA; ground and flight tests were run on a PTA engine mounted in a Gulfstream II test bed.

NASA was also participating in some major R&D programs that have potential for both civil and military applications in future aircraft. Among them was flight testing of the X-29A advanced technology demonstrator, built by Grumman Aerospace for a program sponsored by the Defense Advanced Research Projects Agency (DARPA) with NASA and USAF support. The X-29A incorporates a number of aerodynamic advances, in particular a forward-swept supercritical wing made of composite materials. In midsummer, NASA completed a 104-flight Phase I, in which the X-29A was operated at speeds up to Mach 1.5. Phase II began in July; it involves a year's flight test for study of buffeting, ground effects, structural loads and maneuverability.

In another NASA/DARPA program, the Sikorsky-built X-wing Rotor Systems Research Aircraft made its first test flight on December 2. An experimental vehicle designed to test a concept that combines the helicopter's vertical lift with the faster forward speed of the fixed wing airplane, the X-wing features a four-bladed stiff rotor that can be stopped in flight. For takeoff, hovering and low speed flight, the rotor operates in the spinning mode as a rotary wing; at higher speeds, above 215 miles per hour, the stopped rotor becomes, in effect, two wings, one swept forward, the other rearward. On its first flight, the X-wing flew on jet power without the rotor and some additional hardware that will be installed for advanced testing beginning in 1988.



The first McDonnell Douglas MD-82 built in China rolled off the assembly line in June and was delivered later that month to the Chinese airline CAAC.

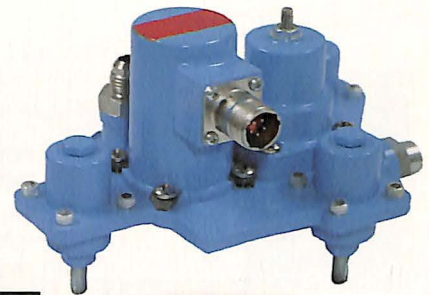


The Cessna Citation V made its first flight in mid-August; initial delivery was planned for February 1988.



Rohr Industries made first deliveries of a superplastically formed heat shield for the General Electric CF6-80C2 engine.

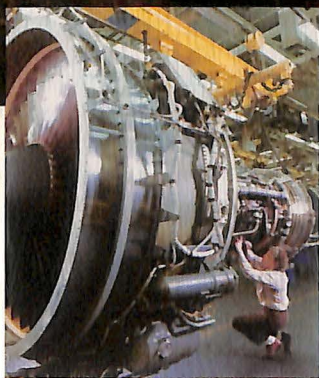
In a control tower mockup, Hughes Aircraft engineers check new automated consoles being developed for the Federal Aviation Administration's traffic control modernization program.



In development by Garrett/Allied-Signal for use on such aircraft as the McDonnell Douglas MD-11 and Boeing 767-300 was an advanced electronic bleed air system for pressurizing cabins; a segment of the system, an electro-pneumatic transducer, is pictured.



In September, the U.S. Customs Service, Westinghouse, and the Bahamian government marked 10,000 flight hours in Project CARIBALL, a balloon-borne surveillance radar program for detecting the flow of illegal drugs into the U.S. A second program was initiated in November with the launching of a radar-equipped aerostat to survey the U.S. southwest border.



Pratt & Whitney's PW2000 series engine, in airline service since 1984, began freighter operations aboard a United Parcel Service Boeing 757-200.



In development during the year was the Pratt & Whitney/Allison Model 578DX propfan propulsion system, shown undergoing test in an Allison wind tunnel.

AEROSPACE OPERATIONS SERVICE



William E. Selby
Boeing Commercial
Airplane Company
Chairman,
Manufacturing
Committee



Terrence H. Hart
Westinghouse Electric
Corporation
Chairman, Quality
Assurance Committee



Robert P. Eldredge
Martin Marietta
Aerospace
Chairman, Product
Support Committee



Wilbur J. Radcliffe
Martin Marietta
Aerospace
Chairman, Logistics
Operations Committee
Chairman



John F. Doyle
Westinghouse Electric
Corporation
Chairman, Materiel
Management
Committee

Manufacturing Conferences

The Manufacturing Committee held its annual industry/government conference in April, featuring the theme "Aerospace Manufacturing—2001: A DoD/Industry Partnership". The program included a number of prominent industry and government speakers who addressed such subjects as Computer Integrated Manufacturing Impact Perspective; NSF Initiatives in Manufacturing Systems; Establishing a Total Quality System; Pushing Into New Electronic Frontiers; and Streamlining. There was also a Cost Management Systems panel.

The Manufacturing Management Systems MTAG of the Manufacturing Committee sponsored a conference on Industrial Competitiveness in September. Speakers from industry, government and academia addressed the potential elements of a U.S. aerospace industry competitive strategy that included technology modernization, total quality management, training and education, competitiveness measurements, customer and supplier networks, and DoD competitiveness incentives.

Manufacturing Committee Reports

Among Manufacturing Committee project reports completed, published and circulated to member companies during 1987 were *Material Requirements Planning Implementation Findings* (MC 85.5); *Profiling the Aerospace Packaging Engineering Function* (MC 85.12); *Artificial Intelligence in Manufacturing Operations, Phase II* (MC 86.1) *Work Instruction Formats* (MC 86.6); *FMS Machining* (MC 86.4); *White Paper on Work Measurement Issues* (MC 87.5); and *Computer Graphic/Solid Geometric Modeling, Phase II* (MC 87.4).

New projects and surveys initiated during 1987 for completion in 1988 included *Simulation in Manufacturing* (MC 87.2); *Analytic Tools in Aerospace Manufacturing, Phase I* (MC 87.3); *Regulation Changes/Performance Oriented Packaging* (MC 87.6); *Reduced VOC Painting* (MC 87.12).

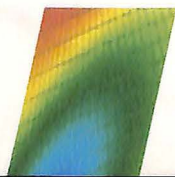
DoD Industrial Base Study

The Office of the Assistant Secretary of Defense (Production & Logistics) requested AIA support for a DoD study of the industrial base, in the form of review and comment on a series of reports—being developed by industry, academic and government experts—that contain recommendations regarding strategy and policy initiatives to be undertaken by DoD and other government agencies to strengthen the U.S. industrial base.

The objective of the study is to create and effectively pursue a DoD strategy to support the fundamental goal of U.S. technological and manufacturing leadership and world class capability. The AIA Management Coordinating Board established a project group made up of members from the various AIA functional councils and committees to provide the requested review and comment. At the conclusion of the comment period, members of the project group participated in a plenary session to achieve consensus on a final set of strategy and policy initiative recommendations. The final product will be presented to Congress by the DoD in early 1988, after which the implementation plan will be announced.

Industrial Modernization Incentives Program

The Industrial Modernization Incentives Program (IMIP) represents a joint venture between DoD and industry to accelerate the implementation of modern equipment and management techniques in the defense industrial base. To aid the negotiation of IMIP business arrangements between DoD and industry, the AIA IMIP Project Group developed a Discounted Cash Flow model that is to be used as a tool by the DoD contracting community to evaluate prospective IMIP projects. The model was expected to be ready for distribution, as a



National Aerospace Standard, to AIA member companies in February 1988. Better understanding of IMIP purposes and procedures by DoD program managers was enhanced by the acceptance of an AIA recommendation to the Dean of the Defense Systems Management College to add an IMIP module to its curriculum.

Priority items for 1988 include consultation and support to NAVAIR to develop a sufficient, stable, and knowledgeable NAVAIR IMIP Staff; development of procedures to conduct IMIP in association with special environment DoD programs; and education through an IMIP Forum of members of Congress and their staffs as to industry IMIP activity and the resulting benefit, planned for May, 1988 in Washington.

Government Quality Initiatives

Each of the military procuring agencies has promulgated regulations requiring institution of quality improvement programs. While these regulations share the objective of improving quality and reducing cost associated with lack of quality, they are very different in their implementation methodology. Some of the implementation procedures are considered burdensome to industry. AIA has expressed its concerns with the differing programs in a letter to the Under Secretary of Defense for Acquisition. The Air Force program is called Get SPEC (Specified Product End Conformance); the Army's, Contractor Performance Certification Program (CP)²; the Navy's, Defect Reduction Program; and the Defense Logistics Agency's, Control of Nonconforming Material.

At yearend, DoD and AIA were working together to develop a Total Quality Management Approach that synthesizes the best elements of all of the current initiatives with the objective of developing a single uniform DoD Quality Improvement Regulation. DoD's goal is to implement this program in 1988.

Nonconforming Material

The AIA Quality Assurance Committee, the National Security Industrial Association Quality and Reliability Assurance Committee, and the U.S. Air Force jointly sponsored a workshop in March to provide an interchange of problems, techniques and methods of implementing both existing and new requirements of the "C" revision to MIL-STD-1520, *Corrective Action and Disposition System for Nonconforming Material*. The revision, which was published on June 27, 1986, contains a number of provisions objectionable to industry. Government participation in the workshop was provided by representatives from Air Force Systems Command, Air Force Contract Management Division, the Air Staff, as well as the Defense Logistics Agency. Thirty-four industrial firms were represented. Resolution of a number of issues was achieved and courses of action to resolve others were developed. At yearend, the Quality Assurance Committee was developing a handbook, for submission to the Air Force, to provide guidance in the implementation of MIL-STD-1520C.

Quality Conference

The Quality Assurance Committee, in conjunction with the National Security Industrial Association's Quality and Reliability Assurance Committee, held its industry-government conference in early October. Keynote speaker Robert C. McCormack, Deputy Assistant Secretary of Defense (Production Support), discussed objectives to guide DoD strategic planning in acquisition and logistics. The conference featured three panels, representing each of the military services, addressing the theme "Operational Readiness—The Ultimate Goal." Discus-



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Committee



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Chairman, Field Support
Committee

sions identified ways that industry can be more responsive to the needs of the military user in field operations. In addition, quality representatives from the DoD, Air Force, Navy and DLA presented current quality and reliability initiatives within their areas of responsibility.

Contractor Operations Review Conference

Held in November, the second annual Contractor Operations Review Conference was arranged to provide feedback to industry from Air Force Contract Management Division (AFCMD) and Defense Logistics Agency (DLA) personnel regarding Operations Review findings, conclusions, lessons learned, plans for the next round of Contractor Operations Reviews (COR), Systems Status Reviews (SSR), Joint COR/SSRs, Source Selection CORs and the schedule and expansion of the operations review process. A number of industry presentations were made regarding various aspects of the contractor audit process including corporate internal audits, collaborative audits, functional audits, product integrity audits, subcontractor procurement audits and labor accounting charge system.

Control of Subcontractors

The Quality Assurance Committee submitted a white paper to the Defense Logistics Agency regarding cost effective resolution of DLA/DCAS initiated Method C/E notices (requests for corrective action regarding a subcontractor's quality assurance program). Some of the issues addressed in the paper are the need for consistent application from contractor to contractor by DCAS Quality Assurance Representatives (QAR); unilateral modification by the QAR of established contractual agreements between a prime contractor and the contracting officer as they relate to the end product and the quality system surrounding its manufacture; a lack of notice prior to issuance of Method C/Es in order to effect resolution of problems; and lack of clear definitions concerning the role of the QAR and the prime contractor in Method C/E resolution.

The white paper concluded that the role of all parties involved in the resolution of Method C/Es needs clarification. It made these recommendations: examine the delegation process and provide guidelines to both the delegating and receiving QARs as to specific product and system task elements with consideration for contract requirements, product manufacture and product application; establish a consistent and effective means of communicating with prime contractor personnel when a potential Method C/E situation exists at a subcontractor facility; and provide prime contractors a reasonable time to review and/or resolve the situation prior to issuance of the formal Method C/E notice.

In an April letter, DLA responded positively to the white paper. At a meeting in May, DLA personnel enumerated the steps taken and planned to implement the AIA recommendations. The white paper was also presented to quality assurance personnel from AFSC and AFCMD with a similarly positive response.

Materiel Management

Electronic Data Interchange (EDI) may have tremendous payoff for the aerospace industry in purchasing. Purchase orders can be electronically recorded and transmitted between two or more distribution channel members, with these transmissions serving as a substitute for written orders. In addition, such systems can transfer related messages such as price and product listing, shipping advice, invoices, payment advice, order status and inventory availability queries. The ANSI X-12 EDI Committee is now developing standards for



such a system. In 1988, responsibility for EDI and membership in the ANSI X-12 Standards Committee will change from the Materiel Management Committee to the newly formed Information Technology Committee under the AIA Operations Service.

Quality Resources Study

The AIA Quality Resources Study, published in June 1987, presents an overview of the aerospace industry's allocation and use of quality resources. Published annually, the study contains 68 quality cost measurements and manpower ratios. Data is presented at the total industry level and by manufacturing type (airframe, engines and accessories, electronics, missiles and space and rocket engines). The study provides member companies with means to identify areas and activities within their organization that are responsible for quality resource consumption. Companies participating in the study can determine how their use of quality resources compares with that of industry.

Work Measurement Status

During 1987, industry provided comments to the Air Force and DoD on a number of proposed work measurement documents. The Manufacturing Committee led CODSIA efforts to review the following: Notice 2 to MIL-STD-1567A and an associated Data Item Description regarding work measurement performance reporting; MIL-STD-1567A *Work Measurement Verification and Audit Plan*; DoD-HDBK-345, the handbook associated with the verification and audit plan; and a DoD proposed rule to implement the requirements in Section 943 of the Fiscal Year 1987 DoD authorization act concerning availability of contractor records. Procurement and Finance Council and Manufacturing Committee members developed an AIA response to a proposed revision to the AFSC FAR Supplement Parts 5315 and 5352, *Work Measurement Policy and Clauses*. The thrust of these documents is toward tighter "how-to" requirements, increased reporting, broader application, and generation, maintenance and analysis of detailed work measurement data. The proposed FAR clauses circumvent the MIL-STD-1567A restrictions on government imposed work measurement system and require work measurement standards even when MIL-STD-1567A is not imposed by contract.

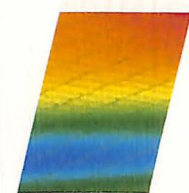
Competition Advocate

The objective of the newly formed Competition Advocate Working Group (CAWG) is to interface proactively with responsible government offices on issues that relate to DoD competition enhancement initiatives. Since the July formation meeting, the CAWG interfaced with the Air Force, Navy and Army Competition Advocate Generals; had representative groups meet with the chairman of the Defense Acquisition Regulation (DAR) Council and the Administrator of the Office of Federal Procurement Policy; and worked successfully its first issue (DAR Case on Subcontract Competition Reporting System). In this case, the Air Force was seeking approval to develop its own reporting system, rather than working toward one consistent DoD system. In the CAWG meeting with the chairman of the DAR Council, this issue was discussed and the DAR Council directed the services to develop one DoD System. At yearend, the CAWG was working with the Competition Advocate Generals to accomplish this task.

Small Disadvantaged Business Utilization

Section 1207, Public Law 99-661 required DoD to set a goal of five percent of its contract dollars to be awarded to small minority firms, including black colleges. The law also authorized DoD to pay up to 10 percent above fair market price, utilize other than full and open competition on a selective basis, utilize Section 8(A) contracting, enhance and provide incentive for prime contractor subcontractor programs, provide technical assistance to small and minority businesses, and report to Congress twice a year on progress relative to minority procurements.

The House of Representatives, concerned that DoD had not implemented Section 1207 fast enough, passed H.R. 1748 which required a five percent minority goal in each "subcontracting



plan" for every prime contract and subcontract over \$500,000. In conference committee deliberation, Section 806 of the National Defense Authorization Act for Fiscal Years 1988 and 1989 did away with this requirement, but required that the Secretary of Defense provide procedures or guidelines for contracting officers to set goals with DoD prime contractors. Those contractors are required to submit subcontracting plans in furtherance of DoD's program to meet the five percent goal established under Section 1207.

The Tri-Association Small Business Advisory Panel (TRIAD), composed of representatives from AIA, EIA and NSIA, worked with the Senate Small Business Committee staff during the development of Section 806, and, with the AIA Competition Advocate Working Group, will work with DoD to develop the policy and regulations to implement Section 806.

Environmental Affairs

The Environmental Affairs Subcommittee continued active efforts to modify proposed legislation aimed at imposing new regional air quality standards and sanctions against industry for non-attainment of the new levels. Working in conjunction with the Office of Legislative Counsel, AIA presented both oral and written testimony on the Clean Air Act Amendments. The subcommittee continued working with the Environmental Protection Agency and the Department of Defense to develop a guidance manual on the Open Burning/Open Detonation of propellants. With joint approval, the guidance manual was to be incorporated into federal regulations covering the disposal of hazardous waste.

Proposed CALS Statement of Work

During an October 1986 meeting, the AIA Product Support Computer-Aided Acquisition and Logistic Support (CALS) Panel was requested by OASD to prepare a strawman CALS Statement of Work (SOW) that could be utilized by DoD agencies to insert in weapon system requests for proposals. This statement would also help acquisition members to standardize CALS requirements imposed on industry. Subsequently, a draft SOW was developed, and after several review cycles a final SOW guidelines draft version became available in September 1987. The goal of this document is to achieve major improvement in supportability and affordability of weapon systems. The scope of this program spans the acquisition, definition, design, manufacturing and logistics processes, with the result being the prime factor for integrating acquisition and logistics systems using product definition data (PDD) to drive the management and logistics process. At yearend, principals were planning a conference to resolve AIA/DoD differences prior to release of an official SOW.

Aerospace Industry Standards For Technical Data

An AIA publications group, having reviewed existing technical data standards, found significant complexity and cost impact in implementing these standards. Technical Text and Technical Graphics teams were formed to study overall problems and recommend appropriate solutions. The Technical Text team developed an Aerospace Industries Mark-up Specification (AIMS) which addresses data base considerations in publishing and electronic display. AIMS provides a glossary, instructions and examples for providing tapes to a receiving system, either that of another manufacturer (subcontractor) or customer. Concurrently, a Document Exchange Specification (DES), which defines mark-up codes needed for electronic displays, was developed.

Key technical specialists who drafted the AIMS and DES documents met with National Bureau of Standards counterparts to review the compatibility of these documents as an input into the enhanced MIL-STD-1840 *Automated Interchange of Technical Information* for use in the Computer-Aided Logistic System standardization effort.

Digital Data Exchange Standards Through CALS

In connection with the DoD Computer-Aided Logistic Support (CALS) program, the Industry CALS Steering Group, in which AIA is represented, was asked to put together work groups for each of the following application areas pertaining to digital data exchange standards: Reliability Analyses, Item Description for Repro curement, Test Program Set Development, Technical Manual Source Data Generation, Logistic Support Analysis Records and Integrated Diagnostics Analysis. By yearend, some AIA representatives had been appointed and were working on defining information requirements for principal electronic equipment logistic applications.

World Airline Suppliers' Guide

Because of the dynamic nature of the airline industry and the continuing flood of new suppliers to the industry, it is essential that each supplier establish for its airline customers a single outline of policy against which all airlines can operate. The purpose of the World Airline Supplier's Guide (WASG) is to assist in this effort. In the past, AIA recommendations for improvement of the WASG received minimal attention. However, with the initiation 18 months ago of a new AIA product support commercial airline panel, a more cooperative relationship has resulted. In April 1987, a joint ATA/AIA proposed WASG revision was initiated and agreed upon. Significant progress was made in establishing language changes that will assist suppliers and airlines in their use of the document. A continuation of the joint ATA/AIA relationship is anticipated for future revisions.

Simplified English

The Simplified English project is a joint effort of the AIA and the AECMA group of European national associations to develop an international maintenance language for the aerospace industry. The impetus for the development of a simplified maintenance language came from the airlines and was based on the need for clear communication of complex maintenance information. Simplified English means a subset of the English language that would eliminate the need for translation, improve the readability of aircraft maintenance procedures and invoke potentially large savings for the airlines and improved customer satisfaction for the manufacturers.

The initial product of this joint study effort was the AECMA Simplified English Document issued in February 1986; changes to facilitate implementation were planned for 1988. Effects of the project have been immediate and world-wide. By yearend 1987, some 200 manufacturers were using the maintenance document for preparing technical documentation. Airlines were realizing the cost-saving benefits; for example, Lufthansa and SwissAir trained mechanics in the use of the document, thus eliminating the 18-week leadtime necessary for translation of technical manuals written in standard English. AIA member companies were providing training sessions in the use of the document to their technical writers and were planning to expand training to include service and field engineers and data management personnel.

Software Standards

The Manpower, Personnel and Training Committee, in response to a Department of Defense effort to implement and standardize the use of computers in the training process, had under development at yearend a white paper setting forth the industry's viewpoint on software requirements to be utilized in computer-based instruction. The decision to develop the industry viewpoint was prompted as a result of meetings with the DoD Training and Performance Data Center, during which the Center expressed concern over the lack of program uniformity in the various services.

Advanced Data Management System

A joint AIA/ATA Publications Task Group completed a compact disc-read only memory (CD-ROM) text trial, a major step in the search for and evaluation of a new medium for the communication of technical documentation. This system, known as the Ad-

vanced Data Management System (ADMS), represents a breakthrough in the ability to intelligently retrieve aircraft and related maintenance information. Information is stored on CD-ROM, the most compact data storage format known. Every word, part number, dimension, and possible phrase are indexed, and therefore can be found and retrieved, offering considerable advantage over retrieval schemes limited to key words or special codes inserted into data to facilitate retrieval.

Spares Acquisition

During the past several years there has been considerable attention—and controversy—relative to the Defense Department's purchases of spare parts. As a result, a number of actions were taken by Congress, the Department of Defense and industry to address those concerns. Early in 1987, an AIA Spares Group developed a briefing that reviews current issues in spare parts. The intent was to promote among members of Congress and their staffs the need to allow current procurement reforms to be fully implemented and their effectiveness carefully evaluated, and to assure continuance of cooperative efforts by industry and DoD to implement truly cost effective initiatives.

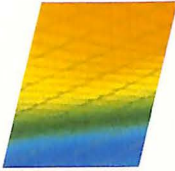
The briefing was previewed at the Army's invitation, via a video satellite network transmitter at Fort Lee, Virginia, to logistics management course students at six Army bases around the country. Because of the excellent response, plans were made to have subsequent briefings of this type given at future Army logistics management courses. On March 27, the briefing was given to Senate members and their staffers. It was well received and reflected interest and concern with the real (hidden) costs to the government of contractor compliance with breakout and competition regulations, quality of the government acquisition workforce, effects of stretchout in administrative leadtime, the industry/government relationship and the need to allow current statutes/regulations to mature before enacting further legislative reforms.

Spares Procurement

The original 1986 recommendations resulting from the joint DoD/Multi Industry Association Panel Meetings, in which AIA was a principal participant, formed the nucleus of the DoD Spares Management Data Master Plan. At yearend, the plan was undergoing final coordination within the Pentagon. It contains over 70 specific action items addressing suggested improvements to the way DoD plans for, acquires, utilizes and shares technical, logistics and acquisition data for better spares management. The plan serves both as an organizer for current spares initiatives and as a framework to incorporate future initiatives as they surface. Approximately 50 of the original DoD/Multi Industry Association Panel recommendations were incorporated as action items in the plan.

Traffic & Transportation

The Traffic and Transportation Committee, in representing AIA member interests before U.S. Customs Service, was primarily concerned with increased enforcement activity, procedures to implement the new harmonized classification system for imports and exports, and efforts by Customs to implement new regulations relating to the definition of fraud in penalty proceedings, the reduction of petitioning time in liquidated damage cases and contractor requirements for obtaining duty free entry of Department of Defense materials. Legislation and regulatory proceedings to retain the benefits of carrier deregulation were supported by the Committee, working with agencies of the administration and industry coalitions with similar interests. These issues included maintaining reasonable tariff provisions for captive and non-bulk shippers, federal preemption of burdensome state regulations and issues relating to highway safety and driver training. In conjunction with the Joint Industry Group, a coalition concerned with trade regulation, the task group on Export-Import issues actively opposed provision under the Omnibus Trade Bill that would provide individuals or industries a private right of action against alleged Customs law violators and the denial of a right to import for those found guilty of repeated violations of the regulations.



AEROSPACE PROCUREMENT SERVICE

Financial Impact Study

The Financial Impact Study (a study of the anticipated impact on the defense industry of the cumulative statutory and regulatory changes made over the past three to four years) was the most ambitious and time-consuming effort undertaken by the Procurement & Finance Council in 1987. AIA took the lead, beginning late in 1986, to develop a work statement for such a study, select a qualified independent consultant and get the study underway. AIA also enlisted the cooperation and support of the Electronic Industries Association and the National Security Industrial Association, who are sharing the cost of the study.

A contract with the MAC Group was signed on May 14, 1987. The premise of the study, i.e., that the regulatory and statutory changes over the past few years will significantly impact the financial capability of the defense industry, was tested on two companies and then the study was broadened to 10 companies. A final report, expected early in 1988, was expected to provide support for recommending a reversal of some recent legislative and regulatory changes.

Material Requirements Planning

After months of meetings and discussions between industry and DoD, the Deputy Assistant Secretary of Defense (Procurement) sent a memorandum on December 10, 1987 to the military departments and the Defense Logistics Agency, containing key elements of acceptable material accounting systems. These key elements and the accompanying implementation guidance should go a long way toward resolving the many issues associated with the use of Material Requirements Planning (MRP) systems. Because of the progress made in developing these key elements, the House Armed Services Subcommittee on Readiness did not move its bill (H.R. 3140) which would require the creation of an advisory committee to recommend standards for MRP systems. H.R. 3140 also contains a requirement for certification by corporate officials that their MRP systems meet all of the standards, as well as all applicable laws and regulations. AIA, along with other industry associations, is adamantly opposed to any such requirement for certification.

Rights in Technical Data

As the project office for a CODSIA Technical Data Task Group, AIA continued to take the lead on rights in technical data. Representatives of the task group met several times with the DAR Council to review both the proposed and final regulations implementing the data rights provisions of the 1985 and 1986 legislation. After the final regulations were issued, AIA authored a letter to the DAR Council and to several members of Congress, noting significant areas in which the regulations failed to implement the intent of Congress.

The principal areas of concern centered around the definition and treatment of private expense data and mixed funding data. The DAR Council adopted an arbitrary 50 percent rule for mixed funding data, i.e., if the contractor's share were less than 50 percent, the government could claim unlimited rights. If the contractor's contribution was more than 50 percent, it would be able to negotiate to give the government license rights. With respect to private expense data, Congress intended that all data resulting from indirectly funded research and development should be private expense data. However, in the regulations the DAR Council only referred to independent research and development. This is being interpreted in some activities to mean only the formally negotiated IR&D program, even though the DAR Council's stated intent was to cover all indirect research and development. At yearend, AIA was attempting to persuade the DAR Council to add clarifying language to the regulations in order to avoid narrow interpretations in the field.



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Truth in Negotiations Act Amendments

A House-passed provision, amendment to the Truth in Negotiations Act, sought to require statutorily that information concerning business plans, projections, or strategies be disclosed once a contractor has made a decision to act on the information, if the information would affect contract cost or price negotiations. The House and Senate conferees agreed to report language on this point which, while not as specific as the proposed statutory amendment, clarified that the definition of cost or pricing data is to be broadly construed, including limited cases in which judgmental data must be disclosed. Additionally, several minor technical amendments to the Truth in Negotiations Act were adopted. However the conferees did not modify the 1986 statutory definition of cost or pricing data.

Prompt Payment

The Office of Management and Budget (OMB) implemented the Prompt Payment Act through its Circular A-125 in 1982. On several occasions since, OMB attempted to revise Circular A-125 and to use it as a cash management tool to slow down the payment of progress payments. (Progress payments on most major programs have been made in five to seven days.) The latest attempt was in June 1987 when OMB proposed an amendment to the circular that would have required that progress payment invoices be paid on or near the 30th day. This slowdown would have caused considerable disruption in the cash flow for most companies.

AIA took the lead in developing a letter to the Director of OMB expressing deep concern for the impact the slowdown would have on AIA members. This letter was signed by eight associations and was followed up by phone contacts with Congressional staffs, Secretary Taft and others in the Office of the Secretary of Defense and to numerous individuals in Office of Federal Procurement Policy and OMB. On September 29, 1987, the Deputy Director of OMB, in a letter to Secretary Taft, agreed that progress payments should continue to be paid as in the past.

Defined Benefit Pension Plan

Concerned that many contractors' funded pension plans had more assets than needed to liquidate obligations and that some were terminating their plans, the Department of Defense issued guidance in September 1986 espousing the negotiation of advance agreements with contractors to assure that the government received an equitable share. While a few companies have negotiated advance agreements, others see no basis for government entitlement. In February 1987, a proposed rule was issued providing for a credit to the government, based on a ratio developed for the 10-year period preceding the date of plan termination.

In a letter to the Under Secretary of Defense, AIA requested the rule be withdrawn; the Under Secretary refused. Near yearend, the Commercial Cost Principles Committee of the Defense Acquisition Regulatory (DAR) Council issued a report recommending a regulatory revision providing government entitlement to a share of excess assets in a terminated defined benefit pension plan. The Cost Accounting Standards Policy Group of the DAR Council was also considering CAS coverage on this matter. While DoD staff activity continued, the Deputy Assistant Secretary for Procurement indicated that DoD was reconsidering its position on pension plan matters.

Self-Governance

The initial efforts of DoD to impose mandatory self-governance through the Defense Acquisition Regulation, were substantially reduced in response to objections by both industry and the DoD Inspector General. The Inspector General was concerned that a mandatory program would be viewed by the courts as conferring the status of agent of the state on employees and would complicate the government's ability to prosecute cases of wrongdoing, particularly when the alleged misconduct was voluntarily disclosed by the contractor as part of its self-governance program.

Subsequently, at the urging of the Inspector General, the Deputy Secretary of Defense signed a letter on August 10, 1987 to top defense contractors commenting on a number of issues associated with self-disclosure under corporate self-governance programs. In addition, Inspector Gen-

eral June Gibbs Brown told the Senate Armed Services Committee during her confirmation hearings that she would like to see the contractor self-governance program "strengthened and continued." She also commented that "all of the fraud and abuse is real," but it is taken out of context. "It is a very small percentage" of the contracting done with the Pentagon and "the image of government contractors taking advantage is just not justified."

Suspension and Debarment

In 1987, there was increasing concern about DoD policies and procedures in connection with suspension and debarment. The Packard Commission devoted more than 10 pages to this subject in its June 1986 report and mentioned it again in its letter to the President on July 10, 1987. The Commission noted particularly that "suspension upon indictment and before conviction is a clear violation of the principle of the presumption of innocence."

A 1987 change in the Defense Acquisition Regulations addressed the prime contractor's responsibility to ensure and certify that it is not doing business with any subcontractors who are on a suspended or debarred list. It also linked suspension and debarment with self-governance, and stated that voluntary disclosure will be given favorable consideration if a firm is being considered for suspension or debarment.

At yearend, there was no indication that DoD planned any action with respect to the remaining Packard Commission recommendations. Therefore, AIA planned to write to the appropriate level in DoD to urge changes in DoD policies and procedures to conform to the Packard Commission's recommendations, particularly with respect to suspension upon indictment.

Progress Payments

In November 1986, DoD lowered the progress payment rate from 80 to 75 percent for large businesses and from 90 to 80 percent for small businesses. The changes implemented Public Law 99-500, the continuing resolution providing DoD funding for Fiscal Year 1987, which required that progress payment rates be lowered at least 5 percent.

The impact of these changes is being addressed in the AIA-sponsored study of the collective financial impact of recent legislative and regulatory changes. Preliminary results indicate that progress payment changes, which have more than doubled contractor working capital requirements, are among the most damaging of DoD's recent policy moves.

Progress payment suspensions are another concern. In September 1987, AIA wrote to the Under Secretary of Defense to express industry's concerns regarding arbitrary and unwarranted suspensions and withholdings. Their response promised to remind the military services and agencies of proper DoD progress payment policy, but provided little hope of strong OSD leadership in this arena.

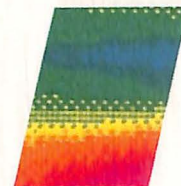
Foreign Selling Costs

Directed by the White House to reduce arms sales, the Department of Defense deleted foreign selling costs as an authorized overhead cost allocation to DoD contracts in 1979. Although the policy was subsequently repealed, the disincentive to foreign marketing continued to work and the U.S. share of the world market declined.

In 1984, a DoD initiative to return to the pre-1979 policy was blocked when a provision was inserted in the Fiscal Year 1985 DoD Appropriations Act—repeated in the FY 1986 and FY 1987 Acts—which precluded a return to the earlier policy. Industry strongly objected to this prohibition as neither cost effective nor reasonable and consistently advocated its repeal.

In the DoD Supplemental Appropriations Act for FY 1987 (Public Law 100-71) language was included that allows costs incurred to promote American aerospace exports at exhibits. A proposed rule allowing such costs was published in early December.

Deputy Secretary Taft wrote to the appropriations committees urging that the prohibition on foreign selling costs be dropped in FY 1988. AIA wrote to the Chairmen of the Defense Subcommit-



tees on Appropriations endorsing the recommendation of Secretary Taft. However, Congress retained this provision for FY 1988.

Employment Cost Index

In recognition of the need to improve the measurement of aerospace labor cost changes, AIA and the Bureau of Labor Statistics (BLS) signed an agreement where the BLS will develop an employment cost index for the aerospace industry. Over a period of 18 months (beginning October 1, 1987 and concluding March 1989) BLS will develop and publish an ECI series for SIC 3721 (Aircraft), SIC 3724 (Aircraft Engines and Engine Parts), SIC 3728 (Aircraft Equipment), and SIC 3761 (Guided Missiles and Space Vehicles).

The contract covers three fiscal years with a price of \$352,000 for FY 1988 with annual adjustments for increased costs, as determined by the Office of Management and Budget, which will not exceed 10 percent of the amount of the prior year's contract value.

Key features that the ECI will include are lump sum wage payments as well as inclusion of white collar workers in its measure of total employee compensation. The first published aerospace ECI data will be for the first quarter of 1989 and will be updated quarterly thereafter. BLS has agreed to provide three progress briefings during the development phase.

Cost Accounting Standards/OFPP Reauthorization

The Department of Defense set up a Cost Accounting Standards (CAS) Policy Group to be the focal point for changes, interpretations, etc., to the standards that were incorporated into the Federal Acquisition Regulation (FAR), effective October 1, 1987. By yearend, DoD had proposed two relatively minor changes which were ready for final publication. Industry does not favor retaining this function in DoD.

Several bills were introduced to re-establish a CAS Board. Representative Brooks included this subject in H.R.3345, a bill to reauthorize the Office of Federal Procurement Policy (OFPP). The bill would establish a seven member Cost Accounting Standards Board under OFPP. The Board would consist of the OFPP Administrator and two representatives each from government, industry, and public accounting firms. The Board would have responsibility for cost principles as well as CAS.

As the 1987 session closed, Brooks' Government Operations Committee had not yet reported the bill. The chairman of the House Armed Services Committee (HASC) requested sequential referral.

On October 15, the Secretary of Defense wrote to a number of members of Congress opposing the legislation. DoD objects to several features of H.R. 3345, but, with respect to CAS, is particularly opposed to giving a CASB authority over the cost principles (cost allowability). At yearend, the Senate had not set hearings on OFPP reauthorization.

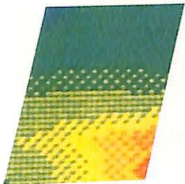
Independent Research and Development

The Procurement and Finance Council continued to work jointly with the Aerospace Technical Council, and with other associations (principally EIA and NSIA), on the issue of Independent Research and Development (IR&D) and Bid and Proposal (B&P). A tri-association group met approximately every six weeks to review the various issues.

There are several activities which should create heightened interest in IR&D and may pave the way to reopening with Congress the issue of full IR&D reimbursement. Among them are:

- An IR&D benefits brochure, prepared by AIA, and
- A RAND study (contracted by DoD), to be published early in 1988, which is expected to provide very positive support for the IR&D concept.

Hearings on changes in the IR&D process before the House Appropriations Committee were planned for the Spring of 1988. AIA planned to emphasize that government should pay its full share of IR&D costs in order to stimulate new products and maintain the U.S. competitive position in the world marketplace.





Profit Reporting

AIA has consistently objected to any proposed profit reporting legislation that would set up a new bureaucracy and require the reporting of commercial profits. Draft legislation proposed by GAO and measures introduced by Senator Proxmire and Representative Bennett contained these features. By yearend, hearings on such bills had not been held.

In anticipation that profit reporting might be added to the Fiscal Year 1988 DoD Authorization Bill, AIA prepared an alternative legislative proposal that would: require the Secretary of Defense to establish a one time commission to develop a profit methodology; require DoD to conduct profit studies every three to five years; and provide for such profit reporting as necessary to determine whether changes in the profit policy were needed. However, the subject of profit reporting did not come up during the authorization bill process.

At the OFPP reauthorization hearings on June 18, the Administrator of OFPP announced that he was forming a task group of OFPP, GAO and DoD to undertake a study of profit *methodology*. In view of this step, several industry associations worked together to develop a proposed profit methodology, which they furnished to OFPP in October 1987, the basic purpose of which was to have an agreement beforehand on the data that will be required or used in conducting profit studies, thus avoiding the continued disagreements by GAO and others as to methodology every time DoD does a profit study.

Facilities and Property Accountability

DoD has become concerned about accountability of government-owned property in the possession of defense contractors. Studies by the General Accounting Office (GAO) and DoD Inspector General showed an increase in this area in contrast to efforts by DoD to phase-down government ownership. Consequently, in November 1986, the Under Secretary of Defense issued a memorandum to the Secretaries of the military departments and Directors of defense agencies requiring action ranging from increased discipline in implementing existing policies to revising the Federal Acquisition Regulations (FAR). DoD will track improvements on a regular basis through various forums.

On a test basis, contractors are required to report additional information in a different format through a revision to the existing DoD Form 1662.

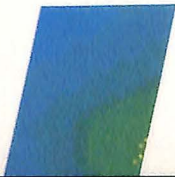
Government sources estimate that approximately \$44 billion of government property is accountable to defense contractors. Industry estimates the value is between \$100-300 billion. Establishing a baseline to track property represents a major problem for both government and industry. The revised Form 1662 requires contractor reporting of property on a contract-by-contract and program-by-program basis.

Testing of the revised Form 1662 was completed and implementation of the new requirements became effective October 15, 1987. Effectiveness of these changes in accountability reporting toward the goal of reducing government property in contractors' possession remained to be seen.

Financial Task Group

Early in 1987, the Procurement & Finance Executive Group agreed that a Financial Task Group was needed to fill a long standing void in dealing with financial accounting issues. The Task Group was formed initially under the chairmanship of Art Lowell of Boeing, and later under the chairmanship of Jim Cunnane of General Dynamics. The group consists principally of corporate controllers.

The areas of primary responsibility developed in the three meetings held this year are: AICPA Audit Standards. (The Task Group is taking the lead in developing comments to an exposure draft of a proposed AICPA audit and accounting guide, *Audits of Government Contractors*); Treadway Commission Report; Financial Accounting for Post Employment Benefits; Financial Accounting for Cost Sharing Development Contracts; Financial Accounting for Mergers and Acquisitions; Financial Controls for Highly Classified Defense Programs; and Government Intrusion into Financial Accounting.



AEROSPACE RESEARCH CENTER

Internationalization

The Center concluded an in-depth study entitled *The U.S. Aerospace Industry and the Trend Toward Internationalization*, working in cooperation with AIA's International Council. The study explored the nature, roots, and direction of internationalization, examined the implications, and explored strategies for success in the evolving international marketplace. It is intended to educate policymakers and the public about the kind of marketplace in which aerospace manufacturers must function and the policy issues that need to be addressed.

The intensive competition in the world aerospace industry has been shaped in large part by the influence of national governments interested in garnering the benefits that a domestic aerospace industry offers. The resulting overcapacity, plus domestic purchase preferences—added to the enormous investment now required for any new aerospace system—have played a major role in the development of an *internationalized* industry. The global aerospace industry is characterized by increased trade and by direct investment and licensing across national borders. There are also growing numbers of joint ventures and other cooperative business arrangements in both the civil and defense sectors.

The issues concerning international cooperative relationships are complex, but the difficulties and disadvantages must be balanced against the expanded opportunities they offer to participate in the marketplace. In many instances, there is no market access outside of a cooperative venture. For the United States, success in the international marketplace—and the ability to benefit from international business arrangements—will depend upon maintaining the industry's financial health and a margin of technological superiority. The United States must forge a national strategy to help industries such as aerospace succeed. That strategy must address the full range of policies which influence capital investment decisions; technology transfer; support of research and development; trade policy; and education, particularly in science and mathematics.

Government Support—Commercial Transport Industry

Center staff developed the AIA publication *Does the United States Support Its Commercial Transport Manufacturers Like Europe Supports Airbus?* and contributed data for a companion piece *Continued International Cooperation in Aerospace*. This project of the Office of Civil Aviation was an effort to contribute to the dialogue on important issues facing the commercial transport industry. The publication addresses the issue of subsidies and the claim of European manufacturers that U.S. government spending, especially defense spending—as well as certain U.S. government policies—constitute aid to U.S. commercial transport manufacturers.

The AIA publication sets the record straight. It points out that the U.S. government does not directly support its transport manufacturers as do European governments and explains how the industry has—and has not—benefited by government funding or policies. AIA's contention is that direct government support for production development, production and marketing distorts the market and hurts everyone—and that the U.S. and European governments need to agree on the rules regarding government participation in the civil aircraft sector and abide by them.

Campaign '88

For Presidential candidates and others concerned with major national issues, the Research Center prepared a summary piece that includes a report on the industry's current status and prospects, and its views on critical issues: world market competitiveness, financial health of the defense industry, research and technology development and space policy.

Campaign '88—An Aerospace Perspective points out the important contributions of aerospace to the economy and to technology development, as well as national security. It contends that the industry's ability to contribute to economic growth, technology development, and national security are seriously threatened today by the growing strength of competitors, often strongly supported by their national governments; by a damaging domestic economic environment of which the national budget deficit is but one manifestation; and by severe pressure on the defense sector resulting from its unique relationship with the government.



Facts & Perspective

Two Research Center information briefs were published. The April issue presented a profile of the aerospace industry and its role in the economy, and detailed aerospace contributions. Aerospace is a major employer and exporter, with a significant trade balance—the highest of any U.S. manufacturing sector. Aerospace is also a major purchaser of goods and services and thus has a broad impact on a range of supplier industries. The industry has been a key contributor to the growth of the commercial air transportation industry, and its technology spinoffs find application in products and systems which enhance health, safety and the quality of life. The industry profile also discussed the important role of research and development in the industry, and the fact that the industry's ability to make major contributions to the economy rests largely on its R&D investment.

The September 1987 *Facts & Perspective* described the substantial growth in world trade in aerospace products and the significant increase in both U.S. exports and imports. At the same time, increasing competition for world markets is demonstrated by the United States' declining share of world trade in aircraft and parts—even as U.S. exports of aerospace products increase.

Year-End Review and Forecast

Research Center staff prepared 1987 year-end estimates of industry economic activity based on three quarters of data, and projected key industry indicators for 1988. The data and accompanying analysis on sales, shipments, backlog, trade, capital expenditures and employment were released at the association's annual Year-End Review and Forecast Luncheon to the media, Capitol Hill, federal agencies and industry analysts.

Statistical Yearbook

The Economic Data Service (EDS) compiled and published the 35th edition of *Aerospace Facts & Figures*, the industry's statistical yearbook. The book presents data and narrative on aircraft production, missile and space programs, air transportation, helicopter usage, research and development, foreign trade, employment and finance, updating each time series with the latest available data. The theme of *Facts & Figures* in 1987 was the visionary perspective of aerospace scientists and engineers, and the long years of development and testing that precede introduction of new aerospace systems.

Statistical Series

Interim reports of data collected by EDS were released throughout the year in more than two dozen statistical series addressing general industry activity, employment, aircraft production, foreign trade, DoD and NASA contracts, obligations and outlays.

Surveys

EDS annually conducts an industry employment survey. The 1987 survey reflected implementation of a new methodology for calculating total aerospace employment; it more accurately accounts for employment in aerospace-related industries.

Assistance was also provided to a number of AIA data gathering and analysis efforts in support of association projects on issues that included facilities management organizations, IMIP/Navair contractual workload projection, and export sales lost despite foreign availability of U.S.-controlled items.

Data Issues

Center staff are providing support, in cooperation with the Procurement and Finance Council, to the efforts of an AIA *ad hoc* group working with the Bureau of Labor Statistics to develop an aerospace employment cost index that will reflect total labor costs. This index will represent a significant improvement over the current aerospace wage series index, providing wider coverage of the industry as well as more accurate data on total compensation for all employees. The index will allow aerospace contractors to account more accurately for changes in labor costs in contracts with their customers.

AEROSPACE TECHNICAL COUNCIL



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Key Technologies

The Aerospace Technical Council project on *Key Technologies for the 1990s* moved forward on both policy and technical levels. The Council briefed AIA members at the Phoenix board meeting, with a request for Board of Governors' approval and support for continuation of the program. The proposed resolution was unanimously adopted by the Board, which endorsed the plan and pledged to support its implementation. President Fuqua's December 16 "Yearender" speech to the media became the public announcement for the effort.

The three elements of Key Technologies for the 1990s include a national cooperative effort among industry, government and academia to focus on the development of identified key technologies; development of policies to facilitate the rapid application of the technology; and focused development of ways to make best competitive use of the expanded technology base.

The eight key technologies were identified by the Aerospace Technical Council on the basis of their high leverage, great potential payoff and wide application to both civil and military products—aerospace and otherwise. The eight key technologies are: composite materials; very large scale integrated circuits; software development; propulsion systems; advanced sensors; optical information processing; artificial intelligence; and ultrareliable electronic systems.

In 1987, the Council accomplished a series of implementing actions in support of the program. Briefings were given to key government officials in the White House Office of Science and Technology Policy, the Department of Defense, the National Science Foundation and NASA. An overview brochure describing the effort was published, and roadmaps to chart the developmental path for each key technology were prepared. Formation of eight key technology groups, with members from industry, government and academia, was underway at year end.

Independent Research and Development

AIA's brochure on the benefits of Independent Research and Development (IR&D) was published late in the year, with widespread distribution planned to increase visibility for the program. The booklet emphasizes that IR&D is the wellspring of innovation leading to new products and is essential to maintaining the U.S. competitive position.

Space Issues

The Space Committee completed a study on *America's Access to Space* which concluded that the U.S. should strive to develop and maintain a capability for assured access to space, in peacetime or in conflict, consistent with the dictates of national security and the national economy. The study identified eight factors that must be addressed in the development of future launch systems: reliability, safety, cost, performance, availability, survivability, technology support and commercial application.

In the area of privatization of space systems, the Space Committee reviewed a proposal for a Launch Service Corporation, a private but quasi-governmental agency to broker launch services. The Space Committee concluded that industry should reject the concept, based on the likelihood of an overabundance of launch capability in the next decade, the desirability of maintaining open competition and the lack of benefits to be achieved by forming a quasi-governmental agency.

Noting congressional concerns about the Space Station, the Space Committee initiated a study entitled *Why Space Station?* The study points out the obvious benefits of the Space Station, not only for the aerospace industry, but to the nation. Key issues covered are short and long range technical benefits, and use of the Space Station as an instrument of national policy.

Acquisition Issues

The AIA Technical Management Committee was instrumental in fostering publication of DoD Directive 5000.43 on acquisition streamlining. In September, DoD issued DoDD-5000.1, *Major and Non-Major Defense Acquisition Programs*, and DoDI-5000.2, *Defense Acquisition Program Procedures*. Both incorporate elements of DoDD-5000.43, which calls for tailored acquisition strategies, use of off-the-shelf components wherever possible, and performance/cost trade-offs. Industry recognizes that implementation of the directive will require a

cultural change within DoD. At yearend, AIA was working to incorporate streamlining provisions into the FAR and expected to see progress early in 1988.

The Technical Management Committee initiated a multi-association effort to help OSD and the service streamlining advocates identify counter-productive requirements, i.e., those that are cost drivers, manpower intensive, or have significant impact on the efficient acquisition of military weapon systems. The CODSIA group evaluated military specifications and standards to identify those considered to be most in need of revision or cancellation. DoD agreed to review those standards that may cause problems. At yearend, a second phase of this study was in progress; it listed 35 additional documents identified as counterproductive.

Responding to recommendations of the Packard Commission Study and the Defense Science Board Study on Use of Commercial Products in Military Equipment, DoD requested industry to identify elements of the acquisition system which impair DoD's ability to acquire commercial products. The industry review concluded that there are numerous facets of the acquisition process that present problems. Papers were developed in the areas of pricing; military standards and specifications; market research and analysis; DoD policies, procedures and directives; the definition of nondevelopmental items; technical data rights; and FAR impediments. AIA urged DoD to focus its implementation of the Fiscal Year 1987 Defense Authorization Act on the acquisition of nondevelopmental items, and not limit implementation to commercial, off-the-shelf items. AIA feels that significant savings can be realized through broad implementation of the Act.

Transition from Development to Production

The U.S. Navy hosted a meeting in February 1987 to encourage industry to get more involved in implementing DoD 4245.7M, *Transition from Development to Production*. A joint industry-government task force was formed to develop implementing recommendations and act as a forum for sharing issues, concerns, and best practices.

The AIA Technical Management Committee expressed strong reservations about the apparent thrust to promote compliance by calling it out in RFPs, to weigh compliance in the source selection process, and to encourage corporations to direct uniform compliance in their line divisions. The TMC presented industry views at an open forum in October 1987. TMC planned to press for the freeing of contracts from conflicting, redundant and unnecessary specifications and "how-to-manage" standards, and to prevent the transition manual from becoming another layer of requirements levied upon contractors.

Standardization Programs

To educate management in industry and government about the benefits of aerospace standardization, the Council initiated a series of "case studies" to document specific instances of standardization efforts that resulted in a measurable payoff in areas such as savings, cost avoidance, product improvement, or safety and reliability. AIA member companies and liaison government organizations were invited to propose candidate case studies, with publication targeted for 1988.

AIA development of National Aerospace Standards in 1987 included publication of 54 new and revised NAS. At OSD request, AIA undertook a program to develop, by 1990, some 300 new metric airframe standards in support of current and future metric systems. To respond to the growing need for AIA standards in digital form, the NAS Committee formed an *ad hoc* committee to study the feasibility of providing standards electronically.

Continuing efforts to harmonize new U.S./European standards, representatives of the National Aerospace Standards Committee met in the summer with members of the AECMA standards organization. The meeting highlighted the desirability of a coordinated U.S. and European strategy regarding international standardization.

International Standardization

At yearend, plans were underway for the 29th plenary meeting of ISO/TC 20, the international committee for aerospace standardization. AIA serves as international secretariat. The meeting was tentatively scheduled for spring of 1988 in Madrid. The ses-



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Chairman, National
Aerospace Standards
Committee



Leon Michelove
The Raytheon Company
Chairman, Materials
and Structures
Committee



Robert E. Warren
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Airworthiness
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Committee



Robert C. Baker
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Committee

sion will bring together representatives of 14 major aircraft producing nations to address issues ranging from qualification/certification to development of standards for space applications.

Metrication

Increased emphasis by the DoD on use of metric units in acquisition was indicated by a September revision to directive 4120.18, *DoD Metrication Program*. The revised directive contains a major policy change requiring the Under Secretary of Defense for Acquisition to approve the nonuse of metric units in all new major systems. Also, it requires that the heads of DoD components designate senior officials to approve requests for the nonuse of metric units in less than major new systems requiring new design.

In a directive issued September 16, 1987 the director of the Strategic Defense Initiative Organization ordered that all newly developed systems for SDI must use the SI metric system. In addition, the policy states the rule applies to any items that are designed, developed or produced using SDI funding "wholly or in part." Also, the policy asserts that systems must be designed in "hard metric" from the start and, in particular, elements of SDI Phase I shall be fully metric by the start of full-scale engineering development.

DoD Adoption of Non-Government Standards

The second conference on DoD adoption of non-government standards was held in the fall in Williamsburg. DoD's long term goal is to stop writing or maintaining Mil-Specs for products that are not inherently military and to replace them with appropriate standards developed by private sector bodies such as AIA, EIA, SAE and ANSI. The Williamsburg conference focused on ways to streamline the DoD adoption process. AIA co-hosted a panel with EIA on user concerns. While supporting the policy thrust, AIA cautioned that implementation must be managed in such a way as to assure technical adequacy of standards replacing canceled Mil-Specs, to avoid negative impact on the procurement process.

DoD Software Development Standards

DoD has been working for six years to consolidate individual service standards for software into common DoD standards. The first consolidated standard, DoD-STD-2167, was issued in the summer of 1985. AIA was deeply involved in updating this standard and the related quality document, DoD-STD-2168. Issuance of a new version of both standards, scheduled for 1987, was delayed by efforts to resolve industry concerns. Some of the issues industry addressed include formulation of the standards to facilitate tailoring, the definition of firmware, and contractor organizational freedom to permit objective evaluations.

Cooperative Research and Development

The Aerospace Technical Council's efforts to explore the potential advantages of cooperative R&D have focused on four technology areas. The Software Productivity Consortium, started as a result of informal discussions at a 1984 Council meeting, is active in the development and integration of automated software tools and reuse of proven software. The Composite Materials Characterization (CMC) consortium, a direct result of Council efforts, was incorporated and was expected to be fully operational in early 1988. CMC Inc. will test advanced composite materials for physical and mechanical properties and will provide this data to participating companies at a greatly reduced cost. Optical Information Processing has attracted support from a nucleus of companies interested in realizing the high potential of optical signal processing for aerospace applications. Additional company and government support is being sought. Finally, the Council explored the need for a High Temperature Test Facility and determined that DoD and NASA developments would fill the need in this area.

FAA Certification Policy

The Aviation Division met in July with members of the FAA Aircraft Certification Management Team on a number of certification issues. The Division stressed that certification requirements need to be defined early in a program and discipline exerted to resist change except where dictated by a legitimate safety issue. Other topics discussed included public involvement in safety issues and international activities, i.e., the number

of multinational ventures being undertaken and efforts to meld U.S. and European airworthiness regulations. The Aviation Division felt that this meeting resulted in greatly improved relations between industry and FAA on certification issues.

Aviation Safety Commission

Congress established the Aviation Safety Commission to conduct an 18-month study into the organization and functions of the FAA. At yearend, the Commission was examining the FAA's dual responsibility of promoting commercial aviation and ensuring aviation safety, and whether FAA should be established as an independent federal agency. AIA developed a position that encourages continuation of the dual responsibilities of the FAA to assure new airplane development, along with ensuring an acceptable level of safety. The AIA position also recommends the establishment of the FAA as an independent federal agency to restore its international stature and to permit the Administrator to deal effectively with Congressional oversight and the Executive Branch.

Engine Icing Requirements

The AIA Propulsion Committee conducted a review of all icing-related damage sustained in commercial service, training flights, and certification flight tests for the past 16 years. The review was prompted by FAA concern over minor damage sustained to several large turbofan engines during experimental and certification flight tests under natural icing conditions. FAA's principal concern is with spinner icing and the chance of continuing to damage the engine in a cumulative fashion as a flight progresses. The AIA data will be the basis for a positive, constructive statement to the FAA regarding the engine manufacturers' test procedures and their disparity with flight test results.

Rotorcraft Issues

In September, the Rotorcraft Advisory Group met with FAA to discuss concerns of the helicopter manufacturing community. The industry briefing covered the Rotorcraft Master Plan, certification of multinational venture products, continued airworthiness of surplus military rotorcraft, and bogus parts enforcement action. The FAA Administrator directed his associate administrators to investigate each concern raised by industry.

The Rotorcraft Airworthiness Requirements Committee created a Crashworthiness Project Group to develop and recommend realistic crashworthiness criteria for future civil helicopters. The recommendations were limited to future products to allow the designer to incorporate recommended safety features along with other design changes needed to accept the added weight.

Transport Airplane Safety

In response to public and congressional urging, FAA initiated rulemaking actions covering cabin fire safety, crashworthiness and emergency evacuation. The Aviation Division is evaluating each rule change individually and assessing the overall effect of the actions. The more significant actions include:

- **Cabin Materials.** FAA's final rule established flammability levels that cannot be met with current technology. AIA and the Air Transport Association countered with a proposal to accept promising new materials and still accomplish a significant increase in flammability resistance.
- **Crashworthiness.** FAA proposed higher seat strength requirements which in AIA's view could result in dangerously stiff seats and a need to modify supporting aircraft structure. Working with seat manufacturers and the airlines, AIA proposed an alternate level which would result in a significant improvement at an acceptable cost.
- **Emergency Evacuation.** FAA completed a study of emergency evacuation procedures and provisions and initiated change proposals that include a limit on distance between emergency exits and location and design of flight attendant seats.
- **Continued Airworthiness.** At yearend, FAA was developing guidance material for maintenance and repair of older airplanes, which could result in increased manufacturer involvement in approval of repairs and alterations to principal structural elements to assure retention of damage tolerance characteristics. Airlines are concerned about the timeliness of such approvals and the impact on maintenance schedules.



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Legislative Issues

Working through AIA's Legislative Counsel, the Human Resources Council developed position papers opposing proposed legislation requiring plant closing/mass layoff control and occupational hazard notification. In addition, the Council continued to monitor the status of major labor-management issues being considered by the 100th Congress, such as comparable worth; anti-double breasting in the construction industry; mandated employee benefits, e.g., health care and family/medical leave; minimum wage; workplace security (polygraph and drug testing); and Davis-Bacon and Service Contract Act reform.

Executive Compensation Study

The Council unanimously approved the development of a focused compensation survey to be conducted by an outside professional compensation consultant.

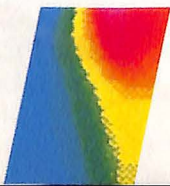
The issues that required AIA to undertake this study/survey were:

- Continuing criticism of defense contractor compensation practices, particularly at the executive/management level, which hinder the industry's ability to compete effectively in today's high technology markets;
- Government reviews (GAO, DCAA, congressional committees) which are predisposed toward a finding that defense contractors are highly paid because of the government's limited access to valid survey data;
- Heightened pressures to reduce costs have focused greater attention on "reasonableness" (therefore allowability) of compensation, including individual executive pay, evidenced by the rationale for transferring compensation reviews from DLA (system review) to DCAA (cost accounting review); and
- Unilateral directives from the Joint Logistic Commanders (JLCs) on forward pricing escalation factors and recent audits interpreting the Federal Acquisition Regulation (FAR) to disallow individual elements/levels of compensation—all of which are symptomatic of the impact on the industry's potential profits and return on investment. The executive compensation survey/study is composed of two parts: an initial one-time study which will provide a broad view of executive compensation practices throughout U.S. industry, and a high technology cross-industry comparative analysis of pay practices, using existing survey sources that focus on a stratified sample of executive/management jobs (corporate through division), which will be provided annually to participating companies and made available to government review agencies.

The survey/study results will be available to each participating defense contractor for subsequent use in individual contractor compensation reviews. A permanent compensation task force of senior professionals was established to supervise consultant performance as well as to develop a strategy addressing those broader compensation cost principles embodied in the FAR as interpreted by DCAA, JLCs, etc.

Congressional Hearings

On October 23-24, the House Committee on Education and Labor and the Subcommittee on Employment Opportunities held hearings on the equal employment and affirmative action performance of eight Southern California aerospace contractors who were alleged to be the source of a substantial increase in the number of complaints being filed that claim race, color, sex, and/or age discrimination as well as national origin or religion. The Committee collected statistical data from the eight contractors regarding hirings, promotions, and terminations of Hispanics, blacks, Asians, American Indians, women and white males for each of the fiscal years 1979 through 1986. At the request of the seven members contacted by the Committee, AIA did not develop a coordinated position on this issue. The members individually responded to the House Committee's request for their Equal Employment Opportunities/Affirmative Action Performance data and their testimony at the hearings.





Hazardous Materials Information System

AIA has developed a working relationship with DoD's Defense Logistics Agency whereby some 30 member companies are participating in their Hazardous Materials Information System, which is a large-scale database containing more than 42,000 elements of Material Safety Data Sheets (MSDS), covering most of the hazardous materials used by the defense industry. AIA companies have provided over 3000 MSDS's to the HMIS database. This program is an outstanding example of industry/government cooperation toward systematic resolution of mutual concerns. The HMIS is the only known comprehensive health, safety transportation and disposal database in existence and has been built, to a great extent, by DoD/AIA partnership.

IR&D Security

In pursuit of IR&D task assists, contractors require a means to work with each other to accomplish state-of-the-art exchange of classified information. At present, no means exists within the Industrial Security Manual (ISM) for the exchange between contractors of classified information, classification guidance and the use of source material for the term of the IR&D. AIA has proposed changes to the ISM that would allow for contractor-to-contractor exchange of IR&D classified materials. Having been told that such changes would require extensive, time consuming coordination within DoD, perhaps many years before final approval, the Industrial Security Committee was making efforts to reduce this time-phase to a year or less.

Personnel Security Clearances

Upon completion in 1986 of an initial feasibility test on electronic transmission of personal security clearance applications and approvals, AIA expanded the test sample from six to 14 defense contractor participants. This contractor test network uses commercially available software, data encryption standard (DES), and an electronic "mail box."

By later spring/early summer of 1988, a system will be in full operation to electronically transmit clearance application data and clearance approval between contractors and DISCO. Time savings for clearing employees for the job for which they were hired will run between seven and 10 working days. Further improvements in the data system will result in even greater savings to contractors and the government in both time and dollars.

Hazardous Communication Standard

The U.S. Occupational Safety and Health Administration's Hazardous Communication Standard was extended to all manufacturers on May 25, 1986 with wide ranging implications for the way contractors must account for, and communicate the presence of, hazardous materials in the workplace. At yearend 1987, many details of implementation—such as uniform package labeling, developing of employee training programs, and means of resolving differences between federal, state and local "right to know" laws—were being coordinated within AIA's Occupational Safety and Health Committee.

Telecommunications Security Training/Certification

AIA's Industrial Security Committee, with the National Security Agency (NSA), has developed a program to train selected contractor personnel in NSDD 145 telecommunications security requirements. Contractor employees successfully completing the course will be certified as the principal contractor authority and contact for NSA on all telecommunication security matters.

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The Omnibus Trade Bill

At year end, the Omnibus Trade Bill (H.R.3) was stalled in the Congress. Passed by the House on April 30, 1987, and by the Senate on July 21, the bill was being addressed by a conference committee at yearend and passage was expected in the spring of 1988. AIA expressed concerns on a variety of key issues of the trade bill directly to the conferees and planned further work with them in 1988.

Arms Export Controls

AIA offered specific recommendations on arms export controls in testimony presented to the House Subcommittee on International Economic Policy and Trade on March 12. As a direct result of AIA's efforts, the House Committee on Foreign Affairs and the Senate Foreign Relations Committee amended the Arms Export Control Act of 1976 to require the President to review, revise and republish arms export control regulations at least once every two years. Also, specifically at AIA's request, the leadership of the House Foreign Affairs Committee sent the Secretary of State a letter on August 14 requesting that the Executive Branch conduct a thorough review of the arms export control licensing system, toward improving and rationalizing the functions of the Office of Munitions Control and the International Traffic In Arms Regulations and submit formal comments to the House Foreign Affairs Committee. At year-end, AIA was awaiting a copy of the report and planned to testify in oversight hearings.

Licensing

AIA devoted considerable effort to improve the processing of export license applications in the Office of Munitions Control (OMC), Department of State. OMC now processes more than 50,000 licenses a year and the load places a heavy burden on limited resources. Technical aspects of license issuance suffer from inadequate facilities and staffing.

Consultations between AIA and senior Department of State officials elicited recognition of the problem. Proposals to improve the process included defined public hours to permit licensing officers more time to process cases, new high-speed machinery to supply data and to produce copy material, laser printers, electronic bulletin board and new data processing capabilities.

Foreign Availability

A critical element in the improvement of U.S. export controls is the test of foreign availability of technologies. In 1987, AIA presented a package of arms export control improvements to the Congress. The core of AIA's proposal called for shifting the responsibility of identifying technologies available abroad from the government to the private sector. While many of AIA's recommendations were readily accepted, the proposal on foreign availability ran aground due to Congressional reluctance to leave to the private sector "certification" of foreign availability.

AIA believes the question of terminology can be resolved, particularly if the aerospace industry graphically illustrates the negative impact on its exports because of failure to recognize the availability of items abroad. To that end, the International Council and the Aerospace Research Center formulated a survey of member companies for specific examples of sales lost because of U.S. controls, even though comparable equipment is available abroad. The Electronic Industries Association has joined AIA in the survey, using the AIA model to solicit its membership.

Technology Cooperation

In terms of the climate for U.S.-Japan cooperation, 1987 was not a banner year. Disputes over semi-conductors, the Kansai International Airport, various trade issues, and Toshiba Machine Company's export control violation clouded the atmosphere.

On the positive side, the two governments reached agreement on implementing Japanese participation in the Strategic Defense Initiative. The two DoD Technology Assessment Teams—one on electro-optics and micromillimeter wave technology, the other on advanced manufacturing techniques—continued to report positively about Japan. The most significant opportunity of all is proposed collaboration on Japan's next-generation fighter support aircraft, known as "FSX."

A few obstacles remain in the path of expanded U.S.-Japan technology cooperation, among them the Japanese government's desire to reserve the right to veto U.S. sales abroad and DoD controls relative to ownership of data.

NATO Cooperative Programs

A major effort of the Department of Defense in the international area centers on NATO Cooperative Programs for conventional defense, the so-called Nunn Projects. AIA solicited DoD in each case for an enlarged opportunity to assist in the generation of the specific Memorandum of Understanding relating to each project. AIA worked closely with the Defense Advisory Committee on Trade (DPACT) to formulate with the Department of Defense procedures for improved consultation with industry. DoD expressed willingness to work through AIA, the DPACT and the Industry Sector Advisory Committee to develop specific guidelines for consultation before memoranda are negotiated.

Export Finance

The Export-Import Bank (Eximbank) has been generally adhering to the terms of the 1985 Large Aircraft Sector Understanding Agreement (LASU). The agreement was accepted informally by the major aircraft manufacturers and has since been formally approved by the Organization for Economic Cooperation and Development (OECD) and the main aircraft exporters. Negotiations to reconcile the difference between the methods employed by European manufacturers in covering the "upfront" fee charged to the exporter and that provided by U.S. manufacturers who export with Eximbank support continued in 1987. The European system includes a subsidy at times, when it is necessary to clinch the sale. Eximbank charges an "upfront" two percent fee, which appears to some as an unfair burden. According to Eximbank, most major companies on both sides are nearing an agreement to reconcile this problem "in principle." In other words, the U.S. financing package will look like that available to the Europeans if an agreement is reached.

Offsets

The magnitude of offsets, as an element in competing for international sales, is a serious and growing trade distortion. Offsets have become an economic fact of life in commercial as well as our military export sales. The area most affected by offsets is industrial competitiveness. While recognizing the economic benefits, a 1987 OMB report states that the foreign production infrastructure created in the context of an offset agreement will lead the purchasing governments to commit to sustaining the resulting capability. The implication is that the U.S. defense industries may continue to lose market share in the international market, as foreign subcontractors become more sophisticated and efficient and their governments become more committed to their development.

International Space Policy Committee

Rapidly rising costs and complexity of space efforts has provided a growing incentive for countries, including major space powers, to seek international partners. However, U.S. policy on this subject remains unclear and at times contradictory. The AIA International Space Policy Committee is concentrating effort in this area to identify policy issues and to formulate proposed AIA positions. Significant international space developments of 1987 included: renewal of the U.S.-Soviet Agreement on Cooperation in Space; protracted negotiations with foreign partners in the NASA Space Station, with major issues still outstanding; accelerated tempo of foreign space efforts, both those of individual nations and of international organizations; growth of an international commercial launch industry; and level playing field discussions with ESA and France on commercial launch services.

Foreign Contacts

A major new thrust of AIA in 1987 was initiation of expanded contacts with foreign counterpart organizations to determine if periodic meetings can identify and resolve international industrial issues at the industrial level before they are shifted to the political arena. AIA met with seven counterparts from Australia, Canada, France, Germany, Italy, Japan and the United Kingdom, in one-on-one meetings. Future meetings with complete agendas were planned.



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United Technologies
Corporation
Chairman, Finance
Committee*



*Dr. Brenda Forman
Lockheed Corporation
Chairman, International
Space Committee*



*Raymond Garcia
Rockwell International
Corporation
Chairman, Legislative
Committee*



*Dr. Ellen L. Frost
Westinghouse Electric
Corporation
Chairman, Technology
Cooperation Committee*

OFFICE OF CIVIL AVIATION

GATT Agreement

The AIA Ad Hoc Committee on the GATT Agreement on Trade in Civil Aircraft was active throughout the year providing advice to the U.S. government. The industry's effort related to two provisions of the GATT Agreement in Civil Aircraft, Article 4, on inducements and government intervention in the marketplace, and Article 6, which deals with the question of subsidies. The industry goals include disclosure of governmental financial support to civil aircraft programs, including provisions for recovery and recoupment; limitation of government subsidies including grants and low interest or nonrecourse loans to research, rather than aircraft development; prohibition of inducements for aircraft sales; and the prohibition of political or ministerial influence in aircraft or component procurement.

During 1987, the U.S. government conducted discussions with the European Economic Community and the four Airbus governments (France, West Germany, Great Britain and Spain). While some agreements had been achieved by yearend on inducements and future production supports, there remained major areas of disagreement. The important areas requiring resolution included the terms and conditions of future launch support and equity infusions, the elimination of trade distorting effects of past government support and indirect government support.

In addition to advising the government on this issue, AIA testified before a congressional subcommittee and prepared two position booklets, *Continued International Cooperation in Aerospace: A Requirement For Success* and *Does the United States Support Its Commercial Transport Manufacturers Like Europe Supports Airbus?*

Foreign Repair Stations

The Office of Civil Aviation worked with the Office of Legislative Counsel, the Operations Service and the Technical Council to coordinate AIA's activities related to the FAA's regulations governing the repair of U.S. registered aircraft in foreign repair stations. In June, House aviation leadership raised questions concerning the safety and job related impact of FAA's plans to liberalize these regulations. AIA and industry representatives testified before the Subcommittee on Aviation of the House Committee on Public Works and Transportation. AIA supported the modernization of the FAA's regulations governing foreign repair stations to recognize the international nature of the industry and U.S. obligations under its multilateral trade agreements. The Office of Civil Aviation also coordinated the association's activities to resist an attempt in the House Continuing Resolution to forbid FAA from spending any funds on the NPRM on foreign repair stations.

FAA Special Inspections

The Office of Civil Aviation has begun to monitor the FAA's special manufacturing inspection program, "Operation Snapshot," introduced in September. Spurred by the rapid introduction of new manufacturing technologies and product incorporated technologies, as well as the proliferation of foreign offset-type contracts in component production, the FAA decided that a thorough examination of its quality control procedures, data collection and inspections was in order. The AIA Board of Governors established an *ad hoc* committee to monitor progress on these inspections, support the process and present industry's views.

Brazilian Informatics Policies

In December, the Office of Civil Aviation, working with the International Council, testified to the Section 301 Committee on Proposed Trade Retaliation Against Brazil pursuant to action under the Trade Act of 1974, supporting the aggressive use of U.S. trade policy statutes. However, AIA noted that the Brazilian government also maintains certain policies to support its indigenous aircraft industry, policies which may discriminate against U.S. manufacturers of general aviation aircraft. AIA recommended that the general aviation trade problem be resolved using a separate track, not as an element of the informatics trade issue. The association requested that complete aircraft be removed from the list for U.S. retaliation because failure to do so would risk counter-retaliation by Brazil against U.S. aerospace products, jeopardize billions of dollars worth of pending and future U.S. aerospace exports to Brazil, and encourage sales of competing products.



OFFICE OF LEGISLATIVE AFFAIRS

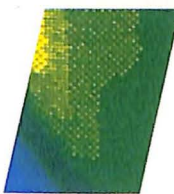
In 1987, the Legislative Office worked with AIA staff and member companies to prepare testimony for presentation to Congress on a number of matters of direct interest to the industry, including:

- Export control reforms (with regard to both the Export Administration Act and the Arms Export Control Act);
- Defense contractor profit policy;
- Implementation of acquisition policies;
- Material requirement planning systems;
- The reauthorization of the Office of Procurement Policy;
- The competitiveness of the U.S. commercial aircraft industry;
- Revision and updating of FAA regulations on foreign repair stations;
- The Clean Air Act.

In addition, approved position papers and/or letters were submitted to Congress on:

- Industrial preparedness and the defense industrial base;
- Proposed amendments to the Arms Export Control Act;
- Reform of the Service Contract Act (S. 266);
- The Omnibus Trade Reform bill (H.R. 3);
- The Government Contractor Whistleblower Protection Act (H.R. 1716);
- The Completed Contract Method of Accounting.

AIA also appropriately communicated with Congress regarding:

- Clean air standards;
 - Government contractor indemnification;
 - The allowability of foreign selling costs with regard to DoD contracts;
 - Israel's use of foreign military sales credits in connection with the Lavi cancellation
 - A House proposal to apply the unrelated business income tax against the passive income of Section 501(c)(6) organizations.
- 

OFFICE OF COMMUNICATIONS



Julian R. Levine
TRW Inc.
Chairman,
Communications
Council

Communications activities in 1987 primarily involved support for AIA's new president, together with planning and initial actions in an aggressive communications program that produced visible results during the year.

Among major actions was development of a detailed communications plan, while a companion effort involved identification of AIA's priority issues. After inputs from various sources, including members and the AIA staff, a list of 10 issues (see page 6) was compiled by the Communications Office and approved by President Fuqua. These issues were incorporated into the communications plan, which then became the actual blueprint for action. The issues and plan were subsequently briefed to the Executive Committee of the Board of Governors and approved on August 10. The Communications Office was reorganized to conform to the emphasis in the plan on media relations and member relations.

Support for the new president involved development and implementation of a short range plan providing, among other things, for orientation visits to member company headquarters; courtesy calls on key DoD and service leaders and those in other government agencies; preparation of speeches and other backup materials; and selected news media activities. By yearend, President Fuqua had visited the headquarters or major elements of 21 member companies, delivered 29 speeches, and participated in 71 events involving the news media, including four TV interviews.

Media Relations

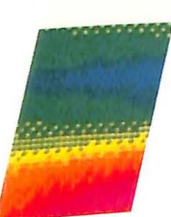
Media activities accelerated to a rapid pace, building on renewed media interest generated by a series of breakfasts for selected news media representatives with President Fuqua. During 1987, 10 breakfast meetings were attended by a total of 34 media representatives. As intended, these breakfasts accomplished several objectives: to introduce President Fuqua to defense and business oriented media; to establish him as a spokesman for the industry; to give him a chance to actively discuss selected issues with the media; and to establish AIA Communications as a must point-of-contact for the press when they are working a story involving the aerospace industry.

Evidence that the latter objective was being achieved was a sharp increase in the number of queries received by AIA and in stories with an AIA input, frequently a quote from President Fuqua. The President participated in 49 interviews and there were at least 50 media reports that quoted him or mentioned him as a source, not counting the heavy media coverage from his December Yearend Luncheon speech, which was still coming in at yearend. Additionally, President Fuqua by-lined two magazine articles, one in *Aviation Week* on defense-industry relations and one in *Military Logistics Forum* on profit policy. He also by-lined an op-ed piece challenging a series adverse to industry in the *Cleveland Plain Dealer* and issued six statements on special subjects. Several letters-to-the-editor from the President were published, including two in December—one in the *Washington Post* and the other in *Aviation Week*.

Member Relations

Within member relations activities, the primary emphasis in 1987 was on generating and compiling the information needed to create a backup book for each of the 10 identified issues. These books were compiled in time to provide the basis for a workshop on the issues during the October Communications Council meeting. This was a major undertaking, since each book contains some or all elements such as position papers, fact sheets, speeches or speech segments, questions and answers, congressional testimony, brochures, sample articles or editorials, news releases, a current clipping file and a bibliography. The continually updated issues books are available in whole or in part to member companies by telefacsimile or overnight mail, depending on the requirement.

In another member relations activity, regular monthly meetings of the Washington public affairs representatives were reinstated in a breakfast format. Beginning in May, seven were held by yearend; they provided an effective and efficient forum for updates on issues and activities, exchange of ideas and discussion of problems.



Council Meetings

The Office of Communications prepared agendas and handled arrangements for two meetings of the renamed AIA Communications Council (formerly Public Affairs Council), one in Washington, D. C. in April, the other in Phoenix, Arizona in October. Both meetings were well attended and regarded by participants as highly productive.

In September, the members of the Communications Council Executive Committee met jointly with their counterparts from the Electronic Industries Association. It was determined that such meetings are useful and should be held periodically. This was a continuation of an effort to work cooperatively with associations and groups with kindred interests to avoid, where possible, the duplicative effort that can occur when the same companies belong to several associations.

Speechwriters Workshop

In mid-December, AIA hosted a day-long workshop for member company speechwriters in Washington. Emphasis was on briefing attendees on the major issues of concern to industry and on special materials and sources, available through AIA, which addressed those issues. More than 30 company representatives attended and initial feedback was very favorable.

Publications

As part of its effort to reorganize, redirect and expand the AIA public affairs function, the Office of Communications commissioned—in July—an audit of AIA publications. The audit was completed in September. Based on the results of the audit, it was decided to discontinue publication of *Aerospace* magazine; to increase the frequency of *Key Speeches*; to change the format of the *Annual Report* to a more standard size and to incorporate the use of color art; and to publish a newsletter that would also fill the role of the *Quarterly Digest*, which would be discontinued. This proposal was reviewed and approved by the Communications Council.

The prototype issue of *Key Speeches* in the new format, which features one major speech reproduced in full text plus summaries of several other speeches of interest to industry, was published in December. At yearend, a second issue was in preparation for January 1988 publication. The planned AIA newsletter was scheduled for initial appearance early in 1988.

Special Projects

A major planning effort by the Communications staff involved the tri-association Financial Impact Study. A public affairs plan was written after the study effort moved into Phase II and the plan later went through several iterations. A joint AIA/EIA/NSIA public affairs committee was formed and met several times, including meetings with the AIA Vice President for Procurement and Finance and representatives of the MAC Group.

The Office of Communications also provided editorial assistance for a brochure entitled *National Benefits of IR&D*, prepared by the Aerospace Technical Committee and published in November. The brochure succinctly describes the benefits and buttresses them with some 140 examples of IR&D accomplished by AIA member companies.

Another significant effort involved public affairs support for the "Key Technologies for the 1990s" program of the Aerospace Technical Council. A Communications committee was created in April and a working group of that committee met frequently in Washington to tailor a public affairs program appropriate to the Key Technologies initiative.

The program was launched at the annual Aerospace Review and Forecast luncheon, which AIA sponsors each year in conjunction with the Aviation/Space Writers Association. The 1987 luncheon was held in Washington on December 16. It marked Don Fuqua's first appearance at this event as president of AIA, and he used the occasion to announce the Key Technologies plan to nearly 400 media, industry and government attendees. There was extensive media coverage of President Fuqua's remarks and the accompanying statistical analysis of the aerospace industry's performance in 1987.

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Allied-Signal Aerospace Company
Defense Systems Company
Aluminum Company of America
Argo-Tech Corporation
B.H. Aircraft Company, Inc.
The Boeing Company
Celion Carbon Fibers
A Division of BASF Structural Materials, Inc.
Colt Industries, Inc.
Chandler Evans, Inc.
Menasco Inc.
Delevan Corporation
Lewis Engineering
Criton Technologies
E-Systems, Inc.
*Fairchild Industries/Fairchild Space Company
FMC Corporation
**Gates Learjet Corporation
General Dynamics Corporation
General Electric Company
General Motors Corporation
Hughes Aircraft Company
Allison Gas Turbine Division
The BF Goodrich Company
Grumman Corporation
Harris Corporation
Hercules Incorporated
Honeywell Inc.
IBM Corporation
Federal Systems Division
IC Industries
Pneumo Abex Corporation
Abex Aerospace Division
Cleveland Pneumatic Company
National Water Lift Company
The Interlake Corporation

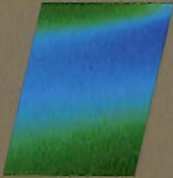
ISC Defense & Space Group, Inc.
ISC Marquardt
ISC Defense Systems
ISC Cardion Electronics
ISC Electro-Magnetic Processes
ISC Datacom/Microwave
ITT Defense Technology Corporation
ITT Aerospace/Optical Division
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Bell Aerospace Textron
Bell Helicopter Textron
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United Technologies Corporation
Western Gear Corporation
Westinghouse Electric Corporation
Wyman-Gordon Company
** Zimmerman Holdings, Inc.

* Joined in 1988

** Membership terminated 12/31/87



**Aerospace
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