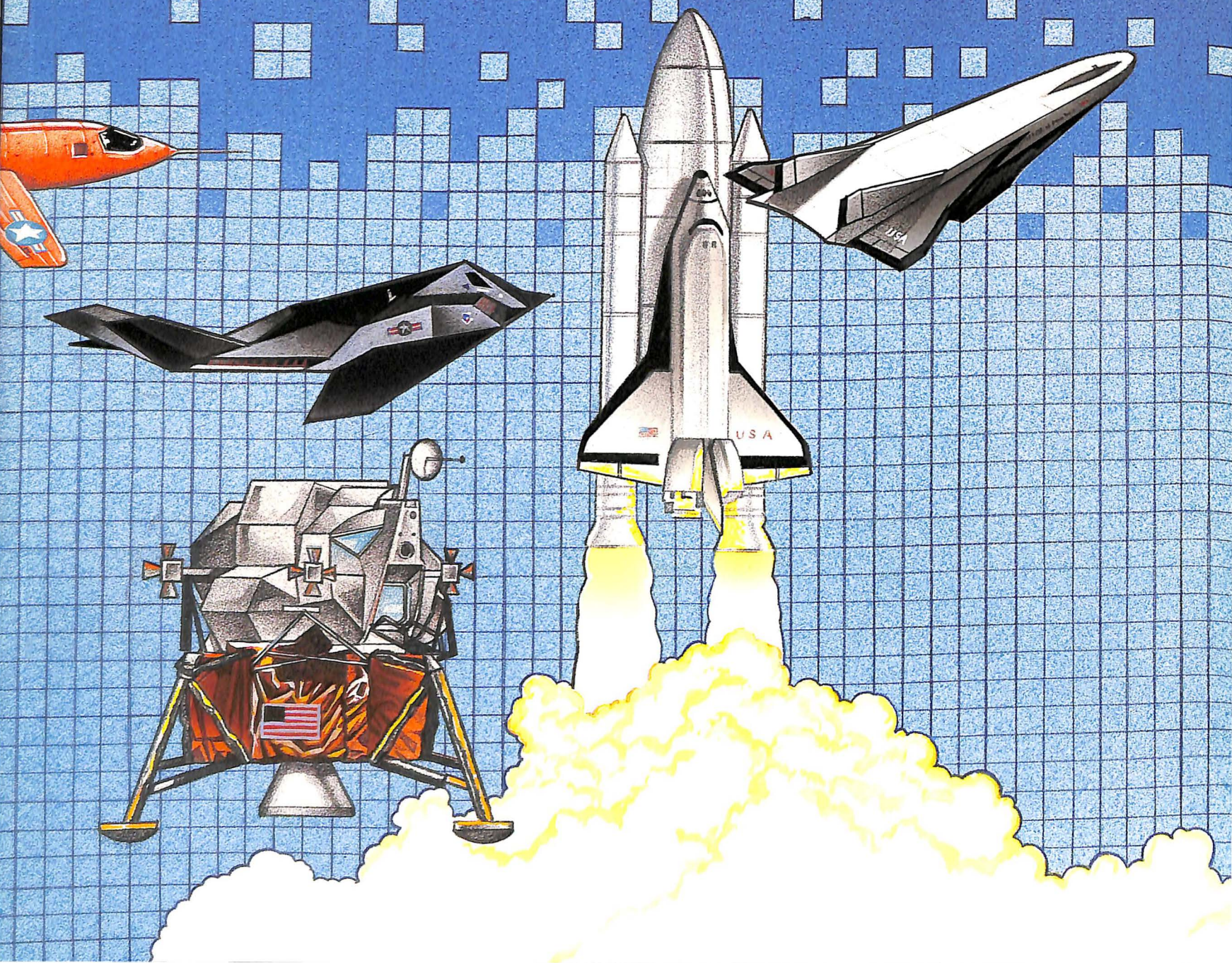


# LEADERSHIP THROUGH TECHNOLOGY

1991 Annual Report  
Aerospace Industries Association









*“It is an old story that the way of the world has  
ever been to regard those who made each new  
advance toward scientific truth as dreamers...*

*The fact that men laughed at Langley, the Wright  
brothers, and Curtiss because they thought that they  
could fly did not keep these men on the ground.”*

*—from the Aircraft Year Book, 1919.*



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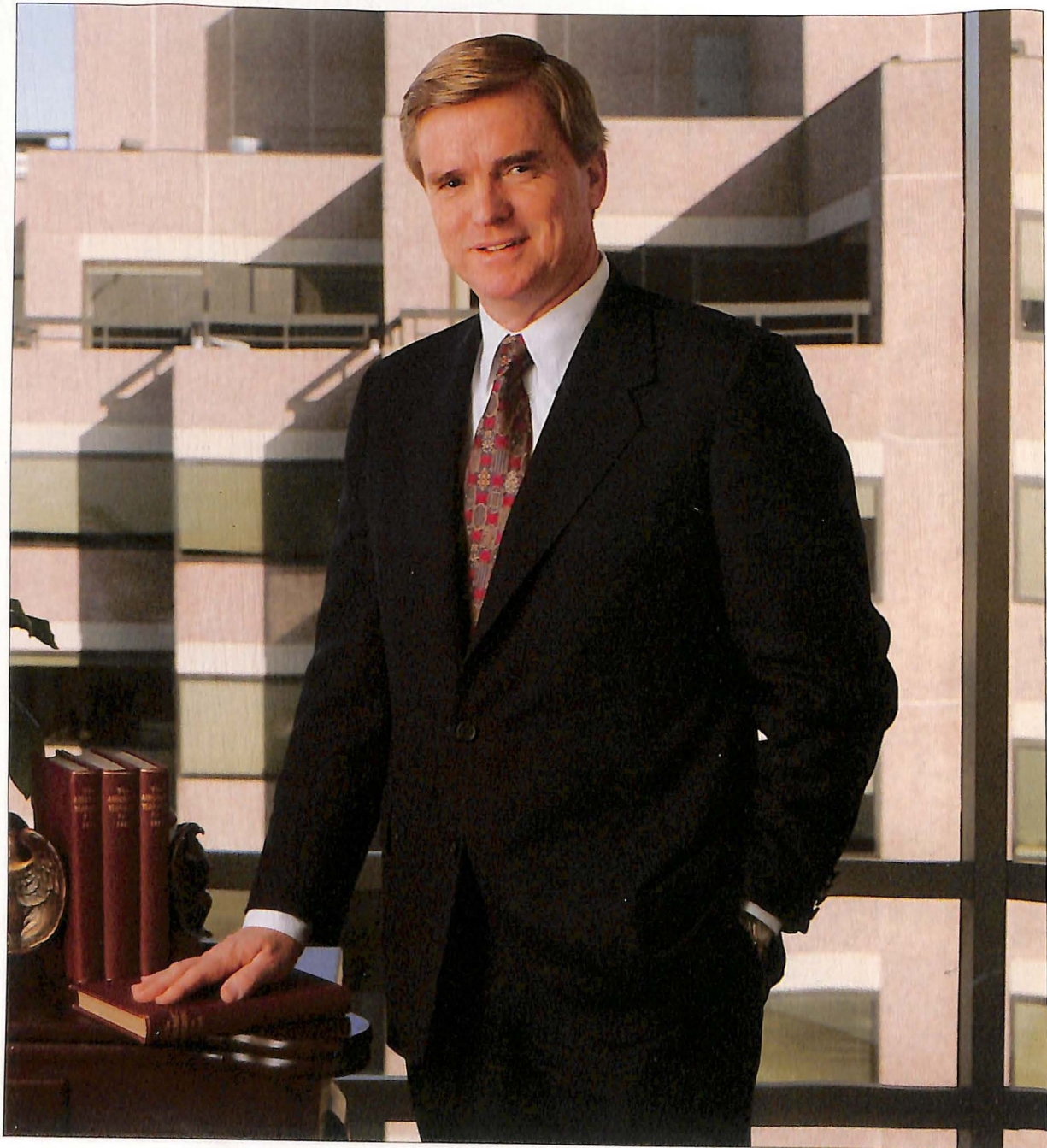
*The Cover: U.S. technological leadership throughout the 20th century is symbolized in the leading edge aerospace products depicted on the cover. From back to front: Wright Flyer, Spirit of St. Louis, B-17, DC-3, XS-1, Apollo Lunar Lander, F-117, Space Shuttle, and X-30 research vehicle.*

*Inside Pages: Highlighted in the Association Activities section of the 1991 Annual Report are technological triumphs from each decade, beginning in the 1900s with the first flight of the Wright Flyer and ending in the 1990s with the promise of more efficient access to space with the National Aero-Space Plane.*

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1250 Eye Street, N.W., Washington, D.C. 20005  
(202) 371-8400*



*Edsel D. Dunford  
Chairman of the Board*





For the aerospace industry, 1991 was both a watershed year of achievement and a time of enormous uncertainty. The space and defense systems we created played a dramatic role in ensuring victory in Operation Desert Storm. Customers and critics alike were impressed with the way our products performed. We can all be proud of the technological superiority our industry afforded allied forces. And we should do everything possible to ensure that we maintain this critical advantage.

The vitality of the aerospace industry, however, depends on government commitment to strong research and development funding and an adequate production base in an era of declining defense budgets. Our ability to keep the technological pipeline flowing will be vital to U.S. national security and economic competitiveness in the 1990s and beyond. That is why it is imperative that proposed Department of Defense budget reductions be carried out in a thoughtful, organized manner that allows industry companies to adjust their operations to the realities of the post-Cold War world and exist as competitive and profitable businesses.

Historically, the United States' postwar defense downsizing has taken both our national security interests and our industry to dangerous limits. The end of World War II, the Korean conflict, and the Vietnam War led to drastic cutbacks of personnel, equipment, and technical competency that rendered the United States at a distinct disadvantage to meet a

rapidly escalating Soviet threat. The aerospace companies of those eras struggled for existence, trying to find the right mix of defense and commercial business in domestic and international markets.

Defense downsizing is inevitable, but we must learn from the lessons of the past and avoid haphazard, helter-skelter cuts that disrupt industry and more often than not cost more than the savings claimed for them. The government must settle on a supportable force level and its requisite annual funding, draw up equipment requirements and stick to them, so that contractors can effectively plan how to invest their limited resources and manage the labor force.

In spite of the collapse of communism, the United States still faces threats to its national interests. Regional conflicts, terrorism, ethnic strife, and rising Third World nationalism contribute to worldwide instability. Moreover, the proliferation of advanced weapons technology—including nuclear, chemical and biological—and advanced delivery systems exacerbates the situation.

Aerospace technology, as so successfully demonstrated in the Persian Gulf, holds the key to developing a national security policy that will face those threats. Such a policy will focus on lighter, more mobile military forces and "smarter" weapons, based primarily in the United States, supported by space-based command, control, and intelligence assets, and complemented with an antiballistic missile capability. It is not sound foreign or domestic policy to

allow the technological foundation for the nation's future security to be dismantled by those who want to turn all of the nation's swords almost instantly into plowshares, no matter how noble that notion may seem.

In addition to its national security role, the aerospace industry stands as a source of national competitive strength. Having won the Cold War, the United States is now competing in world markets with a united Europe, an economically powerful Japan, and emerging Asia-Pacific nations. U.S. market leadership in civil aircraft, civil and commercial space systems, and defense systems can contribute significantly to our overall national economic competitiveness. Maintaining this leadership requires the advanced technology of a healthy aerospace industry—one with sufficient resources to make essential investments in people and equipment.

The Aerospace Industries Association and its member companies must work with the DoD, the Congress, and the American people to ensure that a proper balance is maintained between an affordable national defense and a viable industrial and technological base. We must maintain the momentum developed in 1991 and move toward the next century with the message that we are a vital element to the United States' national security and economic and technical strength—and we must remain so. There are challenges to be met.





*Don Fuqua  
President*





For AIA and the industry it represents, 1991 was a year of solid accomplishment despite the difficulties of adjusting to the changing business environment occasioned by the nation's defense restructuring program.

Preliminary data indicate that the aerospace industry's overall sales reached a new peak in spite of a substantial drop in sales to the Department of Defense (DoD). At \$140 billion, overall sales were up by 5% over the prior year's record level. The increase was due to the fact that a \$2.7 billion reduction in DoD sales was more than offset by another big gain in commercial sales and a moderate boost in sales of civil space systems.

Reflecting the continuing loss of defense business, the flow of new orders dropped sharply and the industry's year-end backlog dipped for the first time since 1981. Industry employment declined by more than 100,000, more than 8% of the labor force in place at the beginning of the year.

On the brighter side, the industry once again set records for export volume and trade balance, underlining the fact that U.S. aerospace companies are holding their own in the ever-intensifying international competition. This is gratifying evidence of the continuing technological excellence of American aerospace products.

As chairman Dunford points out in his message, the performance of industry-

built products in Operation Desert Storm was spectacularly impressive. This demonstration of technological superiority significantly elevated the aerospace/defense industry's credibility among the American people.

In addition to Gulf war operations, industry companies generated technological advances across a wide variety of developmental and production programs. The highlights are detailed elsewhere in this volume.

Among association activities in the industry's behalf, a major highlight was the late-year approval by President Bush of the National Industry Security Program (NISP), which offers potential for significant savings in industrial security costs. We are particularly proud of the fact that this program, now embraced by the entire U.S. industrial security community, originated as an AIA initiative.

Several years of AIA effort bore fruit with the passage of the Fiscal Year 1992 Defense Authorization Act, which contains provisions of utmost importance to our industry. It paves the way for full allowability of Independent Research and Development/Bid and Proposal (IR&D/B&P) costs after a three-year transition period.

The foregoing are examples of an exceptionally broad range of activities conducted by AIA's departments, councils, committees, subcommittees, task groups, advisory groups, and ad hoc groups. These matters are detailed

in the Association Activities section of this report.

For the remainder of this century, AIA expects continuing decline in defense business, mitigated to a degree—but not entirely—by high levels of civil aircraft and space activity. Uncertainties in all three of the industry's major sales categories—defense, civil aviation, and space—make it impossible to project specific sales levels.

This I can say with reasonable certainty: The industry's overall sales levels, the principal indicators of activity, employment, and earnings, will be lower in real terms in the 1990s than they were in the 1980s—perhaps substantially lower.

It promises to be a difficult decade of transition. In the face of lower activity levels, the industry must meet a dual challenge by increasing its international competitiveness and maintaining a robust defense industrial base.

Those objectives are attainable if the government provides essential assistance in the form of competitiveness enhancements and removes the legislative and regulatory obstacles to the industry's financial health that still exist. Given such help, the aerospace industry can emerge from the difficult decade a leaner but stronger industry.



# 1991 AIA BOARD OF GOVERNORS

Member company representatives comprise AIA's Board of Governors. Each year the board elects an Executive Committee from its members to exercise power when it is not in session. The continued active involvement in 1991 of member company CEOs and other top management in conveying industry's message to Congress and other government officials evoked changes that benefited both the aerospace industry and the nation.

## OFFICERS

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**Arthur E. Wegner**, *Vice Chairman*  
**Don Fuqua**, *President*  
**George F. Copsey**, *Secretary-Treasurer*

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*The LTV Corporation*  
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**Robert S. Hughes**,  
*General Manager, Forging and Casting*  
*Division, Aluminum Company of America*  
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*Chairman, President, and Chief Executive*  
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**William B. Mitchell**,  
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*Texas Instruments, Inc.*  
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*Director, Aircraft Systems Division,*  
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*President, Aerojet, A Segment of GenCorp*  
**Paul G. Schloemer**,  
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*Parker Hannifin Corporation*  
**Richard Schwartz**,  
*President, Hercules Aerospace Company*  
**Frank A. Shrontz**,  
*Chairman-Chief Executive Officer,*  
*The Boeing Company*  
**Harry Stonecipher**,  
*President and Chief Executive Officer,*  
*Sundstrand Corporation*  
**Robert L. Witt**,  
*Chairman, Chief Executive Officer and*  
*President, Hexcel Corporation*

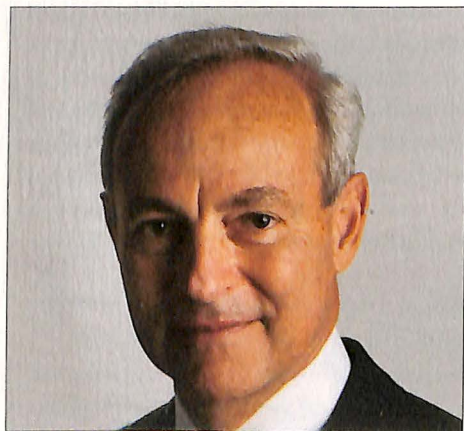
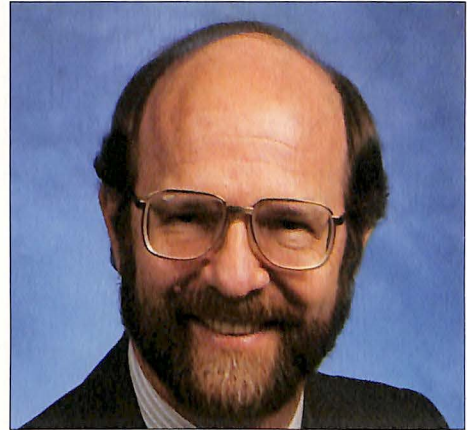
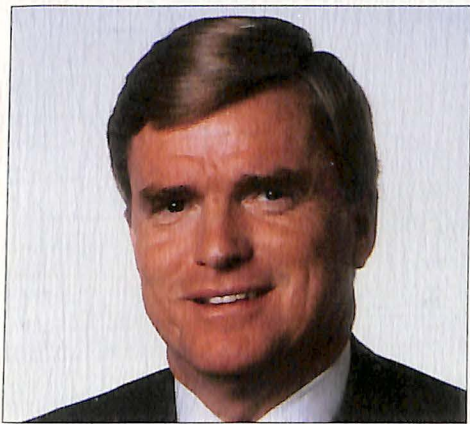
## EXECUTIVE COMMITTEE

Top row  
**E.D. Dunford**,  
*President and Chief Operating Officer,*  
*TRW, Inc.*  
**Don Fuqua**,  
*President, Aerospace Industries Association*

Middle row  
**Edward E. Hood, Jr.**,  
*Vice Chairman of the Board and Executive*  
*Officer, General Electric Company*  
**Richard A. Linder**,  
*President, Electronic Systems Group,*  
*Westinghouse Electric Corporation*  
**John F. McDonnell**,  
*Chairman and Chief Executive Officer,*  
*McDonnell Douglas Corporation*

Bottom row  
**Dennis J. Picard**,  
*Chairman and Chief Executive Officer,*  
*Raytheon Company*  
**Daniel M. Tellep**,  
*Chairman and Chief Executive Officer,*  
*Lockheed Corporation*  
**Arthur E. Wegner**,  
*Executive Vice President and President,*  
*Aerospace/Defense, United Technologies*  
*Corporation*









1. While displaying exceptional performance in Desert Storm, the McDonnell Douglas Army AH-64A attack helicopter achieved an outstanding operational readiness rate of 92%.



2. The Navy's Tomahawk cruise missile, built by prime contractors General Dynamics and McDonnell Douglas, demonstrated extraordinary accuracy against heavily defended targets.

8

“The successes of Desert Storm confirmed the superiority of American technology and assured the American taxpayers that their money has been well spent,” General Norman H. Schwarzkopf told the Senate Appropriations Committee.

The wartime commander-in-chief of the U.S. Central Command in the Middle East listed “the finest military equipment in the world” as one of five major factors that contributed

to victory in the Gulf war. The others are the skill and courage of the men and women of the U.S. armed forces, the rigorous, realistic training they received, a monumental airlift/sealift logistics effort, and the unwavering support of the American people.

General Schwarzkopf cited five weapon systems as representative of the wide variety of aerospace industry-developed equipment and munitions employed in

combat, command and control, and logistical support operations.

He listed the McDonnell Douglas AH-64A Apache attack helicopter, which “fired the first shots of the battle to liberate Kuwait and performed brilliantly throughout the campaign;” the Lockheed F-117 stealth fighter, which “proved to be virtually invisible... delivering ordnance with pinpoint accuracy and suffering not a single aircraft loss;” the General Dynamics/





3



4



5

3. "No contest" is how military officials described the superiority of the General Dynamics/Army M1A1 Abrams tank over Iraqi armor.

4. Although it represented only 3% of the USAF's Gulf assets, the Lockheed F-117 fighter destroyed 40% of all strategic targets attacked by coalition forces.

5. Originally designed as an anti-aircraft weapon, the Army's Raytheon Patriot became a highly effective ballistic missile interceptor in the Gulf war.

McDonnell Douglas Tomahawk land attack cruise missile, which "routinely destroyed targets in areas of the most concentrated Iraqi air defenses;" General Dynamics' M1A1 Abrams tank, which displayed total superiority over Iraqi armored forces; and the Raytheon Patriot missile, which "defended military installations and limited the physical and psychological damage to the civilian population of both the Gulf states and Israel."

The outstanding performance of these and many other systems reinforced public support for the defense establishment and had a most auspicious effect on equipment manufacturers. In a postwar opinion poll, 70% of the respondents said they gained new respect for and confidence in the U.S. defense industry.





1. In April, the USAF selected the Lockheed/Boeing/General Dynamics F-22 as winner of the Advanced Tactical Fighter competition.



2. At midyear, the USAF awarded a Mid-Life Update contract to General Dynamics to upgrade the avionics of older F-16s flown by the U.S., Belgium, Denmark, The Netherlands, and Norway.



3. Aerojet Propulsion Division, engaged in remanufacture of the Minuteman Stage II, delivered the 1,000th motor to the Air Force.

4. The Army announced in April the selection of the Boeing Sikorsky RAH-66 Comanche (shown in mockup) as its next generation light attack helicopter.

In a hectic year characterized by continued "downsizing" of the defense establishment and a 100-day war in the Persian Gulf, the Department of Defense (DoD) nonetheless achieved substantial progress in developing and deploying advanced systems for the military forces.

The developmental highlight of the year was the April 23 selection by the Air Force of the Lockheed/Boeing/General Dynamics team as contractors for the airframe of the Advanced Tactical Fighter (ATF). The USAF simultaneously announced selection of the Pratt & Whitney F-119-PW-100 engine for the F-22 ATF.

The Air Force subsequently awarded a \$13 billion engineering and manufacturing development (EMD) contract for the F-22. The EMD effort calls for construction and test of four pre-production aircraft. Initial production for operational service would begin in Fiscal Year 1997 with first year production of four aircraft. According to USAF plans, the production rate would be increased gradually to 48 aircraft per year by FY 2001 and the Air Force would procure a total of 648 aircraft, including engines at a cost of \$47 billion.





5. In September, IBM won one of the largest contracts in its history with its selection by the United Kingdom Ministry of Defence as prime contractor for production of the EH101 Merlin Royal Navy antisubmarine helicopter.

6. FMC Corporation's Bradley Fighting Vehicle impressively demonstrated speed, firepower, and reliability in the Gulf war.

7. Although still in development status, the Grumman E-8 Joint Surveillance Target Attack Radar System (Joint STARS) was deployed in the Gulf war to provide air and ground commanders a real-time, tactical view of the battlefield. The radar, built by United Technologies Norden Systems, is mounted in the under-nose, canoe shaped radome (white area) of the E-8, a militarized Boeing 707.

8. GM Hughes Aircraft Company won a new Navy contract for AN/UYQ-21 ship command and control displays.

Another major DoD competition was resolved with the April 5 announcement that the Army had selected the Boeing Sikorsky First Team as winner of the service's next generation light helicopter competition. The First Team will embark on an initial 52-month demonstration/validation program of what will be known as the RAH-66 Comanche attack helicopter.

The demonstration/validation effort involves construction of three prototypes

with first flight in 1994. It will be followed by a 39-month full-scale development and test program leading to initial operational capability in December 1998. Army plans call for total production of 1,292 aircraft at a rate of 120 per year.

In other DoD aircraft developments,

- In August, the Navy issued Requests For Proposals for an advanced, stealthy attack aircraft, tentatively known as AX, for operational service in the late 1990s. Five industry teams responded and, at year-end, were awarded system study contracts. The teams are led by General Dynamics, McDonnell Douglas, Lockheed, Rockwell, and Grumman.





1. In April, the Army started guided flight tests of the Javelin Advanced Antitank Weapon System, a fire-and-forget antiarmor weapon being developed by Texas Instruments and Martin Marietta.



2. The USAF/McDonnell Douglas C-17 airlifter made its inaugural flight on September 15.

3. In development by Boeing Defense and Space Group was a new version of its Hummer-mounted Avenger Army air defense system featuring complementary Stinger missiles in the left turret pod and British Starstreaks in the right pod.

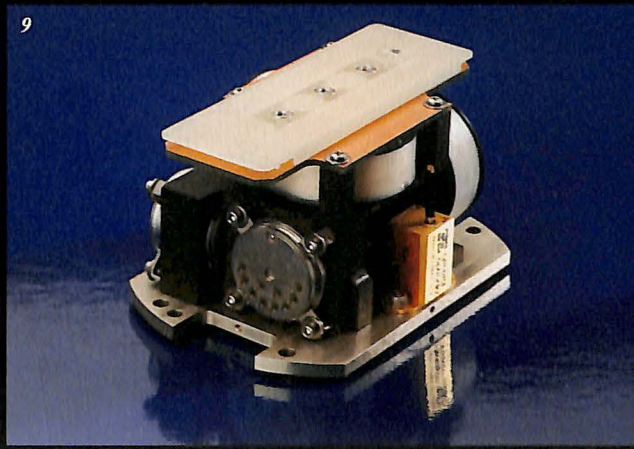
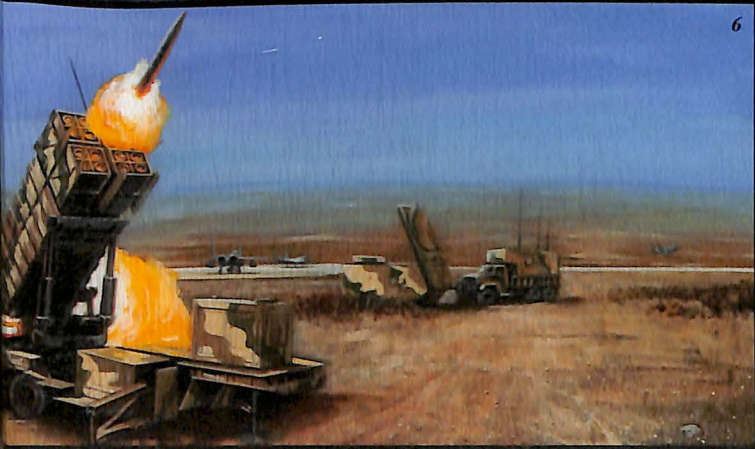
- The Air Force/McDonnell Douglas C-17 airlifter made its first flight on September 15. In early December the C-17 completed an initial test phase involving 23 flights and more than 50 hours in the air to demonstrate airworthiness and flying qualities. In 1992, the first C-17 is to be joined by four more aircraft for a two-year flight test program.

Among missile developments of the year,

- The Navy continued submarine-launched demonstration and shake-down tests of the Lockheed Trident II Fleet Ballistic Missile. In April, the USS West Virginia became the third nuclear-powered sub equipped with the Trident II.

- In June/July, the Army conducted four flight tests of an Upgraded Patriot air defense system developed by Raytheon Company; the system features an improved radar and rocket motor plus a new multimode seeker. Martin Marietta's Electronics, Information and Missile Group initiated development of an upgraded shorter/lighter Patriot launcher





4. In production at Kaman Corporation was the Navy's SH-2G multimission helicopter.

5. Textron Specialty Materials employs large production autoclaves to consolidate metal matrix composites, such as the tail skins for advanced fighter aircraft pictured.

6. LTV Aerospace and Defense was readying the ERINT (Extended Range Interceptor), for 1992 flight tests. ERINT is a small, highly-agile missile designed for direct impact on an attacking ballistic missile.

7. Flight testing of the Bell/Boeing V-22 Osprey multimission tilt-rotor aircraft continued.

8. In full scale development by Rockwell International's Autonetics Strategic Systems Division is the Small ICBM guidance and control system. In the photo, a technician is checking the electronics and computer assembly.

9. The Smiths Industries FOG (Fiber Optic Gyro) was selected as the new compass/attitude/heading reference system for several USAF and Navy aircraft.

- The Small ICBM (SICBM) successfully completed its second test flight, landing a warhead on Kawajalein Missile Range in the Pacific after launch from Vandenberg Air Force Base, California. Principal SICBM contractors are TRW Inc., Thiokol, Aerojet, Hercules, and Rockwell Autonetics.

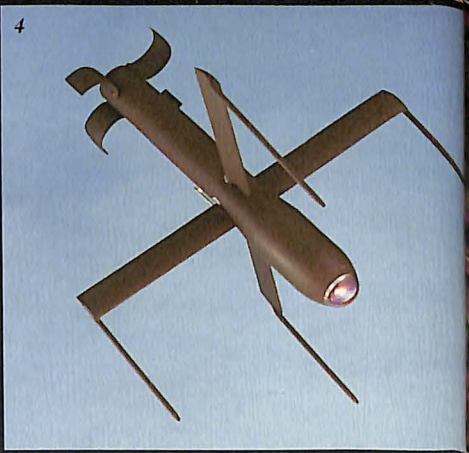
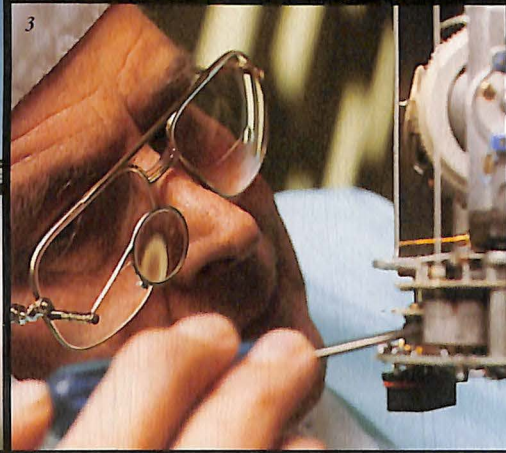
- In mid-April, the Navy started flight tests of an upgraded General Dynamics/McDonnell Douglas Block III Tomahawk cruise missile. The Block III version features increased range and a satellite navigation capability.

- The Army conducted initial guided flight tests, beginning in April, of the Javelin Advanced Antitank Weapon System Medium (AAWS-M) being developed by Texas Instruments and Martin Marietta. Intended as a successor to the Dragon antiarmor weapon, the Javelin is a fire-and-forget weapon carried and operated by one soldier.





1. In May, LTV Aerospace and Defense delivered the first production ATACMS (Army Tactical Missile System).



2. LTV was selected for full-scale development of the Army's LOSAT weapon system.

3. The JET gyro, shown being assembled in a clean room at Jet Electronics and Technology, a unit of BFGoodrich Aerospace, was aboard virtually every Desert Storm aircraft as primary or backup equipment.

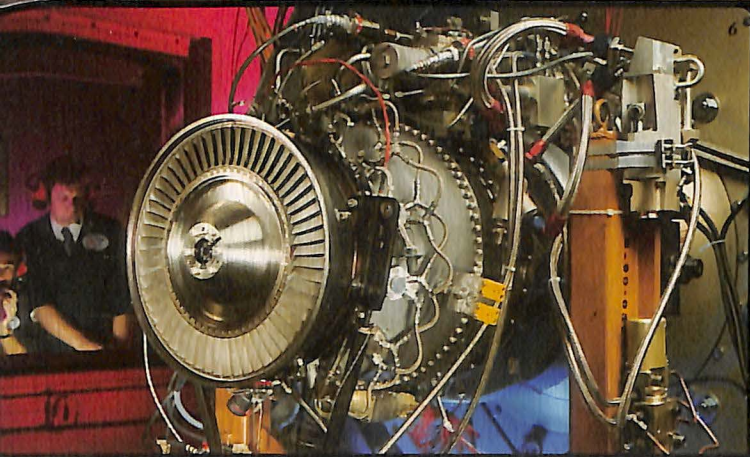
4. Northrop Corporation received an Army engineering and manufacturing development contract for the BAT self-guided antiarmor search and destroy system.

- After a brief hiatus for modifications, General Dynamics and McDonnell Douglas resumed deliveries in November/December of the Air Force AGM-129A Advanced Cruise Missile, which features stealth technology.

- In April, a Block III version of the Navy Standard 2 missile completed its first test flight at White Sands Missile Range, New Mexico. Raytheon Company is contractor for the upgraded Block III series, which features performance improvements and new ordnance.

- In May, and five months ahead of schedule, LTV Aerospace and Defense delivered the first full scale production ATACMS (Army Tactical Missile System). ATACMS is a surface-to-surface, semi-guided ballistic missile.





5. TRW's Military Electronics Avionics Division leads an industry team (Rockwell, ITT, GEC) providing the communications, navigation, and identification avionics for the F-22 Advanced Tactical Fighter.

6. Undergoing test is an LHTEC 800 engine, a joint venture between Allison Gas Turbine Division of General Motors and Garrett Engine Division of Allied-Signal Aerospace, intended for the Army's Comanche helicopter.

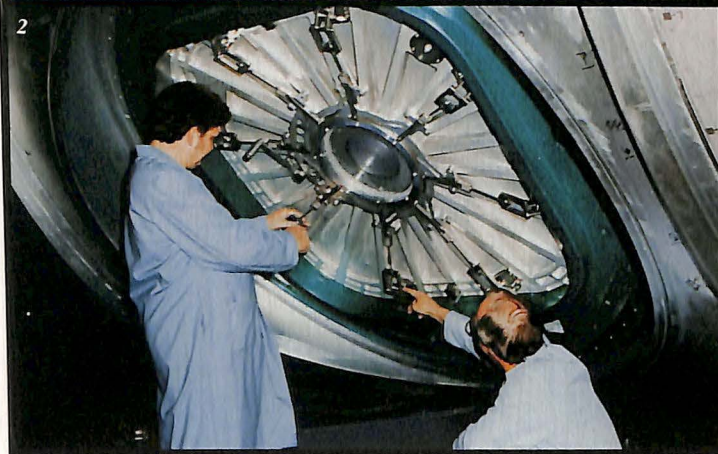
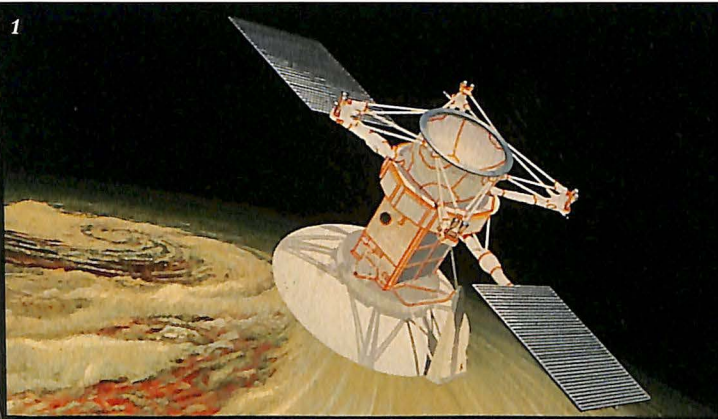
7. October completion of air-launched tests of the Navy's Block 1D Harpoon cleared the way for a ship-launched test series.

8. The Westinghouse Sentinel 1000 non-rigid airship made its first flight on June 26. It is a half-scale version of the Sentinel 5000 surveillance airship being developed under the DoD Air Defense Initiative program.

• In March, LTV was selected for full-scale development of the Army's LOSAT (Line-of-Sight Antitank) weapon system following a successful first integrated flight at White Sands Missile Range. LOSAT is designed for use with the Bradley Fighting Vehicle.

• In October, a second successful air-launched test of the Navy Block 1D Harpoon antiship missile, built by McDonnell Douglas Missile Systems, cleared the way for a new ship-launched test series. The Block 1D system features new software that will allow the upgraded Harpoon to re-attack a target if it does not acquire the target on its first approach.





1. In May, the Magellan spacecraft completed its first cycle of radar-mapping the planet Venus. Martin Marietta is NASA's prime contractor; Hughes Aircraft developed the mapping system.

2. Preliminary design of the restructured Space Station Freedom was completed early in the year. In the photo, Boeing Defense & Space Group machinists check a hatch assembly of a space station node radial port (nodes connect living and working areas).

3. Space Shuttle flight STS-43 lifts off in August, one of six 1991 Shuttle missions. The Shuttle solid boosters are built by Thiokol, the main engines by Rockwell Rocketdyne, and the external tank by Martin Marietta. United Technologies' USBI handles design, assembly, test, and refurbishment of non-motor segments of the boosters.

On May 15, 1991, NASA's Magellan radar-mapping spacecraft completed a full "day" (243 Earth days) of mapping the planet Venus, covering some 84% of the planet's surface with 10 times better detail than previous Venus images. By year-end, Magellan had mapped 93.5% of the surface.

This space highlight generated topographic maps of great importance to space science; they may provide answers to why Earth and Venus, two very similar

planets, evolved in such dissimilar fashion. Martin Marietta Astronautics is prime contractor for the Magellan spacecraft; Hughes Aircraft developed the radar-mapping system.

In April, the Compton Gamma Ray Observatory (CGRO) was launched into orbit, the second of NASA's Great Observatories to go into service. Early CGRO observations found bursts of gamma radiation coming from unknown sources outside the plane of the Milky

Way Galaxy. Another scientifically important observation came in July, when CGRO detected the most luminous and most distant (seven billion light years) source ever noted. TRW Space and Technology Group is NASA's prime contractor for CGRO.

The Galileo planetary probe, bound ultimately for a detailed examination of Jupiter, made the first close-up observation of an asteroid. In October, Galileo flew within 1,000 miles of the





4. Hamilton Standard's extravehicular mobility unit, the space suit worn by astronauts working outside the Shuttle Orbiter, was employed on April's STS-37 mission, the first extravehicular activity in five years.

5. The new Space Shuttle Orbiter Endeavour, built by Rockwell International, was rolled out in April.

6. The TRW-developed Compton Gamma Ray Observatory began orbital service in April.

7. A Thiokol Shuttle booster motor undergoes static test at the company's Promontory, Utah, location.

Eight-mile diameter asteroid Gaspra and returned scientific data and images of the asteroid. Jet Propulsion Laboratory built the spacecraft; Hughes Aircraft and General Electric Company collaborated on development of a planetary probe that will explore Jupiter's atmosphere in 1995.

Among other NASA 1991 activities,

- In January, the Combined Release and Radiation Effects Satellite (CRRES), a joint NASA/Air Force mission, contributed new information on how solar particles can disrupt power and communications systems on Earth. CRRES released chemical vapors that briefly "painted" invisible magnetic fields with luminous particles, enabling study of the interaction of solar particles with Earth's magnetic field.

- In September, NASA initiated its Mission to Planet Earth series of science missions with the launch of the Upper Atmosphere Research Satellite (UARS), which will expand NASA's research in atmospheric ozone depletion. In a related program, NASA's Total Ozone Mapping Spectrometer was launched in August aboard a Soviet Meteor spacecraft to study ozone levels for several years. Principal UARS contractor is GE Aerospace.





1. The March launch of the McDonnell Douglas Delta II carrying the Inmarsat 2 mobile communications satellite marked the 200th launch of a Delta vehicle since 1960.



2. Boeing Defense and Space Group analysts are testing recycled water as part of their research for the Space Station Freedom environmental control and life support system.

3. Shown being fitted with thermal blankets prior to launch is the Hughes Intelsat VI-F5 satellite, delivered to orbit in August.



4. In development by Harris Corporation is a large scale, integrated information processing and communications system for launch monitoring and support at the Air Force Test Range control center.

5. Flown as a secondary payload on the August STS-43 shuttle mission was the Boeing Defense & Space Group's Tank Pressure Control Experiment, a project to provide data for designing low-gravity fluid management system

- Early in 1991, NASA completed the preliminary design of Space Station Freedom following a congressionally-mandated restructuring of the program. The new design features a changed "pre-integrated" truss and laboratory/habitat modules some 40% shorter than the previous design. Crew size was cut to four; first element launch is now targeted for November 1995. U.S. segments of Space Station Freedom are being developed by three contractor teams headed by Boeing Aerospace, McDonnell

Douglas, and Rockwell International's Rocketdyne Division.

- NASA flew six Space Shuttle missions in 1991. Two of them were devoted principally to the April and September launches of the Compton Gamma Ray Observatory and the Upper Atmosphere Research Satellite. The others included STS-39 in April/May, in which the primary payloads were dedicated to gathering data for the Strategic Defense Initiative; STS-40 in June, first of a series

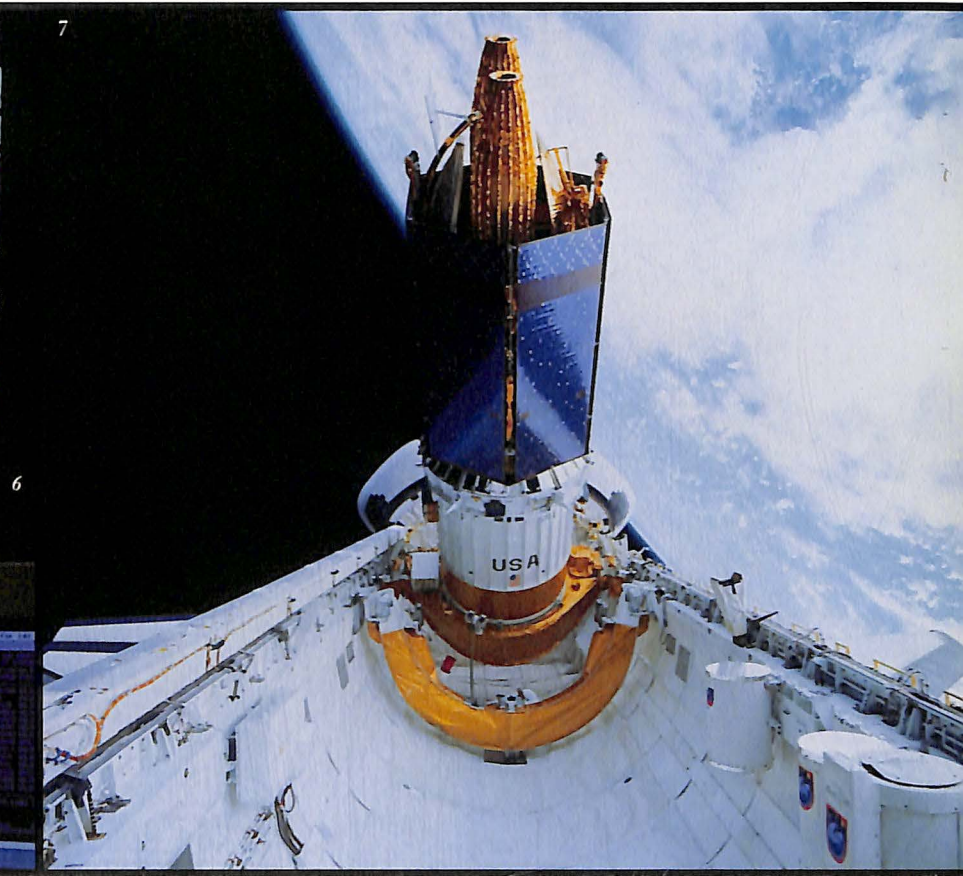
of Spacelab Life Sciences missions for intensive investigations of effects of microgravity on human, animal, and plant life; STS-43, August, deployment of a new, TRW-built Tracking and Data Relay Satellite-5; and STS-44, a Department of Defense mission of the Defense Support Program Series.

- The new Shuttle Orbiter Endeavour delivered to NASA on April 25, restoring the Shuttle fleet to four. Endeavour is capable of flying extended duration





6. For NASA's Earth Observing System, IBM Federal Systems is developing new technologies for extremely high speed storage of massive amounts of data.



7. In September, NASA Shuttle launched TDRS-5, the fifth Tracking and Data Relay Satellite, built by TRW Space and Technology Group.

missions, and it has safety enhancements, such as redundant nose steering and a drag chute system. Principal Space Shuttle contractors are Rockwell International (Orbiter and main engines), Thiokol (solid rocket boosters), and Martin Marietta (external tank).

In March, NASA announced selection of the Pegasus air-launched vehicle for commercial launch services for as many as 10 NASA satellites of the small Explorer class.

- In November, the Italian Space Agency delivered to NASA the Tethered Satellite System (TSS), which will operate in low orbit suspended from the Space Shuttle Orbiter by a 20-kilometer-long tether. The TSS is scheduled for launch in September 1992.

- The National Aero-Space Plane (NASP) program, a joint NASA/Department of Defense effort to develop a single-stage-to-orbit flight research vehicle, progressed in 1991 with the mid-

year completion of a representative full-scale wing surface for the planned X-30 vehicle. This major step in technology advancement for hypersonic flight involves use of a carbon-carbon material lighter than most metals but stronger at the sustained high temperatures the X-30 will encounter. The X-30 team includes three airframe contractors—General Dynamics, McDonnell Douglas, and Rockwell International—and two engine manufacturers—Pratt & Whitney and Rockwell's Rocketdyne Division.

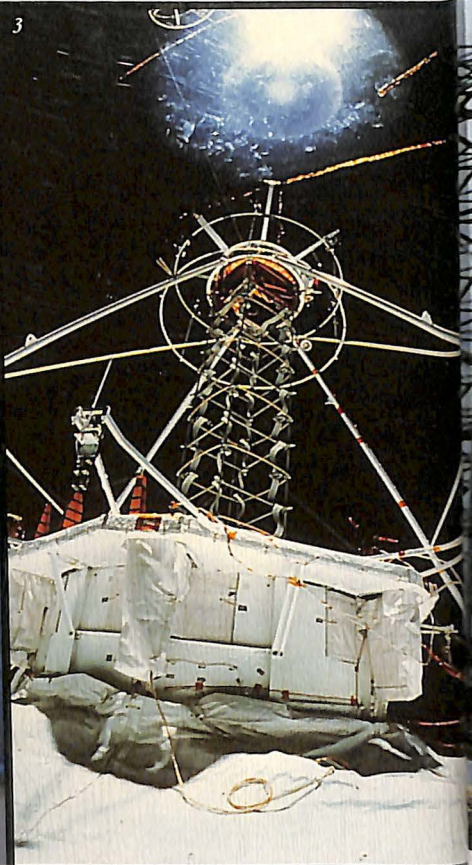




1. The Rockwell-developed LEAP III Lightweight ExoAtmospheric Projectile (shown) and the Hughes LEAP II successfully passed initial hovering tests and were slated for 1992-93 space tests. The space target acquisition systems are part of the Strategic Defense Initiative.



2. A TRW-built Defense Support Program missile-detection satellite was deployed from the Shuttle Orbiter Atlantis in November.



3. Martin Marietta Astronautics engineers prepare the Tethered Satellite System's reel for test in the thermal vacuum chamber; the Italian-developed satellite is due for first orbital operations in September 1992.

In other civil space activities,

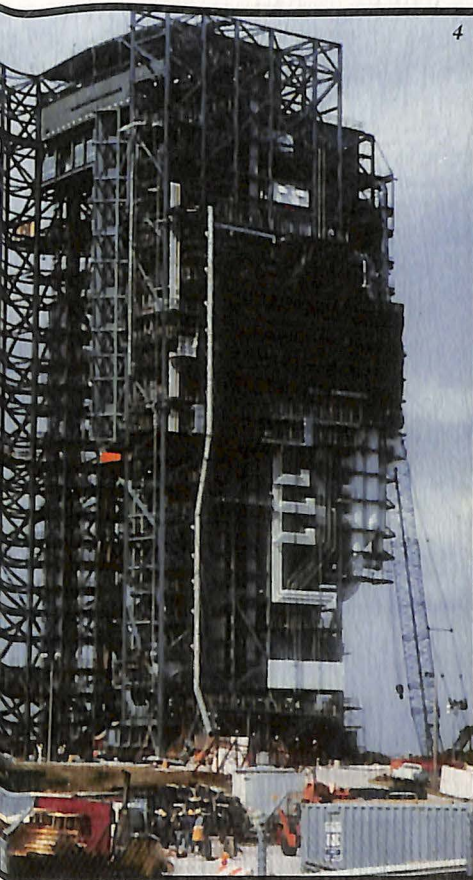
- McDonnell Douglas launched Inmarsat 2 in March using a Delta 6925 vehicle. Inmarsat 2 is a British Aerospace-developed satellite to provide mobile communications services for ships, aircraft, and vehicles.
- In May, a General Dynamics Atlas E launch vehicle lofted the National Oceanic and Atmospheric Administration's (NOAA) Polar

Operational Environmental Satellite to join the NOAA-10 and NOAA-11 weather satellites.

- Also in May, a McDonnell Douglas Delta II launched a NATO joint civil/military communications satellite.
- Intelsat VI-F5, fourth in the new Intelsat satellite series was launched from Kourou, French Guiana, by an Ariane vehicle in August; Hughes Aircraft built the satellite.

- Among military space developments, President Bush announced, in his State of the Union message, a reorientation of the Strategic Defense Initiative (SDI) program. SDI focus is now on GPALS (Ground Protection Against Limited Strike), which has three elements: 1) a large number of ground-based interceptors, perhaps 750 to 1,000, 2) a force of about 1,000 space-based "Brilliant Pebbles" interceptors, and 3) a regional theater defense component rapidly transferrable to an area. The third





4

4. Bechtel National developed a state-of-the-art Mobile Service Tower for the Titan IV launch vehicle at Cape Canaveral Air Force Station.



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5. Martin Marietta Titan IV vehicles carrying classified defense payloads were launched in March and November.



6

6. A Defense Support Program satellite sensor undergoes testing at a GenCorp Aerojet facility. The company's Electronics Division is developing advanced surveillance sensors for the program.

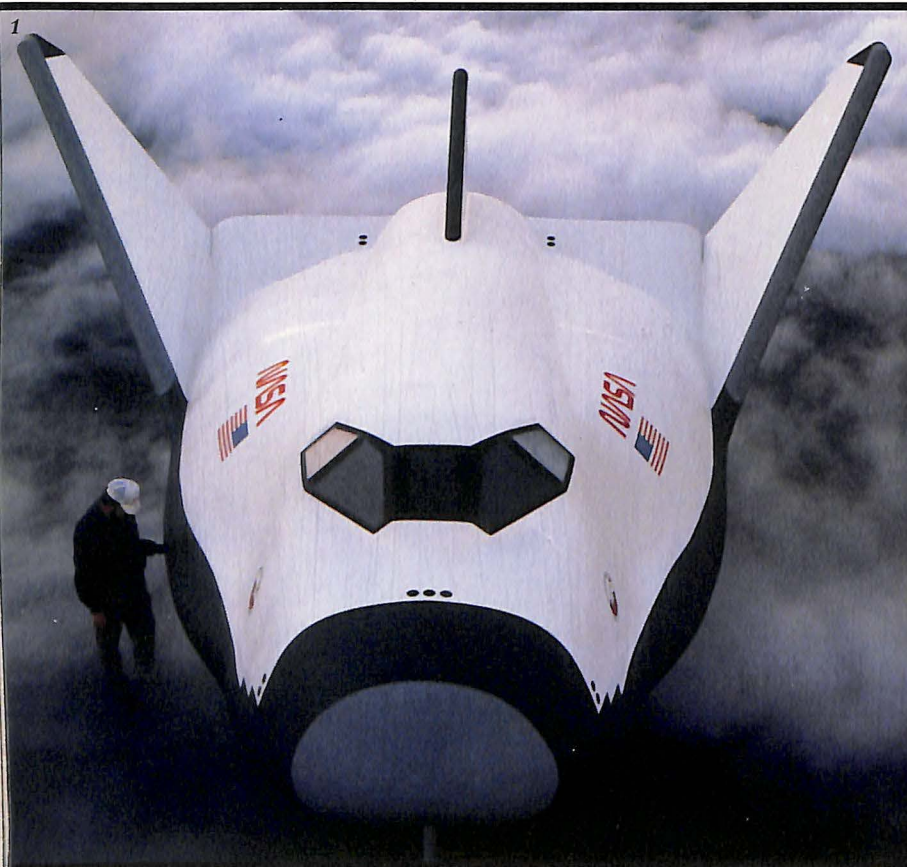
Component might consist of Upgraded Patriot anti-ballistic missile systems and a new Theater High Altitude Area Defense System.

Military space activities of 1991 included,

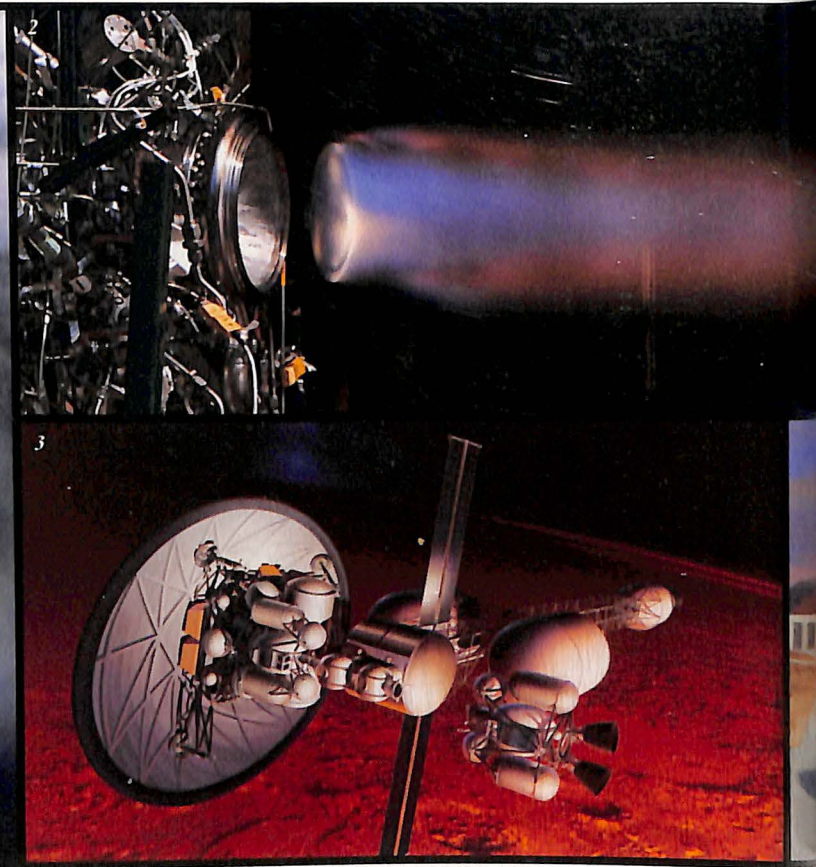
- Award of Brilliant Pebbles development contracts to Martin Marietta Defense and Space Communications (D&SC) and TRW Space and Technology Group. Martin Marietta's D&SC will team up with the company's Electronics, Information, and Missiles Group; the TRW unit will team up with Hughes Missile Systems.

- In June, the SDI Airborne Surveillance Testbed, a modified Boeing 767 with a long wave infrared sensor and a data processing system, successfully tracked a Minuteman missile among several decoys. The testbed is used to develop a variety of optical detection and tracking sensors.





1. Lockheed Advanced Development Company, under NASA contract, is conducting a feasibility assessment of the HL-20 (shown in mock-up) a proposed vehicle for transporting astronauts and cargo to and from low Earth orbit.



2. In September, Rockwell's Rocketdyne Division successfully completed a 100-second demonstration of the XLR-132 high-chamber-pressure engine intended for upper stage and satellite orbit transfer applications.

3. Representative of a series of advanced studies conducted by industry firms for NASA is Boeing Defense and Space Group's concept of a nuclear thermal rocket, shown orbiting Mars.

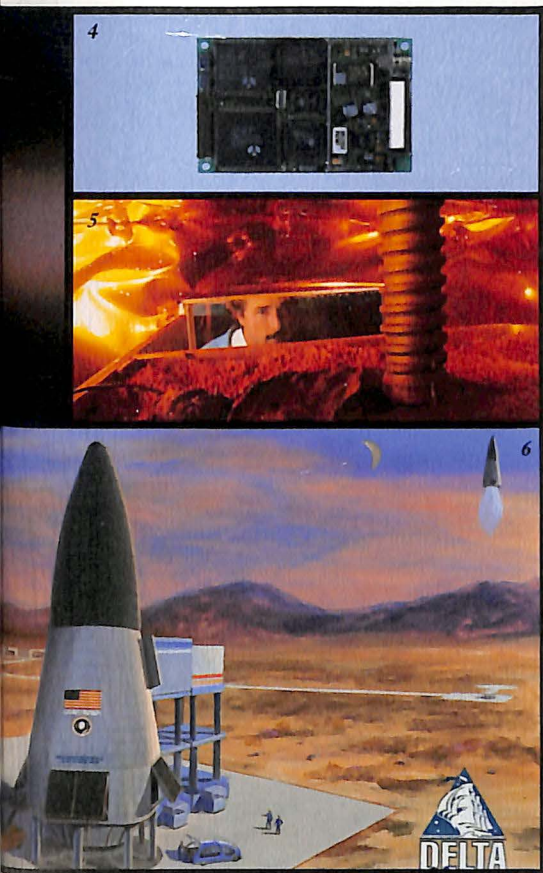
- In July, the USAF launched the 11th of the operational Navstar Global Positioning System satellites. The Navstars are built by Rockwell International and launched by McDonnell Douglas Delta II boosters.
- DoD conducted two tests of LEAP (Lightweight ExoAtmospheric Projectile) systems, which demonstrated target lock-on capabilities in hovering flight. LEAP II, developed by Hughes Missile Systems was tested in June, Boeing's LEAP III

in July. DoD plans a series of LEAP space tests in 1992-93.

- Two Titan IV vehicles carrying classified satellites were launched from Vandenberg Air Force Base, California, the first from that facility. One was launched in March, the second in November. The Titan IV is built by Martin Marietta.

- In November, a DoD Defense Support Program missile warning satellite built by TRW was deployed from the Space Shuttle Orbiter *Atlantis*.
- In December, DoD awarded a contract for use of the air-launched Pegasus, developed jointly by Orbital Sciences Corporation and Hercules Aerospace, to launch two TRW-built Brilliant Pebbles interceptors for an orbital test of several months duration in 1994.

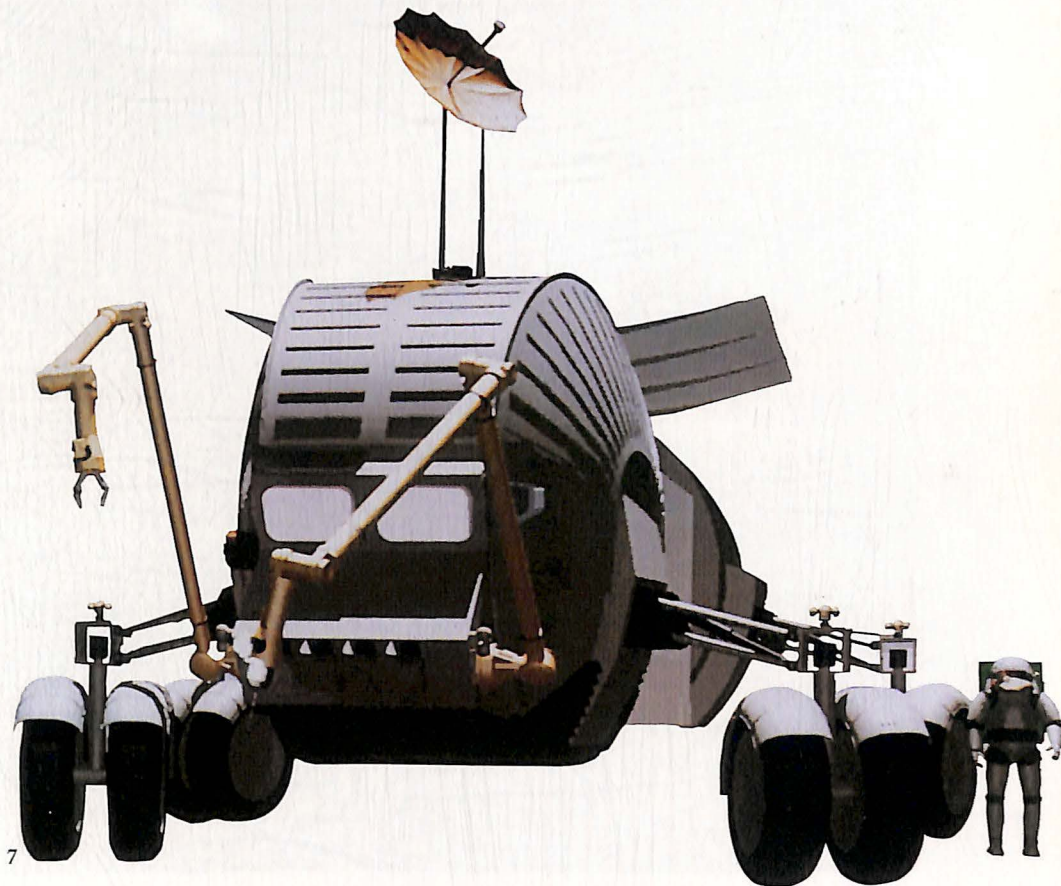




4. In April, Rockwell introduced the NavCore V receiver module for users of the Global Positioning System. Only four inches long, NavCore V can provide position accuracy within an area the size of a baseball diamond.

5. Undergoing study by Martin Marietta Astronautics is an advanced drill for Mars surface exploration.

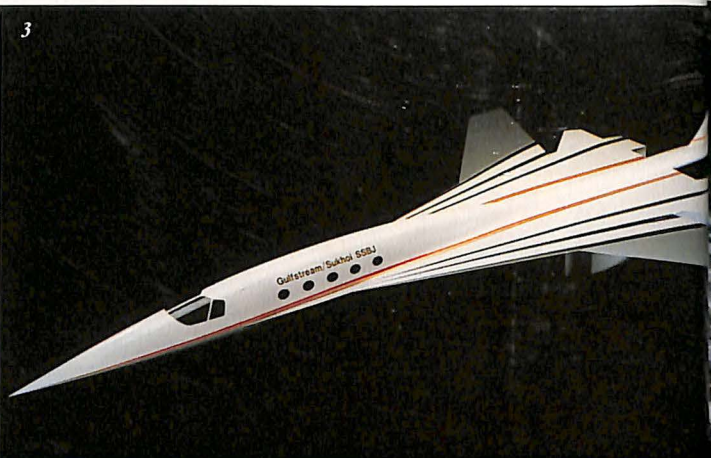
6. The artist's conception shows McDonnell Douglas Space Systems Company's proposed Delta Clipper, a single-stage-to-orbit vehicle that lands vertically.



7. This is a computer-aided design of a next generation planetary rover being studied by Boeing Defense and Space Group.

- Electrical integration of the Milstar military communications satellite was completed in September, clearing the way for tests of an engineering development model of the spacecraft's ground system. The first Milstar, built by Lockheed Missiles & Space Company, is scheduled for delivery to the Air Force in November 1992.





1. In August, Boeing completed an 800-hour wind tunnel test program on the B-777 jumbo twinjet. Among major subcontractors, Rockwell's North American Aircraft Division will manufacture the 777's composite floor beams and wing leading edge slats. Collins Commercial Avionics will provide the electronic library system and the auto pilot flight director.

2. In October, McDonnell Douglas initiated an MD-12 development program for a trijet follow-on to the MD-11.

3. In June, Gulfstream Aerospace Corporation and Russia's Sukhoi Technologies agreed on a twin-engine design for the Gulfstream/Sukhoi Model 521-G supersonic business jet.

4. Kaman Aerospace produces Boeing 767 wing structure assemblies. The company also received a contract to manufacture similar assemblies for the B-777.

Recession in the U.S. and abroad, coupled with diminished international travel occasioned by the Gulf war, combined to reduce world airline traffic and revenues.

U.S. scheduled airlines boarded 439 million passengers in 1991, 3.4% fewer than in 1990, according to Air Transport Association (ATA) preliminary data. Total passenger miles decreased 2.3% to 443 billion.

ATA expected that the scheduled airline's aggregate loss for the year would approach \$2 billion.

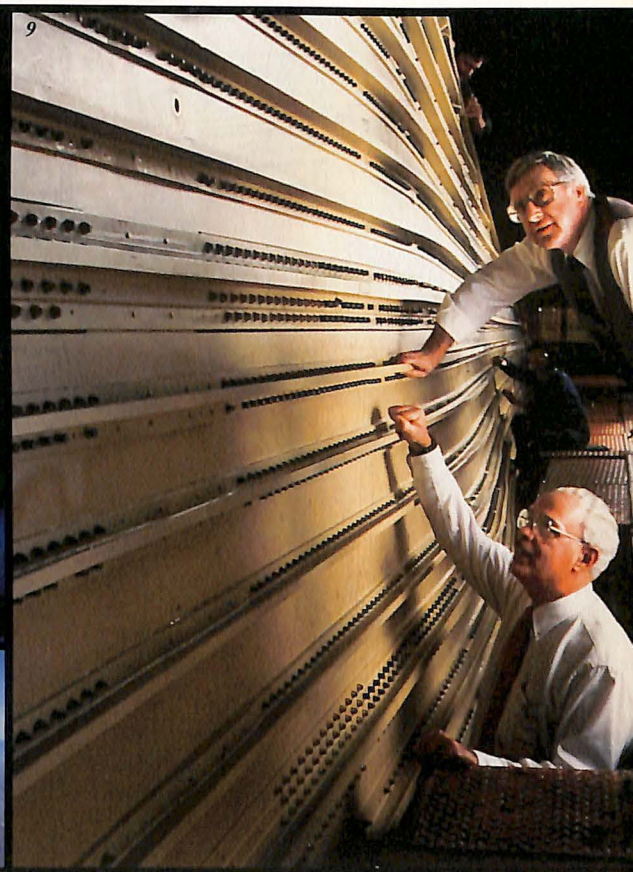
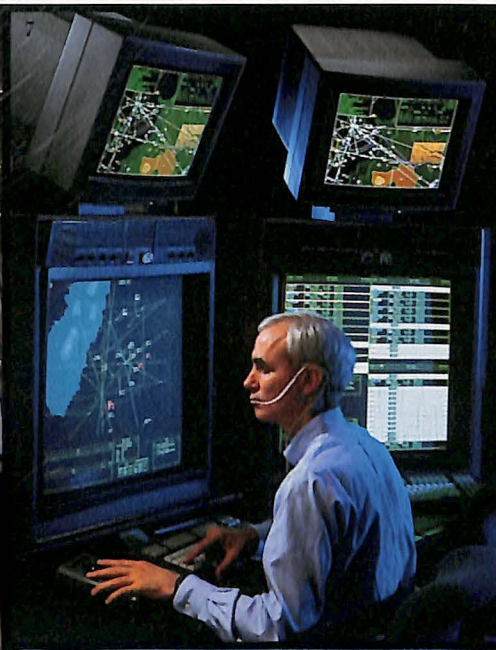
At year-end, airline employment was down 6% from the previous year-end with 533,000 employees on the rolls. The industry suffered more than 50,000 layoffs and lost jobs in 1990/91.

U.S. scheduled airlines had two fatal accidents in 1991 with a total of 47 fatalities out of approximately 6.6 million

flights. There have been fewer accidents in only two years since 1938 when the government began recording airline safety data.

At year-end, U.S. scheduled airlines had orders and options on the books for jet transports valued at more than \$130 billion. More than 280 transport aircraft were scheduled for delivery in 1992, which will enlarge the U.S. jet fleet to 4,400 aircraft.





5. In production by Boeing Commercial Airplane Company was the B-737 twinjet.

6. In development at IBM Corporation for the FAA was the Advanced Automation System workstation, to be introduced to the U.S. aircraft traffic control system over the next decade.

7. Honeywell's fully integrated avionics system for the McDonnell Douglas MD-11 went into service with several airlines in 1991.

8. The McDonnell Douglas MD-11 trijet was FAA-certified to make automatic landings under the most difficult allowable weather conditions.

9. Aluminum Company of America provides aluminum extruded stringers made of high strength alloys for the MD-11 jetliner.

Traffic declined among the world's scheduled airlines for the first time. Total worldwide passenger traffic, domestic and international, including that of the U.S. carriers, amounted to 1.815 billion passenger kilometers, according to International Civil Aviation Organization statistics. That represented a decline of 4%.

International passenger kilometers fell by 6% to 840 million. Combined domestic/international air freight declined by 4%.

Financial data was not available at year-end, but reliable estimates indicated that world airline losses would approach \$4 billion in 1991, on top of a \$2.7 billion loss in 1990.

U.S. commercial transport manufacturers had another banner year. After setting an all-time record for deliveries in 1990 (521 aircraft valued at \$22.2 billion), the industry topped that record by a wide margin in 1991. According to AIA preliminary estimates, there were 593

deliveries of transports with a combined worth of \$27 billion.

The backlog of orders for new airline transports was more than \$108 billion as of September 30, 1991, down from \$112 billion at year-end 1990. Roughly two-thirds of the 1991 backlog value represented orders from foreign airlines.

Overall civil aircraft sales—jetliners, helicopters, and general aviation aircraft—decreased in numbers but increased in





1. McDonnell Douglas Helicopter Company delivered the first production MD520N helicopter to the Phoenix Police Department in October.



2. In April, Sikorsky Aircraft received FAA certification for the S-76G, latest variant of the S-76 helicopter family.



3. Hamilton Standard, in conjunction with Ratier-Figeac of France, developed a braiding process for the spars of all-composite blade propellers.

value. AIA estimated deliveries of 2,189 aircraft worth \$29 billion in 1991; the comparable figures for 1990 were 2,268 planes valued at \$24.5 billion.

Shipments of civil helicopters fell off slightly, down from 603 in 1990 to 596 in 1991; value fell to \$190 million from \$254 million in the previous year. Shipments of general aviation aircraft fell from 1,144 worth \$2.0 billion in 1990 to 1,000 worth \$1.8 billion in 1991.

For 1992, AIA projected deliveries of 609 transports worth more than \$30 billion; 667 civil helicopters valued at \$226 million; and overall civil aircraft sales of 2,276 units valued at \$32.1 billion.

At the end of the year's third quarter, the latest date for which AIA figures are available, Boeing Commercial Airplane Company had orders for 1,472 transport aircraft. The largest component of that backlog was 663 orders for the short-to-medium range twinjet B-737. Boeing

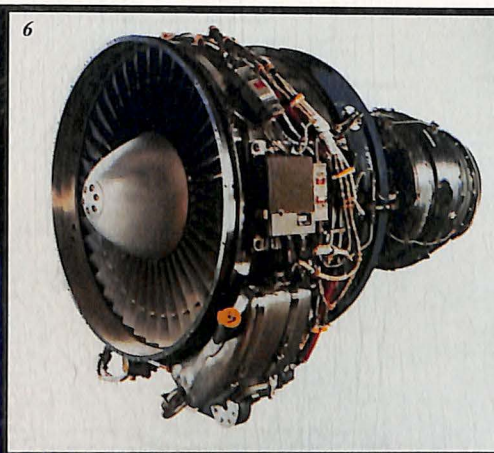
also had orders for 325 B-757s, 239 B-747s, 194 B-767s, and 51 B-777s.

In August, Boeing completed an 800-hour wind tunnel test program to verify the performance and stability of the B-777. Launched in 1990, the 777 is a twinjet similar in configuration to the company's 767, but larger and with many new advanced technology features. The initial version, scheduled for first deliveries in 1995, will have a maximum take-off weight in the 500,000-pound





4. United Technologies' Norden Systems developed for the FAA the ASDE-3 (Airport Surface Detection Equipment) radar to monitor aircraft and vehicle movement on runways and taxiways.



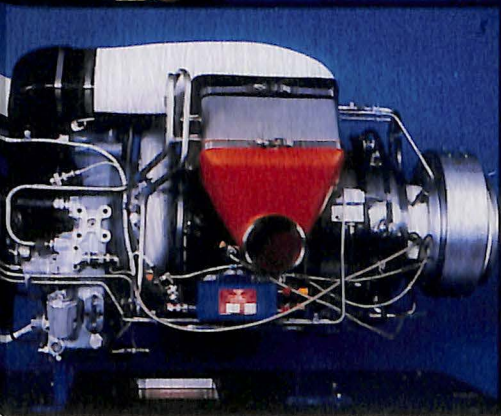
6. Textron Lycoming was granted type certification for the LF507 turbofan engine. LF507 is the first of a new LF500 series designed to power advanced regional jetliners.



8. Cessna's CitationJet 525 made its first flight in May.



9. Williams International's FJ44 turbofan powered two new business jets that first flew in 1991, the Swearingen SJ30 and the Cessna CitationJet.



5. Sundstrand Corporation's Auxiliary Power International developed the APS300 Auxiliary Power Unit.



7. Precision Castparts Corporation produced high quality cases for intermediate thrust turbine engines used on many international aircraft.



10. In October, Raytheon's Beech Aircraft Corporation introduced the 1900D 19-passenger airliner; first delivery was scheduled for year-end 1991.

class, but it is expected that growth in conversions will approach B-747 weights and capacities.

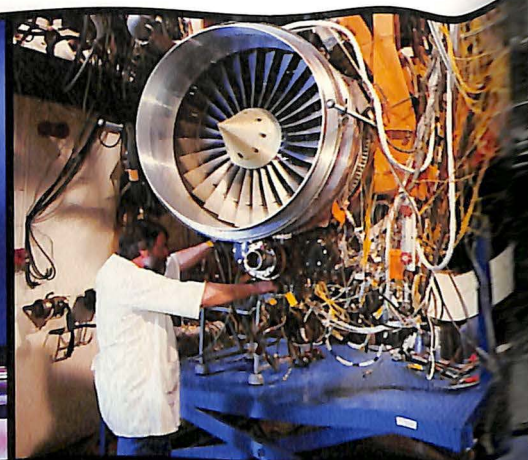
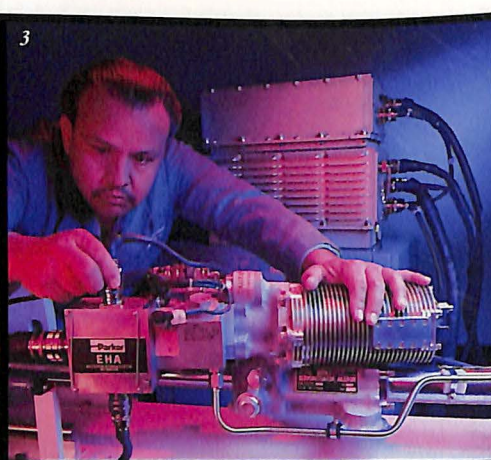
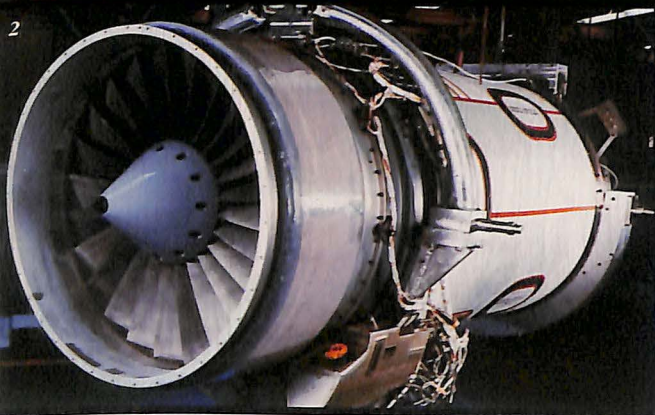
Orders for McDonnell Douglas transports (as of September 30, 1991) totaled 425. The figure included 269 of the MD-80/90 twinjet series and 156 MD-11 trijets. Production of the MD-11 was increased to one a week in August, at which time the first 19 aircraft had been delivered to airline customers.

In October, the McDonnell Douglas board gave the go-ahead for development of the MD-12, a trijet follow-on to the MD-11. The MD-12 is longer than its predecessor, features a new wing and larger engines, and will carry up to 375 passengers. McDonnell Douglas was also studying an advanced technology twinjet, twin aisle transport tentatively known as MD-XX.

Boeing and McDonnell Douglas continued work on NASA's High Speed

Civil Transport study program aimed at eventual development of a second generation supersonic transport. The two companies were also participants in a continuing multinational study of the problems and market potential of an advanced supersonic transport and the possibilities of international collaboration on such a development. The combine also includes manufacturers from the U.K., France, Germany, Italy, and Japan.





1. Ontario Corporation's Pyromet Industries employs laser holography for inspection of a Pratt & Whitney engine stator quadrant.

2. Lucas Aerospace was selected as supplier of GM Allison's GMA 2100 and 3000 series engines (GMA 3007 pictured).

3. Parker Hannifin Corporation successfully flight tested an advanced electrically-powered servoactuation system that requires no external hydraulic supply.

4. Bendix/King Air Transport Avionics Division of Allied-Signal developed a forward-looking windshear detection/avoidance capability for its RDR-4A Doppler Weather Radar System.

5. Being readied for a test cell run is the CFE738 high bypass turbofan, a joint venture of General Electric Company and Garrett Engine Division of Allied-Signal.

6. Hexcel Corporation's new autoclave permits fabrication of the entire skin and core assembly of helicopter blades, cutting lead times.

In aviation safety research, NASA conducted two series of flight tests demonstrating new sensors that can warn airline pilots of the potentially dangerous weather phenomenon called windshear. Conducted by Langley Research Center, the tests employed a Boeing 737 equipped with microwave radar and infrared devices that detect downdrafts of air—microbursts—that occur in storms. The airplane spent two weeks in June flying through storms around Orlando,

Florida, and another two weeks at Denver, Colorado, in July.

In the area of high-speed research, NASA was conducting two programs whose principal applications are military but which also have potential for future civil aviation use. With a McDonnell Douglas F/A-18 High Alpha Research Vehicle, NASA was exploring the aerodynamics of extremely high angles of attack (up to 70 degrees). NASA also concluded its high-alpha (high

angle of attack) research using the Grumman-built X-29 forward-swept-wing research craft.

In a program that has specific potential for civil aviation, a NASA/General Dynamics F-16XL aircraft attained—for the first time—laminar (smooth) airflow over a large part of an airplane wing at supersonic speeds. The F-16XL was fitted with a suction system to remove turbulent air moving over a test section on its upper wing surface. Because





7. BASF Structural Materials, Inc., is producing a unidirectional tape line for aircraft and helicopter composite components.

8. This Boeing 747 elevator "feel" computer, produced by E-Systems Montek Division, provides artificial resistance to the pilot's control column.

9. At Dowty Aerospace Los Angeles, Boeing 737 thrust reverser actuators undergo final inspection. In April, Dowty was awarded a Boeing contract for the B-777 thrust reverser actuation system.

10. Undergoing assembly is a CFM56-5C2 engine, one of the new high bypass turbofans produced by CFM International, a joint General Electric/SNECMA (France) company.

11. B.H. Aircraft Company produces noise-reducing hush kit components for airline compliance with FAA regulations.

12. Heath Techna's newest facility at Bellingham, Washington, manufactures retrofit interior systems for commercial aircraft.

13. Harris Corporation systems are employed by the FAA air traffic control centers to receive and process weather information.

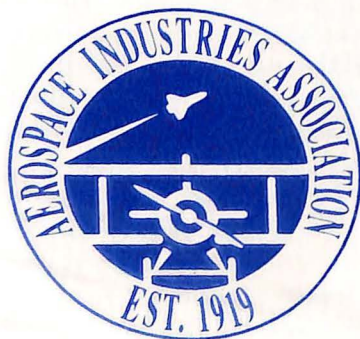
Reducing such turbulence provides a significant reduction in fuel expenditure, the test was an important step toward designing more efficient, future high-speed civil transport aircraft.





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AIA is organized to provide staff support to member company councils and committees. AIA's professional staff keeps up with administrative and technical developments and relays that information to members through regular and special meetings, workshops, seminars, reports, memoranda, and regular publications.



## **POLICY AND PLANNING**

coordinates the key policy issues identified by AIA's Board of Governors and establishes goals and strategies for achieving consensus and action. The following short explanations of each issue are not arranged in any order of priority.

### **International Competitiveness**

To maintain preeminence in global aerospace markets, the U.S. must revamp technology transfer regulations, provide a policy framework for defense trade, and assure export financing for both commercial and military aerospace products.

### **Aerospace Technology Base**

To remain competitive into the 21st century, the U.S. must maintain a strong technology base. Industry, government,

and academia must devise strategies for technology development while using commercial or military innovations.

### **Civil Aviation**

A healthy air transport system requires a strong/effective FAA, improved regulatory procedures in the U.S. and abroad, a modernized air transport system, and government support.

### **Space Policy**

The U.S. aerospace industry supports a broad-based, balanced U.S. space program. Government investment in space launch technologies and infrastructure are crucial to the long-term competitiveness of U.S. aerospace.



Seated, left to right:

Stan Siegel, Vice President, Technical and Operations

Don Fuqua, AIA President

Virginia C. Lopez, Executive Director, Research Center

Herbert E. Hetu, Vice President, Communications

Standing, left to right:

George F. Copey, Secretary-Treasurer

Daniel J. Nauer, Vice President, Human Resources

Thomas N. Tate, Vice President, Legislative Affairs

Robert E. Robeson, Vice President, Civil Aviation

Sandra Carney-Talley, Assistant Vice President, Policy and Planning

Joel L. Johnson, Vice President, International

LeRoy J. Haugh, Vice President, Procurement and Finance

### **Improved Contract Financing**

Policy changes to improve the financial health of the defense industry include a simplified progress payment process and higher rates, recoupment of nonrecurring costs limited to foreign sales of major defense equipment, and elimination of fixed-price contracts for R&D.

### **Streamlined Acquisition Policy**

Actions to streamline acquisition include eliminating redundant government oversight; industry participation in negotiated rulemaking and in developing standards and regulations; and fewer certification, disclosure, and reporting burdens.

### **Defense Industrial Base**

Congress, DoD, and industry must cooperate in bringing about an orderly

transition to reduced spending levels. We must also ensure a viable industrial base that will meet emergency surge requirements and develop, produce, and support U.S. national defense.

### **NISP**

To assist the full implementation of the National Industrial Security Program (NISP), AIA will provide input on a NISP operating manual, FAR change package, NISP compliance review, and changes to laws, regulations, and policies.

### **SDB Subcontracting Awards**

AIA's SDB data base supports industry's goal of increased subcontract awards to SDBs. Incentives in the implementing legislation and regulations of DoD's

SDB mentor-protégé program would maximize industry participation.

### **Environmental Initiatives**

AIA fosters the exchange of technical and administrative solutions and the development of responsible laws, regulations, and standards designed to improve the environment and promote the health and safety of employees and the public.



Sandra Carney-Talley,  
Assistant Vice President,  
Policy and Planning



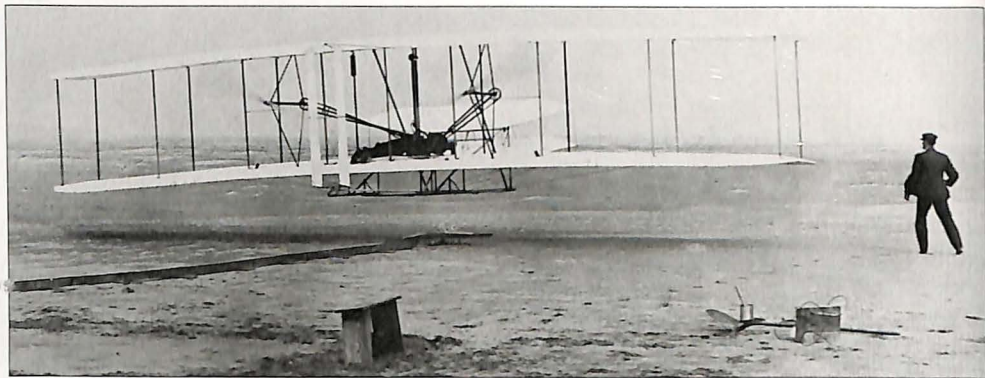
1991  
ASSOCIATION  
ACTIVITIES

**AEROSPACE  
RESEARCH  
CENTER**

*Aerospace Research Center researches, provides analysis, and prepares studies to bring perspective and a better understanding to the issues, problems, and policies of the industry.*



*Virginia C. Lopez  
Executive Director  
Aerospace Research Center*



**Thinking Globally**

In September, AIA released a major Research Center study, *The U.S. Aerospace Industry in the 1990s: A Global Perspective*. The study looks at the global, dynamic, and complex international aerospace marketplace and examines major market players and trends. It discusses what these trends mean for the U.S. industry and economy and America's future international standing.

*A Global Perspective* provides in-depth background on the U.S. aerospace industry and its major competitors in order to explain the industry's positions on various issues. A major conclusion is that the adversarial relationship between government and industry in the United States is damaging to continued industry success.

Copies of the report were distributed to more than 200 key officials in the Bush administration and to members of Congress and staff active in aerospace-related issues. *A Global Perspective* was highlighted in a session of the Congressional Competitiveness Caucus in October along with other Research Center-prepared materials providing background on the industry.

**Maintaining a Strong Industry**

The Research Center coordinated an AIA position paper addressing how the United States can assure that its aerospace industry continues to be the most technologically advanced and financially strong aerospace sector in the world. The paper was provided to the Vice President's Council on Competitiveness and to members of Congress.

Industry is meeting competitive challenges, the paper points out, by 1) investing in important, generic technologies, 2) modernizing manufacturing processes, and 3) employing disciplines such as concurrency of design and manufacture and total quality management. However, government and industry need to work together more, particularly with regard to these issues: financial health of the industry, government-industry relations, predictability and planning, quality products, and a positive trade policy.

The paper maintains that the government must view its role as a partner and not simply as a regulator and customer.



## The First Decade

The first great milestone event of the aerospace age—sustained powered flight—was the product of American technology, accomplished by Orville and Wilbur Wright's biplane Flyer (pictured) on December 17, 1903. Other airplane builders in the United States and Europe advanced the art with improved airframes, power plants, and propellers in the latter years of the first decade.

## Eastern Europe/Soviet Union

*Facts & Perspective* information briefs, written by the Research Center, appear periodically in the *AIA Newsletter*. In April, opportunities and risks for western companies in the Soviet Union and some of its former satellite nations were discussed. While improved East-West relations have opened up intriguing market possibilities for western companies, financial and other problems in the region create significant business risks.

In May, *Facts & Perspective* highlighted the capabilities of the Eastern European and Soviet aerospace industries. Capability differs from country to country, but even the most developed aerospace sectors in this region face obstacles to full participation in the world marketplace. Governments will play a large role in the development of aerospace industries in this part of the world, and this will pose policy dilemmas for the United States.

## Mid-Year Review

An October *Facts & Perspective* provided a mid-year review of the industry's performance. It pointed out that the industry may finally have reached a plateau after years of growth fueled by strong commercial demand and by the military build-up in the 1980s. Mid-year 1991 data indicated the year would be "mixed" for the industry with the commercial sector performing well but with total output falling due to lower military sales. For the first six months of 1991, compared with the same period in 1990, four industry segments showed sales growth. Sales of missiles, commercial

transports, and helicopters grew as did sales to NASA; aircraft sales to the Department of Defense (DoD) and general aviation sales both declined.

## Employment Survey

AIA's annual Aerospace Employment Survey, conducted by the Research Center, revealed that industry employment fell sharply during 1990 from 1989's 20-year high of 1.33 million. Manufacturers trimmed ranks by 61,000 (5%) to 1.27 million in the face of reduced real spending on defense. The 1991 survey, conducted in fall 1991, showed a continuing decline by year-end to an estimated 1.16 million—a loss of 106,000 jobs. Companies expect further cutbacks in 1992 for a total estimated aerospace work force of 1.12 million.

## Facts & Figures

The Research Center completed production of the 39th edition of AIA's statistical yearbook, *Aerospace Facts & Figures*. The theme this year is "The U.S. Aerospace Team: Pride and Purpose" in honor of the world-class U.S. aerospace work force. They are the people behind the products—those who move the nation ahead in commercial aviation and space and help defend freedom in America and around the world.

Sales of *Facts & Figures* totaled more than 1,300. Several thousand copies were also distributed to federal employees, Congress, and the news media.

## Year-End Projections

Research Center staff prepare year-end estimates of industry activity, based on nine months of data, and projections for the year ahead. These forecasts, along with an analysis of industry trends, are part of the media package presented each December at the AIA Year-end Review and Forecast Luncheon. Copies of the data and analysis are mailed with each "sale" copy of *Aerospace Facts and Figures*.

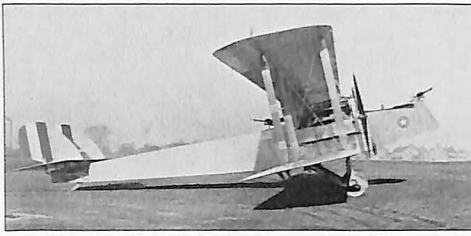
Sales of \$140 billion dollars were projected for 1991, an increase of 5%. Trade balance is expected to reach a record \$29.8 billion. Sales in 1992 should reach \$142 billion—a decline after adjustment for inflation.

## Special Projects

In 1991, Research Center staff assisted other AIA departments by compiling and analyzing data for several special projects:

- Trends in the size of government oversight bureaucracy compared with government procurement spending and the number of companies participating in the defense industrial base.
- Independent Research and Development/Bid and Proposal spending projected through the year 2000 based on DoD funding forecasts.
- A data base on engine trade.
- A data base on potential AIA member companies.
- A background paper on the extension of the Most-Favored-Nation status to the People's Republic of China.
- Background facts and data package on the industry for the Congressional Competitiveness Caucus.





### 1910-1919

*American investment in aviation technology lagged in the early years of the decade and European nations—notably France—took ascendancy. But World War I marked a U.S. aerospace renaissance. A tiny American aircraft industry expanded 35-fold to a labor force of 175,000 that built more than 25,000 airplanes and 32,000 engines. The United States also introduced a number of technological advances, outstanding among them the Liberty engine (pictured is a Glen L. Martin bomber powered with two Liberty engines); more than 15,000 of them powered several types of Allied aircraft.*

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### Statistics

Three new statistical series were added to the list of those developed and published on a continuing basis by the Research Center. One new series covers orders, shipments, backlog, and inventories for aircraft, missiles, and parts. Another provides data on manufacturing, production, capacity, and utilization in the aerospace and aircraft and parts industries. The third new series reports on civil aircraft and civil aircraft engine production.

Ongoing data series are organized into six categories: general statistics, employment, production, foreign trade, DoD, and NASA. The last two are available only to AIA members.

### Information Services

Research Center staff respond to numerous inquiries from AIA staff, industry, government, and others outside the association for data and general information. They also assist those seeking information on industry trends and public policy issues and represent AIA on data-related government and industry study groups.

### Surveys

In 1991, Research Center staff assisted various AIA councils and committees with surveys on contract payments data, Employment Cost Index use, electronic standards prioritization, information technology expense, and costs related to legal and other proceedings.

### Library

The AIA library is part of the Aerospace Research Center. The library is a repository of standard reference materials and departmental records. The librarian obtains books, reports, and periodicals for AIA staff, answers inquiries, and assists with research.



## 1920-1929

Aviation technology development accelerated on both sides of the Atlantic, with the United States demonstrating leadership in such areas as instrument flight, automatic pilots, radio communications, wing flaps, retractable gear, in-flight refueling, and airways navigational aids. The highlight of the third decade came on May 20-21, 1927, when Charles A. Lindbergh flew his Ryan monoplane Spirit of St. Louis (pictured) 3,600 miles non-stop from New York to Paris. The flight convinced a skeptical world of the reliability of the airplane, launched a boom in air transportation, and, in the United States, created a climate for large-scale investment in civil aircraft development.



Working through the Civil Aviation Council and its committees, the Civil Aviation Office gave priority to rule-making activities and coordination with other AIA offices and councils on overlapping issues. AIA also achieved closer working relationships with other industry organizations in the United States and abroad to increase the private sector's effectiveness on airworthiness issues.

### **FAA Aviation Rulemaking Advisory Committee (ARAC)**

ARAC was established by the Federal Aviation Administration (FAA) to expedite the rulemaking process. More than 50 groups, including manufacturers, operators, and community/public organizations, are represented on ARAC and its nine subcommittees. The subcommittees set the work agenda for working groups that perform analysis and draft rulemaking documents. The subcommittees are Air Traffic, Air Carrier/General Aviation Maintenance, Air Carrier Operations, Training and Qualifications, General Aviation Operations, Transport Airplane and Engine, General and Business Airplane, Rotorcraft, and Emergency Evacuation.

AIA established representation on each subcommittee, thereby guaranteeing appropriate placement of industry experts in working groups and an industry voice in the final product.

### **Regulatory Harmonization**

In May 1991, at FAA's request, AIA established a working group to assist in developing an FAA position on

harmonization of Federal Aviation Regulation (FAR) 21 and European Joint Airworthiness Requirements (JAR) 21. These rules set forth the requirements for production and type approvals. AIA also cooperated with other U.S. and European industry groups to harmonize airworthiness requirements governing the design, certification, operation, and maintenance of transport airplanes, rotorcraft, engines, and general aviation category aircraft.

AIA also gave priority to harmonization, working closely with the Association Europeenne des Constructeurs de Materiel Aerospacial (AECMA) and the General Aviation Manufacturers Association (GAMA). Bearing in mind industry's goal of a single certification, AIA also began examining the possibility of accomplishing this through mutual recognition of type design approval and airworthiness certificates by the various authorities.

### **Reverse Thrust Project Group**

AIA took the lead in establishing an industry-wide working group to address issues raised by the crash of a Lauda Air aircraft in May 1991. The working group is charged with determining engine thrust reverser system requirements to assure safe flight. It focused on

- Requirements to validate system reliability.
- Requirements to demonstrate controllability of aircraft in the event of inadvertent in-flight deployment.
- Rulemaking or advisory material as appropriate.

## CIVIL AVIATION

*Civil Aviation Council works with domestic and international agencies, Congress, and others in the aviation community concerning manufacture of civil aircraft, including commercial aircraft, business jets, and rotorcraft.*



*Robert E. Robeson, Jr.  
Vice President  
Civil Aviation*





*Dale S. Warren  
Douglas Aircraft  
Company, McDonnell  
Douglas Corporation  
Chairman, Civil Aviation  
Council*

*Peter Gallimore  
The Boeing Company  
Chairman, Manufacturing  
Integrity Committee*

*Horst Helmann  
G.E. Aircraft Engines,  
General Electric Company  
Chairman, Airplane Noise  
Control Committee*

*Paul Jodon  
Textron, Inc.  
Chairman, Propulsion  
Committee*

*Dick Meinert  
The Boeing Company  
Chairman, Transport  
Committee*

*Susan Walsh  
Pratt & Whitney  
Chairman, Committee on  
Industry and Regulatory  
Affairs*

- The establishment of aircraft review teams to determine compliance of existing designs with the above and report results of this review to the airworthiness authorities.
- A review of maintenance, documentation, and training programs to validate thrust reverser compliance retention. Final recommendations of the group are expected in early 1992.

**International Coordinating Council of Aerospace Industries Associations (ICCAIA)**

ICCAIA is an international organization of aerospace industry associations, established in 1972, that promotes the advancement of economical and safe civil air transport. Currently, ICCAIA has four members: AIA, Aerospace Industries Association of Canada, AECMA, and the Society of Japanese Aerospace Companies.

ICCAIA is an official observer to the International Civil Aviation Organization (ICAO) where it provides advice and technical support to the organization governing civil aviation standards of member nations. In 1991, AIA worked to enhance the effectiveness of ICCAIA in this role in order to keep pace with industry's expanding responsibilities in an era of global regulatory activity. Typical efforts by ICCAIA included work on airplane and rotorcraft noise standards, rotorcraft operational requirements, and planning for the integration of new, state-of-the-art navigation and communication systems into a truly global air traffic control system.

**FAA Aircraft Certification System Evaluation Program (ACSEP)**

The FAA began its prototype manufacturing inspection program in early September. Two firms were inspected in FY 1991 under Phase I. Four more firms will be evaluated under Phase II, which is scheduled for completion in February 1992.

The AIA Manufacturing Integrity Committee (MIC) accepted the responsibility for preparing an industry evaluation of the ACSEP prototype inspections. The results of this review will be shared with the FAA for its use in preparing the final version of its advisory materials.

**Derivative Aircraft Certification Basis**

In September 1990, the FAA issued an action notice outlining procedures for establishing the type certification basis for derivative aircraft, aircraft engines, and propellers. The notice also indicated that the European Joint Aviation Authorities (JAA) will issue a comparable document. A joint FAA-industry effort, the notice is applicable to all derivative products regardless of approval method, such as an amended Type Certificate or Supplemental Type Certificate.

AIA led industry in a joint industry/FAA/JAA International Certification Procedures (ICP) Task Force to address certification of derivative products and the application of later airworthiness requirements to the existing fleet. The task force plans to submit the final report to the FAA and JAA in early 1992.

**Overseas Staffing of FAA Personnel**

AIA established a project group to support FAA efforts to station additional FAA safety inspectors overseas. FAA inspectors are responsible for oversight and approval of repair and maintenance facilities in the United States and abroad. State Department approval is required for billeting U.S. officials in foreign posts.

Top-level management of several AIA member companies addressed their support of FAA's request to Secretary of State James Baker. AIA project group members met with State Department and FAA officials on several occasions through the close of 1991.

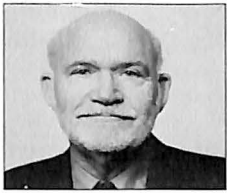
**Part Manufacturer Approvals**

AIA and the Air Transport Association (ATA) are jointly reviewing the process FAA uses to grant Part Manufacturer Approvals (PMA). AIA established an internal project to ensure that AIA's position is clearly delineated and invited FAA's participation. AIA submitted a draft advisory circular with supporting documentation to the FAA in March 1991. The FAA was still reviewing it at year-end.

**Handicapped Access to Transport Aircraft**

In November 1990, AIA and ATA representatives met with Transportation Department staff to discuss several design issues regarding aircraft accessibility for handicapped individuals. ATA agreed to lead a working group to develop design guidelines or standards for interior and ground support equipment accessibility.





R.E. Warren  
United Technologies  
Chairman, Rotorcraft  
Committee



Omar Winter  
Sundstrand Corporation  
Chairman, Commercial  
Customer Support  
Committee

AIA concentrated on problems centered in the aircraft itself, such as lavatory design and seating next to emergency exits. Industry met with representatives of organizations for the handicapped on three occasions.

In October 1991, ATA circulated for comment a draft document—*Guidelines for Accessible Aircraft Lavatories*—to appropriate organizations. The Boeing Company and McDonnell Douglas Corporation, in conjunction with a private company selected by organizations for the handicapped, began a study of the guidelines, using mock-up lavatories and handicapped personnel. The working group plans to issue final guidelines in early 1992.

#### **Rotorcraft Advisory Group**

The AIA Rotorcraft Advisory Group paid particular attention in 1991 to domestic and international regulatory initiatives affecting this business segment. Areas of concern include restrictive ICAO operating rules, burdensome and unrealistic noise certification requirements, and methodologies concerning fatigue evaluation.

#### **Airplane Noise Control Committee (ANCC)**

Implementation of the Airport Noise and Capacity Act of 1990 was a major issue before the ANCC. In 1991, AIA submitted comments to the FAA strongly opposing an interpretation that would permit local restrictions in advance of the dates set forth in the act. AIA also opposed additional stringency requirements.

The committee was actively involved with ICAO in working with AECMA to oppose increased stringency of the requirements and in preparing eight working papers on noise issues. AIA and AECMA supported JAR 36 development and the harmonization of FAR 36/JAR 36 and existing bilaterals. AIA also asked JAA/FAA to incorporate ICAO standards and procedures and to permit AIA/AECMA participation in development of FAR 36/JAR 36.

#### **Commercial Customer Support Committee (CCSC)**

The CCSC participated with ATA in working with Congress to overcome any residual problems associated with maintenance and repair of aging aircraft. The U.S. Navy asked for assistance in determining industry practices for handling excess inventory, and the CCSC responded with a survey of AIA member companies to produce generalized findings.

The CCSC also raised with DoD the issue of unapproved parts and the need for proper documentation of life-limited parts to ensure the integrity of the civilian parts/spares mainstream. Issues involving leased aircraft product support, airworthiness release certificates for exported parts, and FAA parts manufacturer approval and unapproved parts were also on the CCSC agenda.

#### **Committee on Industry and Regulatory Affairs (CIRA)**

CIRA developed AIA position papers on trade negotiations under the Uruguay

Round of the General Agreement on Tariffs and Trade. With AIA's Technical and Operations Council, Office of Legislative Affairs, and Aerospace Research Center, CIRA responded to a draft study of the U.S. turbine engine industry commissioned by Wright-Patterson AFB.

Responding to export financing by the United Kingdom in support of civil aviation products exported to the United States, CIRA initiated discussions with the U.S. Treasury and the U.S. Export-Import Bank to develop viable responses to this problem. The committee also collaborated with AIA's International Council on other civil aviation issues: integration of Eastern Europe and the USSR into a global, market-oriented trading system, U.S.-Japanese-European cooperation, the integrity of commercial loan guarantee programs, and nontariff barriers to trade.

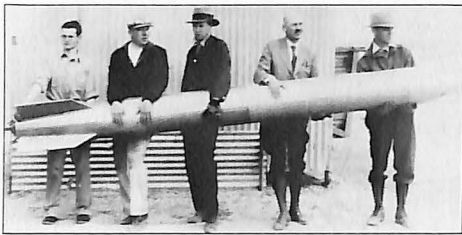
#### **Manufacturing Integrity Committee (MIC)**

Major activities of the AIA MIC included 1) leading the industry effort on ACSEP, 2) participation in the AIA project on unapproved parts, 3) continued work on the FAA Export Airworthiness Release Certificate, and 4) coordinating positions with AECMA on manufacturing certification issues and draft JAR 145 (Approval of Maintenance Organizations) and FAR/JAR 21 harmonization.

#### **Propulsion Committee (PC)**

The PC was active and visible in several areas in 1991. Work progressed on engine





#### 1920-29

*While U.S. aviation technology advanced in the third decade, an American researcher was leading the way toward space flight and long-range missilery, both of which would mature three decades later. On March 16, 1926, Dr. Robert H. Goddard (second from right in photo) became the first to fire a rocket propelled by liquid fuel. Goddard's work was ridiculed in the United States but studied seriously in Germany; it influenced German missile developments in World War II and subsequent U.S. and Soviet rocketry, including space flight.*

certification requirements for bird ingestion, and a draft advisory circular on inclement weather operation was submitted to the FAA and the JAA. The committee also participated in FAA efforts to develop requirements for rotor burst containment and established two working groups, one to address rotor integrity, the other continued airworthiness assessment methodology.

#### **Rotorcraft Committee (RC)**

The RC worked with the FAA on requirements for better seats and for shoulder harnesses for all occupants and was invited by the JAA to participate on its Helicopter Airworthiness Study Group, which is developing JAR 29 certification requirements. The RC also assisted the FAA in developing the U.S. position on ICAO Annex 6 and 14 on helicopter operations.

#### **Transport Committee (TC)**

The TC worked with federal agencies on issues concerning aircraft cabin fire safety to standardize testing and to obtain repeatable results from the National Institute of Standards and Technology's "smoke chamber."

The Airplane Flight Group of the TC developed an industry position on all items related to performance and flight test, including harmonization of the FAR/JAR flight test requirements. Their goal is one flight test to satisfy all of the authorities worldwide. A project group also worked with GAMA and AECMA to assist U.S. and European authorities in revising certification regulations on protecting aircraft systems from adverse effects of lightning and High Intensity Radiation Fields.

The TC's Avionics Subcommittee addressed ICAO's future air navigational system and operations, practices, and procedures for the use of airborne collision avoidance systems.



## 1930-1939

With giant step advances in aerodynamics, propulsion, all-metal construction, cabin pressurization, cockpit instrumentation, and radio aid, aviation technology progressed significantly on both the civil and military fronts—and the United States took a firm leadership position never thereafter relinquished. Along with a number of high-performance fighters and bombers, American manufacturers introduced a series of “modern,” truly productive, high-capacity, all-metal airline transports. Notable among them are the twin-engine Douglas DC-3 (pictured), which eventually found service in virtually every airfaring country, and the Boeing 307 Stratoliner, the first four-engine transport to enter airline service.



In 1991, AIA's Top Ten Issues continued to be the focal point for the three functional areas of the Communications Office: media relations, member relations, and editorial products. As the primary industry spokesman, AIA President Don Fuqua is the point person for the association's issues and communications activities.

The sterling performance of U.S.-manufactured equipment in Operation Desert Storm and the vigorous debate over the shrinking defense budget, while providing a different focus to communications activities, did not change Fuqua's role. He continued to be a much requested speaker, delivering 20 major speeches in 1991 and participating in more than 50 news media interviews.

The Communications Office concluded its program with the U.S. Chamber of Commerce to produce and air a television series of 12, one-minute commentaries by Fuqua on important aerospace issues. Each commentary aired twice on *Nation's Business Today*. The topics covered were “the peace dividend,” the industrial base, U.S. competitiveness and technology, international arms sales, the benefits of space, the environment, defense technology in Desert Storm, credit guarantees for defense exports, civil aviation's contribution to the economy, technology for the future, Independent Research & Development, and the internationalization of aerospace.

At the 27th Annual AIA Year-end Aerospace Review and Forecast

Luncheon on December 11, Fuqua delivered the state of the industry address, stressing the need for stability in the defense budget, strong government support to maintain a robust aerospace industrial base, and the importance of international sales. More than 350 people attended, including 144 media and 50 government public affairs representatives as well as 105 communicators from AIA member companies.

### Media Relations

AIA is an important information source on the aerospace industry to the news media. Early in 1991, media attention focused on the outstanding performance of U.S. equipment in Operation Desert Storm. With the war's end, media interest in global competitiveness, international arms sales, export controls, and the industry's adjustment to a declining defense budget emerged once again. The failed Soviet coup and the president's arms control initiative intensified interest in the industry's future.

Communications supported the National Center for Advanced Technologies (NCAT) Key Technologies for the Year 2000 program and national symposium, “Technology Policy for Global Competitiveness: Forging a Consensus for the Twenty-First Century.” Held September 5-6 in Washington, D.C., the symposium was attended by more than 250 people, including 44 media, reflecting a growing interest in technology development issues.

## COMMUNICATIONS

*Communications Council supports the public activities of AIA's president and staff and conveys industry goals and accomplishments to AIA members, the news media, and the public.*



*Herbert E. Hetu  
Vice President  
Communications*





1940-49

*America's World War II technological thrust took two paths: 1) developmental technology, which led to the introduction of several types of military aircraft of exceptional performance, and 2) manufacturing technology, which enabled the "production miracle" of 1942-45. Abetted by a mobilized automotive industry, U.S. manufacturers built more than 300,000 military aircraft, such as the B-17 long-range, daylight, strategic bomber (pictured).*

On September 11, AIA held a press briefing to release a major study: *The U.S. Aerospace Industry in the 1990s: A Global Perspective*. Attended by 31 media, resulting news articles included positive stories in the national and trade press.

AIA Communications provided spokespersons on key industry issues, such as acquisition policy, the financial health of the industry, and the globalization of the aerospace industry. Attention was also focused on the association's Small Disadvantaged Business (SDB) initiative with a news release in July summarizing AIA and industry efforts and success in this area. An *AIA Newsletter* series highlighting SDB success stories was inaugurated in October.

In 1991, the Communications Office responded to 870 inquiries from the media, arranged 254 staff interviews, held four press breakfasts, and issued 45 news releases.

#### Member Relations

AIA provided Communications Council members with forums for exchanging information with the Department of Defense (DoD), the military services, and other government departments and agencies. Washington-based public relations representatives met with Col. Miguel Monteverde, director for defense information (OASD/PA), Pete Williams, assistant secretary of defense for public affairs, and Brigadier General Thomas V. Draude, director of public affairs for the Marine Corps.

"The Aerospace Industry...After the Storm" was the theme for the spring 1991 Communications Council meeting in Washington, D.C. Dr. Earl Weener, chief engineer for airworthiness, reliability, maintainability, and safety at Boeing, addressed key safety issues affecting the industry; Lt. Gen. Thomas Stafford, USAF (ret.), chairman of the Synthesis Group, discussed the U.S. aerospace industry's role in the Space Exploration Initiative; Pete Williams, assistant secretary of defense for public affairs, described media coverage of Operation Desert Storm. A panel of media and industry representatives engaged in a discussion of "The U.S. Aerospace Industry After Desert Storm: Where Do We Go From Here?"

Discussions at the fall 1991 Communications Council meeting in Tucson centered on global competitiveness. Members also heard from Mac Hay (Pacific Gas and Electric Company) concerning recent Nuclear Free Zone (NFZ) initiatives in Northern California, and Gary Freeman (Northrop Corporation) on communicating health risks associated with aerospace manufacturing to the public, community leaders, and Northrop employees. Lt. Col. Jeffrey D. Fox, USAF, 23rd Tactical Air Support Squadron, shared his experiences as a prisoner of war during Operation Desert Storm.

A panel of recent Malcolm Baldrige National Quality Award winners representing Federal Express Corporation, IBM United States, and Motorola, Inc.,

described their efforts to communicate quality management to employees.

At the Fifth Annual Speechwriters Roundtable in December, AIA staff briefed attendees on the financial health and international competitiveness of the U.S. aerospace industry. A panel of speechwriters from DoD, NASA, and the White House discussed key topics for 1992 and the challenge of conveying their agency's message.

A new Communications Council task group was formed in January 1991 when the AIA Executive Committee expressed the need for cross-council actions to address issues affecting the aerospace industry's ability to compete internationally. Five major issues affecting global competitiveness were identified—export finance for aerospace products, defense trade policy, progress payments, 100% IR&D/B&P recovery, and recoupment of nonrecurring costs.

An action plan was developed and a fact sheet on each issue compiled. Members were asked to provide anecdotal examples where policies relative to the five issues have had a negative impact on their companies.

AIA Communications also monitors information on other AIA initiatives, such as NFZ activities, education, and international arms sales.

*The 1991-92 AIA Directory of Member Company Public Information Representatives* was completed in July and distributed to





Harold Carr  
The Boeing Company  
Chairman,  
Communications Council

more than 800 media representatives, AIA member company public information representatives, and government public affairs representatives.

**AIA Videos.** AIA's new video, *AIA...The Aerospace Leadership Team*, produced by the Communications Office, is an integral part of a new member drive. AIA staff uses it as well to orient new AIA committees and others to the activities of the association. A newly designed recruitment brochure accompanies the seven-minute video.

#### Editorial Products

**AIA Newsletter.** Now in its fourth year of publication, the *AIA Newsletter* focuses on noncompetitive topics of interest to the aerospace industry. Ten times yearly approximately 16,000 copies of the *Newsletter* are mailed to AIA members, Congress, universities, government agencies and departments, financial institutions, and various news media representatives nationwide.

Five goals established at the beginning of the year were met. One of those goals—a good news story in each issue describing AIA member company environmental programs—resulted in favorable publicity to Boeing, General Dynamics, General Electric, Hercules, Hughes, Lockheed, Northrop, Texas Instruments, and United Technologies.

A second goal resulted in special issues focusing on environmental concerns (January/February), Desert Storm technology (March), the National Center

for Advanced Technologies and the Key Technologies for the Year 2000 program (June), civil aviation issues (October), and procurement and finance issues (November). The *Newsletter* also fulfilled a third goal of providing publicity for NCAT's September 5-6 symposium. The June special issue on NCAT was the centerpiece of that effort.

In response to a mandate from AIA's Board of Governors to focus on international competitiveness issues—a fourth goal—several articles on this subject were published in 1991. A fifth goal—to expand *Newsletter* coverage of the technical side of the industry and AIA products, publications, and services—was also achieved.

**Key Speeches.** *Key Speeches*, published 10 times yearly and distributed to 4,500 key members of industry, Congress, the executive branch, and the news media, is a collection of speeches by industry and government leaders on aerospace-related topics.

In 1991 AIA published 42 full texts of speeches and 20 speechbriefs. Featured companies included Allied-Signal, Boeing, FMC, General Dynamics, Grumman, Gulfstream Aerospace, Harris, Hughes, Lockheed, McDonnell Douglas, Raytheon, TRW, and Westinghouse. The government point of view on topics important to the industry was well-represented with contributions from 22 government leaders.

**Annual Report.** "Leadership Through Strength" was the theme of the 1990 annual report, a yearbook and year-end report of the industry and AIA activities. "Old Glory" decorated the cover; quotes from U.S. presidents on a strong national security and strong economy were included throughout the book. The cover theme and quotations were particularly timely with the March publication date, which coincided with the conclusion of Operation Desert Storm.

Approximately 4,000 copies were distributed to select media, various educational and financial organizations, appropriate government organizations and offices, and AIA members.

**Other Editorial Products.** A third desktop publishing system was installed in 1991. Both *Key Speeches* and the *AIA Newsletter* are designed and produced in-house.

Other publishing projects included the *1991-92 AIA Directory of Member Company Public Information Representatives*, a new membership recruitment brochure and ancillary materials, a reprint volume of AIA environmental articles, an Electronic Data Interchange informational brochure, and meeting book covers.

*Preview*, the weekly AIA staff internal newsletter, is written and produced by the editorial products staff.



## HUMAN RESOURCES

*Human Resources Council is concerned with labor and employee relations, industrial security, employee compensation, occupational safety and health, and environmental issues relevant to the aerospace industry.*



*Daniel J. Nauer  
Vice President  
Human Resources*



*Jeffrey P. Wilkens  
TRW, Inc.  
Chairman, Human  
Resources Council*



*Ronald H. Beatty  
Rockwell International  
Corporation  
Chairman, Industrial  
Security Committee*

### **Industrial Security**

**The National Industrial Security Program (NISP).** In December 1990, President Bush concurred with plans to establish an interagency task force to develop a NISP and to include industry participation in its development. In January 1991, government and industry co-chairs were selected for 11 working groups.

A steering committee, co-chaired by Maynard Anderson (DoD) and Harry Volz (Grumman), included representatives from the National Industrial Security Advisory Council, the Energy Department, the Defense Industrial Security Agency, the Central Intelligence Agency, the Information Security Oversight Office (Executive Office of the President), the State Department, the Justice Department, the Office of Management and Budget, and intelligence community staff. Most industry co-chairs and working group members were security representatives from AIA member companies while others represented the National Security Industrial Association, the National Classification Management Society, and the American Society for Industrial Security.

In June 1991, the 11 working groups made their reports to the steering committee, which then prepared the interagency task force response. In October 1991, the response was approved by the deputy secretary of defense, the secretary of energy, and the director of central intelligence and sent to the White House.

Following approval by President Bush, some aspects of the program's structure will be implemented simultaneously with the preparation and coordination of an executive order authorizing the NISP. The president is expected to sign the executive order sometime in spring 1992.

No later than a year after the executive order is signed, a NISP Operating Manual will be issued to all government departments and agencies and the contractor community. At a minimum, it will include standards for

- Security education and training.
- Inspections and compliance.
- Determining realistic threats.
- Determining complete cost of industrial security.

The standardized, single-scope personnel background investigation was approved by the president on October 21, 1991. This will require all government departments and agencies to accept the results of background investigations conducted by departments and agencies other than their own. Although this may not appear to be of major importance, requiring acceptance of single-scope background investigations can result in significant savings of investigative time and the time of individuals awaiting clearance.

Similar to the timing for implementing the single-scope background investigations, other aspects of the NISP will be implemented at the time of their completion and not held to a pre-determined schedule. The NISP should





*Don Black  
Rockwell International  
Corporation  
Chairman, Compensation  
Practices Committee*



*Thomas C. Montag  
Honeywell, Inc.  
Chairman, Occupational  
Safety & Health  
Committee*



*Renzo Venturo  
Hughes Aircraft Company  
Chairman, Environmental  
Affairs Committee*

be fully operational in four to six years from the signing of the executive order.

**Other Industrial Security Efforts.** We have provided significant input into the new *Industrial Security Manual*, particularly in the areas of computer security and international issues. Increased globalization of aerospace markets and the trend toward internationalization require the simplification and removal of obstacles to foreign classified visits, the transfer of properly protected information, and the reciprocity of facility and personnel clearances.

Through the Council of Defense and Space Industry Associations, AIA articulated the defense industry's position on newly imposed security alarm and patrol requirements and on the elimination of company-granted confidential clearances. Using cost-benefit analyses as a major argument, AIA is attempting to prevent government imposition of unnecessary and very expensive security measures.

### **Compensation Practices**

**Executive Compensation.** The Summit Survey of Executive Compensation revealed, once again, that pay patterns between defense and commercial participants do not differ significantly.

In 1991, 65 companies participated in the Summit Survey, one more than in 1990. Forty-two of the 65 are primarily commercial, 23 primarily defense. This ratio of participation between commercial and defense should continue.

Slightly more than one-half of survey participants are AIA members who recognize the need for reliable survey data that objectively compares defense and commercial pay levels for key executive jobs. The Summit Survey is useful in Defense Contract Audit Agency (DCAA) audits of executive compensation practices and for substantiating executive compensation recommendations made to corporate compensation committees and boards of directors.

**AIA/DCAA Interface.** DCAA pushed back the 1991 seminar to continue its dialogue on compensation with the contractor community to early 1992.

When this seminar takes place, AIA will present its position on several topics: 1) the definition of compensation offsets, 2) the imposition of disallowances based upon collective bargaining agreements, 3) consideration of company executives as a class of employees in lieu of individual analysis, 4) the percentage deviation from survey rates for determining reasonableness of executive compensation, and 5) DCAA's continued use of broad and inappropriate survey data in compensation audits.

AIA has been effective in redirecting DCAA's interpretation of offsets, bargaining unit pay, and focusing on compensation policy and systems rather than individual compensation.

The Compensation Practices Committee has been working with AIA's Cost Principles Committee to improve defense

acquisition regulations dealing with compensation for personal services. The committee will pursue all opportunities to influence the positive development of DoD compensation audit policy.

### **Human Resources**

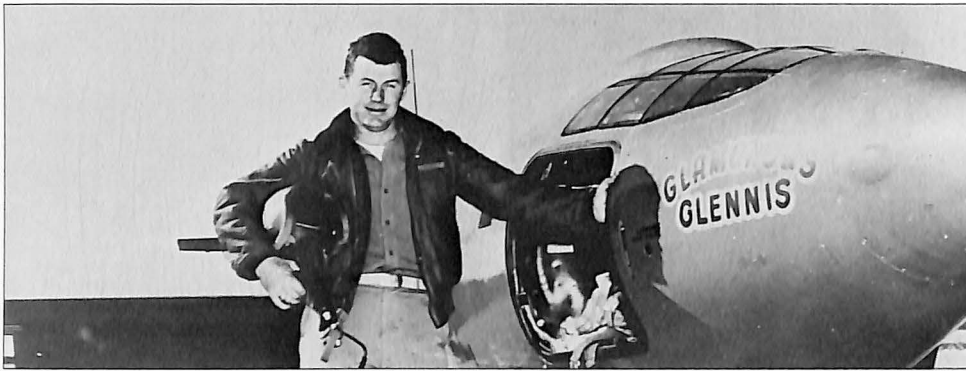
**Americans with Disabilities Act (ADA).** Effective July 26, 1992, employers' compliance with the ADA will be subject to review and audit.

The Human Resources Council is working to ensure that employers accommodate the disabled through job redesign and restructuring and that these efforts comply with OSHA (Occupational Safety and Health Administration), state, and local safety and health regulations.

**Legislation.** The Human Resources Office works closely with AIA's Office of Legislative Affairs to coordinate association positions on legislative initiatives. Attention to the issues listed below has been ongoing and will continue into 1992:

- Family and medical leave.
- Employee drug testing.
- Mandated health care.
- OSHA reform.
- Banning striker replacement.
- Bypassing worker's compensation to allow private rights of action.
- Establishing a federal worker's compensation program.
- Requiring joint trusteeship of pension plans.
- Comparable worth.





#### 1940-49

America's great wartime air strength evaporated in the hectic demobilization of 1945-46, but the nation's aerospace technology capability continued to advance. The United States overtook early British/German leads in jet-powered flight and introduced the first truly operational turbine-powered military aircraft. The technological highlight of the decade came on October 14, 1947, when U.S. Air Force Captain Charles E. Yeager flew the rocket-propelled Bell XS-1 research plane (pictured) to a speed greater than the speed of sound, a world first.

#### Environmental Concerns

The pace of new environmental regulations surged in 1991. Restrictions were tightened on the use in manufacturing of toxic substances, smog-forming substances, and ozone-depleting substances. Many other requirements were promulgated at both federal and state levels dealing with new training and record keeping requirements related to the use of chemicals that threaten the environment.

AIA's Environmental Affairs Committee follows proposed regulations to assure that the costs and effects of new restrictions are taken into account by the regulating agency. AIA works closely with other Washington-based organizations having similar concerns.

#### Informing the Public of Aerospace Environmental and Safety Efforts.

AIA's director of environmental affairs and occupational safety and health worked with AIA's Communications Office to publish a monthly column in the *AIA Newsletter* titled, "Aerospace and the Environment." The column documents and publicizes current efforts or topics related to environmental or safety issues affecting the aerospace industry. The 1991 January/February *Newsletter* was a special issue focusing on the environment, which highlighted environmental and safety initiatives underway at AIA member companies. The special issue was very well received by the environmental community, and the focus will be repeated in 1992.

A second project to be produced by AIA's Communications Office is publication of a "green book" of articles from the *Newsletter*. A public relations tool, the booklet documents the positive contributions the industry is making toward finding technical solutions to environmental and safety problems.

#### Aerospace Control Techniques

**Guideline.** The Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards has begun work on preparing an aerospace *Control Techniques Guideline* (CTG), a document aimed at reducing pollutant air emissions from aerospace paints and coatings. The document is required by the 1990 Clean Air Act Amendments.

The AIA Clean Air Task Group, a subgroup of the Environmental Affairs Committee, has taken the lead in creating a dialogue among the aerospace industry, the EPA, and other agencies and organizations that would be affected by the aerospace CTG, such as NASA, DoD, the Federal Aviation Administration, the Air Transport Association (ATA), and the National Paint and Coatings Association. These groups are working with AIA to establish realistic specifications for aerospace paints and coatings that will result from the CTG.

#### DoD Environmental Initiatives.

The Environmental Affairs Committee, along with representatives from the Occupational Safety and Health Committee, the Legal Committee, and other affected associations, have formed a

DoD/industry working group that will discuss hazardous materials management issues in the acquisition process, including contract language and the design of "green" aerospace systems. The Air Force Human Systems Division is the lead within DoD for this initiative. The DoD/industry working group will focus on protecting the environment and workers and minimizing cost.

#### Joint Efforts with the Air Transport Association.

The Environmental Affairs Committee has been working closely with ATA on several environmental issues. A monthly meeting, called the Aviation Environmental Roundtable, is jointly hosted in Washington, D.C., by AIA's director of environmental affairs and the ATA counterpart. Other joint projects include development of the aerospace CTG and an examination of work underway to reduce the environmental impacts of polluting emissions from jet engine exhaust. In addition, ATA members now participate in the annual Aerospace Hazardous Waste Minimization Conference.





#### 1950-59

Military aviation technology advanced another giant step with introduction of the first supersonic fighters and the first jet-powered bombers. In the United States, the missile age arrived with service introduction of short-range air defense weapons and pilotless aircraft, later intermediate-range ballistic missiles. The United States initially trailed other nations in commercial jet transportation, but by decade's end had firmly established market leadership with the Boeing 707 and Douglas DC-8. Similarly, the United States trailed the USSR in testing intercontinental ballistic missiles (ICBMs), but in 1959 introduced the USAF/Convair Atlas ICBM (pictured) to operational service. It fell to the USSR to launch the space age in 1957—with Explorer I (February 1, 1958), the United States embarked on a comeback that would soon lead to unquestioned U.S. space leadership.

**Sixth Annual Aerospace Hazardous Waste Minimization Conference.** On June 25-27, 1991, Boeing's Corporate Environmental Affairs Department hosted the Sixth Aerospace Hazardous Waste Minimization Conference in Seattle, Washington. More than 45 formal papers were presented to 350 registrants at the conference. Topics covered included education, environmental regulations, and surplus chemical sales, but the primary emphasis was on source reduction of waste generated during manufacturing. This unique, once-a-year meeting was opened this year to allow attendance by aerospace subcontractors and suppliers and commercial airline employees.

#### **Occupational Safety and Health**

Because most environmental issues overlap safety and health issues, AIA's Occupational Safety and Health Committee works closely with the Environmental Affairs Committee. In 1991, new restrictions on worker exposure to heavy metals and toxic chemicals were debated at the federal level as were new proposals that would 1) reform the Occupational Safety and Health Act, 2) protect workers from repetitive motion injuries, and 3) deal with indoor air hazards.

#### **Aerospace Safety and Health Data**

**Base.** To help aerospace manufacturers compare their safety and health performance with their counterparts in a timely manner, the Occupational Safety and Health Committee developed a data base of safety and health statistics. The

first report in 1991 resulted from a survey sent out in January 1991. It covers data from 1988, 1989, and 1990. The AIA data is reported by averages for various aerospace Standard Industrial Classification codes and is compared to data developed by the Bureau of Labor Statistics.

#### **Joint Efforts with the Suppliers of Advanced Composite Materials Association (SACMA).**

The Occupational Safety and Health Committee has joined with SACMA in several task groups that work on safety and health issues associated with composite materials. One project resulted in a list of corporate contacts within SACMA and AIA member companies that can facilitate direct corporate interface on health-related issues. A second project—guidelines for SACMA companies required to provide hazard information to accompany composite materials—is underway. The data, which will be supplied to users of composites, is needed for regulatory requirements and also to evaluate the hazard potential of the supplied material.

**AIA Composites Project.** The AIA Composites Task Group reports to the Occupational Safety and Health Committee. The task group is completing a three-year study on industry experience and work practice recommendations when handling advanced composite materials. The final report will summarize findings and provide companies with guidelines on how to minimize exposures to composite materials. The recommendations will be summarized by composite type and also by manufacturing task.



## INTERNATIONAL

*International Council addresses international issues affecting the ability of U.S. firms to compete and cooperate in a global marketplace.*



*Joel L. Johnson  
Vice President  
International*



*Robert V. Garvin  
General Electric Company  
Chairman, International  
Council*

The U.S. aerospace industry faced an international climate in 1991 that was marked by rapid change and contradictions.

At the beginning of the year, the world watched an awesome demonstration of the quality of U.S. defense equipment as Desert Shield became Desert Storm. Yet most of the star performers were due to be phased out of U.S. procurement plans within the next few years. By year-end, the United States was in the forefront of trying to encourage some limit on the transfer of military hardware to the Middle East.

The meltdown of the Soviet empire continued. Offers were made to the United States to sell any and all aerospace products. The U.S. government, in turn, wrestled with how to help introduce former Soviet bloc countries into a market system without undercutting that system in the process.

Reductions were made in the level of technology to be withheld from the former Soviet bloc countries. But new efforts were underway to restrict technology transfer to Third-World countries that might be used for weapons of mass destruction and their delivery systems.

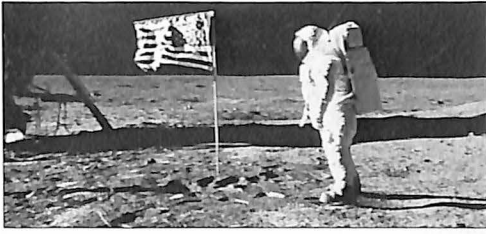
Pacific Rim countries remained critical markets for U.S. commercial and military aerospace products and, increasingly, became sources for capital, components, and cooperative relationships for U.S. aerospace companies. Concerns still exist, however, that these same countries could

become major rivals to the U.S. aerospace industry in the future.

Amidst these trends and countertrends one fact was clear—there will be more growth in commercial and military aerospace markets offshore than in the United States, and, hence, the U.S. aerospace industry will have to rely more and more on international markets to maintain its health and preeminence. Over the remainder of the decade, international sales will account for a larger share of U.S. commercial and military aerospace production, a theme highlighted in a major study produced by AIA's Research Center in 1991.

The International Council organized itself into four committees for 1991: Defense Trade, Regional Trade and Industrial Cooperation, Export Controls, and Legislative. Where appropriate, committees established individual working groups to tackle specific issues.





#### 1960-69

*In the 1960s, the United States became solidly entrenched as acknowledged world leader in all four major avenues of aerospace endeavor. The military services were operating families of highly advanced aircraft, some with double sonic speed. U.S. manufacturers dominated the jet transport market and inaugurated further advance with the introduction of the "wide-body" jumbo jets. In missilery, U.S. forces operated a complete spectrum of high-performance weapons, including silo-based, solid-fuel ICBMs and submarine-launched fleet ballistic missiles. And, on July 20, 1969, the United States effectively ended all argument as to space leadership when the Apollo spacecraft delivered two astronauts to the surface of the Moon, mankind's greatest technological achievement (pictured).*

#### Defense Trade

The ability to sell U.S. defense products to friendly countries is critical to the future of several individual weapons systems and to the general health of the defense industrial base. There is increasing understanding of this phenomenon in some places in the executive branch and in Congress.

**Export Finance.** As one manifestation of this understanding, Senator Christopher Dodd (D-CT) and the Bush administration each pressed for legislation that would have provided an export credit guarantee facility for defense exports, a long-held objective of AIA. Association members and staff worked with Congress and the administration to obtain this legislation, and although the Senate did pass a provision, it was defeated in the House-Senate conference by one vote. This issue will again receive strong International Council support in 1992.

**Mideast Arms Sales.** Decisions on potential sales of U.S. equipment were delayed during 1991 because of Desert Storm operations, the cash flow problems of friendly Gulf Coast Arab states, and the movement towards Middle East peace negotiations and agreement on sales of weapons systems to that region.

However, the administration carefully pointed out that it would provide for the legitimate defense needs of friendly countries in the area. Over the course of the year, notifications for approximately \$9 billion of arms sales to the region were sent to Congress. In the past, the

International Council has supported administration decisions on specific arms sales and will likely do so in the future.

**R&D Recoupment.** The International and Procurement and Finance Councils worked closely together in urging the Department of Defense (DoD) to take a more reasonable approach to recovering government nonrecurring costs, such as research and development, when equipment is sold overseas or when military technology is used in commercial products. Agreement is near on a policy that would at least limit recoupment on defense exports to major defense equipment and similar military items.

#### Regional Trade and Industrial Cooperation

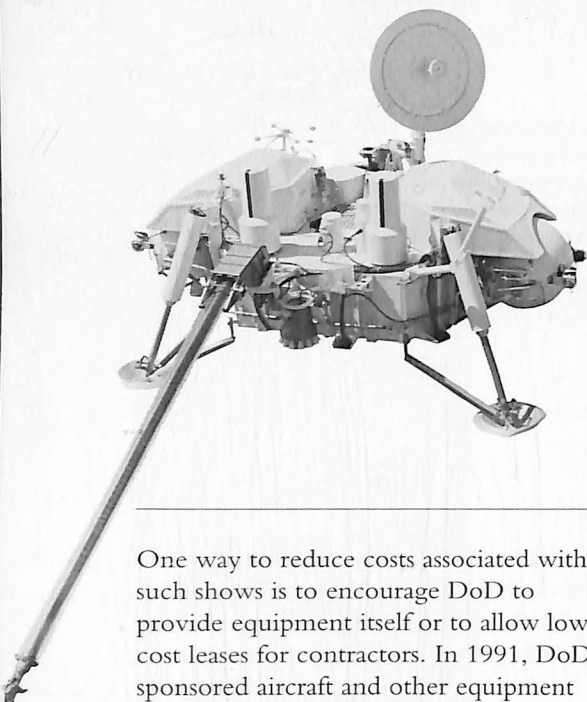
The Regional Trade and Industrial Cooperation Committee monitored developments related to the integration of European commercial and defense markets but focused primarily on the Pacific Rim and Japan. It also established a working group to examine how AIA could help its members deal with the proliferation of air shows and the increased expense of participating in them.

**Japan.** AIA maintains a close working relationship with its Japanese counterpart, the Society of Japanese Aerospace Companies (SJAC). Several joint meetings were held to discuss such issues as how the respective governments treat technology in joint projects and Japan's interest in becoming a larger producer of components for civil aircraft. AIA and SJAC are writing a joint paper that would

help companies contemplating U.S.-Japan cooperative activities understand the kinds of issues involving treatment of technology that could arise.

**International Trade Shows.** AIA member companies are concerned that foreign air shows have increased in number and expense. The working group on air shows recommended that AIA obtain an Export Trade Certificate of Review from the Commerce Department to deal collectively with trade shows. This certificate provides antitrust protection to AIA member companies wanting to exchange information on participation in particular shows and to negotiate as a group better terms and conditions with show managements or other show-related services. Under the certificate, companies could also choose to operate joint facilities at shows. The International Council and AIA's Board of Governors have approved moving forward with this proposal. AIA expects to have the certificate by early 1992.





#### 1970-79

*In July and August 1976, the Viking 1 (pictured) and Viking 2 spacecraft landed on the surface of Mars to transmit information for several years, a major highlight among important space advances of the decade. Others included advanced weather, communications, and Earth resources monitoring satellites for civil use, expanded use of space systems for defense, manned operation for 171 days in 1973-74 of the first U.S. space station, Skylab, and the U.S./USSR Apollo-Soyuz rendezvous/docking mission of 1975. Meanwhile, the United States maintained leadership in military aerospace technology through development of a variety of new piloted and automated weapon delivery systems. On the civil aircraft front, U.S. manufacturers were now experiencing strong competition from abroad, but U.S. jetliner sales, nonetheless, soared to record levels.*

One way to reduce costs associated with such shows is to encourage DoD to provide equipment itself or to allow low-cost leases for contractors. In 1991, DoD sponsored aircraft and other equipment at the Paris and Dubai Air Shows. AIA coordinated industry activity with DoD and arranged for and managed a facility at each show for the military to use as a command center and ready room. At year-end, DoD was formulating long-term policies with respect to military participation at trade shows and national demonstrations. AIA will urge a policy that would allow the kind of support industry enjoyed at the Paris Air Show.

#### Export Controls

The fall of the Eastern bloc resulted in reduced controls for U.S. goods and technologies to the East. In the aftermath of the Persian Gulf war, however, there has been continued emphasis on curbing weapons of mass destruction to Third-World destinations. The administration has incorporated unilateral controls on a broad range of goods as a means of limiting indigenous production of such weapons and stimulating other countries to follow suit. Although AIA supports the administration's objectives, the East-West debate demonstrated that controls must be specific and multilaterally enforced to be truly effective.

**Core List.** The United States and its COCOM (Coordinating Committee for Multilateral Export Controls) partners achieved a historic restructuring of the export control system in 1991. Effective September 1, 1991, a core list of streamlined controls replaced the post WWII Industrial List. Export controls on civil products, including aircraft, inertial navigation systems, and current production of civil aircraft engines, for example, were virtually eliminated.

**Commodity Jurisdiction.** AIA member companies pressed for a clearer distinction between military and dual-use products. Early in 1991, the Senate passed a bill to reauthorize the Export Administration Act. It included AIA-supported language that more clearly defines a "defense article" for purposes of export controls. The House version of the extension, passed late in the year, included a

mechanism to resolve disputes over commodity jurisdiction between government agencies. It did not include the definition language favored by AIA. A conference on the two versions was delayed until 1992. AIA wants a compromise that would include both a clear definition and a fair and prompt dispute resolution mechanism.

#### Missile Technology and other Control Regimes.

AIA has urged a strong multilateral approach to curtailing the spread of weapons of mass destruction. During 1991, however, the United States initiated unilateral controls on a range of strategic and nonstrategic goods and technologies in the Enhanced Proliferation Control Initiative. Controls under this regime extend to nonmilitary goods that could be used in the manufacture of weapons of mass destruction. Although the United States has pursued multilateral adherence to the Missile Technology Control Regime, major producers, such as the Russians and the Chinese, have yet to join. AIA is pressing for limits on unilateral controls.





*Karl F. Lauenstein  
General Dynamics  
Corporation  
Chairman, Legislative  
Committee*



*Willard Mitchell  
Teledyne International  
Chairman, Regional  
Trade and International  
Cooperation Committee*



*James R. Nelson  
Martin Marietta  
Corporation  
Chairman, Defense Trade  
Committee*



*Paul A. Seymour  
Smiths Industries  
Chairman, Export  
Controls Committee*

**International Traffic In Arms**

**Regulations (ITAR).** The slow progress on several initiatives that would bring the U.S. defense export system into line with those of our major allies has frustrated industry. An administration-sponsored initiative to harmonize the U.S. Munitions List with the COCOM Munitions List has dragged on for more than a year and, in some instances, has resulted in additional unilateral controls for U.S. products. In the important areas of civilian space equipment and technology, the administration is divided on how to proceed.

AIA is urging more direct industry input. An industry-sponsored rewrite of the ITAR, presented to the State Department in late 1990, has yet to be fully reviewed. AIA stressed the need for progress on this initiative at high-level meetings with State Department and other administration officials.

**Customs Handbook.** AIA currently enjoys a productive and positive relationship with U.S. Customs officials. An AIA/Customs Working Group cooperated closely with the Customs Service to provide technical comments and recommendations for the new *Customs Handbook of Procedures*, which Customs field officials throughout the United States will use.

**Legislative**

Through the Legislative Committee, AIA member companies and staff coordinate the promotion of specific international issues in Congress. The Committee focused on three areas in 1991: 1) legislation for an export credit guarantee facility for defense products, 2) improvements in the legislation to extend the Export Administration Act and the Defense Production Act, and 3) the defeat of proposals that would disrupt or prevent specific arms sales.



## LEGISLATIVE AFFAIRS

*Legislative Affairs monitors policy matters affecting the industry and prepares testimony that communicates industry's viewpoint to Congress.*



*Thomas N. Tate  
Vice President  
Legislative Affairs*

### **IR&D/B&P**

Several years worth of effort by AIA came to fruition as Congress approved, and the president signed into law, important changes to statutes covering allowability of Independent Research and Development/Bid and Proposal (IR&D/B&P) costs and the treatment of technical data rights. These changes were among the issues of great interest to AIA member companies in the FY 1992 Defense Authorization Act.

Despite many false starts, Congress, industry, and the Department of Defense (DoD) were able to agree on language that provides for full allowability of IR&D/B&P costs after a three-year transition period. During those three years, IR&D/B&P costs amounting to 105% of the previous year's costs are allowable. If a company's IR&D/B&P spending is increasing, those costs are allowable to 105% plus an inflation factor. These changes remove significant administrative burdens, for example, detailed and costly IR&D/B&P technical evaluation brochures and the tri-service negotiation process.

### **Technical Data Rights**

DoD's position on ownership and use of technical data has created significant problems. Congress, therefore, mandated formation of a joint government-industry committee on rights in technical data. This committee must submit proposals to the secretary of defense for regulations covering rights in technical data along with proposed legislation designed to

achieve the purposes set forth in Section 2320 of Title 10 (Technical Data Rights) if it becomes necessary.

### **Suspension and Debarment**

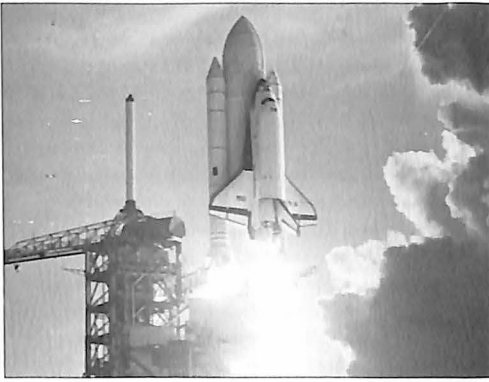
During House Defense Appropriations Subcommittee consideration of the FY 1992 defense appropriation, language was added to consolidate the DoD suspension and debarment functions into a central location under the defense inspector general. This was a proposed solution to the inconsistent treatment of federal contractors by the suspension/debarment offices of the military services. AIA vehemently opposed this move because it would have given an investigative arm of the government the power to render decisions affecting national defense and contractor financial health.

The language was removed during conference negotiations and replaced with a requirement that DoD publish in detail its suspension/debarment practices and procedures and rescind the DoD policy letter that requires de facto suspension/debarment.

### **Technology Policy**

As defense budgets decline, industry, Congress, and the Bush administration are becoming more aware of maintaining our strength in aerospace through greater emphasis on our industrial and technology infrastructure. As a result, the first session of the 102nd Congress endorsed a technology package within the 1992 Defense Authorization Bill intended to improve the current U.S. technology base





#### 1980-89

*The April 1981 introduction of the Space Shuttle (pictured) to operational service marked a U.S. world-leading innovation of singular promise for space transportation, a reusable system that offered utility as a manned payload delivery vehicle, an orbital laboratory, an Earth-to-space station link, and a means of revisiting orbiting satellites for repair or retrieval. Although Shuttle operations were marred by the tragic 1986 loss of Orbiter Challenger and its crew, 38 successful flights were accomplished by the end of the decade. Beginning in 1984, the Department of Defense and its aerospace contractors launched the Strategic Defense Initiative, a research program aimed at developing space-based and ground-based technologies for defense against ballistic missiles.*

through coordinated efforts in key, generic technologies.

Senator Jeff Bingaman's (D-NM) package reflects AIA's strong support for taking greater action on key technologies with government, industry, and academia coordinating basic research and development and with the utilization of manufacturing technologies. The Dual-Use Critical Technology Partnerships of the Defense Advanced Research Projects Agency, multi-year strategies for federally supported generic technologies, and manufacturing technology development are included in the Bingaman package and have AIA's support.

#### Minority Subcontracting

AIA is committed to finding opportunities for increasing awards to Small Disadvantaged Businesses (SDBs). In 1991, the association worked closely with Senator Sam Nunn (D-GA) and his staff to strengthen the authorized FY 1991 Mentor-Protege program. Mentor-Protege was established so that industry can provide business, technical, financial, and contractual assistance to SDBs.

Questions arose about the breadth of the test program when DoD published the regulations in early 1991. Congress was alerted to industry's concerns, and Senator Nunn took legislative action to broaden the program and create opportunities for industry and the minority community to participate in this pilot program.

#### Space Policy

The National Aeronautics and Space Administration (NASA) survived one of its most contentious years of debate. Members of Congress were faced with a budget agreement having fixed-dollar amounts and a diverse appropriations committee representing Veteran's Affairs, Housing and Urban Development, and Independent Agencies.

Programs within NASA were reviewed and prioritized. A push to cancel Space Station *Freedom* survived the legislative process but caused industry and Congress to realize the impact of the Budget Enforcement Act of FY 1991, which will stay in effect until 1993.

The final tally for NASA's FY 1992 budget cleared \$15.2 billion, \$594 million below the president's original request.

#### Defense Export Financing

Industry made headway in 1991 toward convincing Congress and the administration to establish a defense export financing program. Senator Christopher Dodd's (D-CT) amendment creating the program was included in the Foreign Relations Authorization Bill.

The program, which provided for guaranteed loans for the sale of defense equipment to a select group of U.S. allies, was to be administered by the State Department. It required close scrutiny of a nation's creditworthiness. Although the Dodd amendment received support from the majority of the Senate Foreign Relations Committee, the language was

deleted in a House-Senate conference committee session by one vote.

#### Competitiveness

Competitiveness became the buzz word on Capitol Hill in 1991. AIA made certain that members of Congress were aware of the industry's efforts in this area.

In October, AIA participated in a forum on the future of the U.S. aerospace industry sponsored by the Congressional Economic Leadership Institute for the Congressional Competitiveness Caucus. AIA had the opportunity to highlight the industry's positive trade balance and to outline future challenges. AIA worked diligently with the U.S. Congress in 1991 to ensure the enactment of export laws beneficial to U.S. manufacturers.





#### 1980-89

A highlight of aeronautical development in the 1980s was introduction of low-observable (stealth) technology, exemplified by the Lockheed F-117A (pictured), which first flew in June 1981 and became operational in October 1983. Amid history's greatest U.S. peacetime military buildup, defense aeronautical technology advanced across a broad spectrum with major advances in aerodynamic design, propulsion, flight controls, cockpit information, navigation, targeting, battlefield surveillance, radar suppression, and aircraft on-board self-protecting measures. In civil aviation, U.S. manufacturers countered intensifying foreign competition with advanced technologies and maintained leadership in commercial air transport sales.

## PROCUREMENT AND FINANCE

*Procurement and Finance Council monitors and coordinates legislative and regulatory changes and initiates actions for improvement in procurement and procurement-related issues, including patents and data rights.*



*LeRoy J. Haugh  
Vice President  
Procurement and Finance*

### Organization

The Procurement and Finance (P&F) Council operates through seven functional committees—Cost Principles, Economic Advisory, Facilities and Property, Legal, Intellectual Property, Tax Matters, and Procurement Techniques—under the oversight and guidance of a 15-member Executive Committee. In addition, the Controllers' Forum (formerly Finance Committee), comprised of senior finance officials, provides guidance on finance-related issues. One other committee, the Washington Procurement Committee, comprised primarily of AIA member company procurement and legislative representatives in the Washington area, provides "quick reaction" advice and recommendations to the Executive Committee on fast-track legislative and regulatory issues.

### Priority Issues

The P&F Council Executive Committee focused on the following broad issues during 1991: 1) financial health of the industry, 2) downsizing and maintaining the defense industrial base, 3) reduction of adversarialism and oversight, 4) acquisition streamlining and reform, 5) environmental issues, and 6) Research and Development (R&D).

The AIA Board of Governors (BoG) Executive Committee selected three specific issues—simplified contract financing, recoupment, and full recovery of Independent Research and Development/Bid and Proposal (IR&D/B&P) costs—for priority attention under

the umbrella of international competitiveness. The P&F committees worked very actively during the year on these and a range of related issues.

### Simplified Contract Financing

The customary method of financing contract performance under fixed-price type contracts is progress payments. The progress payments rate has ranged from 70% to 90% over the past 25 years and currently is 85%. While this (85%) is an improvement over the 75% industry was receiving just three years ago, the true rate is less, often by several percentage points, because of exclusions (for example, spare parts) from progress payments and also because Department of Defense (DoD) precludes flexible progress payments in contracts that provide for 85%. In addition, the payment process has become overly complex. The numerous calculations required to support a payment request, which must be accompanied by an Estimate at Completion (EAC), are subject to many misinterpretations and require the involvement of too many government and industry personnel.

Industry does not believe the extent of contract financing should be determined by the type of contract. Under cost type contracts, the government reimburses 100% of costs. But even if progress payments remain at 85%, simplifying the process to eliminate much non-value added work will be a big step.

Representatives of the P&F Economic Advisory Committee met with cost,



price, and finance representatives in DoD to urge a joint DoD and industry effort to achieve a simplified payment procedure. DoD's director of defense procurement has confirmed a willingness to engage in this effort. The P&F Council will continue to pursue this matter in 1992. A BoG ad hoc committee has been set up to provide high-level support.

#### **IR&D/B&P**

The BoG ad hoc committee on IR&D/B&P decided in February that AIA should pursue full reimbursement of these costs by 1993. Currently companies are limited in the recovery of IR&D/B&P costs by the terms of advance agreements with DoD.

In the FY 1991 Defense Authorization Act, Congress broadened the scope of allowable IR&D efforts by introducing the concept of "potential interest" to DoD. This would include activities that 1) strengthen the defense industrial and technology base, 2) enhance U.S. industrial competitiveness worldwide, 3) increase development of dual-use technologies, 4) promote the development of critical technologies, and 5) provide cleanup, restoration, and other environmental benefits.

The House Version of the FY 1992 Defense Authorization Bill approved further changes that would eliminate IR&D/B&P advance agreements and require full allowability of reasonable IR&D/B&P costs starting in FY 1993. The Senate version was silent on the issue. DoD objected to the House

provisions, and a compromise was reached in conference that eliminates advance agreements and ceilings and provides for gradual increases in allowable costs for three years. After 1995, all IR&D/B&P costs would be fully reimbursed to the extent they are reasonable, allocable, and not otherwise made unallowable by law or regulation.

#### **Recoupment**

Currently, nonrecurring costs of developing defense equipment are recouped by a pro rata surcharge on Foreign Military Sales (FMS) and other sales of such equipment, including sales of items derived from defense hardware (derivative items) with 10% or more commonality. The amount and duration of recoupment is often fixed arbitrarily by DoD and there is no provision for appeal.

Both the Procurement Techniques Committee and the Intellectual Property Committee have devoted considerable effort in 1991 to get this policy changed. A new rule proposed on October 25, 1991, would reduce the scope of products subject to recoupment charges. Charges would be made only on articles categorized as Major Defense Equipment (MDE), Major Items (MI), or derivatives (50% commonality) of MDE or MI. This is a slight improvement over the current rule but still would inhibit industry's ability to compete in world markets.

AIA believes an equitable policy should 1) limit recoupment to MDE or essentially similar items, 2) provide for industry and government to mutually

determine recoupment charges, and 3) include an appeal process.

#### **Employment Cost Index**

The Bureau of Labor Statistics (BLS), under a contract with AIA for the past four years, developed and maintained Employment Cost Indexes (ECIs) for aerospace. The ECI is used to measure the increase in price under a contract that contains an economic price adjustment clause.

AIA expected that, after the initial three-year contract, the BLS would continue to publish these indexes without a special charge. This has not materialized. Therefore, for the time being, continuing the contract arrangement is the only way to ensure that AIA member companies continue to receive ECI data.

Several companies find the indexes useful, but they do not appear to be as widely used as originally anticipated. AIA is surveying its member companies to determine how many actually use them and would be willing to pay the contract costs if a continued contract arrangement is necessary. At the same time, the matter is being directed to the Secretary of Labor to urge that BLS include the ECI as a part of its normal output without additional charge.

#### **Accounting for Government Property**

DoD is working to standardize its information management systems and bring about savings in the \$9 billion spent





Robert Johnson  
Lockheed Corporation  
Chairman, Procurement  
and Finance Council



Bette Bardeen  
Rockwell International  
Corporation  
Chairman, Legal  
Committee



Arnold Chiet  
Martin Marietta  
Corporation  
Chairman, Tax Matters  
Committee

annually on information technology. In the area of government property, a Government Material Corporate Information Systems (CIM) working group has been trying since early 1989 to establish a transaction-based general ledger type system.

The AIA Facilities and Property Committee has been attempting to convince the government group that much of what they are trying to accomplish is already in place in the various government and contractor record systems, and that there is no need to create a new system of duplicate records and reports. The existing systems should be examined to see what additional data may be needed and then an assessment can be made whether it is cost effective to make any changes. The committee delayed the implementation of any new financial accounting system and believes this initiative is unlikely to be pursued for several years.

#### Environmental Issues

Concern with the ever increasing emphasis on environmental compliance and cleanup is a top issue for the P&F Council. Environmental issues have an impact on several functional areas in AIA: legal, facilities and property, procurement techniques, and cost principles.

The Facilities and Property Committee views the abandonment of hazardous government property as the principal issue facing the property community. A regulation proposed by the Defense Acquisition Regulatory (DAR) Council

provides that the government may not abandon any hazardous property without the written consent of the contractor.

Another critical issue involves a proposed revision to the cost principles that would allow a contractor to recover a portion of its environmental cleanup costs, provided the contractor did not violate then-current environmental laws or regulations and had taken steps to minimize any environmental damage.

The legal ramifications of almost any policy or decision on environmental matters is of continuing concern to the Legal Committee.

#### Amicus Briefs

AIA receives requests with increasing frequency from litigants seeking its participation in cases as an amicus curiae. The extent of involvement ranges from lending AIA's name to a brief, prepared at minimal cost to AIA, to full responsibility for preparing the brief, which must be paid as an unbudgeted expense. These requests raise issues of 1) the tactical wisdom of AIA participation in a given case, 2) the preparation and content of AIA's brief, and 3) the cost. Guidelines for AIA involvement in amicus curiae briefs were initiated by the Legal Committee, finalized by AIA General Counsel, and adopted by the BoG.

The following criteria govern AIA's participation:

- AIA should limit its participation as amicus to cases in which a majority of its membership has a direct and important

interest and in which AIA's position offers a special, although not necessarily unique, perspective.

- Cases having wide geographical application, significant precedential effect, and at least a reasonable prospect of a favorable result should be favored.
- The cost of AIA participation as an amicus curiae can be significant and will be considered, but not decisive, in determining whether AIA will participate in a given case.

#### Defense Management Report (DMR) Regulatory Review

The 1991 edition of the *Defense Federal Acquisition Regulation Supplement* (DFARS) was developed under the DMR to produce a shorter and more easily understood regulation. A Council of Defense and Space Industry Associations (CODSIA) DMR Regulatory Relief Task Force commented extensively on draft segments of the rewrite.

The revised DFARS eliminates much unnecessary text and a number of clauses. Some retained material was transferred to the *Federal Acquisition Regulation* (FAR) or to other DoD directives. DoD also eliminated or modified various thresholds, certifications, approval levels, and other regulatory burdens. AIA views all of this as an important first step.

On a second track after the DFARS rewrite, a CODSIA group, led by AIA, met with the director of defense procurement's staff and pressed for timely consideration of approximately 100 recommendations for policy changes in





### The 1990s

Designed to "gain and maintain the air superiority advantage," the Air Force F-22 Advanced Tactical Fighter (pictured) is representative of the high-performance developmental and operational combat aircraft for the 1990s and beyond. Despite sharply lower appropriations, the Department of Defense continues a strong R&D effort to provide new aeronautical and missile technology for the smaller but highly effective defense force planned for tomorrow. In civil aviation, U.S. manufacturers are similarly developing new jetliners and a wide range of associated technology to assure continued U.S. leadership.

DoD procurement. Staff review of these has been substantially completed, but final disposition is still pending.

### Development Contracts with Fixed-Priced or Not-to-Exceed Ceilings on Production Options

Notwithstanding the DoD policy against use of fixed-price contracts for R&D, many firms were being asked to respond to Requests for Proposals (RFPs) calling for cost-type Engineering and Manufacturing Development (EMD) but with fixed-price or capped (Not-to-Exceed) production options.

AIA wrote to the under secretary of defense for acquisition and to the Service Acquisition Executives (SAEs) in February 1991 to express concern about such practices and followed up with a letter to the director of defense procurement noting that it is impossible to envision any situation in which the use of such production options is appropriate while the hardware is still undergoing development. AIA recommended specific prohibitions against these practices.

In June 1991, DoD replied that requiring initial production options in EMD is "an appropriate technique in certain limited circumstances..." AIA is concerned that such overly flexible DoD guidelines lead to a disparity of service-level approaches to development contracting, such as the Navy's recently issued "Competitive Phased Pricing" memorandum on the use of options for the procurement of initial production requirements.

The dialogue with DoD on this subject continues. AIA is calling for a clear, consistent message on these matters in order to avoid the acquisition aberrations of the past.

### Tax Policy & Long-Term Contract Accounting

The last trace of the Completed Contract Method (CCM) of accounting for long-term contracts was eliminated in the Omnibus Budget Reconciliation Act of 1989. Companies with long-term contracts must now report income for tax purposes based on the cost-to-cost Percentage of Completion Method (PCM). Under PCM companies must report as income a proportionate amount of progress payments received even though these payments do not cover all the actual costs incurred. The result is the taxing of income before it is realized.

After the loss of CCM, a dozen AIA member companies with significant interest in this matter sponsored a study on the economic aspects associated with taxing long-term contracts. The study concludes that PCM is unfair and recommends adopting the Capitalization-Imputation Method (CIM) to more properly measure income by recognizing the time value of money and other costs that PCM fails to recognize.

The Treasury Department concurs with the study's conclusions. However, the legislative climate is such that any industry tax relief proposal must be revenue neutral. The following revisions to PCM are being considered as a possible

alternative: 1) drop the requirement that a contract for "unique" items must be accounted for as long-term, 2) provide a 24-month, rather than 12-month, performance period in defining long-term contracts, and 3) increase the percentage under the "cliff rule," which currently provides that no income need be reported until 10% of the contract costs have been incurred. This would narrow the definition of a long-term contract and minimize the use of PCM.

### Rights in Technical Data

One of the most frustrating issues that continues to evade resolution after more than six years is a fair and workable regulation on rights in technical data.

Allegations of overpriced spare parts in the early 1980s gave rise to congressional concern that the lack of rights in technical data was an impediment to competitive procurement. In the Defense Procurement Improvement Act of 1984 (P.L. 98-525), Congress directed DoD to provide regulations on rights in technical data but stressed that such regulations should balance the interests of both the government and industry, depending on who funded the development of the data. The overreach in several DoD-proposed regulations over the next three years drew strong criticism from both industry and Congress, and Congress amended the statute four times to clarify its intent.

Following issuance in October 1988 of the current interim rule, which industry found objectionable, the AIA BoG established an ad hoc committee of





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corporate executives, chaired by Arthur E. Wegner, executive vice president, United Technologies Corporation, and president, Aerospace/Defense, to pursue industry's concerns with the deputy secretary of defense and the under secretary of defense for acquisition.

AIA then took the lead in early 1990 to form a multi-association group, also chaired by Wegner, to coordinate the diverse views of several industry sectors and make recommendations. The coordinating group includes the National Tooling & Machining Association and the Proprietary Industries Association in addition to AIA. A working group with participation from four additional trade associations supports the coordinating group.

In April 1990, the coordinating group presented a set of policy principles upon which to base a regulation to DoD's director of defense procurement. Several meetings between industry and a multi-agency government team to gain agreement on the principles evoked some beneficial exchanges but little progress. In October 1990, DoD, the General Services Administration, and NASA issued a proposed FAR rule, which had been developed without industry input, and scheduled six public hearings. While the proposed FAR was some improvement over the interim DoD rule with respect to the allocation of rights, the primary objective still appeared to be to acquire technical data for competitive procurement with rights in that data being, at most, a secondary objective.

At this point, industry decided to develop an alternative regulation to translate the April 1990 policy principles into regulatory language. The industry proposal was submitted to DoD and signed by seven trade associations on January 31, 1991.

The industry alternative is premised on the belief that the originator of technical information (data) is the owner of that information and that rights are controlled by the owner. This is in accord with intellectual property law and in compliance with existing statutes on rights in data and competition.

The proposal provides for the government's needs in several ways: 1) a limited rights license in deliverable technical information for internal government purposes, 2) the opportunity to elect greater rights where the deliverable technical data is government funded, 3) government purpose rights where the contractor expresses the intent to commercialize the technical information, and 4) where the government needs greater rights, the ability to negotiate for such rights. To enhance timely access to deliverable technical information that the government has a right to use for procurement purposes, industry's proposal recommends that the government contract with the originator/developer to be a repository for such information. Finally, it provides language on the treatment of rights in technical information for commercial products

and separate coverage for technical information related to computer software.

While the industry proposal is complex, it enhances the protection of property rights. However, DoD would not accept it and proceeded to develop a new regulation. Industry, concerned that its issues could not be satisfactorily resolved administratively, prevailed upon the Senate Armed Services Committee to include a provision, Section 834 in the DoD FY 1992 Authorization Act, establishing a federal advisory committee on rights in technical data with a final rule to be issued June 1, 1992. AIA is optimistic that this turn of events will soon lead to the long-sought balanced regulation.

### **Cost Accounting Standards (CAS) Board Issues**

Since June 1991, the CAS Board has issued four staff discussion papers of interest to AIA: 1) "Accounting for Unfunded Pension Costs," 2) "Revised Thresholds for Cost Accounting Standards Coverage," 3) "Accounting for Fully-Funded Defined Benefit Pension Plans," and 4) "Recognition and Pricing of Changing Capital Asset Values Resulting from Mergers and Business Combinations by Government Contractors." AIA studied these papers and provided comments on all of them to the CAS Board.

The CAS Board issued a proposed rule recodifying the CAS into Part 99 of the Code of Federal Regulations (CFR) on June 12, 1991. AIA provided comments on August 23, 1991, noting that the





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Northrop Corporation  
Chairman, Procurement  
Techniques Committee

proposed recodification contained numerous errors and extensive substantial changes that should be subject to the full rulemaking promulgation process. The CAS Board's response was still outstanding at year-end.

Arthur H. Lowell, the CAS Board member representing industry, announced his retirement from the board effective when his initial two-year appointment expires in May 1992. AIA is working with the National Security Industrial Association and the Financial Executives Institute to develop a list of candidates.

#### **Post-Retirement Benefits (PRBs) Other Than Pensions**

Accounting for costs associated with employee PRBs other than pensions has been a continuing major financial issue for AIA.

In December 1990, the Financial Accounting Standards Board (FASB) issued FAS 106, which requires companies to recognize retiree health and other PRB costs on their books during the employees' active working lives. Such costs were previously recognized on a "pay-as-you-go" basis as costs were incurred. However, many industry accountants believe that a company's financial statements should reflect the future liabilities represented by PRBs.

FAS 106 is effective for a company's first fiscal year beginning after December 15, 1992. A company may then either take an immediate charge in the current year for PRB costs attributable to employees' past

service or amortize such costs over the remaining service of those employees.

As a result of FAS 106, the government has issued two rules on PRB costs. The first requires that contractor accruals of PRB costs must be funded to be allowable. AIA has maintained throughout the promulgation process of this rule that it is severely deficient and violates good (accrual) accounting practice. It is based on the erroneous premise that good accounting would result in an unfair cash advantage to contractors. To the contrary, the FAR rule could preclude contractors from recovering legitimate contract costs.

The second rule would limit the allowable amount of a company's PRB costs for any fiscal year to the amount that would be assigned to that year using the amortization method described in FAS 106. This would require companies who elect the one-time charge method for accounting purposes to use the amortization method for recovering PRB costs associated with government contracts. AIA provided comments to the FAR Secretariat in October 1991 on this interim FAR rule.

AIA has also written to the chairman of the CAS Board, concerning both of these FAR rules. It is AIA's opinion that both rules deal with a topic—the allocation of cost to the proper accounting period—that is governed by the CAS Board and not the regulatory councils of the government. As a result

of AIA's correspondence, the cost accounting treatment of PRB costs has been placed on the CAS Board's agenda.

#### **What's Ahead?**

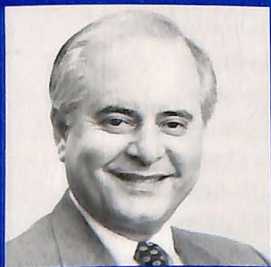
It is clear from the above issues in varying stages of resolution that there is plenty to do. In addition, environmental concerns will become more important and will significantly affect the cost of future programs. At the same time, the defense budget is coming down and any non-value added costs that can be eliminated will enable DoD to stretch its procurement dollars. These will be added, if not overriding, considerations as we continue to try to streamline and simplify the acquisition process.

This is a long-term effort, and progress may be not only slow but also very difficult to measure. However, there is room for optimism because of the widespread concern in Congress, the executive branch, and industry. The Defense Acquisition Law Advisory Panel, set up under Section 800 of the FY 1991 DoD Acquisition Bill and sponsored by Senator Jeff Bingaman (D-NM), is engaged in a Herculean overhaul effort. If the panel succeeds, industry may be on the threshold of a major breakthrough in early 1993 when the panel's legislative proposal goes to Congress.



## TECHNICAL AND OPERATIONS

*Technical and Operations Council focuses on all aspects of technological, operations, and engineering efforts to advance all aspects of program management, industrial base, engineering, development, test, manufacturing, quality, materiel management, product support, and information to better address issues stemming from the production of aircraft, missiles, and space vehicles.*



*Stan Siegel  
Vice President  
Technical and Operations*

### **Key Technologies for the Year 2000**

Approximately 300 people attended the NCAT/AIAA symposium "Technology Policy for Global Competitiveness" held in Washington, D.C., on September 5-6, 1991. In addition to the progress made through the symposium, the AIA Key Technologies Committee is working to complete the strategic plans that, with the exception of Software, Computational Science, Superconductivity, and Advanced Metallic Structures, should be finalized in early 1992.

The strategic plans are the first step in incorporating technologies into products. Implementation will require some form of technology demonstration that uses the technology plus related process and manufacturing technology in a product upgrade or a new product prototype. Demonstrations would show that risk had been reduced to an acceptable level and that technology transition occurred.

The Aerospace Technology Policy Forum, which met three times in 1991, continually reviews the technologies and also participated in discussions related to demonstrations. The Policy Forum supports the demonstration effort.

As in 1990, AIA, the Electronic Industries Association (EIA), and the National Security Industrial Association (NSIA) are participating in a review of the DoD Critical Technologies Plan. A report on a joint workshop held in October on the five common NCAT and DoD technologies (Advanced Composites, Airbreathing Propulsion, Advanced

Sensors, Optical Information Processing, and Superconductivity) will be given to DoD for use in the 1992 DoD plan.

### **Contractor Performance Assessment Review (CPAR)**

In July 1991, the Air Force Systems Command (AFSC) briefed a new initiative, CPAR for Subcontractors, to a Tri-Association Group (AIA, EIA, NSIA) of contracts and materiel company representatives. In the new initiative, AFSC evaluates the performance of a critical subcontractor on a weapon system acquisition and uses this evaluation in future source selections where the subcontractor is either included in a prime contractor proposal or bids as a prime contractor on a new weapon system.

Draft comments developed by AIA and reviewed by EIA and NSIA were extremely critical of this initiative because it would undermine the legal and ethical contractor-subcontractor relationship from source selection to contract completion. Final comments were transmitted to AFSC in September, and it now appears the initiative will not be implemented.

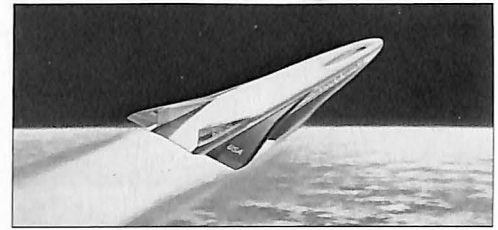
### **Best Value Subcontractor Rating Systems**

Industry CEOs met with the AFSC in 1990 on best value subcontractor rating systems. As a result, the AFSC began an initiative to obtain DoD's acceptance of rating systems that consider quality, schedule, and performance as well as price. A policy letter from the under secretary of defense for acquisition



## The 1990s

The early years of the century's last decade witnessed two major new space thrusts: the start of a new round of advanced planetary exploration and the first operations of a family of "Great Observatories" for comprehensive examination of phenomena in the universe. NASA is also conducting the National Aero-Space Plane (pictured) program to develop the technology for more efficient access to space, Space Station Freedom, which will advance space technologies across a very broad spectrum, the Mission to Planet Earth, a quest for understanding of global change, and the Space Exploration Initiative, which seeks to extend human presence beyond Earth orbit. These and other planned advances will assure continuance of U.S. space leadership into the 21st century.



(USDA) and a change in the *Defense Federal Acquisition Regulation (DFAR)* will be required.

As a result of a meeting between AIA, AFSC, and the Defense Contract Management Command, AIA provided AFSC with documented instances where use of these rating systems had been questioned during contractor purchasing systems reviews. AIA discussed this issue with senior DoD officials and transmitted a Tri-Association request to the USDA for a policy letter advocating the use of best value rating systems for subcontractors.

### **Small Disadvantaged Business (SDB) Development**

In May, senior socioeconomic executives from AIA member companies evaluated recommendations in the *Strategies for Increasing Awards to SDBs*, prepared by the School of Business and Industry, Florida A&M, and Harbridge House. Congressional staff responded positively to AIA's evaluation and supported a "best practices" conference on SDB development and subcontracting conducted by AIA on December 12, 1991.

In June 1991, DoD published interim policy and regulations implementing the Mentor-Protege Pilot Program legislation. Representatives from DoD and the Council of Defense and Space Industry Associations (CODSIA) were concerned, first, that the policy and regulations did not address procedures for direct reimbursement by DoD to mentor companies and, second, that credit against

their SDB subcontracting goals provided little incentive for mentors to develop agreements with proteges (SDBs) inasmuch as all cost for the assistance would be deducted from profit.

Roundtable discussions involving AIA, DoD, SDBs, and the legislation's author Senator Sam Nunn (D-GA) prompted an AIA letter to Senator Nunn that led to positive results for industry. In the FY 1992-93 Defense Authorization, Congress directed \$30 million each year to the Mentor-Protege program, allowed mentors to be reimbursed through overhead for indirect assistance costs for credit only mentor-protege agreements, and required DoD to contract directly with mentors for assistance costs incurred in reimbursement only mentor-protege agreements.

### **Industrial Modernization**

In May 1991, the final results of an AFSC Process Action Team (PAT) on the Industrial Modernization Incentives Program (IMIP) was presented and approved for implementation by the AFSC commander.

Implementation will totally streamline the IMIP process and reduce the time from eight to three years from initiation to completion of an IMIP. The final report of the AFSC PAT highly praised AIA Industrial Modernization Committee (IMC) members for their participation as co-chairmen and members of the PAT committees and oversight group. The members of the IMC are again co-chairing and participating directly on

committees to write the implementation guidance for AFSC PAT results.

### **Manufacturing Committee (MC)**

The MC developed priority areas in manufacturing: 1) concurrent engineering (CE), 2) environmental issues, 3) interface with the government on industrial base issues, 4) key/critical technologies support, 5) review of specifications and standards, 6) personnel training and education, and 7) industrial competitiveness.

The committee made progress in six of those areas in 1991: 1) MC conference on CE implementation, 2) MC conference on sharing of manufacturing environmental solutions, 3) manufacturing issues development for interface/discussions with government manufacturing-oriented officials on industrial base issues, 4) participation in the key/DoD critical technologies process, 5) projects on reviews of specifications and standards, and 6) sharing "best practices" on training and education programs among member companies.

### **International Quality Standards**

The Quality Assurance Committee worked with DoD on reconciling international standards (ISO 9000 series) for quality with current military standards. Certification can be a requirement under the ISO program, and because there is no internationally recognized U.S. certifying organization, this poses a potential trade barrier.

While DoD is reluctant to adopt the international standards, the committee is





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developing a transition document and changes to the DFARS to coordinate these regulations with the ISO language.

### **Exemplary Facilities Program**

The DoD Exemplary Facilities (EF) Program will establish guidelines to measure contractor performance. The Quality Assurance and Procurement Techniques Committees have met with DoD representatives to develop an acceptable regulation.

While industry views the EF concept as a positive attempt to stimulate and reward performance improvement, the draft regulation may be redundant to existing programs and may duplicate rather than eliminate existing oversight functions. Furthermore, the original draft regulation, which contained industry viewpoints, was not approved by all the military services, and a second revision contains extensive use of unacceptable metrics. A further review by the military services and industry will be scheduled before the document is placed in the *Federal Register* for public comment.

### **In-Plant Quality Evaluation Program (IQUE)**

The Defense Logistics Agency (DLA) IQUE initiative focuses on manufacturing process control techniques and reduced government quality assurance oversight. As a program that measures process quality in lieu of product inspection, it has been endorsed by industry and is being implemented in contractor facilities.

Industry is concerned, however, about what measures will be taken to blend the IQUE program into the overall DoD Exemplary Facility Program. The Quality Assurance Committee will address these concerns in future meetings with DLA and in comment to DoD on the draft EF regulation.

### **Electronic Standards Development**

The Information Technology Committee completed an extensive survey to develop a prioritized listing of electronic standards critical to ongoing or future industry programs and where industry can influence the technical content to its benefit. The summarized results will be reviewed with the National Institute of Standards and Technology (NIST), DoD, and standards organizations to accelerate the development or revision of the key standards. This initiative will be coordinated with the joint DoD and Commerce Department National Initiative for Product Data Exchange, an initiative to harmonize U.S. and international data standards.

### **Contractor Integrated Technical Information Services (CITIS)**

The Information Technology, Procurement Techniques, and Technical Management committees submitted joint comments to the DoD/CALS (Computer-aided Acquisition and Logistics Support) Program Office on the proposed CITIS specification. CITIS objectives include automating government repositories for technical data, access to contractor data bases, both technical and business, and

the use of digital formats throughout the acquisition process.

A concern of industry is the extent to which government will be able to access proprietary data under the proposed specification. Industry has urged DoD to simplify or withdraw the document specification and to develop a handbook to guide industry in meeting any CITIS requirements. AIA is developing the cost algorithms and methodologies for the various levels of CITIS access to determine the potential cost impact for complying with the specification.

### **Government Open Systems Interconnection Protocol (GOSIP)**

At year-end, the Information Technology Committee was in the final stages of a review of procedures to demonstrate production operability for technologies required to support the GOSIP initiative. The use of GOSIP protocols can be a government requirement. Results of the demonstration will be used in discussions with NIST as it tests open electronic systems and in the development of the industry network interconnections needed for teaming arrangements and to meet contractual requirements.

### **Product Support**

The AIA Product Support Committee and its Spare Parts and Service Publications working committees worked with DoD in 1991 to streamline and improve the logistics process and its automated standard systems. Besides the major activities described below, ongoing projects include support equipment





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Committee



Richard McClellan  
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acquisition, spare parts data, simplified English, simplified graphics, and hazardous material warning definitions.

### **Provisioning Process Action Team**

AIA is the industry lead on a joint DoD/multi-association (AIA, EIA, NSIA, CALS Industry Steering Group) team charged with improving the DoD provisioning process in the changing defense environment. Major results to date include merging the provisioning standard (MIL-STD-1561) with the Logistics Support Analysis Record (LSAR) standard (MIL-STD-1388 series), and initiation of provisioning quality measures and training surveys to identify needed process changes.

### **Role of Contractors in a Contingency**

AIA drew on the experiences of AIA member companies in Desert Shield/Desert Storm to advise the U.S. Army on the role of contractors in a contingency. In a letter briefed to the deputy assistant secretary of the army for procurement on November 15, 1991, AIA called for integrating contractor requirements into the military logistics system and increased joint contingency, requirements, and procurement planning.

### **Logistics Implications of Concurrent Engineering**

The Product Support Committee completed a white paper on how concurrent engineering would affect logistics planning and execution. The paper was given to AIA's Technical and Operations Council Ad Hoc Concurrent

Engineering Committee and will be forwarded to DoD in January 1992.

### **Logistics Applications of CALS**

The Product Support Committee worked with the CALS ISG and DoD to establish guidance and standards for logistics operations in a digital environment. The main emphasis was to ensure that industry positions reflect the corporate views of AIA member companies and not just those of individuals working within the industry. The most significant efforts underway are:

**Provisioning:** Integration of provisioning requirements (MIL-STD-1561) into LSAR standards (MIL-STD-1388 series).

**LSAR/IETM:** Joint industry/U.S. Air Force team addressing use of the LSAR as a source for the Interactive Electronic Technical Manuals (IETM) data authoring process.

**MIL-STD-28000 Series:** Input to standards dictating digital representation requirements for product data and illustration.

**IETM Specifications:** Development of draft specifications for Interactive Electronic Technical Manual data bases, electronic display systems, and quality assurance provisions.

### **Logistics Lessons Learned—Desert Shield/Desert Storm**

The Product Support Committee collected "lessons learned" from contractor support of aerospace equipment in Desert Shield/Desert Storm. Data is archived at AIA and will

be pursued as appropriate with DoD. No formal AIA report was issued.

### **MIL-STD-499, Systems Engineering**

MIL-STD-499 defines the scope and requirements of the system engineering efforts required to transform identified needs into an effective, affordable weapon system. The revised document is a direct flow down of policy requirements specified in Part VI, Systems Engineering, DODI 5000.2, Defense Acquisition Management Policies and Procedures. Industry joined a DoD working group to assure that all relevant acquisition streamlining policies are incorporated into the standard and that all "how-to" requirements are deleted from previous versions of the standard.

Industry also advocated incorporating a statement in Section 4 of the standard that would require development of a System Engineering Management Plan (SEMP). SEMP would be tailored to the contractor's view of the program and upon contract award would be the controlling contract system engineering document.

### **MIL-STD-973, Configuration Management (CM)**

MIL-STD-973, which is intended to be the principal DoD standard for CM, consolidates CM requirements scattered throughout several documents. It contains material now in MIL-STD-1521, MIL-STD 499, and DOD-STD-2167A and identifies the needs of the entire configuration management community, both hardware and software.





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Chairman, Product  
Support Committee



Mique Talcott  
Rockwell International  
Corporation  
Chairman, Electronic  
Systems Committee



Lawrence M. Walsh  
McDonnell Douglas  
Corporation  
Chairman, National  
Aerospace Standards  
Committee



C.E. "Ted" Walter  
Martin Marietta  
Corporation  
Chairman, Service  
Publications Committee

Industry's initial review found the standard to be flawed because it does not adequately address the requirements for electronic interchange of configuration management data. It inappropriately attempts to use configuration management to acquire technical data for provisioning, procurement, and follow-on acquisitions—requirements that should be addressed in a technical data package or the contract.

The Technical Management Committee (TMC) participated in several disposition meetings and is working with DoD to resolve the numerous comments provided by industry and the military services.

#### **MIL-T-31000, Technical Data Packages**

MIL-T-31000 prescribes the requirements for preparing data packages that can be used in development, procurement, production, and maintenance phases of a system life cycle. The proposed document is so onerous it could cause a significant increase in program cost, as much as seven times greater according to one estimate. Another concern is that the procedure for calling out data requirements could be interpreted to give the government approval authority on the selection of subcontractors.

In a joint meeting between industry and government, industry, for the first time, convinced the government that the proposed specification would have a major adverse impact on the orderly and reasonable acquisition of systems.

#### **Review of MIL-STD-100E, Engineering Drawings**

Industry began working with the Army Research and Development Command in 1990 to develop an engineering drawing standard. AIA participated in three meetings of a Drawing Practices Group to resolve the outstanding issues. After a final specification review in late summer, the standard was released for publication on September 30, 1991. AIA was commended for its efforts.

#### **Benchmarking in the Aerospace Industry**

Several AIA member companies believe there is value in the benchmarking strategy. Fifty-seven divisions of leading aerospace companies have already participated in a *Purchasing Performance Benchmark* study.

The Materiel Management Committee, working through the Center for Advanced Purchasing Studies, developed a survey to define benchmarking criteria in the purchasing function. The results of the study have been widely distributed and allow a company to judge its effectiveness in performance by comparison to an overall industry standard. The benchmark concept might also be possible in other functional areas, design for example.

The TMC met with a representative from the American Productivity Center to better understand the process, to assess the TMC's role in initiating the process, and to develop a viable approach to achieving effective design benchmarking.

#### **Subsidiary Specifications**

AIA member companies are concerned about how to incorporate the latest issue of specifications into the production of systems without being declared in nonconformance with the contract. Strict interpretation of a contract could mean that if the latest issue of a specification were used versus that called out in the contract, the specification could be classified as product substitution. Current industry practice is to advance to the latest issue of a specification. There remains, however, a worry that at some future time a legal claim against the manufacturer could be introduced.

A change to the Federal Acquisition Regulation (FAR) has been submitted seeking authorization for automatic advancement to DoD-approved and listed standards and specifications. Unless expressly prohibited, the proposed wording would permit the use of any earlier or later revisions to the specifications or standards.

#### **DoD Standards for Software**

Through the Embedded Computer Software Committee, AIA took the following actions in the area of software standards:

- MIL-STD-2168A, Software Quality Management Program: Established a CODSIA case to communicate industry concerns on the draft revision of the standard, such as removal of exclusions for nondeliverable software, specification of company organization for evaluating compliance with quality plans, and potential conflicts with MIL-STD-2167.



- **Mil-HDBK-WBS.SW on Work Breakdown Structure for Software Elements:** Established a project to review the draft of this proposed handbook, which defines a work breakdown structure for software cost collection. AIA member companies are concerned that the document requires cost reporting at too low a level. They also questioned the need for the document and whether it could become applicable to contracts.
- **Air Force Software Management Plan:** Industry and government representatives joined in three critical process teams to develop recommendations for improving the software acquisition process in three key areas: requirements, baselines, and program management.

#### **International Standardization**

ISO/TC 20, the international standardization committee for aerospace, completed its 31st plenary meeting in Sao Paolo, Brazil, in April. AIA serves as secretariat for the committee. The 13 member nations took several actions:

- Established a working group, headed by the United States, for standards on symbols for airline passenger information.
- Agreed to establish a new structure and work program of standards for space applications.
- Established harmonization mechanisms between international and European regional standards bodies.

Recognizing the potential impact of international standardization and certification issues on aerospace business, the Technical and Operations Council established an inter-council project to

assess the impact and to recommend appropriate AIA actions. Concerns from both the civil and military sides of industry, including quality, trade, and materiel management, will be addressed.

The project group identified certification of quality systems to international standards as the primary immediate issue for industry. Of concern is potential added cost and multiple certifications, negotiation of mutual recognition with the European Community and other foreign systems, and potential conflict with current airworthiness requirements.

#### **Composite Materials Standardization**

The Materials and Structures Committee (MSC) addresses AIA's role in accelerating and enhancing composite materials standardization. The committee agreed that the AIA/MSC should support the Society of Automotive Engineering, Inc./Aerospace Materials Division in developing composite materials specification and the American Society of Testing and Materials in developing test procedures, provided that the Suppliers of Advanced Composite Materials Association and government representatives concur on the testing.

The committee also agreed to sponsor tri-service procurement design criteria and to continue to support small and narrowly defined collaborative ventures, such as Composite Materials Characterization, Inc. The MSC has also established a project on standardization of advanced composite materials.

#### **Maintenance of National Aerospace Standards (NAS)**

The National Aerospace Standards Committee (NASC) maintains and develops NAS for the aerospace industry. During 1991 the NASC developed 11 new standards, revised 120 standards, and inactivated 10 standards. Currently the committee has a large workload of 138 projects, but with the drawdown of AIA member company standardization resources, 45 of these projects are either on hold or had no activity during 1991.

#### **DoD Cancelling Military Documents**

In early 1991, the U.S. Navy, as part of the Defense Management Review of DoD specifications and standards, gave AIA a list of 741 documents proposed for cancellation or inactivation. After review, AIA communicated its concerns to NAVAIR.

At the May NASC meeting, the Navy briefed the committee on the status of its review: 326 cancellation notices, 135 change actions, and 290 additional documents scheduled for cancellation. A number of the cancelled military documents would be replaced by commercial grade documents. NASC believes that many of these documents are inadequate for aerospace applications and is looking for possible alternatives, such as rescinding the cancellation or developing NAS replacement standards.





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President  
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Executive Vice President  
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**Symposium Summary**

The National Center for Advanced Technologies (NCAT) supported AIA's Key Technologies for the Year 2000 program with a major policy symposium in Washington, D.C., in September 1991 titled "Technology Policy for Global Competitiveness, Forging a National Consensus for the 21st Century." An impressive list of speakers, panel chairmen, and panelists assembled before an audience of approximately 300. Eleven organizations joined in sponsoring the event, which received excellent press coverage.

The symposium achieved all of its objectives: 1) the NCAT strategy was endorsed, 2) the Key Technologies program received wide attention, 3) the contributions of AIA and NCAT in producing roadmaps and consensus strategic technology development plans were recognized, and 4) discussions provided guidelines for the next step in the process—technology feasibility demonstrations. The publicity and effectiveness of the symposium resulted in major new contacts outside the aerospace industry, another goal.

**Cooperative Efforts**

NCAT worked closely with the Department of Defense (DoD), the Office of Science and Technology Policy, the Commerce Department, and NASA in 1991. AIA, the Electronic Industries Association, and the National Security Industrial Association furnished comments on the DoD 1991 Critical Technology Plan, and a two-day workshop held in

mid-October provided additional DoD and industry dialogue on the five technologies common to the DoD and NCAT technology lists.

NCAT also volunteered three more technologies where plans are nearing completion. NASA is using the rocket propulsion and advanced composites development plans for their planning and will use plans for air-breathing propulsion, ultra-reliable electronic systems, advanced sensors, advanced metallic structures, and others as they become available.

The academic community is increasing their use of Key Technologies plans. The University of Alabama at Huntsville is using the rocket propulsion plan as the basis for their new Propulsion Research Center. The University of Texas, as a result of the NCAT-sponsored advanced composites symposium in December 1990, has sought NCAT's help to establish an aerospace advanced materials center in Austin, Texas.

As a result of the exposure and publicity generated by the policy symposium, other groups approached NCAT to explore future cooperative efforts. In particular, one or two of the national laboratories under the Energy Department are interested in building on NCAT's work. The center also suggested to the Council on Competitiveness that they lead a coalition to make the disparate groups working on competitiveness, technology, manufacturing, and companion areas more effective.

**The Next Step**

Roadmaps and strategic technology development plans will be largely complete by year-end 1992. The Key Technologies Committee, the AIA Technical and Operations Council, and the Aerospace Technology Policy Forum agreed that the next step in the Key Technologies program should be technology demonstrators. Comments from attendees to the policy forum also support this conclusion.

A workshop to define this step more fully will be held in February 1992. As it is now conceived, three or four demonstrators will combine several key technologies and prove them ready for product application. NCAT plans to continue working with government and academia to develop jointly a national program for technology development based on demonstrators or "fieldable prototypes," as DoD refers to them.



**AIA MEMBER COMPANIES—  
YEAR-END 1991**

Aerojet, A Segment of GenCorp  
Allied-Signal Aerospace Company  
Aluminum Company of America  
American Pacific Corporation  
Argo-Tech Corporation  
BASF Structural Materials, Inc.  
Bechtel National, Inc.  
Best Foam Fabricators, Inc.  
B.H. Aircraft Company, Inc.  
The Boeing Company  
Chrysler Technologies Corporation  
Coltec Industries Inc.  
    Chandler Evans  
    Menasco Aerosystems  
Dowty Aerospace Los Angeles  
E-Systems, Inc.  
Fairchild Corporation  
FMC Corporation  
GEC-Marconi Electronic Systems  
    Corporation  
General Dynamics Corporation  
General Electric Company  
General Motors Corporation  
    General Motors Hughes Electronics  
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    Hughes Aircraft Company  
    Allison Gas Turbine Division  
The BFGoodrich Company  
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    Engine and Fuel Systems  
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Harris Corporation  
Heath Tecna Aerospace Company  
HEICO Corporation  
Hercules Incorporated  
Hexcel Corporation  
Honeywell Inc.  
IBM Corporation  
    Federal Sector Division  
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Kaman Aerospace Corporation  
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Lord Corporation  
The LTV Corporation  
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Martin Marietta Corporation  
McDonnell Douglas Corporation  
Northrop Corporation  
Ontario Corporation  
Parker Hannifin Corporation  
Precision Castparts Corporation  
Raytheon Company  
Rockwell International Corporation  
Rohr, Inc.  
Smiths Industries Aerospace & Defense  
    Systems, Inc.  
Sundstrand Corporation  
Teledyne, Inc.  
    Teledyne Brown Engineering  
    Teledyne Controls  
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    Defense Systems & Electronics Group  
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TRW Inc.  
United Technologies Corporation  
    Aerospace/Defense:  
    Pratt & Whitney  
    Sikorsky  
    Hamilton Standard  
    Norden  
Westinghouse Electric Corporation  
    Electronic Systems Group  
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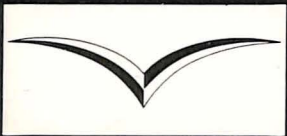
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